How private landowners use and value the native forest that they own

A report based on a sample survey conducted in South-East New South Wales

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SUMMARY

This report presents findings from a survey conducted in South-East New South Wales (SE NSW) examining the uses and values that private forest landowners have for native forest. The specific objectives of this study were to detail:

(a) the past uses landowners engaged in regarding their native forest;
(b) the future uses landowners were planning for their native forest;
(c) landowner's attitudes towards stewardship, ecological sensitivity, production, preservation and conservation of their forests; and,
(d) what environmental values landowners held.

Data were collected using a self-administered mail questionnaire sent to private forest landowners in the Bega Valley and Bombala Shires in SE NSW. The sample population of native forest landowners was developed using the rural ratepayer databases of the Bega Valley and Bombala Shire Councils overlayed with native forest cover on private land. The total number of private forest landowners identified was 1,758. Of these, 625 were mailed surveys in August-September 2001. The total response rate was 379 (60%), and the useable response rate was 317 (51%).

Non-response to the survey is difficult to assess, though a basic assessment has been conducted here. There is a good possibility that an appropriate cross section of the population has been sampled, however, the results should be read with care as it is possible the sample that replied to the survey was skewed towards those with views sympathetic to environmental issues. There is also a possibility the sample was skewed towards particular socio-demographics, in particular male respondents and highly educated respondents than occur in the wider private forest landowning population.

A variety of socio-demographic concepts relating to private forest landowners were measured in the survey; sex, age, education level, income, property/ forest size, length of property ownership and location of residence. A basic overview of the outcomes of these measures are given below.

- Sixty-three percent indicated they were male and 32% female; 5% of surveys were returned by people who completed the survey as a pair. The criteria for (self) selection as a respondent was not based on sex, so it is not surprising that females may have been under-sampled, especially as land management has traditionally been seen as a predominantly male activity in Australia.
- The average age of respondents was 53 years, with a standard deviation of 12 years. The median age of respondents was 52 years and this was well above the median age of Bega Valley and Bombala Shire respondents in the 2001 census. This is expected, as it reflects the general trend of ageing landowners across rural Australia.
- The survey population was highly educated compared to the population of the Bega Valley and Bombala Shires in the 2001 census. When the survey population was asked about the highest post-school qualification they have received, 28% reported holding a trade certificate or equivalent, 28% a diploma, 22% a degree, 18% a postgraduate qualification and 9% some form of other post-school qualification.

This result may reflect over-sampling of highly educated people in the population, but it is possible that it indicates a high level of education is actually held by many private forest landowners in SE NSW.

- The three most common uses of properties which contain native forest were, in order of frequency, (1) animal production, (2) recreation/relaxation and (3) residence. Other uses were mentioned much less frequently.
- The average length of ownership was 26 years with a standard deviation of 32 years. Almost 76% of landowners had owned their property for less than 26 years. Properties, it appears, are being turned over relatively rapidly, certainly well within the time it takes for a generation of native forest to grow to maturity.
- Many respondents (n = 137) chose not to disclose their income. Of those who did, 24% reporting having an annual household income of $20,000-39,999 in the financial year 2000, while 19% reported earning $40,000-59,999; 12% earned $60,000-79,999 and 19% earned over $80,000.
- The size of both property and forest owned varied considerably among respondents. Property sizes ranged from 3 to 4,600 hectares (ha), while forest sizes ranged from 2 to 1,012 ha[1]. Within this range the majority of landowners owned smaller properties, with the median property size being 47 ha with a median forest size of 30 ha. Three quarters of respondents owned properties between three and 196 ha in size and between two and 57 ha of forest. A small number of landowners owned the majority of both land and forest.
- Sixty-five percent of respondents had their primary residence on a rural property, while 16% lived in a capital city and another 6% in other cities with over 100,000 people. The remainder had their primary residences in towns or cities with a population of less than 100,000. Sixty nine percent of respondents lived within the Bega Valley or Bombala Shire Council zones and 39% outside these zones.

When asked what uses they had made of their native forests since the start of the year 2000[2], the three top responses, attracting 87 to 89% of 'yes' replies, were (1) 'seek solitude and/or privacy', (2) 'observing animals and/or plants', and (3) 'hiking and/or nature walking'. Many (65%) also 'take visitors into forest', and go 'camping or picnicking' (55%).

The most common property management use was 'harvest timber for on-property use', undertaken by 57% of respondents. Landowners who lived on rural properties were more likely to harvest timber for on-property use. 'Forest management activities to reduce fire risk' had been undertaken by 50% of respondents, while 45% had taken some action to 'control pests and/or diseases' and 39% had undertaken 'conservation activities'. Landowners living on rural properties were more likely to have undertaken conservation activities than those whose primary residence was in a city. More general 'forest management activities to alter forest quality' had been undertaken by 24% of landowners.

[1] Please note that before the survey was posted to potential respondents, the minimum for the size of both property and forest was set at 2 hectares.

[2] Respondents were asked to detail their uses from the beginning of 2000 up to the point that they had received the survey, which would have been, dependent on post, within the period of August-September 2001.

Privately owned native forest had been used for 'farming activities' by 41% of respondents since the start of 2000. Of these, landowners owning their property for a shorter time and with a larger area were more likely to be using their forest for farming activities.

Recreation activities that make direct use of the forest were undertaken by some respondents, with 36% reporting they 'drive and/or ride vehicle (off-road), 25% having gone 'hunted and/or fishing' and 21% had gone 'horse riding'.

Only 4% of respondents had gone to 'harvest timber for sale' on their property since the start of 2000.

Respondents were asked what activities they intended to undertake in their forests over the next ten years. Of the 63% who responded that they planned to undertake activities in their native forest over the next ten years, older landowners were more likely to be planning these activities.

The majority planned to both maintain and use the forest for its aesthetic, relaxation and recreational qualities. The most commonly planned activity was to 'maintain or improve forest for its natural beauty'. Landowners whose primary residence was in a city were more likely to be planning these types of activities than landowners who lived on a rural property.

However, a higher proportion of landowners intended to undertake property and conservation management activities than had undertaken them since the start of 2000. 'Maintain and/or improve forest to protect land/ water source/table'; to 'maintain or improve for conservation' and 'improve the quality (health) of your forest' were ranked 5th, 6th and 7th most important of 24 uses. 'Maintain or improve forest to enhance residential area' was ranked 8th as an important planned use, while 'maintain or improve forest in order to pass on through your will' was ranked 9th. The difference between the number of landowners who have undertaken these activities since 2000 and the higher number planning to undertake these activities in the next 10 years, may indicate landowners with intent, but being restricted by a past lack of resources, skills or time to undertake these activities.

Income generation and other earnings-related activities in general were ranked lowest of all types of uses, with the 14th ranked use being to 'maintain or develop the forest on the speculation that a future income can be drawn from the forest', the 22nd ranked response being to 'maintain or develop forest to supply regular income from timber sales' and the 23rd being to 'maintain or develop forest to supply regular income from sale of non-timber forest products'. Landowners with larger forests were more likely to be planning to use their forest for income or generation of other earnings.

Respondents were asked to rank a series of statements relating to particular types of values held for forests and the environment on a five-point scale[3], ranging from 'strongly agree' to 'strongly disagree'. A basic overview of these responses are given below.

[3] The particular type of scale used was a Likurt scale (see De Vellis 1991: 68-70).

- Private forest landowners have a high degree of ecological sensitivity, being aware of the impacts of their actions on the environmental health of their forest and the species in it.
- Private forest landowners have a strong sense of stewardship over their forest. Interestingly, 53% agree and 40% disagree that owners of native forest on private property should be able to do as they please with their forests, while 78% agreed and 12% disagreed that government should have a strong role in overseeing landowner use of their forest. The apparent contradiction between these results may indicate landowners believe they are able to take care of their own forests but that others need more oversight, although it is not possible to explain these results without further study.
- A minority of landowners had production oriented values in which their forests were primarily valued for income generation and timber production.
- A majority of landowners had preservation oriented values in which they believe their forests should be left to grow as nature intended and that they intend to preserve their native forest from timber harvesting.
- A majority of landowners agreed with the statement that, if carefully managed, privately owned native forest can provide products from the forest and conservation outcomes.
- When asked questions on their environmental values, landowners agreed strongly with eco-centric statements in which the environment is valued for its intrinsic worth. They agreed less strongly with utilitarian statements in which the environment is valued for the use and benefits it provides for humans. The majority disagreed with pro-development statements in which it is considered acceptable to exploit the environment in a possibly destructive way for economic gain.

The results for forest and environmental values indicate that eco-centric values are held by the majority of landowners. However, some of the results (particularly the high agreement with the statement that if managed carefully, native forest can both provide products and conservation outcomes) indicate that landowners can both hold eco-centric values and be willing to consider using their forests to obtain certain goods, such as the timber that 57% of respondents indicated they have harvested for on-property use since the start of 2000.

Overall, and un-surprisingly, the results of this study show both similarities and differences with other studies on the uses and values landowners hold for their privately owned forests. Most studies (of those reviewed herein) have found that owners of forests use and value them for their aesthetic, relaxation and recreational qualities. However, the proportion of landowners willing to consider harvesting timber for sale varies fairly widely between studies. For instance, one study in Victoria has found landowners willing to consider harvesting timber for sale while an Australian national survey of trees on farms found very few farmers plan to harvest trees for sale. The differences between regions and types of landowners, alongside differing research practices, needs further exploration.

RECOMMENDATIONS TO SE NSW PRIVATE FORESTRY

The results of this study suggest some directions for future extension programs for private forest landowners in SE NSW.

The study found a difference between the current and intended use of forests for property and conservation management activities. More private forest landowners are planning to undertake activities relating to fire risk reduction, control of pests and diseases and conservation activities, than have undertaken them since the start of 2000. Directing extension programs to educate landowners about their forest health and the types of activities that can be undertaken to improve forest quality and health would help landowners achieve their goals of protecting and improving forest quality. Improving awareness amongst those landowners who do not undertake these activities may also be needed to ensure private forests are being managed to sustain and improve their health wherever possible.

Similarly, extension programs could be designed to assist landowners who use their forests for farming activities. As 41% of landowners use their forests for this purpose, there is potential to assist landowners in undertaking these activities in as sustainable a manner as possible.

Extension should also be designed to target particular types of private forest landowners. A significant proportion of private forest landowners in SE NSW live in cities. These landowners were less likely to have undertaken conservation activities or to have harvested timber for on-property use, they were also more likely to primarily use their forest for recreation and relaxation activities. As landowners living on rural properties and landowners in cities appear to have different priorities for their forests and to undertake different forest uses, extension needs to be designed to target each group.

Similarly, some differences were noted between the use behaviour and use intentions of owners of large and small forests. Large forest owners were more likely to plan to use their forest for income generation and less likely to be undertaking conservation activities in their forest. Given the different priorities it seems appropriate to separately tailor extension practice for each of the two groups of landowners, based on larger and smaller forest ownership, as discussed further below.

Very few landowners plan to harvest their timber for sale. Given that the majority of landowners are willing to harvest or take timber for on-property use, the low importance of timber harvesting for sale is likely to relate to factors other than an unwillingness to harvest any products from the forest, although that may still be an important factor. Targeting extension towards the management of native forest to provide products that support the property in a sustainable manner is more likely to be successful and useful than attempting to assist landowners to harvest timber for sale.

The exception to this may be owners of large forest areas. A minority of landowners own the majority of forested land. It is these owners who appear most likely to plan to use their forest to generate income through activities such as sale of timber products. Since their plans may affect a large area of privately owned native forest, it may be appropriate to target extension to these owners to assist them in sustainable income generation from their privately owned native forests.

The majority of private forest owners own a relatively small area of forest. Extension programs need to be designed to assist landowners to undertake the types of activities that can be undertaken sustainably on relatively small forest blocks.

INTRODUCTION

Forests and Australian society

Native forests are an integral part of the Australian landscape, both biologically and culturally (see Groves 1994: 87-290; Lindenmayer and Franklin 1997: 53; Boutland 1988: 162; Jackson 1999: 118). In present day Australia, the role of native forests is strongly contested (Mercer 2000: 108; Young 2000: 76). Perhaps the best known example of this is the ongoing debate over the need for preservation of native forests versus their use for timber production (Dunlap 1999: 291). This debate is linked to the modern environmental[4] movement, which is itself part of a larger set of issues involving the ongoing and changing relationship between humans and nature (Hutton and Connors 1999: 2-4; Franklin 2002: 15).

Forests have been an important focus for the environmental movement (Goodin 1992: 182) and as a result environmentalism has had a significant effect on the way in which native forests are used (Dargavel 1995: 8-13). While a large part of the conflict over forest use and management has occurred over publicly-owned native forests, in recent years governments have increasingly developed an interest in regulating and influencing management of native forests on private property. This increased interest has highlighted the relative lack of research conducted in Australia on uses and values held for privately-owned native forests (Dargavel and Moloney 1998: 293). The research presented here contributes to building a better understanding of the uses and values held for these forests.

The South-East NSW Private Native Forest Management and Value Added Project

The funding for this research was provided by South-East New South Wales Private Forestry (SE NSW Private Forestry), a business entity primarily resourced by government and based in Bega, New South Wales. Funding for the project was directed through SE NSW Private Forestry's *South-East New South Wales Private Native Forest Management and Value Added Project*, which was in turn funded by the Commonwealth Government's Natural Heritage Trust. The project is under the general direction of the South-East New South Wales Regional Plantation Committee[5].

The South-East New South Wales Private Native Forest Management and Value Added Project has two main goals:

[4] After Peter Hay (2002: 1-4), the various terms used to refer to issues related to the environment, such as 'environmentalism', 'ecological or 'green', for instance, will be referred to in this report by the terms 'environmental' and 'environmentalism'.

[5] Regional Plantation Committees (RPCs), funded by the Commonwealth Government Farm Forestry Program, act to advance farm forestry and plantation forestry in Australia. RPCs bring together private individuals and groups, industry and government in order to promote a collaborative approach to the further development of the forestry sector (SE NSW Regional Plantation Committee n.d.).

1. "….to promote sustainable native forest management practices on private property"; and,

2. "….support the development of a value-added timber manufacturing industry to utilise this resource in the South-East of New South Wales" (Commonwealth Department of Agriculture, Fisheries and Forestry n.d.).

To help towards achieving these goals, information on the following three topics was required:

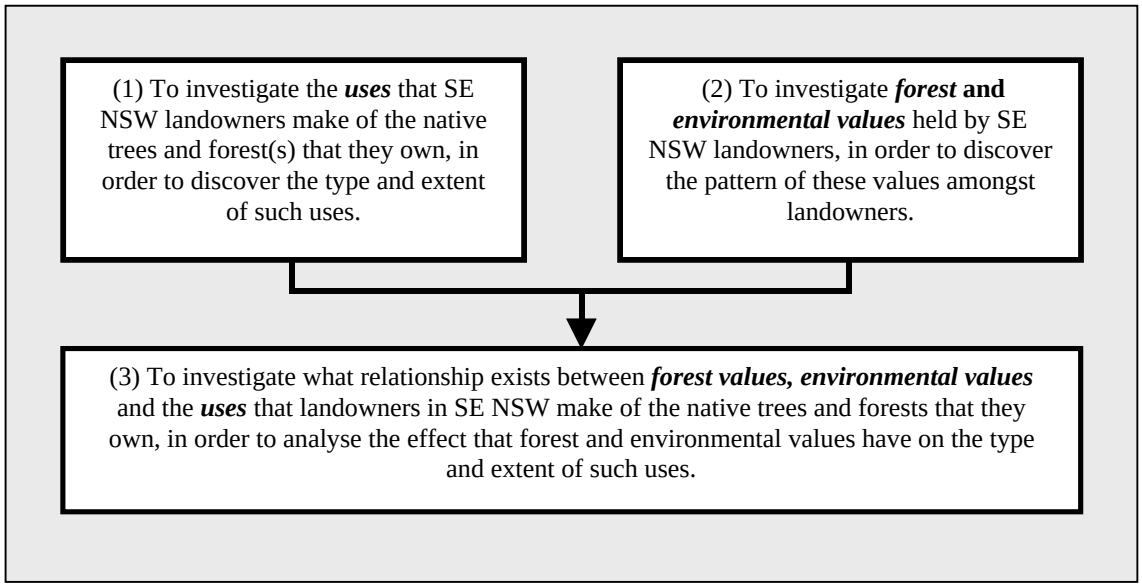
- the population of family (and individual) landowners who hold native forest in the South-East;
- the intentions of family (and individual) landowners regarding use of their native forest; and,
- the extent and form of native forest timber production, conservation and management across the South-East on private property.

OBJECTIVES OF THIS RESEARCH

Overall objectives

This research project investigated the effect that forest values, held by private forest landowners, have on the extent and type of uses these landowners are undertaking, or planning to undertake, in their native forests[6]. Figure 1 shows the objectives of the project.

Figure 1 Research objectives.



Objectives of this report

A subset of the project's research objectives are discussed in this report, in order to provide information useful to SE NSW Private Forestry in the design of its extension programs for landowners. The report presents results relating to the uses made and values held for native forests by SE NSW native forest landowners, but does not present results on the relationship between uses and values which will be reported on in the Masters thesis resulting from this research (see Deane in progress).

[6] Definitions for all these concepts; 'value', 'forest value', 'environmental value', 'private forest landowners', 'use', 'use behaviour', 'use intent' and 'native forest', can be found in Appendix 1.

METHODS

Introduction

An appropriate method of achieving the objectives of the research was to conduct a sample survey. Data were collected through a self-administered mail questionnaire (Dillman 1991) and subsequent analysed statistically. The survey was conducted between late August and early October 2001, in the Bega Valley Shire Council and Bombala Shire Council zones of New South Wales.

Underpinning the choice of survey and survey content was a series of theoretical insights drawn from the disciplines of social psychology and sociology[7]. The survey design followed four principles, as follows.

- The survey was designed to replicate other research overseas, enabling it to be compared with that research.
- The survey used theoretical perspectives that have had practical application within the last decade, with the assumption that this would incorporate the most recent understanding of peoples' behaviour and interactions.
- The survey used relatively easy to apply theoretical perspectives. With little previous Australian research on this topic and a resulting need to develop knowledge in a broader context[8], a simpler theoretical framework was preferable which involved less complexity in survey design and analysis.
- The survey collected and analysed data through a sample survey. This met SE NSW Private Forestry's needs to obtain data that could be generalised over a population of private forest landowners.

An extensive literature review was undertaken to develop a research design that met these criteria. The literature review is not described here, instead the resulting research design is outlined. The sections below describe development of the survey sample, design of the survey questions and response rates to the survey.

Survey sample design

When conducting a sample survey it is important to ensure that the sample adequately represents the target population. In this case, the goal was to sample the population of private forest landowners in SE NSW. To do this, a sampling frame for the survey (that is a list of all members of the relevant population from which the survey was to draw its sample) was created by combining three separate databases.

1. Bega Valley Shire Council and Bombala Shire Council rural ratepayer databases.

[7] This research sits in a post-positivist framework and is an example of a large '*n*', correlational, cross-section study.

[8] In other words, the lack of previous Australian research meant that it was more appropriate to measure broad concepts which allow a greater scope for investigation as compared to narrower concepts (for example, 'forest use intention' rather than particular 'type of silvicultural practice used').

2. Cadastre from the NSW Crown Land Identification Database covering the Bega Valley Shire Council and Bombala Shire Council zones. This identified the boundaries of each property under private ownership.
3. Aerial Photography Interpretation (API) database of native forest cover in the Eden and Southern Regional Forest Agreement areas (which cover the two council zones).

In order to identify an appropriate population to be sampled, these three databases were overlaid in a Geographical Information System (GIS). The rural ratepayer and cadastral databases were merged by using the common Lot/DP[9] identifier that occurs in both the cadastral and ratepayer databases. This allows individual privately owned properties to be selected for inclusion in the survey population. Native forest cover data were then overlaid. While the minimum size of forest that could be identified using the API data was 10 ha (New South Wales National Parks and Wildlife Service 1998: 2). A single 10+ hectare forest area identified using the API data, however, could be spread across several properties. This means that forests smaller than 10 ha could be identified in the GIS as belonging to individual properties. It was necessary to decide on a minimum size of forest that would be used to identify which properties were to be included in the sample frame and which could be excluded. It was decided that the minimum forest size would be two ha. This was considered an appropriate size in order to maximise the diversity of ownership practices surrounding native forest.

As a respondent could own more than one property (ie., one Lot/DP), all Lot/DP's with two or more examples of the same name were combined and included in the sample frame once only. Where two or more different names occurred for the same address (attached to a Lot/DP), one name was randomly removed. Respondents were removed from the list if they did not appear to be family landowners, ie., were a government department, Aboriginal corporation or major corporate entity. Some addresses had both personal and corporate names attached to a street or rural mail box address; these were assumed to be private landowners who had incorporated their business activities, and were included in the sample frame.

Ground-truthing was undertaken on a number of properties identified through the GIS process. When the ground-truthing was concluded, there was adequate confidence that a population of native forest owners had been successfully constructed. The sample frame generated from the GIS process gave a list of landowners and the total amount of forest that they owned.

The final sample frame had 1,758 potential respondents. Of these 1,457 potential respondents owned land in the Bega Valley Shire Council zone and 301 potential respondents owned land in the Bombala Shire Council zone. Most mailing addresses were located within the Bega Valley Shire Council zone and Bombala Shire Council zone. Significant numbers had addresses in the Australian Capital Territory, elsewhere in New South Wales or in Victoria. A small number of people had mailing addresses

[9] Lot/DP is an abbreviation of Lot/Section/Deposited Plan. This is the system used to register plans of freehold land at the (NSW) Land Titles Office. Essentially, each Lot/DP number is a unique number assigned to a single parcel of freehold land.

elsewhere in Australia and an even smaller number had overseas mailing addresses (primarily in the United States of America).

The total number of landowners from the sample frame that would be surveyed was capped at around 600 for financial and time reasons. A representative sample was created through stratified probability sampling (de Vaus 1991: 65), in which a particular proportion of specified groups is sampled (in this case the two Shires). This method was chosen as the population of Bega Valley Shire (approximately 30,000 in 2001) is considerably larger than the population of Bombala Shire Council zone (approximately 2,500 in 2001). This 10 to 1 difference was roughly maintained with the private forest landowner population (1,457 vs 301). If a random sample was taken from the sample population as a whole, then in all likelihood there would be very few landowners from the Bombala Shire (probably about 60 landowners would have been chosen). This would not have left any real possibility of obtaining a statistically useful response. Consequently, in order to make sure an effective response from Bombala Shire Council zone could be obtained, the Bombala sample was weighted. The result from the stratified probability sampling were that 625 potential respondents received survey questionnaires with 363 of the potential respondents having properties located in the Bega Valley Shire Council zone and 262 in the Bombala Shire Council zone.

Question design

Considerable time was spent designing both effective questions and the questionnaire. The survey questionnaire was tested with the help of three landowners in the South-East, who worked through the survey under controlled conditions. The questionnaire is reproduced in Appendix 2.

There were 16 main questions, divided into a series of sub-questions. The questions were primarily closed questions in which the respondent has to tick or circle one of a number of pre-determined answers, with a small number of open questions.

Filters, which 'filter out' respondents who should not be responding to particular questions (after Dillman 2000: 34-35), were extensively used, notably in Questions (1) through (4). Question (1) guided the potential respondent through determining if they should answer the rest of the questionnaire by assessing if the respondent was: (a) an owner/part owner of land with native forest in one of the two Shire Council zones; (b) if the native forest owned was equal to or greater than two ha in one patch/area; and, (c) if at least two ha of native forest was remnant or remaining native forest. The other filters in the questionnaire operated by directing respondents around or further into certain question sets. The minimum number of questions that could be completed was 44 with a maximum of 99.

An effort was made to reduce the complexity of the survey questions. The easiest and most effectively remembered questions were asked first, with a series of 'yes/no' questions on use behaviour. Questions became more complex from this point. Socio-demographic questions, which can lead to non-response if presented early in a survey, were asked last.

The questionnaire was split into five major sections.

1. How the landowner had used their forest (*use behaviour*).
2. If the landowner believed they were a manager and if so what management actions had been taken (*management behaviour*).
3. How the landowner planned to use their forest (*use intent*).
4. Whether the landowner agreed or disagreed with a presented list of values (*forest values I, forest values II, environmental values*).
5. Socio-demographic questions.

Use behaviour, management behaviour and use intent

Expert knowledge and local knowledge were drawn on to develop a list of 29 types of forest use, listed in Table 1, that were then used for the use behaviour (questionnaire Q2) and use intent questions (Q4) in the questionnaire.

Use behaviour (Q2) was measured using a series of 'yes/no' questions. Management behaviour (Q3) was measured using open-ended questions. Use intent (Q4) was measured using a Likurt scale, in which respondents were asked to assess 24 different uses as being of either 'nil', 'low', 'medium' or 'high importance' to them over the next 10 years.

Table 1 Types of native forest use presented in the questionnaire (Q2 and Q4).

1	Barter forest products [B and I].
2	Camping and/or picnicking [B and I].
3	Conservation activities [B]. Maintain or improve for conservation [I].
4	Control pests and/or diseases [B].
5	Drive and/or ride vehicle (off-road) [B and I].
6	Farm non-timber forest products for on-property use [B and I].
7	Farm non-timber forest products for sale [B]. Maintain or develop forest to supply regular income from sale of non-timber forest products [I].
8	Farming activities [B].
9	Forest management activities to alter forest quality [B]. Improve the quality (health) of your forest [I].
10	Forest management activities to reduce fire risk [B].
11	Harvest timber for on-property use [B and I].
12	Harvest timber for sale [B] Maintain or develop forest to supply regular income from timber sales [I].
13	Hiking and/or nature walking [B and I].
14	Horse riding [B and I].
15	Hunting and/or fishing (if waterway in forest) [B and I].
16	Maintain or develop forest as an asset to property value [I].
17	Maintain or develop forest on the speculation that a future income can be drawn from the forest [I].
18	Maintain or develop forest to provide employment opportunities for yourself or other family member [I].
19	Maintain or improve forest for its natural beauty [I].
20	Maintain or improve forest in order to pass on through your will [I].
21	Maintain or improve forest to enhance your residential area [I].
22	Maintain or improve forest to protect land/ water source/ table [I].
23	Observing plants and/or animals [B and I].
24	Photography and/or painting in (or of) the forest [B and I].
25	Planning to sell part or all of native forest in next ten years [I].
26	Protect part or all of forest by making a change to property title [I].
27	Seek solitude and/or privacy [B]. Maintain or improve forest for solitude and/or privacy [I].
28	Take paying customers into forest [B]. Maintain or develop forest as part of a broader business (ie., eco-tourism or holiday accommodation) [I].
29	Take visitors into forest [B].

KEY: Each item in the table is given a letter code which indicates which questions included that forest use. These codes equate to: [B] = use behaviour questions (questionnaire Q2.B, Q2.D); and, [I] = use intent (questionnaire Q4.B, Q4.D and Q4.F).

Forest and environmental values

Forest values (Q5 and Q6) were measured using two Likurt scales, in which respondents were asked to assess the importance, in total, of 12 forest values along five point scales (strongly agree, somewhat agree, neither agree or disagree, somewhat disagree or strongly disagree).

The 12 forest values used were identified through a review of literature on forest values, drawing particularly on research which has utilised typological constructs of stewardship and ecological sensitivity (Bliss *et al.* 1997; Rickenbach *et al.* 1998) and protection, production and conservation ethics (Bourke and Luloff 1994; Steel *et al.* 1994; Kangas & Niemeläinen 1996; Kuuluvainen, Karppinen & Ovaskainen 1996; Manning, Valliere & Minteer 1999; Brown & Reed 2000; McFarlane & Boxall 2000). The statements that respondents were asked to rank are shown in Tables 2 and 3.

Table 2 Statements respondents were asked to rank in the Forest Value I question set on stewardship and environmental sensitivity (Q5).

1	My land and forest are a part of a much bigger natural system.
2	What I do to my land and forest can affect others and their land.
3	Owners of native forest on private property should have the right to do as they please with their forests.
4	Individual plant and animal species are important to me.
5	It is my religious or spiritual duty to take care of my native forest.
6	Government should have a strong role in overseeing landowner use of their own native forest.
7	What I do to my land and forest will matter to future generations.

Table 3 Statements respondents were asked to rank in the Forest Values II question set on protection, production and conservation (Q6).

1	My native forest should be used to maximise income to my enterprise/ household.
2	My forest should be left to grow as nature intended.
3	My native forest should mainly be used to produce timber products.
4	If carefully managed, privately owned native forest can provide products from the forest and conservation outcomes.
5	I intend to preserve my native forest from timber harvesting.

Environmental values (Q7) were measured using one Likurt scale. Respondents were asked to assess the importance of 10 environmental values along five point scales ('strongly agree', 'somewhat agree', 'neither agree or disagree', 'somewhat disagree' or 'strongly disagree'). In an effort to make this research more robust, the question set for environmental value was taken directly from the work of Papadakis (2000)[10]. This question set is shown in Table 4.

Table 4 Statements respondents were asked to rank in the Environmental Values question set (Q7).

1	The greatest value of National Parks and nature reserves is in recreation activities such as bushwalking, camping, or just taking photographs.
2	Jobs are the most important thing in deciding how best to use our natural resources such as mineral deposits and forests.
3	Development should be allowed to proceed where environmental damage from activities such as mining is possible, but very unlikely.
4	It is very important to have places where native wildlife and plants are preserved, even if I never go there to actually see them.
5	In deciding how to use Australia's natural resources, it is more important to consider the needs of future generations than our own.
6	In deciding how to use our natural resources, such as mineral deposits and forests, the most important thing is the financial benefits for Australia.
7	National Parks should be preserved for their sheer natural beauty.
8	National Parks should be preserved for the pleasure they give to so many holiday makers.
9	I cherish nature and preserve it as one of the most precious things in life.
10	The great value of national parks is the opportunities they provide for people to enjoy nature.

Socio-demographic concepts measured

It is common for social surveys to investigate the socio-demographic make-up of a survey population. Vaske *et al.* (2001) directly studied the influence of socio-demographics on environmental value and found that certain socio-demographic concepts could be important explanatory devices in understanding forest management. The 16 socio-demographic concepts measured in the survey are given in Table 5.

[10] Taking a question set from the literature is a recommended and appropriate method, as such sets have already been tested to varying degrees and this increases the potential for robust measures of the concept/s under investigation.

Table 5 Socio-demographic concepts included in the questionnaire (Q8 through Q15).

1	Sex
2	Attendance at primary or secondary school
3	Age at which left primary or secondary school
4	Achievement of qualification/s beyond primary or secondary school
5	Highest qualification achieved after primary or secondary school
6	Age
7	Primary use/s of property
8	Years property(ies) have been in family ownership
9	Income
10	Total hectares of land owned
11	Total hectares of forest owned
12	Occupation
13	Dependence of livelihood on forest industry
14	Dependence of livelihood on environmental organisation or group
15	Location of primary residence in terms of built environment
16	Location of primary residence in terms of local or remote region

Data collection

The process used to encourage response to the survey, both during and after mailing of the questionnaire, was based upon a modified Tailored Design Method (Dillman 2000). The Tailored Design Method aims to use surveying procedures that;

> "….create respondent trust and perceptions of increased rewards and reduced costs for being a respondent, which take into account features of the survey situation and have as their goal the overall reduction of survey error" (Dillman 2000: 27).

Of the 625 surveys mailed out, 379 responses (60%) were received. Of these, 223 came from owners with holdings in the Bega Valley Shire Council zone and 145 from owners with holdings in the Bombala Shire Council zone. Eleven responses could not be identified in terms of shire location. The total number of useable responses was 317, which is an effective response rate of 51%. The 9% difference between number of responses received and number of responses useable was at least partly made up by potential respondents filtering themselves 'out' after a minor systemic error in part of the sample frame (which sent surveys to people who should not have been in the survey population). This and other types of non-response will be discussed below.

In examining response rates, factors which may have biased the response need to be examined. A variety of factors may have influenced the choice made by survey recipients about whether or not to complete the survey and return it.

The survey, due to its focus on determining sensitivity to environmentalism, was likely to experience some non-response from those who interpreted this as a bias towards environmentalism and disagreed with this perceived bias. In addition, during telephone and person-to-person conversations conducted as the survey was run, it became clear that a number of people were uncomfortable replying to the survey as they thought it was too 'green'. A number of other people felt the survey served vested interests in the timber industry and was essentially too 'brown'. In addition, some people also expressed concerns that the survey was an invasion of privacy, or felt the survey was operating as part of a government plan to determine who may be inappropriately utilising their forested land.

An accurate assessment of non-response was not conducted (due to time and cost), so it is difficult to assess the impact that the above issues have had on the survey, but the assessment of the primary author is that there is potentially a higher number of people responding to the survey who are environmentally sensitive than those who may be considered as pro-development.

There was a significant time delay (of ten months) between obtaining the Bega Valley database and the Bombala Shire Council database, as the application period for the databases covered the activation of the *New South Wales Privacy and Personal Information Act 1998* and presented a learning challenge for the primary author. This meant that some of the Bega Valley Shire Council database was out of date by the time the questionaries were mailed (3-5% turnover in population is probably a reasonable figure during this time period).

Fifty five per cent of those who owned land in the Bombala Shire Council zone responded to the survey, compared to 61% in the Bega Valley Shire Council zone. This slightly lower rate was not considered a concern, as it probably emerged from difficulties with the cadastral assessment used in building the survey population. About half the cadastre for the Bombala Shire Council zone was identified using topographic maps (between 20-30 years old) rather than digital cadastre, due to cost. The age of the maps and the fact they contain only partial Lot/DP data, made identification of ownership considerably less certain than for the electronic cadastre (GIS) component. This increased non-response from Bombala Shire Council zone due to incorrect selection of landowners for inclusion in the sample frame. This lower rate was not considered a serious concern.

Data analysis

The type of survey conducted here and its focus on concepts such as 'value' and 'use' that are theory-laden meant that inferential statistics were going to be required. This report though, presents only a partial analysis of the data set and a more in-depth analysis of the relationship between values of private forest owners and their use intent will be reported subsequently (see Deane in progress).

Here we report the summary statistics for the different questions in the questionnaire and the relationships between some of these questions (2.B, 3.A, 4.A, 4.B, 4.C, 4.E) and the socio-demographic data. These relationships were explored using either logistic regressions, when the socio-demographic data were continuous variables such as forest size, or contingency tables, when the socio-demographic data were categorical variables such as income groups or place of residency. The tests explored whether the probability of answering 'yes' or 'no' to a certain question or to give a certain importance ranking for an activity was influenced by the socio-demographic variables. The level of significance for these statistical models was set at $p < 0.05$.

Only some of the socio-demographic variables could be used to test whether there was a significant relationship between particular forest uses and socio-demographic variables. Age, highest level of education, length of property ownership, size of forest area owned and place of residence were all variables for which it was possible to test if a significant relationship with particular forest uses existed.

Sex was a variable used to test for significant relationships with forest uses, although it is potentially problematic. The sex of the person who completed the survey does not necessarily reflect the sex of the people on any individual property who make decisions regarding forest use.

Income was also a variable used to test for significant relationships with forest uses, but is also problematic. Of the 317 useable responses, 137 respondents chose not to disclose their income, meaning there is high or strong potential for respondent bias. Therefore this variable was used with caution to test for significant relationships.

Other variables such as property use/s, size of property and employment were not used to test for significant relationships with forest uses, as they are problematic to use for tests of significance.

Similarly, it was not possible to test all 29 forest uses to look for significant relationships with socio-demographic variables. For some of the uses there were too few responses to be able to test their relationship to other variables.

The relationship between socio-demographic variables and forest and environmental values held by survey respondents was not explored as the five-point ranking system precluded obtaining significant responses.

RESULTS

Results for different parts of the survey are presented below, with a brief discussion after each set of results.

Socio-demographic data

A snapshot of the socio-demographic data

Table 6 gives a brief summary of some key statistics from the collected socio-demographic data. A further discussion of each is given as this section unfolds.

Table 6 Snapshot of socio-demographics of survey respondents.

Socio-demographic concept	Measure	Variable
Sex	Mode*	Male
Age	Mean**	53 years
Age at which left school	Mean	16.5 years
Post-school qualification	Mode	Equally, trade certificate and diploma
Location of residence	Mode	Rural property (in the South-East)
Occupation	Mode	Self-employed (without employees)
Income	Mode	AUS$20,000-$39,000
Length of time respondent had owned property	Median***	16 years
Total area of land owned	Median	47 hectares
Total area of forest owned	Median	30 hectares
Property use	Mode	Animal production

* Mode refers to the most frequently mentioned response given by respondents.

** Mean refers to the average of all the responses given.

*** Median refers to the middle score of all the responses given.

**** 'AUS$' is an abbreviation for Australian dollar.

Note: each category (and associated variable) is independent of each of the other categories.

Detail on socio-demographic data[11]

Sex of respondents

The distribution of sex of respondents is given in Table 7. Just under two-thirds of respondents identified themselves as male, while a third identified themselves as female.

Table 7 Sex of survey respondents.

Sex	No. respondents	%
Male	195	63
Female	97	32
Male and female pair	15	5
Female and female pair	1	<1
Total number of responses	**308**	**----**

Ages of respondents

The distribution of ages of respondents is given in Table 8. Of the 308 respondents who gave their age:

- the average age of respondents was 53 years, with a standard deviation of 12 years;
- the median age was 52 years;
- seventy five percent of respondents were aged over 46 years of age and 25% over 59 years of age; and,
- the youngest age given was 19 years and the oldest 89 years.

[11] All of the following figures have been rounded to the nearest whole number, unless otherwise indicated.

Table 8 Age of survey respondents.

Age of respondents	No. respondents	%
<=19	1	<1
20-29	6	2
30-39	28	9
40-49	97	31
50-59	109	35
60-69	40	13
70-79	20	6
80-89	7	2
Total number of responses*	**308**	**----**

* 308 surveys were received in which this question was completed. Of these, eight were completed by two people. For each of these eight, the age of the first person was included in the table above but not the second, to reflect the number of properties to which the ages correspond. In all eight cases the difference in ages between the two people completing the survey was five years or less.

Education

All 307 respondents to the question 'have you ever attended primary or secondary school' replied that they had been through primary or secondary schooling. Of 305 respondents to question, 'how old where you when you left (primary or secondary) school'[12]:

- the average age at which respondents left school was 16.5 years with a standard deviation of 2.3 years;
- 90% of respondents completed school between the ages of 15 and 18; and,
- the earliest a respondent indicated that they completed primary or secondary schooling was 7 years and the oldest was 36 years.

Table 9 shows the distribution of ages at which respondents left primary or secondary school.

[12] The figures for age of leaving school have been rounded to one decimal place.

Table 9 Age at which respondents left primary or secondary school.

Age at which left primary or secondary schooling	No. respondents	%
<14	12	4
14	8	3
15	50	16
16	72	24
17	94	31
18	62	20
19	2	<1
20+	5	2
Total number of responses*	**305**	**----**

* 305 surveys were received in which this question was completed. Of these, four were completed by two people. For each of these four, the age of completion of schooling of the first person was included in the table above but not the second, to reflect the number of properties to which the survey responses correspond. In all four cases the difference in ages between the two people completing schooling was four years or less. Where a respondent put their age as anything other than a whole number, the age was rounded appropriately before inclusion in this table.

Respondents were asked if they had completed post-school qualifications and 79% (240 out of 305 responses) indicated they had. Table 10 gives the responses to the question asking respondents to indicate the highest post-school qualification they had achieved.

Table 10 Highest post-school qualifications obtained by survey respondents.

Highest post-school qualification obtained	No. respondents	%
Trade certificate	65	28
Diploma	65	28
Degree	51	22
Postgraduate	42	18
Other*	9	4
Total number of responses	**232**	**----**

* Twenty-five respondents recorded holding some other type of qualification, but only nine of these had not already ticked one of the other types of qualification as well.

Uses of property

Respondents were asked to list the three most common ways they used their property or properties. As respondents could list more than one use and the question was open-ended, responses have been summarised into categories. Table 11 shows the frequency of response for each category rather than a percentage. Two hundred and four respondents gave 504 responses to this question.

Seventy-nine percent of all responses came to be grouped in three categories; that of (1) animal production, (2) relaxation/ recreation and (3) residence. Ninety-three percent of all responses added another three categories to these earlier categories; that of (4) horticulture, (5) conservation and (6) 'other'[13].

Table 11 Main uses of properties by respondents.

Rank order	Use	Number of times mentioned
1	Animal production	156
2	Recreation/ relaxation	126
3	Residence	118
4	Horticulture	39
5	Conservation	16
6	'Other'	14
=7	Firewood supply	8
=7	Forest production	8
8	Horse ownership	5
9	Cropping	3
=10	Aqua-culture	2
=10	Artistic activities	2
=11	Business, general	1
=11	Employment	1
=11	For retirement	1
=11	Forestry	1
=11	Honey production	1
=11	Real-estate investment	1
=11	Storage site	1

[13] The 'other' category included difficult to place responses, such as (for instance) 'future residence', 'habitat', 'no primary use' and open ended free flow commentary.

Length of ownership of property

Respondents were asked how long their property or properties had been owned by their family. Table 12 summarises the responses. From 315 responses:

- property(ies) had been in the family an average of 26 years, with a standard deviation of 32 years;
- the shortest period of family ownership was 1.5 years, the longest 169 years;
- approximately 15% of respondents had held their property(ies) less than 5 years, and half of all respondents for under 16 years;
- nearly 76% of respondents had owned their properties for 26 years or less; and,
- 90% of respondents had owned their properties for less than 57 years.

Table 12 Number of years property or properties owned by family.

Number of years property or properties owned by family	**No. respondents**	**%**
1.5*-9	94	30
10-19	80	25
20-29	73	23
30-39	16	5
40-49	12	4
50-59	9	3
60-69	3	<1
70-79	4	<2
80-89	6	2
90-99	1	<1
100-109	2	<1
110-119	1	<1
120-129	5	<2
130+	9	3
Total number of responses	**315**	**----**
* One and a half years was the shortest period of ownership given by a respondent.		

Income

Respondents were asked to give an estimate of their total household income during the financial year 2000. The results are shown in Table 13. Of 207 respondents:

- the most commonly reported category was $20,000-39,000 (24% of respondents); and,
- nineteen percent of respondents reported a combined family income in excess of $80,000 per year.

Table 13 Income during the 1999-2000 financial year.

Income during the financial year 2000 (July 1st 1999 to June 30th 2000) in Australian dollars	No. respondents	%
Made a loss during the financial year 2000	7	3
Effectively had no income for the financial year 2000	4	2
$1 to $19,999	43	21
$20,000 to $39,999	50	24
$40,000 to $59,999	40	19
$60,000 to $79,999	25	12
$80,000 to $99,999	14	7
$100,000 or more	24	12
Total number of responses	**207**	**----**

Area of land and native forest owned

Respondents were asked the size of the property they owned and the area of native forest on their property.

With regard to the total land owned, of a total 73,649 ha reported owned by the 309 respondents who answered the question:

- the median area owned was 47 ha;
- the mean area owned was 238 ha with a standard deviation of 517 ha. However, 78% of all respondents owned an area of 238 ha or less, which makes the median a more appropriate measure than the mean;
- three quarters of all respondents owned land that was between 3 and 196 ha in size. One quarter held 24 ha or less of land; and,
- the largest area reported owned was 4,600 ha and the smallest area three ha.

Total land owned was grouped into six categories which are shown in Table 14[14].

[14] For details on these data, see Table A3.1 in Appendix 3.

Table 14 Size of property owned by survey respondents.

Area of total land owned (hectares)	% respondents	% of total land area
2-15	13	<1
16-45	36	5
46-100	18	5
101-300	13	10
301-800	11	23
801+	8	56

It can be seen from Table 14 that the majority of the land was owned by a minority of respondents. Seventy four percent of the land was owned by only 19% of respondents. The majority of respondents owned properties of 100 ha or less in size, with 67% of respondents owning only 10% of the total land area (corresponding to all landowners who own 100 ha or less).

With regard to the total ha of forested land owned, of a total 20,727 ha reported owned by the 287 respondents who answered the question[15]:

- the median area owned was 30 ha;
- the mean area owned was 72 ha with a standard deviation of 137 ha. However, 80% of respondents owned 72 ha or less, which makes the median a more appropriate measure than the mean;
- three quarters of respondents owned between 2 and 57 ha of forested land. One quarter owned 13 ha or less; and,
- the largest area reported owned was 1,012 ha and the minimum two ha.

Total forested land owned was grouped into six categories which are shown in Table 15[16].

[15] The lower number of respondents giving their area of forest probably reflects the greater difficulty of estimating the area of forest within a property than knowing the entire area of the property, so leading to non-response to the question.

[16] For details on these data, see Table A3.2 in Appendix 3.

Table 15 Size of native forest owned by survey respondents.

Area of total forest owned (hectares)	% respondents	% of total forest area
2-15	30	3
16-45	40	16
46-100	16	15
101-300	10	25
301-800	4	27
801+	1	14

It can be seen from Table 15 that, similar to the results for land ownership, a majority of the forest was owned by a minority of respondents. Forty one percent of the forest was owned by only 5% of respondents. The majority of respondents owned forests of 100 ha or less in size, with 86% of respondents owning 34% of the total forest area (corresponding to all landowners who own 100 ha or less).

Employment with forest product industries or environmental groups

Seventeen respondents out of 312, or 5%, indicated they relied upon a forest products industry of some kind for the majority of their income. Three respondents out of 309, or 1%, indicated that they relied upon some kind of environmental organisation or group for the majority of their income.

Location of primary residence

Respondents were asked about their primary residence. The 309 responses are detailed in Table 16.

Table 16 Primary residence of survey respondents.

Location of primary residence	No. respondents	%
On a rural property	201	65
In a city that is a capital of an Australian state	50	16
In a town of between 1,500-10,000 people	18	6
In a city of over 100,000 people	17	6
In a town of less than 1,500 people	16	5
In a city of between 10,000-100,000	5	2
Other (such as overseas)	2	<1

Some respondents gave more than one answer to this question (ie., '*I live 50:50 city and country*'). These replies were randomly assigned to one of the core categories that they covered.

The majority of owners are located on a rural property. A significant number, around one-fourth, are located in a town or city with a population greater than 10,000.

Respondents were then asked whether their primary residence was within the Bega Valley or Bombala Shire Council zones. Table 17 gives the responses.

Table 17 Number of survey respondents living within or outside the Bega Valley and Bombala Shire Council zones.

Location of primary residence	**No. respondents**	**%**
Within Bega Valley or Bombala Shire Council zones	212	69
Outside Bega Valley or Bombala Shire Council zones	96	31
Total number of respondents	**309**	**----**

Approximately one-third of all landowners do not live within the borders of the Bega Valley Shire Council or Bombala Shire Council zones.

Summary and discussion of socio-demographic data

The majority of respondents to the survey were male and this is not un-surprising, as the physical management of a property is still strongly considered a male activity. However, there is a possibility that the survey did not reflect the true make-up of the landowner population. Reeve (2001), when conducting a follow-up survey to identify response bias for an Australia-wide survey of rural landowners, found that women were more likely than men not to have returned the initial questionnaire. The Australian Bureau of Statistics 2001 census data for Bega Valley Local Government Area (LGA)[17] (ABS 2002a) found that the population for all age groups was approximately 50% male and 50% female (Bombala LGA (ABS 2002b) was also approximately 50% male and 50% female). Therefore, while it seems likely that more landowners are male than female and this is certainly the norm for rural landholding populations, there is a possibility that women were under-sampled in the survey.

All respondents had completed at least some schooling and 90% had left school at the equivalent of School Certificate or Higher School Certificate levels. The level of post-school qualification, particularly postgraduate qualifications, was above the national average and well above the average education of residents in Bega Valley LGA found in the 2001 Census (ABS 2001a). In the 2001 Census the number of Bega Valley LGA residents with a postgraduate degree, graduate diploma or graduate certificate was 2.1% (1.7% for Bombala (ABS 2002b)), compared to 18% of survey respondents; while the number of residents found in the 2001 census holding a Bachelor degree was 6.4% (4.6% for Bombala), compared to 22% of survey respondents. Other higher education achievements showed similar differences.

[17] Local Government Area is equivalent to 'shire'.

The relatively high education of survey respondents may reflect a mix of factors. Many survey respondents did not live in Bega Valley or Bombala LGA, instead living in cities, where a higher proportion of the population has generally achieved post-school qualifications. However, the higher education of survey respondents was still above the national average. Reeve (2001) found, in his assessment of non-response bias for his survey of Australian rural land holders, that people with higher levels of education were more likely to respond to a survey than those who had less education. This may indicate some survey response bias. It does seem though, that the landowner population sampled had a higher level of education than the regional and national average.

The median age of respondents was quite high at 52 years (average was 53 years), reflecting the generally aged nature of the rural population and particularly the landowning population in rural areas. It should also be kept in mind that land ownership tends to occur later in life once enough resources are accrued or there is a capacity to enter into debt. While the median age in the 2001 Census for Bega Valley LGA was found to be 42 years (and 41 years for Bombala), this includes children who are unlikely to be landowners. The Census has shown an increase in median age of LGA residents from 36 years in 1991 to 39 years in 1996 and 42 years in 2001 (ABS 2002a).

The majority of respondents live on a rural property in SE NSW. However, nearly a quarter lived outside SE NSW in a city of over 10,000 people and one-third lived outside the two LGA .

Many respondents chose not to disclose their income (137 respondents did not complete the question on income). Because of this, it is difficult to come to any reasonable conclusion about income levels. The median category of reported income (annual family income of AUS$20,000-$39,999, or AUS$384-$769 per week) is close to expected average income in SE NSW - the median household income in the Bega Valley LGA according to the 2001 census (ABS 2002a) was AUS$500-$599 per week (and AUS$600-699 for Bombala LGA (ABS 2002b)), which sits within the range reported by survey respondents. The approximately 20% of landowners reporting family income of over AUS$80,000 per year may reflect a significant number of high earning professional landowners in the sample population.

Landowners predominantly use their properties for three main activities: (1) producing agricultural products, (2) residence, and (3) recreation / relaxation.

Properties appear to be turned over relatively rapidly, with nearly half of all properties in the sample owned for less than sixteen years and approximately 90% owned for less than 60 years, which is typically less time than a generation of trees needs to grow to maturity.

A small number of landowners in the sample owned most of the land. The majority of owners had small properties under 100 ha in size. Properties over 100 ha in area made up nine tenths of the land owned and were held by about one-third of landowners. When properties of 300 ha or more were examined, one-fifth of landowners owned eight-tenths of the total area of land.

Similarly, a small number of landowners owned most of the native forest. A little under 90% of landowners owned forest of less than 100 ha in size, representing one-third of the total amount of forested land. Nearly 20% of the landowners hold two-thirds of the forested land, and 5% of landowners owned 40% of the forested land.

Landowner use of native forest

A snapshot of the use data

Respondents were asked about their use behaviour (how they have used their forest) and use intent (how they intend to use their forest). They were asked:

- to state if they had undertaken certain given uses of their forest in the year 2000; and,
- to estimate the importance of certain given activities in their plans for use of their forest over the next 10 years.

The two most and two least common forest behaviour and intent uses are detailed in Table 18.a and 18.b. More detailed results are presented in the oncoming sections.

Table 18.a Two most and least common forest use behaviours of survey respondents.

Uses with the two highest responses in the '<u>yes</u>' category	**Uses with the two highest responses in the '<u>no</u>' category**
1. Seek solitude and/ or privacy	1. Take paying customers into forest
2. Observing plants and/or animals	2. Harvest timber for sale

Table 18.b Two most and least common forest use intentions of survey respondents.

Uses with the two highest responses for the '<u>important</u>' category	**Uses with the two highest responses for the '<u>not-important</u>' category**
1. Maintain or improve forest for its natural beauty	1. Barter forest products
2. Observing plants and/or animals	2. Farm non-timber forest product for on-property use

Use behaviour

Respondents were asked which of a list of activities they had undertaken in or on their native forest since the start of the year 2000. Table 19 gives the percentage of respondents who replied 'yes' to each use behaviour item[18]. As with any research attempting to examine human behaviour, there is the potential for error when asking respondents to recall things they have done in the past.

Table 19 Use behaviour of survey respondents by use category.

Use category*	**No. respondents that had undertaken that use**	**%**
Seek solitude and/ or privacy (217)	194	89
Observing animals and/ or plants (211)	188	89
Hiking and/ or nature walking (213)	185	87
Take visitors into forest (198)	129	65
Harvest timber for on-property use (227)	129	57
Camping and/ or picnicking (192)	105	55
Forest management activities to reduce fire risk (225)	113	50
Photography and/ or painting in (or of) the forest (190)	86	45
Control pests and/ or diseases (217)	97	45
Farming activities (222)	92	41
Conservation activities (218)	86	39
Drive and/ or ride vehicle (off-road) (196)	71	36
Hunting and/ or fishing (if waterway in forest) (187)	46	25
Forest management activities to alter forest quality (219)	52	24
Horse riding (193)	41	21
Farm non-timber forest products for on-property use (210)	15	7
Farm non-timber forest products for sale (207)	11	5
Barter forest products (208)	9	4
Harvest timber for sale (211)	8	4
Take paying customers into forest (210)	1	0

* The number in brackets after each activity indicates the total number of respondents who ticked either 'yes' or 'no' for that activity.

[18] The raw collated data for this chart can be found in Tables A4.1 and A4.2 in Appendix 4.

It is possible to see some clear patterns in the way private forest landowners have used their forests since the start of the year 2000 by categorising the different uses into broader groups. The forest uses respondents were asked about fell into five primary groups[19]:

- *Passive recreation,* in which the native forest is used for recreation or relaxation activities which do not directly utilise the forest or resources within the forest. Examples include 'seeking solitude and privacy' or 'observing plants and animals';
- *Active recreation,* in which the forest and forest-related resources are actively utilised for recreation, or relaxation. An example is 'hunting and/ or fishing';
- *Property management,* in which the forest is used or managed to maintain or improve the property;
- *Providing livelihood,* in which the native forest is used to produce saleable or tradeable products such as timber, non-timber products and services to tourism; and,
- *Conservation management,* in which the forest is used in a way that aims to improve conservation/preservation outcomes.

Table 20 shows the uses landowners had undertaken, grouped from most to least common and including the broad use group each use category fell into.

The general trend in the table is for passive recreational uses to be amongst the most common uses of forest, while uses that provide a livelihood were less commonly undertaken. Caution needs to be exercised when reading off this table though, as it aggregates what were presented to respondents as separate items.

[19] This grouping is useful, but individual categories also need to be examined as they were presented to respondents individually and may have attracted differing responses; the aggregation to five groups should be treated with care.

Table 20 Use behaviour of survey respondents by use group.

Group no.	Percent reporting use*	Use category	Broad use group
1	87-89	1. Seek solitude and/ or privacy	1. Passive recreation
		2. Observing animals and/or plants	2. Passive recreation
		3. Hiking and/or nature walking	3. Passive recreation
2	50-65	1. Take visitors into forest	1. Passive recreation
		2. Harvest timber for on-property use	2. Property management
		3. Camping and/ or picnicking	3. Passive recreation
		4. Forest management - for fire risk	4. Property management
3	36-45	1. Photography and/ or painting	1. Passive recreation
		2. Control pests and/ or diseases	2. Property management
		3. Farming activities	3. Providing livelihood
		4. Conservation activities	4. Conservation mngt.
		5. Drive and/ or ride vehicle	5. Active recreation
4	21-25	1. Hunting and/ or fishing	1. Active recreation
		2. Forest management - forest quality	2. Property management
		3. Horse riding	3. Passive/active rec.
5	<1-7	1. Farm NTFP for sale	1. Providing livelihood
		2. Barter forest products	2. Property management
		3. Harvest timber for sale	3. Providing livelihood
		4. Take paying customers into forest	4. Providing livelihood
		5. Farm NTFP for on-property use	5. Property management

* The percentages given in the second column of this table are taken from Table 19 (column 3) and the percentage groups have been created by looking (by eye) for patterns in the percentages in Table 19.

Relationship between forest use behaviour and socio-demographic characteristics

The questions on forest use (Q2.B) were compared to some socio-demographic variables to see if any significant relationship existed between the type of use made of the forest, and factors such as age, sex, length of ownership of property, size of property/ forest and location of residence.

Statements for which 'yes' responses were low

For some statements on forest use (Q2.B) response rates were too low to obtain a significant result. For each of these statements, the number of respondents replying 'yes' was too small to be statistically analysed. These statements have not been included in the presentation of findings below. The statements in Q2.B that were not included were;

'Barter forest products', 'Farm non-timber forest products for on-property use', 'Farm non-timber forest products for sale', 'Harvest timber for sale' and 'Take paying customers into the forest'.

This low 'yes' response rate itself indicates that across the broad spectrum of the population surveyed, the majority of the population was very unlikely to undertake these activities (most of which involved utilising the native forest for economic activities, whether providing livelihood or property management).

Have you harvested timber for on-property use (Q2.B)?

Of 227 respondents to this question, 129 or 57% replied that they had harvested timber for on-property use since the start of 2000. The probability that private forest landowners have harvested timber for on-property use was:

- higher for landowners who lived on rural properties than landowners who lived in cities;
- not related to the size of the forest they owned;
- not related to landowner age, sex, or income; and,
- not related to the length of time a landowner had owned their property.

Have you used your forest for farming activities (Q2.B)?

Of 222 respondents to this question, 92 or 41% replied that they had used their forest for farming activities since the start of 2000. The probability that private forest landowners had used their forest for farming activities:

- was influenced by the length of time of property ownership (in other words, landowners who had owned their property a long time were less likely to use their forest for farming activities);
- declined with forest size (in other words, the smaller the area of forest owned, the less likely it was that the forest had been used for farming activities);
- was lower when the landowners did not live on a rural property; and,
- was not related to landowner sex, age, or income.

Have you carried out management to reduce fire risk (Q2.B)?

Of 225 respondents to this question, 113 or 50% replied that they had undertaken management to reduce fire risk since the start of 2000. The probability that management to reduce fire risk had occurred:

- was not related to landowners sex, age or income;
- was not related to the length of property ownership;
- was not related to the size of the native forest owned; and,
- was not related to place of residence (ie., urban or rural residence).

Have you carried out conservation activities (Q2.B)?

Of 218 respondents to this question, 86 or 39% replied that they had carried out conservation activities (such as revegetation, creating water features, fencing off, etc) on their properties since the start of 2000. The probability that private forest landowners had undertaken conservation activities:

- was less when landowners did not live on rural properties (less than 20% of those living in cities with greater than 100,000 population had undertaken conservation activities, compared to 47% of those who lived on rural properties);

- was not related to landowner sex, age or income, although respondent pairs (male/female or female/female) had a higher likelihood of having undertaken conservation activities; and,
- was not related to the length of property ownership or size of forest area.

Have you carried out pest and/or disease control (Q2.B)?

Of 217 respondents to this question, 97 or 45% replied that they had carried out pest and/or disease control in their native forest since the start of 2000. The probability that private forest landowners had carried out pest and/or disease control:

- was not related to landowner age, sex or income, although couples were more likely to have undertaken this type of activity;
- was not related to length of property ownership;
- was not related to size of forest owned; and,
- was not related to place of residence.

Have you carried out activities to alter forest quality (Q2.B)?

Of 219 respondents to this question, 52 or 24% replied that they had carried out activities to alter forest quality (such as thinning, pruning, or coppicing) since the start of 2000. The probability that landowners had carried out activities to alter forest quality:

- tended to be higher when the property had been owned for a longer period of time (in other words, length of property ownership and probability of carrying out activities to improve forest quality were positively correlated);
- was not related to landowner sex, age or income;
- was not related to size of forest owned; and,
- was not related to place of residence.

Do you manage part or all of your native forest (Q3.A)?

Of the 301 respondents to this question, 151 or 50% replied that they did manage part or all of their native forest. No significant correlations between likelihood of managing the native forest and the socio-demographic characteristics of landowner age, sex and income, length of property ownership, size of forest area or place of residence were found. Women were more likely to reply that they did manage their native forest but the relationship was not found to be statistically significant, probably due to the lower proportion of female respondents.

Use intent

Respondents were given a list of activities and asked to rank their importance as an intended use of their forest over the next 10 years. Table 21 shows, for each use, the total number of respondents who ranked that use as important[20] for their intended future use of the forest[21].

[20] 'Important' refers to those respondents who answered that a future use of their native forest was of 'medium' or 'high' importance. 'Not important' responses were made up of respondents who answered that a future use of their native forest was of 'nil' or 'low' importance.

[21] The collated data can be found in Table A5.1 in Appendix 5.

Table 21 Use intent of survey respondents by use category.

Use category	Number of respondents for whom use was important over next 10 years	Total number of respondents*
Maintain or improve forest for its natural beauty	184	233
Observe plants and/or animals	179	215
Maintain or improve forest for solitude and/or privacy	175	215
Hiking and/or nature walking	173	214
Maintain or improve forest to protect land/ water source/ table	172	226
Maintain or improve for conservation	171	229
Improve the quality (health) of your forest	140	226
Maintain or improve forest to enhance your residential area	138	228
Maintain or improve forest in order to pass on through your will	135	228
Camping and/or picnicking	118	206
Photography and/or painting in (or of) the forest	96	210
Maintain or develop forest as an asset to property value	95	141
Harvest timber for on property use	88	232
Maintain or develop forest on the speculation that a future income can be drawn from the forest	48	140
Horse riding	48	206

Table continued over page…..

Table 21 CONTINUED Use intent of survey respondents by use category.

Use category	Number of respondents for whom use was important over next 10 years	Total number of respondents*
Hunting and/or fishing (if waterway in forest)	48	204
Protect part or all of forest by making a change to property title	45	222
Maintain or develop forest as part of a broader business, such as eco-tourism or holiday accommodation	42	140
Drive and/or ride vehicle (off road)	42	205
Farm NTFP for on property use	37	224
Maintain or develop forest to provide employment opportunities for yourself or other family member	36	133
Maintain or develop forest to supply regular income from timber sales	18	137
Maintain or develop forest to supply regular income from sale of non-timber forest products	15	137
Barter forest products	10	226

* The total number of respondents for each statement vary widely as the table combines results from survey questions Q4.B, Q.D and Q4.F. As a result, the table is ranked in order of the number of respondents answering that the use was important, rather than by percentage of respondents.

As before, these responses can be summarised into broader categories as shown in Table 22. The same process as was conducted earlier for Table 19 was repeated here. That is, the results in the second column of Table 21 were reviewed by eye into 5 groups as shown in Table 22.

Table 22 Use intent of survey respondents by use group.

Group no.	Number range of respondents reporting intention to use forest for this purpose	Abbreviated purpose statement	Broad use category
1	172-184	1. Natural beauty	1. Passive recreation
		2. Observe plants and/or animals	2. Passive recreation
		3. Solitude and/or privacy	3. Passive recreation
		4. Hiking and/or nature walking	4. Passive recreation
		5. Protect land/ water source/ table	5. Property management
		6. Conservation	6 Conservation management
2	118-140	1. Improve quality (health) of forest	1. Property management
		2. Enhance residential area	2. Passive recreation
		3. Pass on through your will	3. Property management
		4. Camping and/or picnicking	4. Passive recreation
3	88-96	1. Photography and/or painting	1. Passive recreation
		2. Asset to property value	2. Providing livelihood
		3. Harvest timber for on property use	3. Property management
4	37-48	1. Speculation for a future income	1. Providing livelihood
		2. Horse riding	2. Passive/active rec.
		3. Hunting and/or fishing	3. Active recreation
		4. Protect by changing property title	4. Conservation mngt.
		5. Part of a broader business	5. Providing livelihood
		6. Drive and/or ride vehicle	6. Active recreation
		7. Farm NTFP* for on property use	7. Property management
		8. Provide employment opportunities	8. Providing livelihood
5	10-18	1. Income from timber sales	1. Providing livelihood
		2. Income from sale of NTFP	2. Providing livelihood
		3. Barter forest products	3. Property management

* NTFP = Non-timber forest product/s.

The same polarity found with use behaviour is evident here. Respondents were likely to intend to use their forest for passive recreation and were less likely to intend using their forest to provide a financial livelihood.

Relationship between use intent and socio-demographic characteristics

Some questions on intended use (Q4.A, Q4.B, Q4.C and Q4.E) were compared to socio-demographic variables to see if any significant relationship existed between use and factors such as age, sex, length of ownership of property, size of forest area and location of residence.

Use intent questions with low responses in the 'yes' or 'important' categories

One statement on use intent, asking respondents if they intended to barter forest products in the next 10 years, had such a low response rate in the 'important' category that it could not be included in the analysis of correlation with socio-demographics.

It was not possible to analyse the relationship of socio-demographics to use intent for any of the statements included in Q4.D, which asked a series of questions about intentions to use native forest to generate an income or other earnings. The number of respondents planning these types of uses was too low for a sensible analysis. This in itself suggests the relatively low importance to private forest landowners of income-generating or other earnings-related activities in their native forests.

Are you planning to do anything with your native forest over the next 10 years (Q4.A)?

Of 295 respondents, 186 or 63% indicated they planned to use their native forest over the next ten years. The probability that a landowner planned to use their native forest over the next 10 years:

- increased with landowner age;
- was not related to the length of property ownership;
- was not related to size of forest area; and,
- was not related to place of residence.

Do you plan to harvest timber for on-property use (Q4.B)?

Of 232 respondents to this question, 88 or 38% replied that plans to harvest timber for on-property use in the next 10 years were of 'medium' or 'high importance' to them. The probability of rating timber harvesting of 'medium' or 'high importance':

- was lower with increasing age (in other words, older landowners were less likely to reply that it was an important use for the next 10 years);
- was higher with larger forest size (landowners with larger forests were significantly more likely to state that it was of 'medium importance' in the next 10 years);
- was not related to sex; and,
- could not be tested for income.

Do you plan to farm non-timber forest products for on-property use (Q4.B)?

Of 224 respondents to this question, 37 or 16.5% replied that plans to farm non-timber forest products for on-property use in the next 10 years were of 'medium' or 'high importance' to them. The probability of rating on-property use of non-timber forest products of 'medium' or 'high importance':

- decreased with landowner age (the probability of replying 'nil importance' was significantly positively related to higher age, while the probability of replying 'high importance' was significantly negatively related to age);
- decreased with length of property ownership (the probability of replying 'nil importance' was positively correlated with the length of time a property had been owned - the probability of replying 'low', 'medium', or 'high importance' declined with the length of property ownership); and,
- was not related to forest size;

Do you plan to improve the quality (health) of your forest (Q4.B)?

Of 226 respondents to this question, 140 or 62% replied that plans to improve the quality of their forest in the next 10 years were of 'medium' or 'high importance' to them. The probability that improving the quality of their forest was of importance to a landowner:

- was unrelated to landowner sex or age;
- was unrelated to length of property ownership; and,
- was unrelated to forest size.

Do you plan to maintain or improve your forest for conservation purposes (Q4.B)?

Of 229 respondents to this question, 171 or 25% replied that maintaining or improving their forest for conservation purposes was of 'medium' or 'high importance' to them over the next 10 years. The probability that maintaining or improving the forest for conservation was of importance to a landowner:

- was lower with increasing forest size (owners of larger forest areas were significantly more likely to reply that this use was of nil importance to them in the next 10 years);
- was unrelated to landowner sex, age or education; and,
- was unrelated to length of property ownership.

Do you plan to maintain or improve your forest to protect land/water source/table (Q4.B)?

Of 226 respondents to this question, 172 or 76% replied that maintaining or improving their forest to protect their land or water source/table was of 'medium' or 'high importance' to them over the next 10 years. The probability that maintaining or improving forest to protect land/water source/table was of importance to a landowner:

- was unrelated to landowner sex, age or level of education;
- was unrelated to length of property ownership; and,
- was unrelated to size of the forest.

Do you plan to maintain or improve your forest for its natural beauty (Q4.B)?

Of 233 respondents to this question, 184 or 79% replied that maintaining or improving their forest for its natural beauty was of 'medium' or 'high importance' to them over the next 10 years. The probability that maintaining or improving forest for its natural beauty was of importance to a landowner:

- was unrelated to landowner sex, age or education;
- was unrelated to length of property ownership; and,
- was unrelated to forest size.

Do you plan to maintain or improve your forest in order to pass it on through your will (Q4.B)?

Of 228 respondents to this question, 135 or 59% replied that maintaining/improving their forest to pass it on through their will was of 'medium' or 'high importance' to them in the next 10 years. The probability that doing this was of importance to a landowner:

- was unrelated to landowner age or education, but showed some relationship to sex (women were significantly more likely than men to reply either 'nil importance' or 'high importance');
- was unrelated to length of property ownership; and,
- was unrelated to forest size.

Do you plan to maintain or improve your forest to enhance your residential area (Q4.B)?

Of 228 respondents to this question, 138 or 60.5% replied that maintaining/improving their forest to enhance their residential area was of 'medium' or 'high importance' to them over the next 10 years. The probability that doing this was of importance to the landowner:

- decreased with length of time property has been owned;
- decreased with increasing forest size; and,
- was unrelated to landowner sex, age or education.

Do you plan to protect part or all of your forest by making a change to your property title (Q4.B)?

Of 222 respondents to this question, 45 or 20% replied that protecting part/all of their forest through changing their property title was of 'medium' or 'high importance' to them in the next 10 years. The probability that doing this was of importance to the landowner:

- was unrelated to landowner sex, age or level of education;
- was unrelated to length of property ownership; and,
- was unrelated to forest size.

Are you planning to use your native forest to generate an income or any other form of earning over the next 10 years (Q4.C)?

Of 241 respondents, 85 or 35% replied that they planned to use their native forest to generate an income or other form of earning over the next 10 years. The probability that landowners planned to use their native forest to generate income or earning:

- increased with forest size (landowners with larger forests were more likely to be planning to use them for income/earnings generation).
- was significantly lower for women than men (of the females replying to the question, 78% said they did not plan to use their forest for income/earnings generation, compared to 60% of men and 62% of couples);
- was unrelated to landowner age, income or level of education;
- was unrelated to length of property ownership; and,
- was unrelated to place of residency.

Are you planning to use your native forest for any recreation or relaxation activities over the next 10 years (Q4.E)?

Of 248 respondents, 198 or 80% replied that they planned to use their native forest for recreation or relaxation over the next 10 years. The probability that landowners planned to use their forest for recreation or relaxation:

- was significantly related to landowner age, with older landowners less likely to plan to use their native forest for recreation or relaxation;
- was lower the longer landowners had owned their property;
- was lower for rural residents as compared to urban residents (of those who identified themselves as living on a rural property, 75% planned to use their forest for recreation or relaxation, compared to 91% for those who identified their main residence as being other than on a rural property);
- was unrelated to landowner sex, income or level of education; and,
- was unrelated to forest size.

Comparing use behaviour and use intent

Table 23 below compares the results for use behaviour and use intent (summarising the 'broad use group' columns of Table 20 and Table 22).

Table 23 Comparing use behaviour and use intent by use groups.

Group number*	Use behaviour (highest ranked listed first)	Use intent (highest ranked listed first)
1	Passive recreation	Passive recreation
		Property management
		Conservation management
2	Passive recreation	Property management
	Property management	Passive recreation
3	Passive recreation	Passive recreation
	Property management	Providing livelihood
	Providing livelihood	Property management
	Conservation management	
	Active recreation	
4	Active recreation	Providing livelihood
	Property management	Passive/active recreation
	Passive/ active recreation	Active recreation
		Conservation management
		Property management
5	Providing livelihood	Providing livelihood
	Property management	Property management

* Group number (1) equals most common uses, through to group number (5) which equals least common uses.

There are two immediate outcome from assessing Table 23. Firstly, passive recreation uses are consistently prioritised across use behaviour and use intent. Generally then, primary engagement with the forest through passive recreational activities is evident in the immediate past and will continue to be prioritised in the longer term. Secondly, property management uses are higher on the future planning horizon than have been conducted within the immediate past, suggesting the general desire of landowners to lift their engagement with active property management regards their forest.

Summary and discussion of native forest use results

The four most common uses undertaken in native forests between the start of the year 2000 and the time of survey completion (in August – September of 2001) were recreational; (1) 'seeking solitude and privacy', (2) 'observing plants and animals', (3)

'hiking or walking', and (4) 'taking visitors into the forest'. This is perhaps not surprising as it describes many common activities and of the 20 forest uses asked in questions 2.B and 2.D, nine uses referred to recreation or relaxation activities. Recreation-related activities also made up the 6th, 8th, 12th, 13th, and 15th most common activities, with active recreation (in which the forest may be altered by the activity) less likely to be undertaken than passive recreation (in which the forest is usually not altered by the activity). Even though many recreation questions were asked, the fact that six of the nine ranked in the top ten of the twenty activities listed indicated the high importance of many recreational activities.

The fifth most common use of private native forests was harvesting timber[22] for on-property use, undertaken by 57% of respondents. Harvesting timber for sale, however, ranked 19th, with only 4% of landowners undertaking this activity. This indicates a willingness to harvest timber in particular ways and for particular purposes that need to be explored more closely. Respondents who did harvest timber for on-property use were likely to live on their property.

Forty one percent of landowners reported using their forest for farming activities and these landowners were more likely to have owned their property for a short time, to own larger forests and to live on the property containing the forest.

Managing the forest to reduce risk and improve the health of the forest ranked in the middle of activities undertaken; the 7th most common use was management activities to reduce fire risk (undertaken by 50% of respondents), the 9th controlling pests and diseases (undertaken by 45% of respondents) and the 11th was conservation activities (undertaken by 39% of respondents). Management activities to alter forest quality were undertaken by 24% of respondents. Many landowners had therefore not undertaken activities aimed at maintaining or improving forest safety, health or quality since the start of the year 2000. Interestingly, fire risk reduction and pest and disease reduction activities appeared to be equally undertaken by landowners living on or away from their property, perhaps reflecting an emphasis on reducing risk to self and others when owning property. Conservation activities, however, were more likely to be carried out by residents living on rural properties than people whose primary residence was in a city. Activities to alter forest quality were more likely to have been carried out by landowners who had owned their properties for some time.

In general, uses which involved earning income from the forest, or otherwise gaining in a financial sense, were the least likely activities to be undertaken in the forest with the exception of utilising timber for on-property use (which may or may not carry an income earning component).

When the data on use was explored to look for significant relationships with socio-demographic data, some relationships were found, as discussed above. However, no significant relationships were found to exist between any of the forest uses and landowner age, sex or income. This may reflect the difficulties in using the sex and

[22] It should be noted that the term 'harvesting' is likely to have had a far more general meaning to landowners than to those with a forestry background (ie., for landowners covering the collecting or taking of woody debris as much as the actual felling of a tree or trees).

income data, as discussed earlier in the section on methods. Further, the results for age indicate that age may not be a predictor of forest use for this survey population.

When respondents were asked about their intentions for using their forest over the next 10 years, there were some similarities and some differences to their use since the start of the year 2000. The use intent questions included 24 uses, with eight of these recreation or relaxation activities, six relating specifically to income or earnings generation and the rest relating to a range of management options including conservation and property management.

When respondents were asked if they planned to do anything with their native forest in the next 10 years, 63% responded that they planned to use their forests. The likelihood of planning to use the forest increased with landowner age, but was not significantly related to other socio-demographic characteristics.

In terms of use intent, recreation uses again dominated with passive recreation making up the four most common intended uses of the forest. Active recreation was less likely to be undertaken, ranking 15th or below in the 24 uses. Older landowners, landowners who had owned their property for some time and landowners living in rural areas were less likely to be planning to undertake recreation or relaxation activities in their forests.

Activities which improve forest health and quality through property management and conservation management, however, were ranked much higher as an intended use than they were as a use since the start of the year 2000 (as can be seen in Table 23, on page 38). Maintaining or improving the forest to protect land, water sources or water tables; to improve the forest for conservation; and to improve the quality of the forest ranked 5th, 6th, and 7th of the 24 uses. This may indicate a desire to undertake more activities relating to improving forest quality and health. This suggests landowners may have a desire to engage in more conservation activities, while not having had time, resources and/or skills to do so between the start of 2000 and the time of completing the survey. A wide range of landowners intended to undertake these activities, with few correlations found with socio-demographic characteristics. Owners of larger forests, however, were less likely to intend maintaining or improving their forest for conservation purposes.

Harvesting timber for on-property use was listed as an important future use by 38% of respondents, while 57% had undertaken it since the start of the year 2000. The reasons for the higher level of actual as compared to intended use need to be explored and may relate to the utility provided by on-property use of forest products which is not fully recognised or planned by landowners. Older landowners were less likely to rank harvesting timber for on-property use as an important intended use than were younger landowners and were also less likely to be planning to farm non-timber forest products for on property use. Landowners with larger forests were more likely to be planning to harvest timber for on-property use. It appears that landowners who have owned their properties for a shorter period of time are more likely to intend farming non-timber forest products for on-property use than those who have owned their properties for a longer time.

Only 35% of respondents stated an intention to use their forest to generate income or earnings in the next 10 years. Of these, men were more likely to intend using their forest to generate income or earnings, as were landowners with larger forests.

The harvesting of timber for sale ranked 22nd of the 24 uses, again a potential future use not planned for by many landowners. The low scoring for timber harvesting for sale was expected in the use behaviour results, as respondents were asked only to describe uses taking place since the start of the year 2000 and generally timber harvesting only occurs periodically. Therefore, the likelihood it had taken place in 2000 was relatively low even for landowners who were willing to undertake timber harvesting. However, as harvesting timber for sale remains a very low priority as an intended use over the next 10 years, it seems likely that many respondents have no intention of harvesting timber products for sale from their forest. This appears to be consistent with the results from the forest values questions, which are reported below and in which the majority of respondents did not hold values associated with producing timber.

When use behaviour and use intent are compared in Table 23, it is clear that the most common uses, both in terms of behaviour and intent, fall into the passive recreation category. Activities focused on developing the forest to assist with income or earnings are less common uses, both in terms of behaviour and intent. Whether this is due to a lack of opportunity, a clash with the dominant recreational uses or some other influence cannot be ascertained here.

Forest and environmental values data

A snapshot of the values data

Respondents were asked to complete three questions on values (Q5, Q6 and Q7 in the questionnaire). For each question, they were given a list of statements, and asked the extent to which they agreed or disagreed with each statement. The first question (Q5, referred to from this point as 'Forest Values I') was on values related to ecological sensitivity and stewardship of their native forest. The second question (Q6, referred to from this point as 'Forest Values II') was on the production, preservation and conservation values held for privately owned native forest. The third question (Q7, referred to from this point as 'Environmental Values') included statements relating to society's use of natural resources.

A brief look at some key responses is given in Table 24. More detailed results are presented in the following sub-sections[23].

[23] Expanded results from the Forest Values I question set can be found in Appendix 6, Table A6.1. Expanded results from the Forest Values II question set can be found in Appendix 6, Table A6.2 and expanded results from the Environmental Values can be found in Appendix 6, Table A6.3.

Table 24 Snapshot of results from questions on forest and environmental values.

Value scale	Item with the highest response for the 'strongly agree' category (ie., I strongly agree that….)	Item with the highest response for the 'strongly disagree' category (ie., I strongly dis-agree that….)
Forest Values I: stewardship of native forest	Individual plant and animal species in my forest are important to me	Owners of native forest on private property should have the right to do as they please
Forest Values II: environmental and economic issues	I intend to preserve my native forest from timber harvesting	My native forest should mainly be used to produce timber products
Environmental Value: society's use of natural resources	It is very important to have places where native wildlife and plants are preserved, even if I never go there to see them	Jobs are the most important thing in deciding how best to use our natural resources such as mineral deposits and forests

The results below are quoted as percentages and do not have quite the same accuracy as the original scores, though they are more easily interpretable.

Forest Values I: ecological sensitivity and stewardship

The Forest Values I question gave respondents a set of seven statements intended to assess their ecological sensitivity and stewardship values for their native forest.

Ecological sensitivity

Three statements in the Forest Values I set aimed to assess 'ecological sensitivity', which refers to values about the place of the native forest in the environment and interactions between humans, native forests, and the general environment[24]. The results for these statements are given in Table 25.

[24] All the categories presented in this results section (eg., environmental sensitivity, stewardship, pro-development, etc) are typologies that were deliberately applied in the survey questions; in other words, they have not been developed from the data but were used as underlying themes with which to analyse the data.

Table 25 Ecological sensitivity of survey respondents.

Statement	Strongly agree (%)	Somewhat agree (%)	Neither agree nor disagree (%)	Somewhat disagree (%)	Strongly disagree (%)
My land and forest are a part of a much bigger natural system	72	21	4	1	2
What I do on my land and forest can affect others and their land	61	28	4	4	3
Individual plant and animal species in my forest are important to me	74	18	5	2	1

The primary trend was for agreement, with 89% or more of respondents agreeing[25] for each of the three statements. A very small number of landowners disagreed to some extent with the three statements relating to ecological sensitivity.

[25] Throughout this section, the term 'agree' is used to refer to respondents who answered 'strongly agree' or 'somewhat agree' to a statement; the term 'disagree' refers to respondents who answered 'somewhat disagree' or 'strongly disagree' to a statement.

Stewardship

Four statements in the Forest Values I set related to stewardship of the forest, in other words the role of the owner and others in taking care of the native forest. Table 26 gives the responses to these stewardship statements.

Table 26 Stewardship values of survey respondents.

Statement	Strongly agree (%)	Somewhat agree (%)	Neither agree nor disagree (%)	Somewhat disagree (%)	Strongly disagree (%)
What I do to my land and forest will matter to future generations	70	21	5	2	2
It is my religious or spiritual duty to take care of my native forest	38	21	24	6	11
Owners of native forest on private property should have the right to do as they please with their forests	28	25	7	21	19
Government should have a strong role in overseeing landowner use of their own native forest	40	38	10	9	3

Of the four questions relating to stewardship, two – 'what I do to my land and forest will matter to future generations' and 'government should have a strong role in overseeing landowner use of their own native forest' – were agreed with by a large majority of respondents.

The statement on 'religious or spiritual duty' had a wider spread of responses, with 17% disagreeing with the statement compared to 4% and 12% for the first and fourth statements respectively, and a higher percentage of 'neither agree or disagree' responses than occurred for the other statements.

The statement 'owners of native forest on private property should have the right to do as they please with their forests' had the highest response rate of all statements for the Forest Values I set, and had a wide spread of responses, with 53% agreeing with the statement and 40% disagreeing.

Forest values II: production, preservation and conservation

The Forest Values II question gave respondents a set of five statements intended to assess their orientation toward production, preservation and/or conservation values.

Production

Two statements in the Forest Values II set referred to the use of forests for income generation and timber production. The results are shown in Table 27.

Table 27 Production-oriented values of survey respondents.

Statement	Strongly agree (%)	Somewhat agree (%)	Neither agree nor disagree (%)	Somewhat disagree (%)	Strongly disagree (%)
My native forest should be used to maximise income to my enterprise/household	11	17	25	23	25
My native forest should mainly be used to produce timber products	5	11	18	23	43

The majority of respondents disagreed with the two statements specifically relating to commercial use of native forests. Forty eight percent disagreed with the statement 'my native forest should be used to maximise income….' compared to 28% who agreed, while 68% disagreed with the statement 'my native forest should mainly be used to produce timber products'. For both statements there were a significant number of respondents (25% and 18% respectively) who responded 'neither agree or disagree'.

Preservation

Two statements in the Forest Values II set related to preservation of the forest, where preservation refers to a focus on protecting natural resources from interference, ie., preserving them from any development. Table 28 gives the results.

Table 28 Preservation-oriented values of survey respondents.

Statement	Strongly agree (%)	Somewhat agree (%)	Neither agree nor disagree (%)	Somewhat disagree (%)	Strongly disagree (%)
My forest should be left to grow as nature intended	35	36	13	12	5
I intend to preserve my native forest from timber harvesting	44	19	15	11	11

The majority of respondents agreed with the two statements relating to preservation of their native forest.

Conservation

One statement in the Forest Values II set referred to conserving native forest, where conservation is taken to refer to the use of natural resources in a way that prevents their degradation or waste, ie., resources being utilised in a sustainable manner. Table 29 gives the results.

Table 29 Conservation-oriented values of survey respondents.

Statement	Strongly agree (%)	Somewhat agree (%)	Neither agree nor disagree (%)	Somewhat disagree (%)	Strongly disagree (%)
If carefully managed, privately owned native forest can provide products from the forest and conservation outcomes	36	45	12	5	2

There was a very strong positive skew in the responses to this statement, with 81% of the 310 respondents to the question agreeing that if carefully managed, privately owned native forest can provide products from the forest as well as conservation outcomes. Only 7% disagreed with the statement and 12% neither agreed or disagreed.

Environmental values: pro-development, utilitarian and eco-centric

The Environmental Values question set (drawn from Papadakis 2000) aimed to develop, as its header suggests, a sense of the environmental values held by respondents. Three types of value statements were included in the list:

1. pro-development statements, which reflect a strong anthropocentric (ie. human centred) rational, emphasising the development and utilisation of natural resources;
2. utilitarian statements, which reflect "….the preservation of the environment because it is good for humankind…." (Papadakis 2000: 32); and,
3. eco-centric statements, in which nature is considered to have existence value, ie., it has valued in and of itself rather than for its usefulness to humans.

For a more broad-ranging, yet straightforward discussion of environmental values, see Carter (2001).

Pro-development

Three statements in the Environmental Values set reflected pro-development values. The results for these are shown in Table 30.

Table 30 Pro-development values of survey respondents.

Statement	Strongly agree (%)	Somewhat agree (%)	Neither agree nor disagree (%)	Somewhat disagree (%)	Strongly disagree (%)
Jobs are the most important thing in deciding how best to use our natural resources such as mineral deposits and forests	5	13	11	29	42
In deciding how to use our natural resources, such as mineral deposits and forests, the most important thing is the financial benefits for Australia	5	14	12	29	40
Development should be allowed to proceed where environmental damage from activities such as mining is possible, but very unlikely	8	25	12	27	28

The majority of respondents disagreed with all three pro-development statements, and where they did agree, were more likely to 'somewhat agree' than 'strongly agree'.

Utilitarian

Three statements in the Environmental Values set reflected utilitarian values; the results are shown in Table 31.

The majority of respondents agreed with each of the three utilitarian statements regarding the value of National Parks for human use, although 28% disagreed with the statement that 'the greatest value of National Parks and nature reserve is in recreation activities...'.

Table 31 Utilitarian values of survey respondents.

Statement	Strongly agree (%)	Somewhat agree (%)	Neither agree nor disagree (%)	Somewhat disagree (%)	Strongly disagree (%)
The great value of national parks is the opportunities they provide for people to enjoy nature	40	38	10	9	3
National Parks should be preserved for the pleasure they give to so many holiday makers	24	40	14	17	5
The greatest value of National Parks and nature reserves is in recreation activities such as bushwalking, camping, or just taking photographs	25	35	12	20	8

Eco-centric

Four statements in the Environmental Values set reflected eco-centric values; the results are shown in Table 32.

Table 32 Eco-centric values of survey respondents.

Statement	Strongly agree (%)	Somewhat agree (%)	Neither agree nor disagree (%)	Somewhat disagree (%)	Strongly disagree (%)
It is very important to have place where native wildlife and plants are preserved, even if I never go there to actually see them	77	17	2	2	2
I cherish nature and preserve it as one of the most precious things in life	57	28	8	5	2
In deciding how to use Australia's natural resources, it is more important to consider the needs of future generations than our own	50	33	8	6	3
National Parks should be preserved for their sheer natural beauty	48	31	9	9	3

The large majority of respondents (79% or above for all of the statements, with 94% agreeing with the first statement in Table 32) agreed with all four eco-centric statements, with 12% or less disagreeing with each of the four statements.

Summary and discussion of forest and environmental values data

Similarly to the results for use of forest, the results for values show a pattern that suggests sensitivity to the environment. The top scoring items for each of the three question sets on forest and environmental values all show a sensitivity to valuing nature over and above its material value to people. In other words, they show an eco-centric viewpoint rather than a pro-development viewpoint. The top scoring items in the strongly disagree categories for the three question sets on forest and environmental values, in contrast, are largely material, traditional or pro-development items.

When we turn to the individual typological constructs (ecological sensitivity, stewardship, etc.) within each of the value questions, the emphasis on non-material versus material values remains prominent.

The first value typology was 'ecological sensitivity'. Respondents ranked statements consistent with ecological sensitivity extremely high in the agree category, with 89% or above agreeing with each of the three statements. This indicates a significant number of respondents are strongly sensitive to the place of their forests in the local landscape, both social and natural.

Looking at stewardship, the data become more complex. Theoretically, the results would be expected to show a tension between allowing government a role in overseeing use of private native forest and the desire of private landowners for retaining control over their native forests. If this was the case, a strong response in one direction with government control should be reflected by a strong response in the other direction for private control. This is not the case. The statement relating to 'landowners being able to do as they please with their forest' attracted a wide range of response from across the four primary categories. It may be that government oversight is viewed positively, but landowners have faith in their own ability to be the primary decision makers regarding their forests. The ambiguity here suggests the issue needs to be explored more closely.

Also, un-surprisingly, there is a strong sense that landowners feel present actions taken on or in their forest will impact on future generations. Of less clarity is the response to spiritual or religious duty in taking care of the forest. This question attracted a large number of queries from respondents regarding its wording and about how much the item has to do with actually taking a morally or ethically informed position on the future care of forest. The item attracted one of the highest rates of response in the 'neither agree or disagree category'. There is a reasonable argument that this item is poorly worded and is not indicative of stewardship as a result.

The statements regarding 'production' values were disagreed with by the majority of respondents, though less so regarding using the forest to produce some kind of income for the household than for producing timber products.

Statements regarding 'preservation' and 'conservation' showed some interesting results. There was a very high level of agreement with statements relating to preserving the

forest, but a higher percentage agreed with the statement that assessed 'conservation' values, in which utilisation of forest resources in a sustainable manner is considered acceptable.

In general, respondents were likely to disagree with production activities generally, strongly supported preservation but also were very likely to believe that with appropriate management some production of forest products is acceptable, if care is taken to protect the inherent value of the forest. However, the types of activities that constitute 'careful management' were not defined in the question and perceptions of what would be appropriate 'careful management' are likely to vary widely between different landowners.

In relation to the environmental value data, there is a strong favouring of eco-centric values which is consisted with the results presented above. Respondents were very likely to disagree with pro-development statements. Only one pro-development statement, 'development should be allowed to proceed where environmental damage from activities such as mining is possible, but very unlikely', was agreed with by more than one-third of respondents; the other two pro-development statements were agreed with by only 18% and 19% of landowners, respectively.

Utilitarian value statements, which were closer in their wording to the eco-centric statements than the pro-development statements, were generally agreed with by respondents, though not to the same extent as the eco-centric items. They are assumed to tap individuals valuing of the environment for its usefulness to humans or to human well-being. This is in comparison to the eco-centric items which are supposed to tap an individuals understanding of nature as valuable in itself and without any reference to human needs and desires.

A large majority of respondents agreed with the eco-centric statements. This reflects the general support of the sample population for seeing nature as having value in its own right, which is consistent with other results. Protecting species, considering future generations, cherishing an aesthetic relation to nature and acknowledging the need to preserve and protect nature were all more strongly agreed with than utilitarian and pro-development statements. This suggests that a significant proportion of the sample population is orientated towards eco-centrism.

The strong trend towards holding eco-centric values may be explained by a range of factors. As stated earlier, there is a possibility that survey response was biased toward eco-centrism, although it is not known with any accuracy if this did occur. Assuming that survey bias did not account for all of the strong trend towards eco-centrism, factors which may explain this trend include:

- the influx of new residents (alternative 'lifestylers', retired people, educated professionals, for example) to the coastal region may have effected a cultural shift in the surveyed region which has been reflected in a shift from an older development ethic, associated with making an income, to a newer development ethic, associated with making a lifestyle; and/ or,
- it is possible that at least some of the major values found in environmental thought have been integrated into broader society so, no matter the underlying orientation

toward making an income or making a lifestyle, landowners can be expected to be more broadly sympathetic to nature as having value in its own right.

COMPARISON TO PREVIOUS STUDIES

Previous studies examining landowner uses and values for privately owned forests have primarily been undertaken in countries other than Australia. While most of these studies are not directly comparable to this one, having measured different variables or used different methods, the general results from some regarding uses of the forest and values held for the forest can be cautiously compared with results from this study.

In general, studies undertaken from the mid-1980s through to recent years show broadly similar results to this study regarding the types of uses most commonly undertaken in forests and values most commonly held for privately owned forests.

The most common reasons for owning, using or valuing forest, perhaps best phrased as the primary ways of experiencing private forests, are usually described by private forest landowners as appreciating the beauty of the forest, observing plants and/or animals and preserving or conserving nature. Studies in which these types of uses ranked as most important included Birch, Hodge and Thompson (1998); Blatner, Baumgartner and Quackenbush (1991); Bliss *et al.* (1997); Brunson *et al.* (1996); Dettman, Hamilton and Curtis (2000); Egan and Jones (1993); Egan *et al.* (1995); Kangas and Niemelainen (1996); Kingsley, Brock and Debald (1988); Kuhns, Brunson and Roberts (1998); O'Hara and Reed (1991); Rickenbach *et al.* (1998); Wilson (1992); and Young and Reichenbach (1987).

Most of the above studies were undertaken in the United States of America, with the exception of three studies; (1) Dettman, Hamilton and Curtis (2000), who undertook their study of landowner values and intentions regarding remnant vegetation management in Australia; (2) Wilson (1992), whose study was undertaken in Aotearoa/New Zealand; and, (3) Kangas and Niemelainen (1996), who undertook their study in Finland.

A study with significantly different results to the results presented in this report was that by Schuster (1978). Schuster (1978) found that private forest landowners in Western Montana, USA, when asked why they owned forest, ranked 'part of farm or ranch' and 'timber production' the highest reasons while aesthetic and recreational uses ranked lower. This may be partly explained by the time at which the study was carried out, as since the late 1970s it is possible that eco-centric values have become more common amongst private forest landowners. The design of survey questions and type of population surveyed may also have contributed to any variance in the results of this survey when compared to other surveys.

Many studies have been undertaken examining the likelihood of landowners being willing to sell timber from their forest and not all of these have examined other forest uses, such as recreation. The proportion of landowners willing to undertake management for the purposes of income generation in the form of timber production varied widely, from 2% to 50% of landowners, between studies. Part of this difference is likely due to

the different ways questions were asked about this topic, other differences may be regional or cultural.

Studies in which timber harvesting was considered important by more than 10% of the private forest landowners surveyed included the following.

- Birch, Hodge and Thompson (1998) who undertook their study in Virginia, USA and found approximately 28% of landowners citing timber production as a reason for owning their forest.
- Blatner, Baumgartner and Quackenbush (1991) who undertook their study in Washington State, USA and found income from timber being cited as a forest ownership objective by 56% of survey respondents.
- Bourke and Luloff (1994) asked respondents if they agreed with encouraging timber harvesting in general, and found 51.4% of non-industrial private forest landowners agreed.
- Dettman, Hamilton and Curtis (2000) in their Victorian study on landowner values and intentions regarding remnant vegetation in the Box-Ironbark region found that 86% of respondents ranked timber production as somewhat or very important. Respondents in this study were still likely to rank other forest uses/values higher than timer production, but clearly were more willing to consider timber production than respondents in this study. This difference needs to be explored more closely to find explanations for the different between forest owners in the two studies.
- The Forestry Commission of Tasmania (1982) found 77% of private forest landowners were willing to sell wood from their forests. This result again varies considerably from results in this survey and may reflect the strong history of private forest harvesting in Tasmania, the higher number of respondents in that study who were employed in the forest and forestry industries, and possibly different values held for forest twenty years ago when the study was undertaken.
- Kuhns, Brunson and Roberts (1998) found considerable differences between landowners in Utah and Indiana in the number of private forest landowners who cited 'timber income' as one of the benefits they derived from their forest land. In Utah, 5% cited timber income as a benefit, while 45% did in Indiana.
- O'Hara and Reed (1991) in their study in north-west Minnesota found 25% of respondents had an ownership objective of growing timber or other forest products for income.

In Australia, the results of the ABARE 1993-94 farm survey included questions on the use of trees on farms in Australia. They found that only 7% of NSW farmers and 6% of farmers Australia-wide use their trees on farms for production of sawlogs. A higher proportion, but still a minority, produced other products with 25% of NSW farmers and 22% of Australian farmers using their trees to produce wood products other than sawlogs or pulplogs for use or sale (Wilson *et al.* 1995). This result is similar to that found in this survey, in which use of privately owned forest for wood products for on-property use was much more likely than the production of timber products for sale,

although the different categories used in the surveys means the comparison is, at best, cautious.

Interestingly, two studies; Kangas and Niemelainen (1996) and Greene and Blatner (1986), found that owners with larger forests were more likely to use their forests for income earning activities. This is similar to the results for this study, in which owners of larger forest areas were more likely to be planning to use their forest for income earning activities.

Clearly there are some areas where, while aesthetic and preservation/ conservation activities are valued more highly than other forest uses, timber production is considered more acceptable than in other regions. Examining the history of forest harvesting and use as well as extension programs in these regions may provide some better explanation of these variations.

It appears possible that private forest landowners in SE NSW are less likely than private forest landowners in some other regions of Australia and in parts of the USA to be willing to harvest their forests for the purpose of selling timber products.

CONCLUSION

Uses that landowners in South-East NSW make of their native forest are many and varied. Uses of a recreational or aesthetic nature are the most commonly engaged in on a day to day basis. They are also the most commonly planned uses that landowners wish to undertake during the next 10 years. This, in part, may relate to the amount of energy and time that has to be applied to undertake more complex and involved activities but there appears enough evidence to cautiously suggest that many landowners are quite comfortable with this form of relationship with their native forests.

Further, native forests are not used by the majority of landowners to support the property or household in an economic sense. About the only exception to this is the harvesting of timber for on-property use. Preventive and passive uses which support the property and household (such as reducing fire risk, controlling pests and diseases, and protecting ecological values and waterways) are carried out by about half of the respondents to the survey. Generally, the least important uses, both current and planned, are those that contribute to an income or earnings. Included in this are the specific uses of harvesting timber and providing a source of employment.

Private forest landowners have generally shown an awareness of their native forests as an important part of the landscape, both social and natural. They recognise the role their forests may play in the lives of future generations and value both their own forests and forests in the landscape for their inherent value and for their value as sources of beauty and leisure. The role of government in overseeing native forest on private land is recognised, but landowners clearly are protective of their private rights in relation to control over their forest. Finally, even though there appears a general resistance to production activities in native forests generally, there is an understanding that, with care, native forests can produce forest products and be conserved at the same time.

Recommendations arising from this study for SE NSW Private Forestry's extension program are given at the beginning of this report.

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APPENDIX 1: CONCEPTS DEFINED

Throughout this report, several concepts are used which are defined in particular ways.

Native forest

A forest is a lifeform (with living and non-living components). It is a structural classification of vegetation involving life form and height of stratum, described as;

> "an area, incorporating all living and non-living components, that is dominated by trees having usually a single stem and a mature or potential mature stand height exceeding two meters and with existing or potential crown cover of overstory strata about equal to or greater than 20 percent" (National Forest Inventory 1998: xix).

Note that this definition also covers the class of vegetation known as woodland.

This study concentrates on native forest, that is forest which is dominated by trees indigenous to Australia. Consequently, native forest is defined against exotic forest (for instance, *Pinus radiata* (Monterey pine) forest). Native forest/ trees can be planted by people or can grow/ regrow naturally. This study focuses specifically on native forest/ trees that grow/ regrow naturally (in other words, not plantation forest). There are two types here; remnant forest and remaining forest (these are referred to in the questionnaire (Q1-filter)).

- Remnant forest is one form of;

  > "….native vegetation occurring within fragmented landscapes…. [and]….These patches of vegetation are [usually] surrounded by crops or sown pastures and are often viewed as relatively discrete and readily definable…." (Williams 2000, p.14).

- Remaining forest is forest that appears to have a strong or large amount of connectivity and little habitat modification. A good example of remaining forest would be a significant area of national park or extant Crown forest.

The occurrence of such remnant and remaining forests is accepted as being restricted to, for this study, rural lands beyond the boundary of urban settlements in excess of a thousand or so people. Also, the minimum forest size was determined at 2 hectares, which removes from the picture urban blocks (which are generally smaller than this minimum).

Private forest landowner

The term *Non-Industrial Private Forest landowner* (NIPF landowner) is the standard name used in natural resource management and forestry literature to refer to private landowners of forest. However, the term is often left undefined, and there is a good argument that NIPF is a poor term for describing landowners and their forests. For example, Finley *et al.* (2001) point out that;

> The 'non' name says to private forest landowners, 'You are second rate - a step below industrial' (2001: 48).

Further, definitions of NIPF landowners vary, and some authors argue there is a need to distinguish between NIPF landowners and farm forestry landowners. For instance, van der Ploeg and Wiersum (1996, p.48) define these two categories of landowners as follows:

- NIPF landowners are people who own (forested) land, but who do not farm it or draw the majority of their income from on-property agricultural activities. They tend to be either ex-farmers who have changed the source of their income to off-property activities or urban people who have purchased land for recreation or investment.
- Farm foresters are people who own (forested) land but who draw the majority of their income from on-property agricultural activities and who use their forests as support for other agricultural activities or rely on the forest to supplement income when needed.

Rather than using the problematic terms of NIPF landowner or farm forester, this report follows Finley *et al*. (2001: 48) by referring to NIPF landowners and farm foresters collectively as private forest landowners.

Management and use behaviour / use intent

Several concepts could have been used to describe the ways that private forest landowners use, and plan to use, their native forests. The concepts 'management' or 'forest management' are commonly used, but are problematic. In any survey research it is essential;

> ….That all respondents have a shared, common understanding of the meaning of the question…. (Fowler 1995: 9).

The concept 'management', however, is likely to be understood differently by different people. Given the diverse range of landowners to be surveyed, it seemed likely that different landowners would believe different activities constituted 'managing' and 'not managing', resulting in landowners who may be conducting similar activities giving different responses to the same survey questions. This would have created validity and reliability problems for the research. Use of the term 'management' was largely restricted to Q3 and was worded in such a way that it allowed landowners to determine what was or wasn't management.

The term 'use' was selected as a more appropriate alternative. It does not have the same variety of definitions as 'management', instead usually being interpreted closely to the dictionary definition of "to put into action or service (a thing) for an intended purpose" (Encyclopaedia Britannica 1976: 2523-2524).

For this research, the dictionary definition was modified so that the term 'use' is defined as *to act or to have an intent to act upon a tree or forest, which one has a right to do through the institution of (private) property, for some valued purpose*.

The term 'use behaviour' is used when describing a use that has occurred (in the past). The term 'use intent' is used when describing a use that is planned (for the future).

Value, forest value and environmental value

The study of values occurs across the social sciences (Mayton, Ball-Rokeach and Loges 1994: 1). As a result, there is an established set of theoretical and methodological approaches available for defining and studying values (Lockwood 1999: 381-382) including research examining the interaction of forests and humans (Bengston 1994) and work examining links between modern environmentalism and changing cultural values (Goodin 1992: 15; Martell 1994: 110).

For this research, value was broadly defined as 'some concept of the good' (that is virtuous, desirable, etc., see Goodin 1992: 19-83). More specific definitions of 'forest value' and 'environmental value' were taken from the literature, as follows.

Forest value: this is defined by Bengston (1994: 520) as;

> "… an enduring concept of the good related to forests and forest ecosystems".

For this research, it is defined as being a form of specific attitude and represents *'favour or dis-favour regarding forest use preferences of the landowner in terms of their native forest*'. Specific types of forest values were determined by reviewing previous research.

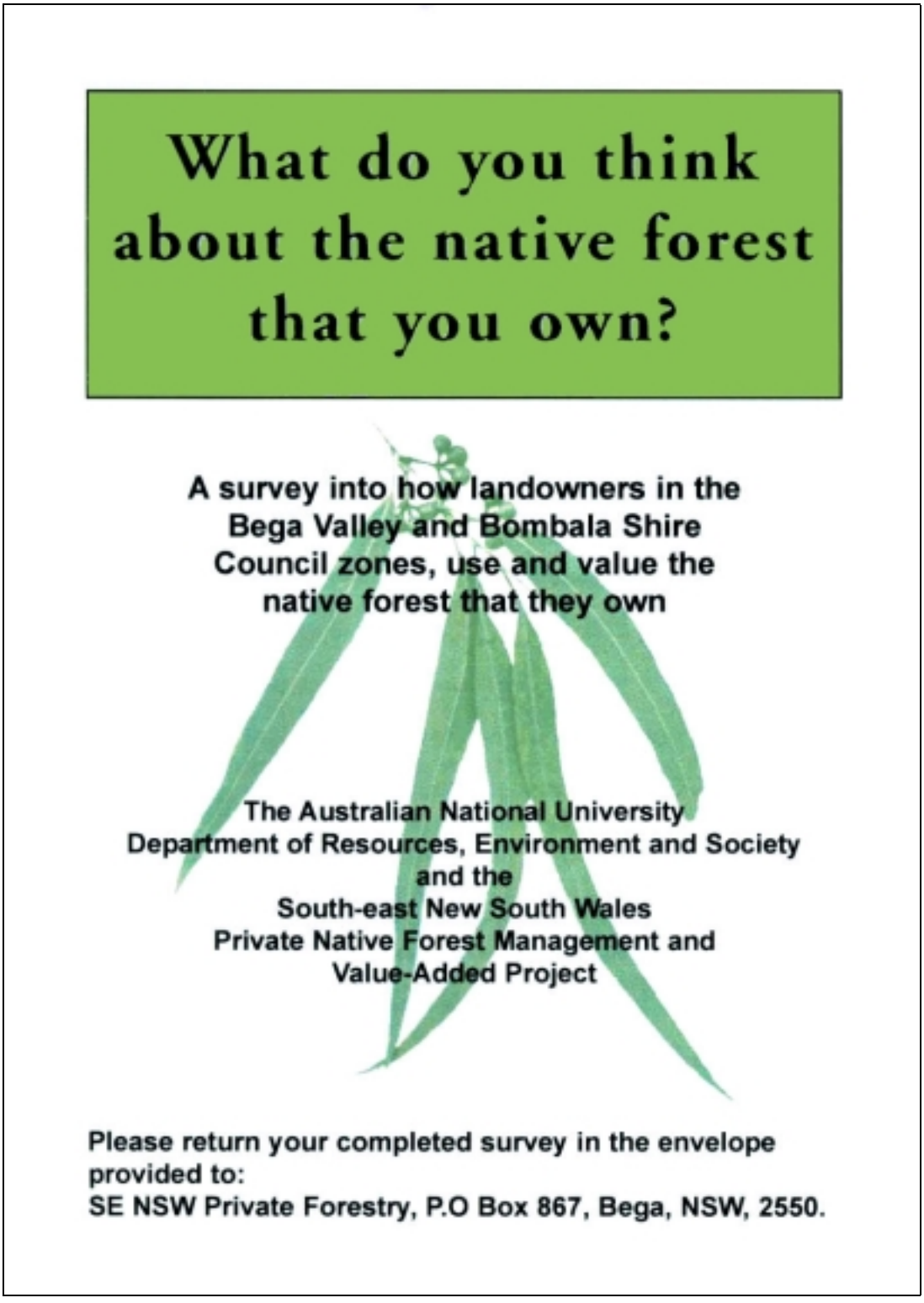
Environmental value: this was defined as a form of held value and represents a belief in a particular mode of conduct being more preferable to some other mode of conduct. Specific environmental values used to construct survey questions, drawn from Papadakis (2000), were based on a typology utilising the concepts of anthropocentrism and eco-centrism. Anthropocentrism is where value is centred on what is worthy to humans and human interests are pre-eminent. Eco-centrism is where the non-human world, or nature, has intrinsic value or value in and of itself.

APPENDIX 2: DEPICTION OF QUESTIONNAIRE

The questionnaire has been supplied here as a set of scanned and then printed Joint Photographic Experts Group (JPEG) images. There is some difference in size between the depicted images as compared to the original questionnaire, as not all the images are taken from each page, instead being presented by question for ease of reading. The questionnaire booklet was supplied to landowners in the following form.

- Cover on 120 gsm light card which was copied in full colour with text pages in black. This took the form of 12 A4 pages produced double sided to A5, finished (14.7 cm wide and 21 cm deep) as a saddle stitched booklet. Printing was by Photobition Australia, Braddon, Australian Capital Territory.

Figure A2.1 Questionnaire title page.



Note: the above figure should be approximately the same size as the original booklet.

Figure A2.2 Filter for determining if an individual was part of survey population.

Start here:

1. The following **three** questions will tell you if the survey is relevant to your household and if the survey would be best filled in by you or someone else in your household.

(1.A) Are you an owner or part owner of land with native forest in the Bega Valley and/or Bombala Shire Council zones? ***Please tick one box only and read the instructions next to that box.***

Yes.. ❑➤ Please go to the next question; (**1.B**)

No... ❑➤ (If No) Could you please pass this survey onto another person in your household who is an owner. If there is no one who is, could you please return the survey in the envelope provided so we can check you off the mailing list. Thank you.

(1.B) Is the native forest owned equal to or greater than two hectares in at least one patch or area? (Two hectares is approximately equal to five acres). (*Please tick one box only*).

Yes.. ❑➤ Please go to the next question; (**1.C**)

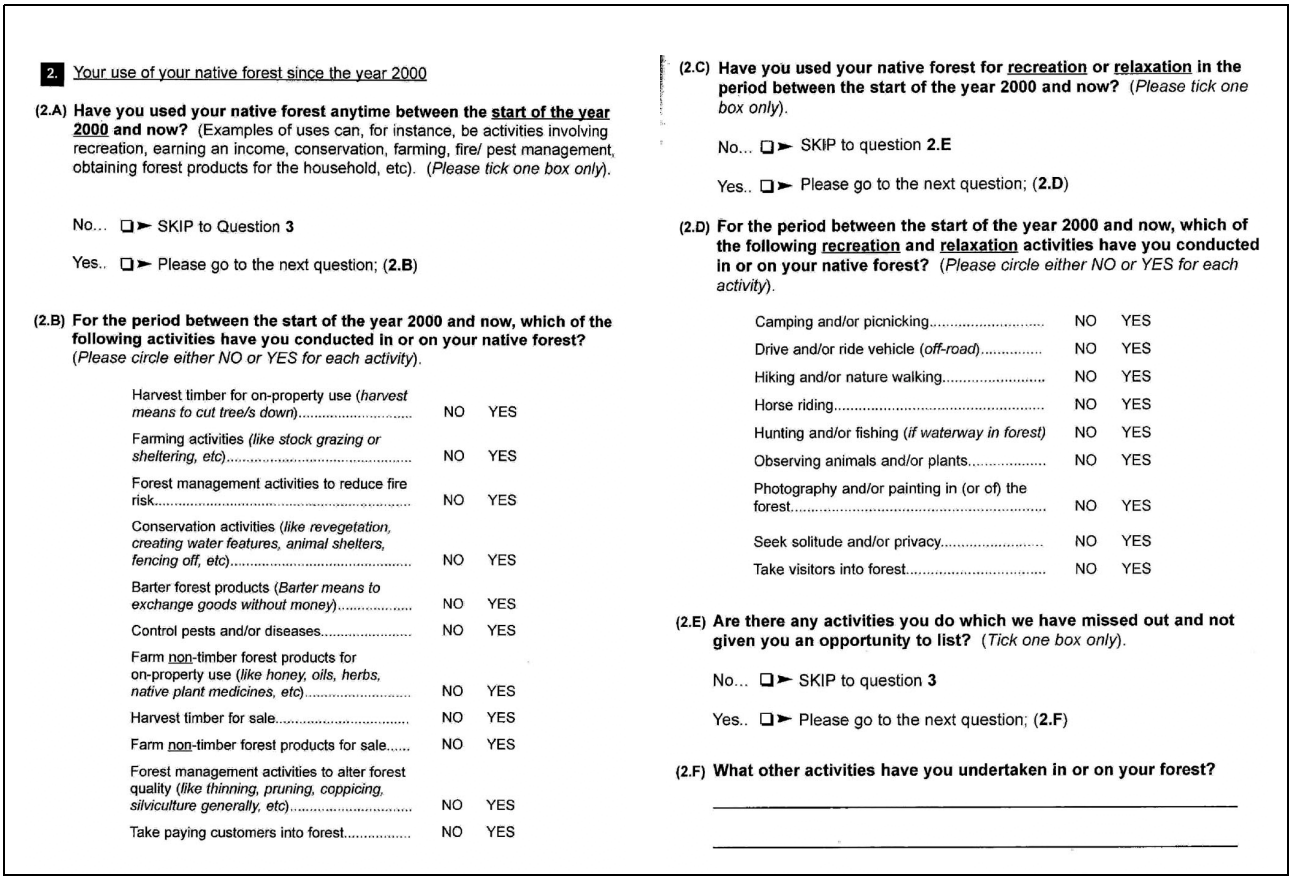
No... ❑➤ (If No) It is not necessary for you to complete the rest of this survey. Could you please return the survey in the envelope provided so we can check you off the mailing list. That will help us a great deal. Thank you.

(1.C) Is at least two hectares or more of your native forest remnant or remaining native forest? (There are two types of native forest: (1) remnant (or remaining); and, (2) plantation native forest. This survey is focussed upon remnant (or remaining) native forest and not plantation native forest). (*Please tick one box only*).

Yes.. ❑➤ Please turn over the page and continue the questions.

No... ❑➤ (If No) It is not necessary for you to complete the rest of this survey. Could you please return the survey in the envelope provided so we can check you off the mailing list. That will help us a great deal. Thank you.

Figure A2.3 Question 2: use behaviour



2. Your use of your native forest since the year 2000

(2.A) Have you used your native forest anytime between the start of the year 2000 and now? (Examples of uses can, for instance, be activities involving recreation, earning an income, conservation, farming, fire/ pest management, obtaining forest products for the household, etc). (*Please tick one box only*).

No... ❑➤ SKIP to Question **3**

Yes.. ❑➤ Please go to the next question; (**2.B**)

(2.B) For the period between the start of the year 2000 and now, which of the following activities have you conducted in or on your native forest? (*Please circle either NO or YES for each activity*).

Harvest timber for on-property use (*harvest means to cut tree/s down*)	NO	YES
Farming activities (*like stock grazing or sheltering, etc*)	NO	YES
Forest management activities to reduce fire risk	NO	YES
Conservation activities (*like revegetation, creating water features, animal shelters, fencing off, etc*)	NO	YES
Barter forest products (*Barter means to exchange goods without money*)	NO	YES
Control pests and/or diseases	NO	YES
Farm non-timber forest products for on-property use (*like honey, oils, herbs, native plant medicines, etc*)	NO	YES
Harvest timber for sale	NO	YES
Farm non-timber forest products for sale	NO	YES
Forest management activities to alter forest quality (*like thinning, pruning, coppicing, silviculture generally, etc*)	NO	YES
Take paying customers into forest	NO	YES

(2.C) Have you used your native forest for recreation or relaxation in the period between the start of the year 2000 and now? (*Please tick one box only*).

No... ❑➤ SKIP to question **2.E**

Yes.. ❑➤ Please go to the next question; (**2.D**)

(2.D) For the period between the start of the year 2000 and now, which of the following recreation and relaxation activities have you conducted in or on your native forest? (*Please circle either NO or YES for each activity*).

Camping and/or picnicking	NO	YES
Drive and/or ride vehicle (*off-road*)	NO	YES
Hiking and/or nature walking	NO	YES
Horse riding	NO	YES
Hunting and/or fishing (*if waterway in forest*)	NO	YES
Observing animals and/or plants	NO	YES
Photography and/or painting in (or of) the forest	NO	YES
Seek solitude and/or privacy	NO	YES
Take visitors into forest	NO	YES

(2.E) Are there any activities you do which we have missed out and not given you an opportunity to list? (*Tick one box only*).

No... ❑➤ SKIP to question **3**

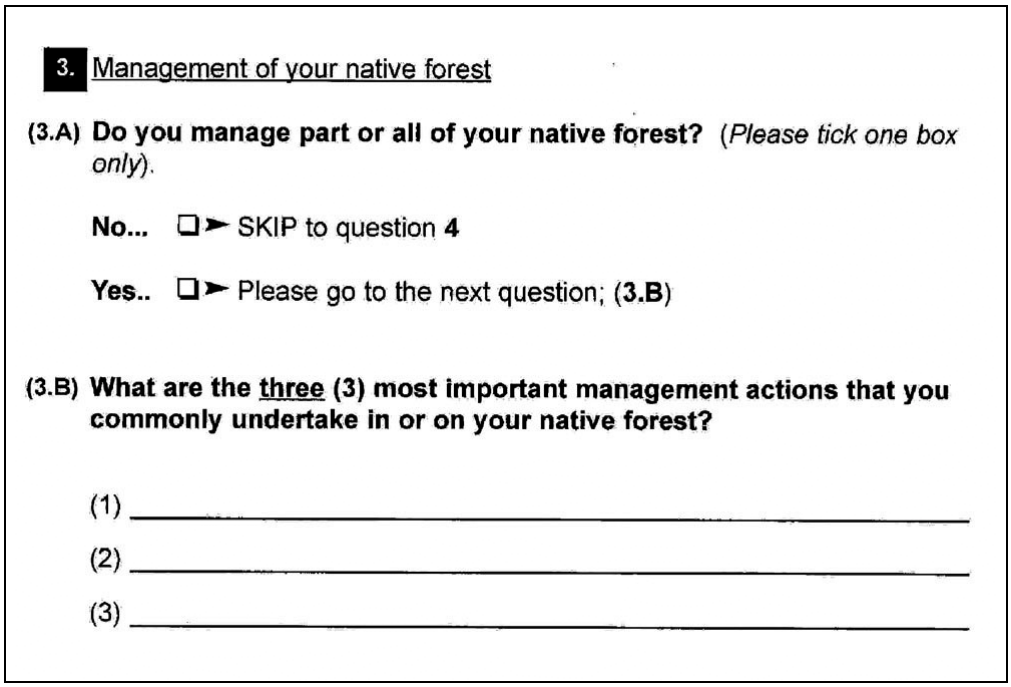
Yes.. ❑➤ Please go to the next question; (**2.F**)

(2.F) What other activities have you undertaken in or on your forest?

_____

_____

Figure A2.4 Question 3: management behaviour.



3. Management of your native forest

(3.A) Do you manage part or all of your native forest? (*Please tick one box only*).

No... ❑➤ SKIP to question **4**

Yes.. ❑➤ Please go to the next question; (**3.B**)

(3.B) What are the three (3) most important management actions that you commonly undertake in or on your native forest?

(1) _____

(2) _____

(3) _____

Figure A2.5 Question 4: filter for use intent.

4. Plans for using your native forest over the next ten years

(4.A) Are you planning to do anything with your native forest over the next ten (10) years? (*Please tick one box only*).

No... ❑➢ SKIP to question **5**

Yes.. ❑➢ Please go to the next question; **(4.B)**

Figure A2.6 Question 4: use intent (Q4.B and Q4.C).

(4.B) For your native forest, could you please indicate the importance to you of each of the activities listed below which you may be planning to undertake within the next ten (10) years. (*Please circle either Nil, Low, Medium or High for each activity*).

	Importance of planned activity			
Harvest timber for on-property use.....	Nil	Low	Medium	High
Farm non-timber forest product for on-property use (*an example are foodstuffs, like honey and nuts*).....	Nil	Low	Medium	High
Improve the quality (health) of your forest.....	Nil	Low	Medium	High
Maintain or improve for conservation.....	Nil	Low	Medium	High
Maintain or improve forest to protect land/ water source/table.....	Nil	Low	Medium	High
Maintain or improve forest for its natural beauty.....	Nil	Low	Medium	High
Maintain or improve forest in order to pass on through your will.....	Nil	Low	Medium	High
Maintain or improve forest to enhance your residential area.....	Nil	Low	Medium	High
Barter forest products (*Barter means to exchange goods without money*).....	Nil	Low	Medium	High
Protect part or all of forest by making a change to property title (*an example is a Voluntary Conservation Agreement*).....	Nil	Low	Medium	High

(4.C) Are you planning to use your native forest to generate an income or any other form of earning, over the next ten (10) years? (*Please tick one box only*).

No... ❑➢ SKIP to question **4.E**

Yes.. ❑➢ Please go to the next question; (**4.D**)

Figure A2.7 Question 4: use intent (Q4.D through Q4.H).

(4.D) For your native forest, could you please indicate the importance to you of each income generation or earning activity, which you may be planning to undertake within the next ten (10) years. (*Please circle either Nil, Low, Medium or High for each activity*).

	Importance of planned activity			
Maintain or develop forest to supply regular income from timber sales	Nil	Low	Medium	High
Maintain or develop forest to supply regular income from sale of non-timber forest products	Nil	Low	Medium	High
Maintain or develop forest as an asset to property value	Nil	Low	Medium	High
Maintain or develop forest to provide employment opportunities for yourself or other family member	Nil	Low	Medium	High
Maintain or develop forest on the speculation that a future income can be drawn from the forest	Nil	Low	Medium	High
Maintain or develop forest as part of a broader business, such as eco-tourism or holiday accommodation	Nil	Low	Medium	High

(4.E) Are you planning to use your native forest for any recreation or relaxation activities over the next ten (10) years? (*Please tick one box only*).

No... ❑➤ SKIP to question **4.G**

Yes.. ❑➤ Please go to the next question; (**4.F**)

(4.F) For your native forest, could you please indicate the importance to you of each recreation or relaxation activity which you may be planning to undertake within the next ten (10) years. (*Please circle either Nil, Low, Medium or High for each activity*).

	Importance of planned activity			
Camping and/or picnicking	Nil	Low	Medium	High
Drive and/or ride vehicle (*off-road*)	Nil	Low	Medium	High
Hiking and/or nature walking	Nil	Low	Medium	High
Horse riding	Nil	Low	Medium	High
Hunting and/or fishing (*if waterway in forest*)	Nil	Low	Medium	High
Maintain or improve forest for solitude and/or privacy	Nil	Low	Medium	High
Observing plants and/or animals	Nil	Low	Medium	High
Photography and/or painting in (or of) the forest	Nil	Low	Medium	High

(4.G) Are you planning to sell part or all of your native forest within the next ten (10) years? (*Please tick one box only*).

No... ❑➤ Please go to the next question; (**4.H**)

Yes.. ❑➤ Please go to the next question; (**4.H**)

(4.H) Could you please list your top three (3) most important planned activities (or list the first and/or second if you do not have three).

(1) _____

(2) _____

(3) _____

Figure A2.8 Question 5: stewardship.

5. Stewardship of native forest

(5.A) Please indicate whether you agree or disagree with each of the following statements. Please circle one of either strongly agree, somewhat agree, neither, somewhat disagree or strongly disagree for each statement. There are no right or wrong answers to these questions, we would just like to know your opinion.

	Your opinion				
My land and forest are a part of a much bigger natural system.....	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
What I do to my land and forest can affect others and their land.....	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
Owners of native forest on private property should have the right to do as they please with their forests.....	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
Individual plant and animal species in my forest are important to me.....	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
It is my religious or spiritual duty to take care of my native forest.....	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
Government should have a strong role in overseeing landowner use of their own native forest.....	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
What I do to my land and forest will matter to future generations.....	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree

Figure A2.9 Question 6: preservation, conservation and production.

6. Environmental and economic issues surrounding privately owned native forest

(6.A) Please indicate whether you agree or disagree with each of the following statements. (*Please circle either strongly agree, somewhat agree, neither, somewhat disagree or strongly disagree for each statement*). There are no right or wrong answers to these questions, we would just like to know your opinion.

	Your opinion				
My native forest should be used to maximise income to my enterprise/ household.....	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
My forest should be left to grow as nature intended.....	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
My native forest should mainly be used to produce timber products.....	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
If carefully managed, privately owned native forest can provide products from the forest and conservation outcomes.....	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
I intend to preserve my native forest from timber harvesting.....	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree

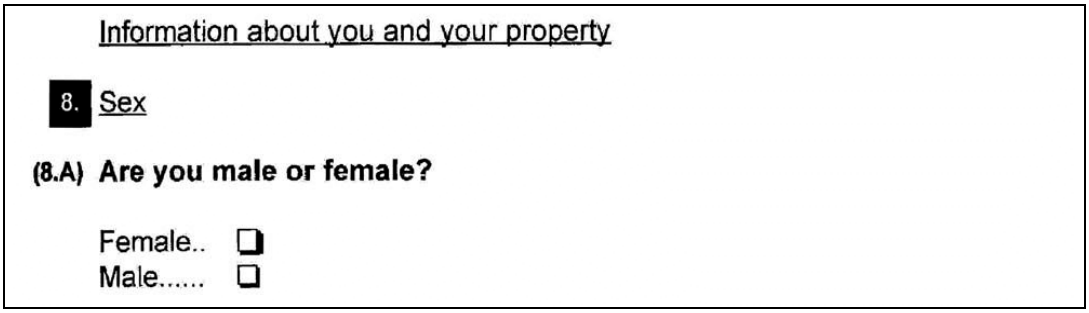
Figure A2.10 Question 7: environmental value.

7. Our society's use of natural resources (forests and minerals)

(7.A) This question focuses broadly on our society's use of natural resources for conservation and development. Please indicate whether you agree or disagree with the following statements.
(Please circle your choice for each statement).

	Your opinion				
The greatest value of National Parks and nature reserves is in recreation activities such as bushwalking, camping, or just taking photographs	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
Jobs are the most important thing in deciding how best to use our natural resources such as mineral deposits and forests	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
Development should be allowed to proceed where environmental damage from activities such as mining is possible, but very unlikely	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
It is very important to have places where native wildlife and plants are preserved, even if I never go there to actually see them	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
In deciding how to use Australia's natural resources, it is more important to consider the needs of future generations than our own	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
In deciding how to use our natural resources, such as mineral deposits and forests, the most important thing is the financial benefits for Australia	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
National Parks should be preserved for their sheer natural beauty	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
National Parks should be preserved for the pleasure they give to so many holiday makers	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
I cherish nature and preserve it as one of the most precious things in life	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
The great value of National Parks is the opportunities they provide for people to enjoy nature	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree

Figure A2.11 Question 8: sex.



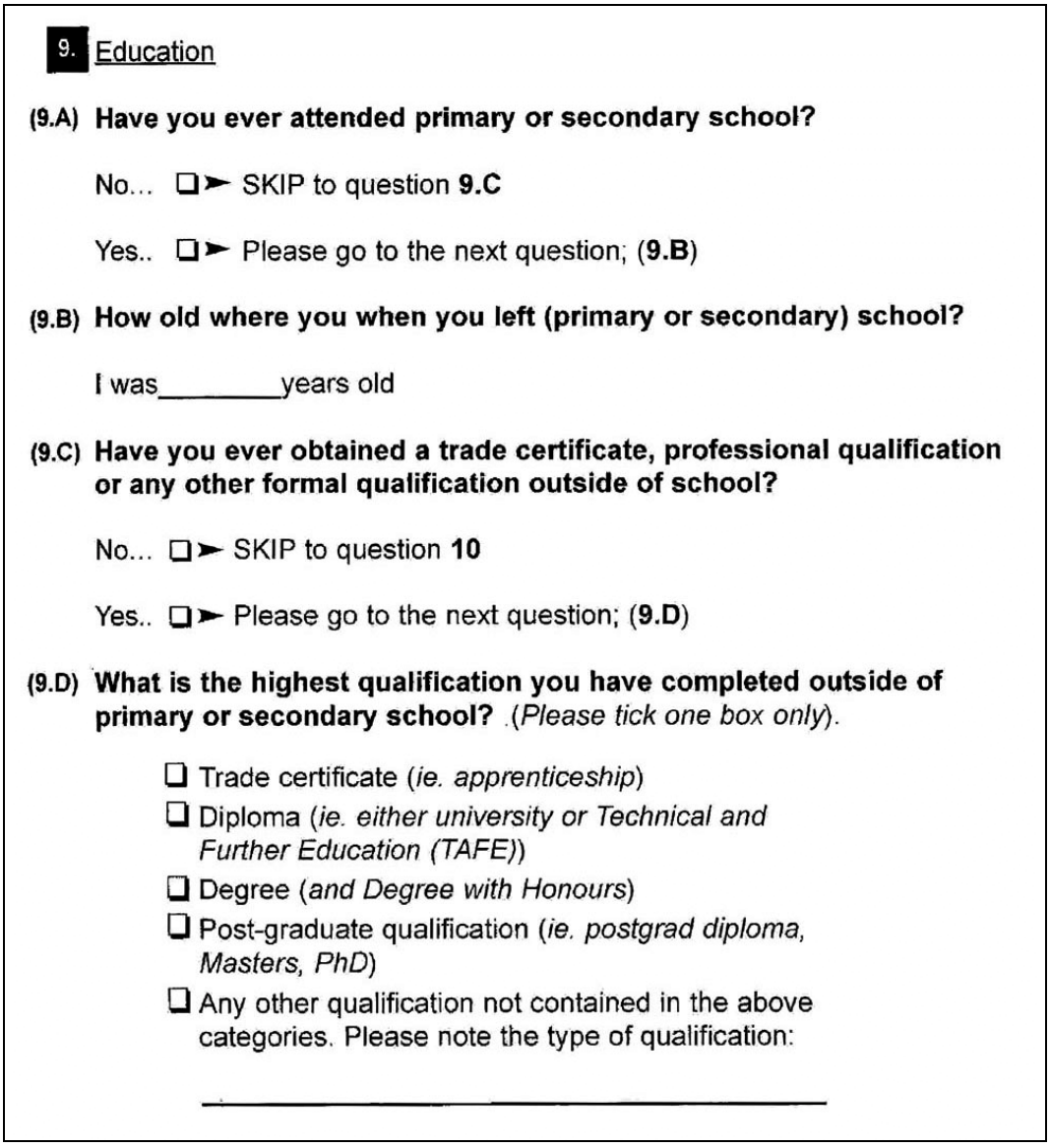
Information about you and your property

8. Sex

(8.A) Are you male or female?

Female.. ❑
Male..... ❑

Figure A2.12 Question 9: education.



9. Education

(9.A) Have you ever attended primary or secondary school?

No... ❑➢ SKIP to question **9.C**

Yes.. ❑➢ Please go to the next question; (**9.B**)

(9.B) How old where you when you left (primary or secondary) school?

I was_____years old

(9.C) Have you ever obtained a trade certificate, professional qualification or any other formal qualification outside of school?

No... ❑➢ SKIP to question **10**

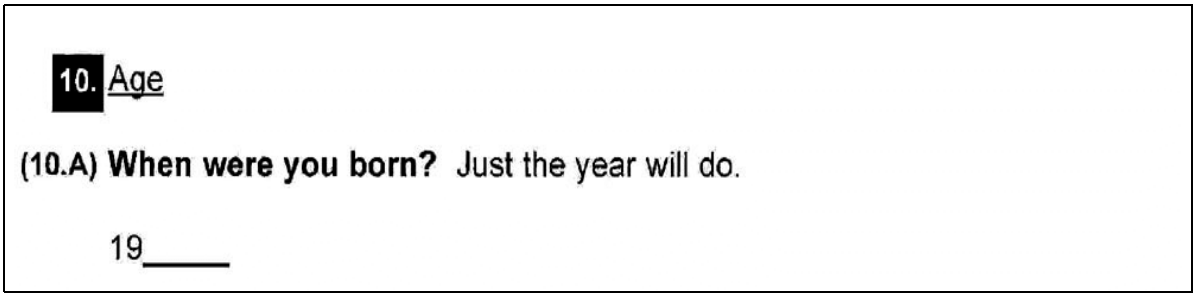
Yes.. ❑➢ Please go to the next question; (**9.D**)

(9.D) What is the highest qualification you have completed outside of primary or secondary school? (*Please tick one box only*).

- ❑ Trade certificate (*ie. apprenticeship*)
- ❑ Diploma (*ie. either university or Technical and Further Education (TAFE)*)
- ❑ Degree (*and Degree with Honours*)
- ❑ Post-graduate qualification (*ie. postgrad diploma, Masters, PhD*)
- ❑ Any other qualification not contained in the above categories. Please note the type of qualification:

_____

Figure A2.13 Question 10: age.

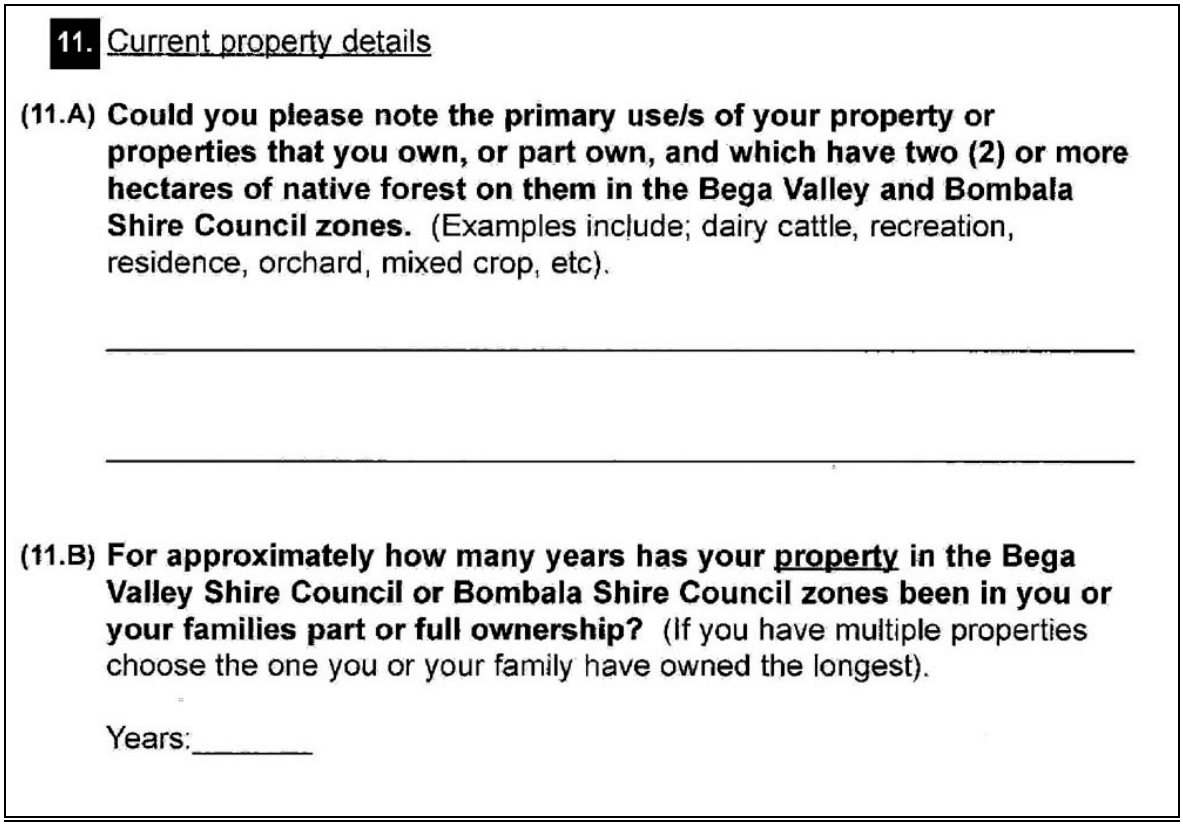


10. Age

(10.A) When were you born? Just the year will do.

19_____

Figure A2.14 Question 11: property details.



11. Current property details

(11.A) Could you please note the primary use/s of your property or properties that you own, or part own, and which have two (2) or more hectares of native forest on them in the Bega Valley and Bombala Shire Council zones. (Examples include; dairy cattle, recreation, residence, orchard, mixed crop, etc).

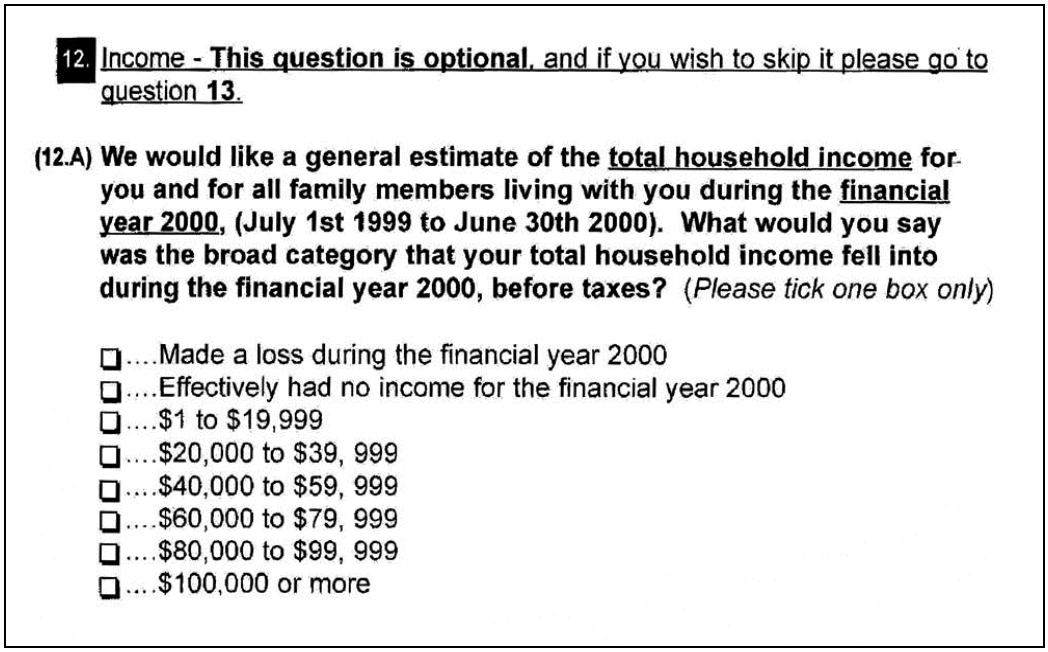
_____

_____

(11.B) For approximately how many years has your property in the Bega Valley Shire Council or Bombala Shire Council zones been in you or your families part or full ownership? (If you have multiple properties choose the one you or your family have owned the longest).

Years:_____

Figure A2.15 Question 12: income.

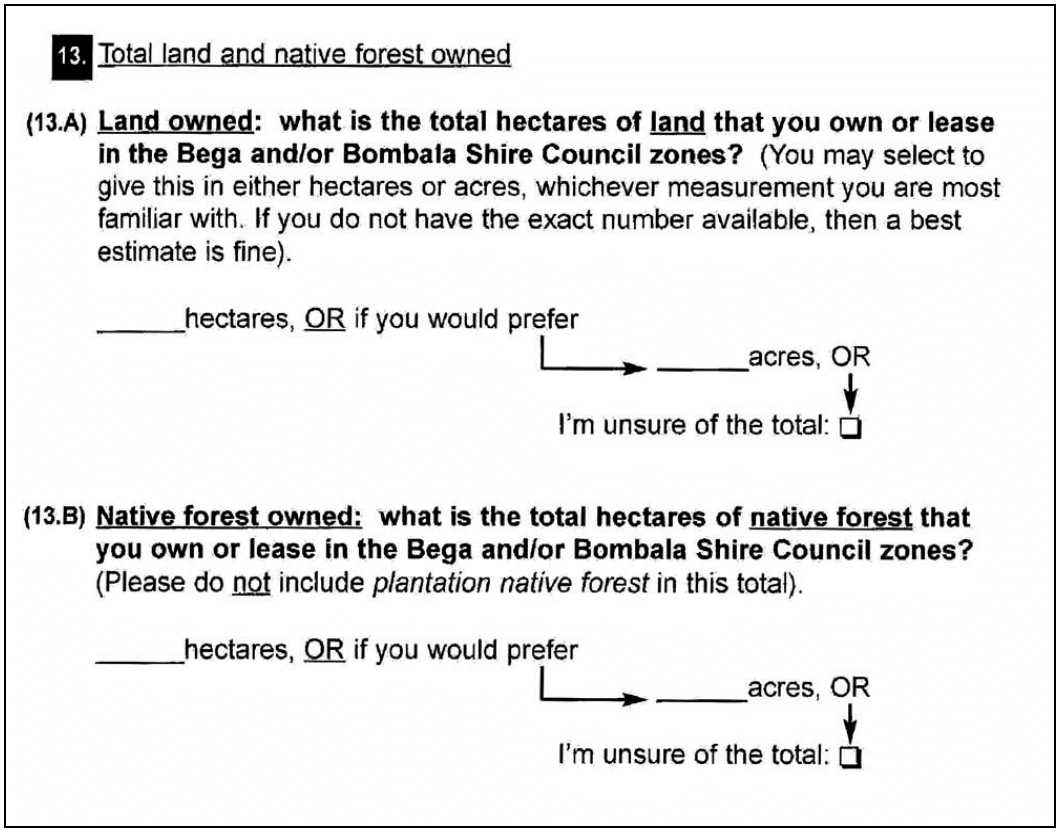


12. Income - **This question is optional**, and if you wish to skip it please go to question **13**.

(12.A) **We would like a general estimate of the total household income for you and for all family members living with you during the financial year 2000, (July 1st 1999 to June 30th 2000). What would you say was the broad category that your total household income fell into during the financial year 2000, before taxes?** (*Please tick one box only*)

- ❑ ....Made a loss during the financial year 2000
- ❑ ....Effectively had no income for the financial year 2000
- ❑ ....$1 to $19,999
- ❑ ....$20,000 to $39, 999
- ❑ ....$40,000 to $59, 999
- ❑ ....$60,000 to $79, 999
- ❑ ....$80,000 to $99, 999
- ❑ ....$100,000 or more

Figure A2.16 Question 13: total land and forest owned.



13. Total land and native forest owned

(13.A) **Land owned: what is the total hectares of land that you own or lease in the Bega and/or Bombala Shire Council zones?** (You may select to give this in either hectares or acres, whichever measurement you are most familiar with. If you do not have the exact number available, then a best estimate is fine).

_____hectares, OR if you would prefer → _____acres, OR

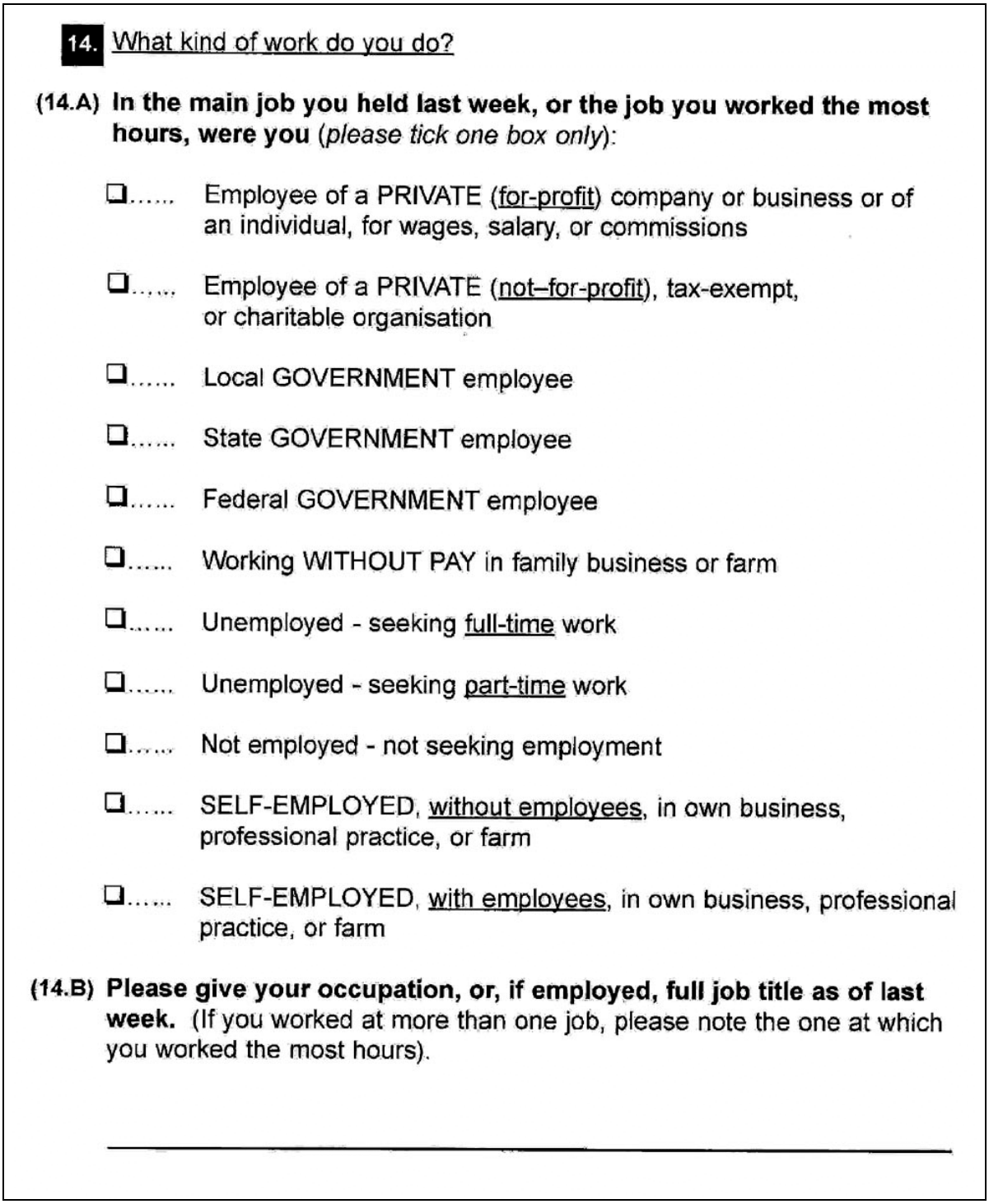
I'm unsure of the total: ❑

(13.B) **Native forest owned: what is the total hectares of native forest that you own or lease in the Bega and/or Bombala Shire Council zones?** (Please do not include *plantation native forest* in this total).

_____hectares, OR if you would prefer → _____acres, OR

I'm unsure of the total: ❑

Figure A2.17 Question 14: occupation.



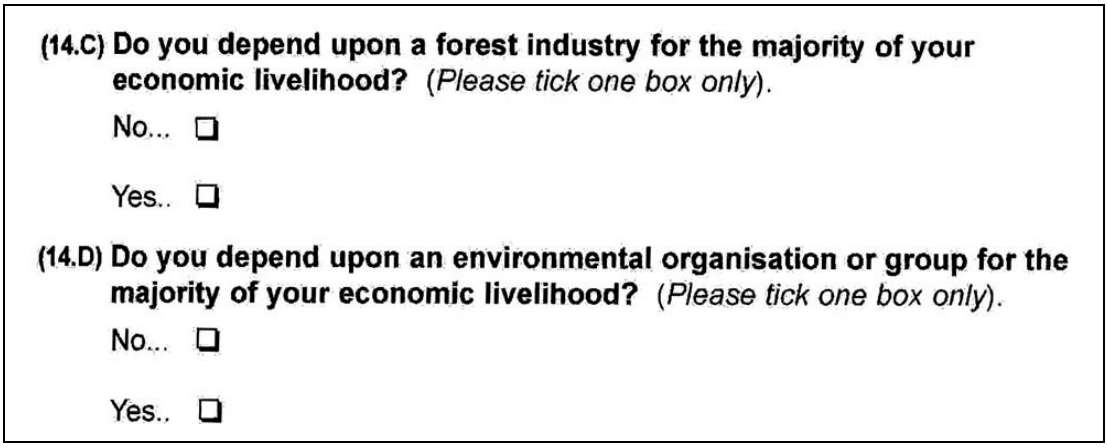
14. What kind of work do you do?

(14.A) In the main job you held last week, or the job you worked the most hours, were you (*please tick one box only*):

- ❑..... Employee of a PRIVATE (for-profit) company or business or of an individual, for wages, salary, or commissions
- ❑..... Employee of a PRIVATE (not–for-profit), tax-exempt, or charitable organisation
- ❑..... Local GOVERNMENT employee
- ❑..... State GOVERNMENT employee
- ❑..... Federal GOVERNMENT employee
- ❑..... Working WITHOUT PAY in family business or farm
- ❑..... Unemployed - seeking full-time work
- ❑..... Unemployed - seeking part-time work
- ❑..... Not employed - not seeking employment
- ❑..... SELF-EMPLOYED, without employees, in own business, professional practice, or farm
- ❑..... SELF-EMPLOYED, with employees, in own business, professional practice, or farm

(14.B) Please give your occupation, or, if employed, full job title as of last week. (If you worked at more than one job, please note the one at which you worked the most hours).

Figure A2.18 Question 14: livelihood from forest industry/ environmental organisation?



(14.C) Do you depend upon a forest industry for the majority of your economic livelihood? (*Please tick one box only*).

No... ❑

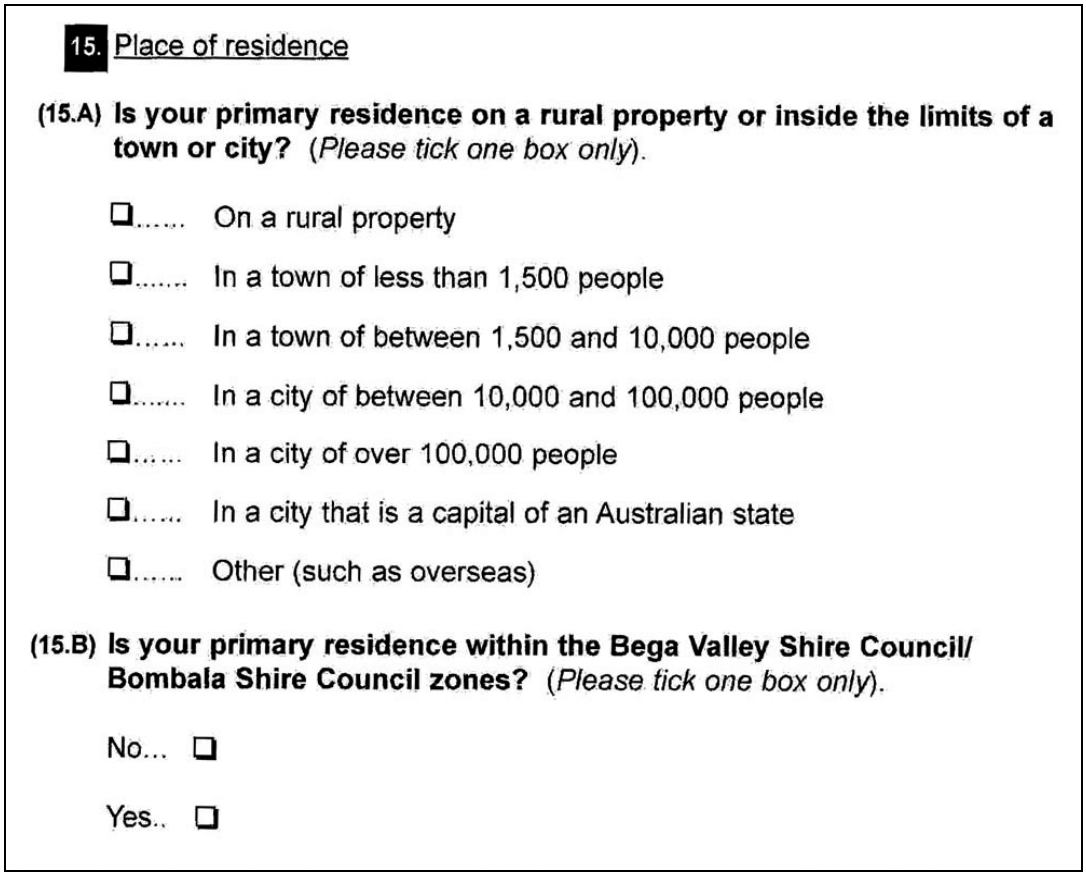
Yes.. ❑

(14.D) Do you depend upon an environmental organisation or group for the majority of your economic livelihood? (*Please tick one box only*).

No... ❑

Yes.. ❑

Figure A2.19 Question 15: location.



15. Place of residence

(15.A) Is your primary residence on a rural property or inside the limits of a town or city? (*Please tick one box only*).

❑..... On a rural property

❑..... In a town of less than 1,500 people

❑..... In a town of between 1,500 and 10,000 people

❑..... In a city of between 10,000 and 100,000 people

❑..... In a city of over 100,000 people

❑..... In a city that is a capital of an Australian state

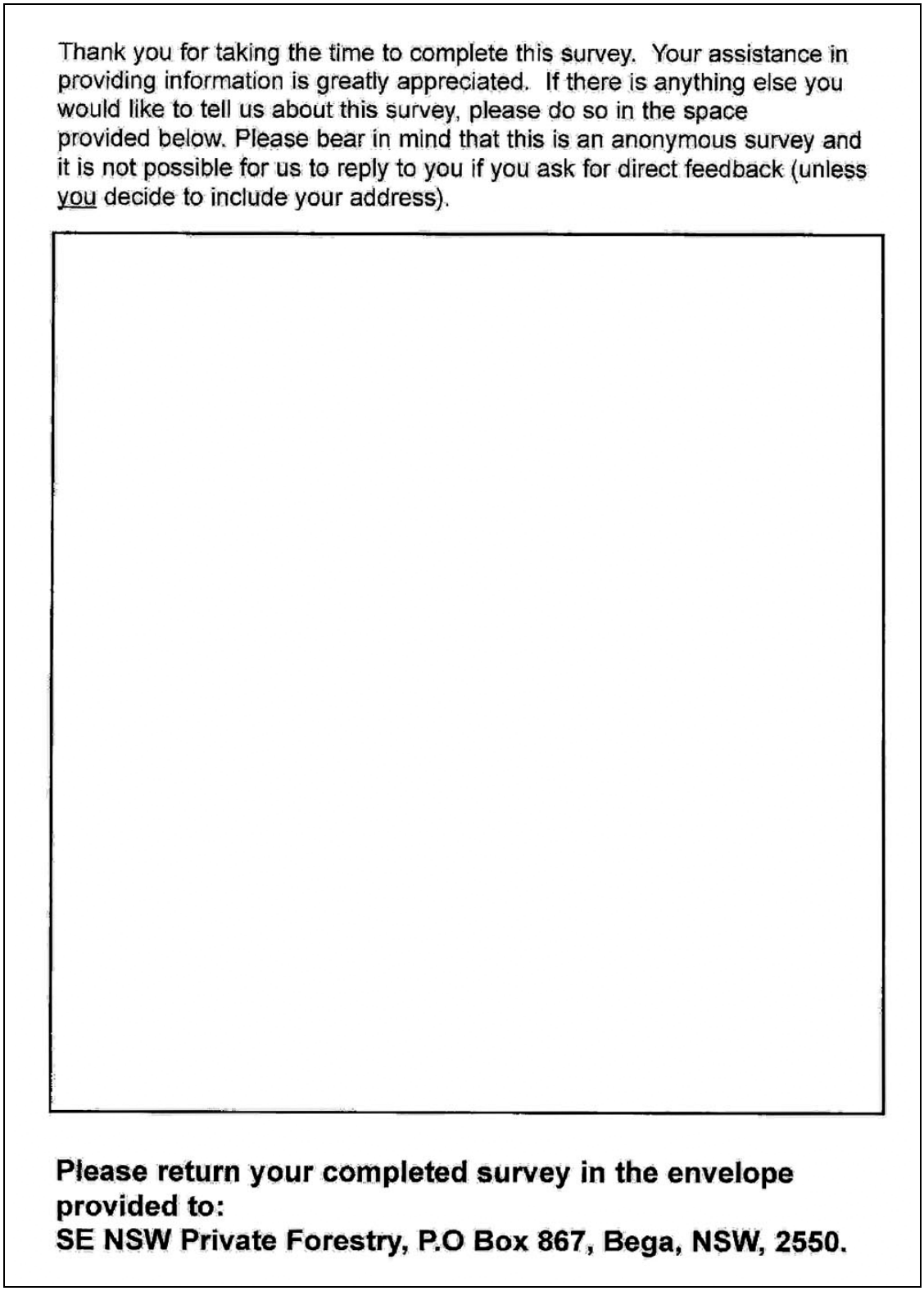
❑..... Other (such as overseas)

(15.B) Is your primary residence within the Bega Valley Shire Council/ Bombala Shire Council zones? (*Please tick one box only*).

No... ❑

Yes.. ❑

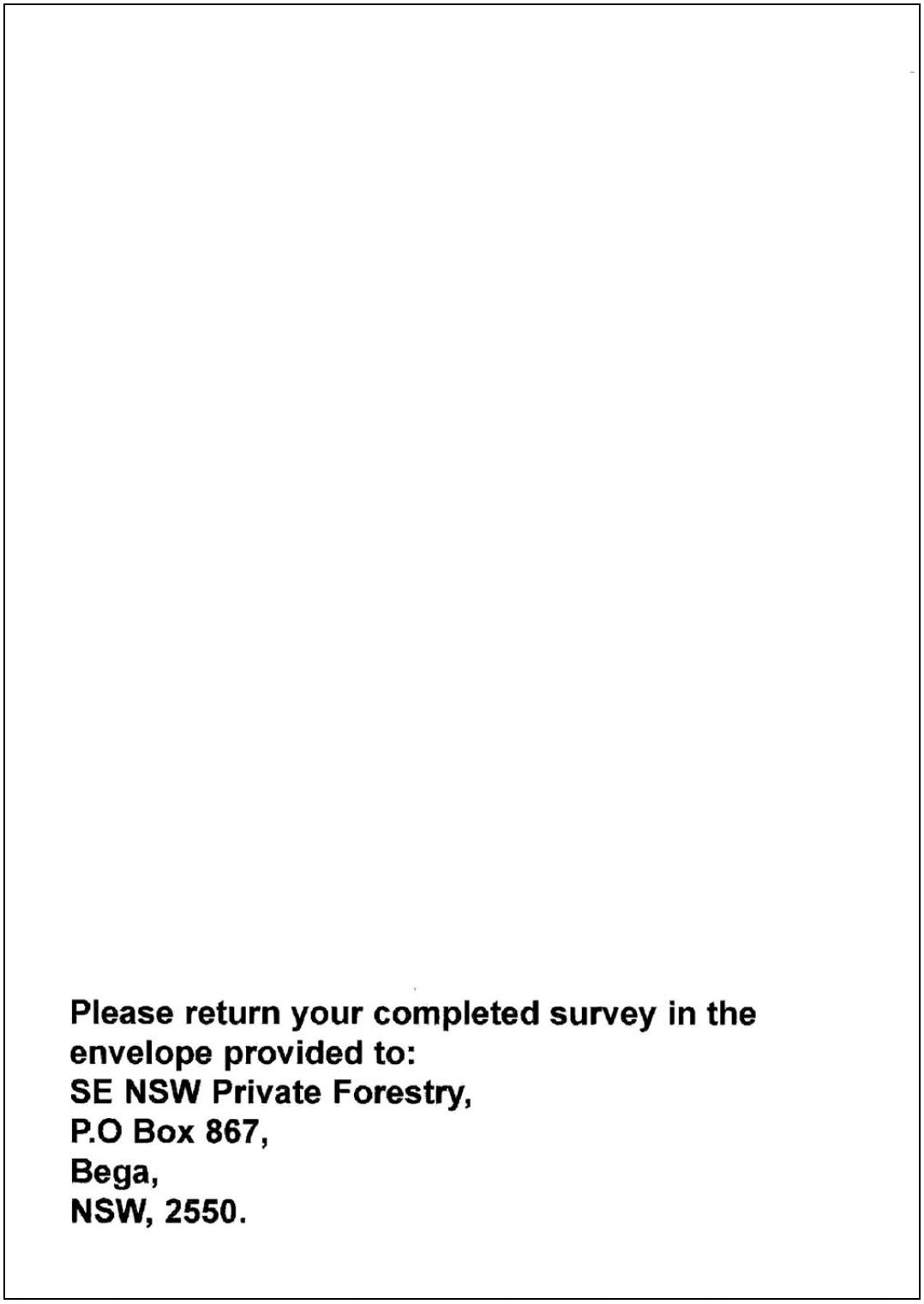
Figure A2.20 Open question for general comments.



Thank you for taking the time to complete this survey. Your assistance in providing information is greatly appreciated. If there is anything else you would like to tell us about this survey, please do so in the space provided below. Please bear in mind that this is an anonymous survey and it is not possible for us to reply to you if you ask for direct feedback (unless you decide to include your address).

Please return your completed survey in the envelope provided to:
SE NSW Private Forestry, P.O Box 867, Bega, NSW, 2550.

Figure A2.21 Questionnaire end page.



APPENDIX 3: EXPANDED LAND AND FOREST OWNED DATA

Expanded results for land and forest hectares data are presented here.

Table A3.1 Hectares of land owned (Q13.A).

Hectare category	Total hectares in category	% of total hectares in category	Total number of respondents in category	% of total no. of respondents in category
2-15	349	0	41	13
16-45	3564	5	111	36
46-100	3753	5	55	18
101-300	7282	10	41	13
301-800	17138	23	35	11
801+	41560	56	26	8
Totals	73649	100	309	100

Table A3.2 Hectares of forest owned (Q13.B).

Hectare category	Total hectares in category	% of total hectares in category	Total number of respondents in category	% of total no. of respondents in category
2-15	722	3	85	30
16-45	3333	16	114	40
46-100	3095	15	45	16
101-300	5120	25	28	10
301-800	5636	27	12	4
801+	2821	14	3	1
Total	20727	100	287	100

APPENDIX 4: EXPANDED USE BEHAVIOUR DATA

The expanded results for use behaviour are shown below in Tables A4.1 and A4.2.

Table A4.1 Expanded results on general use of native forest since the start of the year 2000 (Q2.B).

Forest use	'No' responses (No. respondents)	'No' responses (%)	'Yes' responses (No. respondents)	'Yes' responses (%)	Total respondents
Harvest timber for on-property use	98	43	129	57	227
Forest management activities to reduce fire risk	112	50	113	50	225
Control pests and/or diseases	120	55	97	45	217
Farming activities	130	59	92	41	222
Conservation activities	132	61	86	39	218
Forest management activities to alter forest quality	167	76	52	24	219
Farm non-timber forest products for on-property use	195	93	15	7	210
Farm non-timber forest products for sale	196	95	11	5	207
Barter forest products	199	96	9	4	208
Harvest timber for sale	203	96	8	4	211
Take paying customers into forest	209	100	1	0	210

Table A4.2 Expanded results on recreation/relaxation uses of native forest since the start of the year 2000 (Q2.D).

Forest use	'No' responses (No. respondents)	'No' responses (%)	'Yes' responses (No. respondents)	'Yes' responses (%)	Total respondents
Seek solitude and/or privacy	23	11	194	89	217
Observing plants and/or animals	23	11	188	89	211
Hiking and/or nature walking	28	13	185	87	213
Take visitors into forest	69	35	129	65	198
Camping and/or picnicking	87	45	105	55	192
Photography and/or painting in (or of) the forest	104	55	86	45	190
Drive and/or ride vehicle (off-road)	125	64	71	36	196
Hunting and/or fishing (if waterway in forest)	141	75	46	25	187
Horse riding	152	79	41	21	193

APPENDIX 5: EXPANDED USE INTENT DATA

Table A5.1 shows the full results relating to use intent – Questions 4.B, 4.D and 4.F in the questionnaire.

Table A5.1 Use intent results: expanded results.

Q. no.	Native forest use	Nil	Low	Not important*	Medium	High	Important **	Total responses
Q4_B	Maintain or improve forest for its natural beauty	24	25	**49**	69	115	**184**	233
Q4_F	Observe plants and/or animals	11	25	**36**	56	123	**179**	215
Q4_F	Maintain or improve forest for solitude and/or privacy	15	25	**40**	53	122	**175**	215
Q4_F	Hiking and/or nature walking	20	21	**41**	66	107	**173**	214
Q4_B	Maintain or improve forest to protect land/ water source/ table	24	30	**54**	70	102	**172**	226
Q4_B	Maintain or improve for conservation	21	37	**58**	73	98	**171**	229
Q4_B	Improve the quality (health) of your forest	34	52	**86**	64	76	**140**	226
Q4_B	Maintain or improve forest to enhance your residential area	46	44	**90**	61	77	**138**	228
Q4_B	Maintain or improve forest in order to pass on through your will	46	47	**93**	56	79	**135**	228
Q4_F	Camping and/or picnicking	47	41	**88**	58	60	**118**	206

* Not important = the sum of the 'nil' and 'low importance' categories

** Important = the sum of the 'medium' and 'high importance' categories

Table A5.1 continued over page….

Table A5.1 – CONTINUED: Use intent results: expanded results.

Q. no.	Native forest use	Nil	Low	Not important*	Medium	High	Important **	Total responses
Q4_F	Photography and/or painting in (or of) the forest	43	71	**114**	53	43	**96**	210
Q4_D	Maintain or develop forest as an asset to property value	13	33	**46**	54	41	**95**	141
Q4_B	Harvest timber for on property use	47	97	**144**	51	37	**88**	232
Q4_D	Maintain or develop forest on the speculation that a future income can be drawn from the forest	46	46	**92**	35	13	**48**	140
Q4_F	Horse riding	102	56	**158**	33	15	**48**	206
Q4_F	Hunting and/or fishing (if waterway in forest)	120	36	**156**	34	14	**48**	204
Q4_B	Protect part or all of forest by making a change to property title	134	43	**177**	24	21	**45**	222
Q4_D	Maintain or develop forest as part of a broader business, such as eco-tourism or holiday accommodation	68	30	**98**	27	15	**42**	140
Q4_F	Drive and/or ride vehicle (off road)	95	68	**163**	19	23	**42**	205
Q4_B	Farm NTFP for on property use	136	51	**187**	25	12	**37**	224

* Not important = the sum of the 'nil' and 'low importance' categories

** Important = the sum of the 'medium' and 'high importance' categories

Table A5.1 continued over page….

Table A5.1 – CONTINUED: Use intent results: expanded results.

Q. no.	Native forest use	Nil	Low	Not important*	Medium	High	Important **	Total responses
Q4_D	Maintain or develop forest to provide employment opportunities for yourself or other family member	60	37	**97**	25	11	**36**	133
Q4_D	Maintain or develop forest to supply regular income from timber sales	90	29	**119**	12	6	**18**	137
Q4_D	Maintain or develop forest to supply regular income from sale of non-timber forest products	85	37	**122**	8	7	**15**	137
Q4_B	Barter forest products	154	62	**216**	9	1	**10**	226

* Not important = the sum of the 'nil' and 'low importance' categories

** Important = the sum of the 'medium' and 'high importance' categories

APPENDIX 6: EXPANDED FOREST AND ENVIRONMENTAL VALUES DATA

The expanded results for the question sets on forest and environmental values are given in Tables A6.1, A6.2 and A6.3 below.

Table A6.1 Forest Values I question set: expanded results (Q5).

Value statement	Measure type	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree	Total
My land and forest are a part of a much bigger natural system	Percent	72	21	4	1	2	100
	Count	223	66	14	3	6	312
What I do to my land and forest can affect others and their land	Percent	61	28	4	4	3	100
	Count	188	88	14	12	8	310
Owners of native forest on private property should have the right to do as they please with their forests	Percent	28	25	7	21	19	100
	Count	89	79	23	64	60	315
Individual plant and animal species are important to me	Percent	74	18	5	2	1	100
	Count	233	58	16	5	2	314
It is my religious or spiritual duty to take care of my native forest	Percent	38	21	24	6	11	100
	Count	116	64	74	17	35	306
Government should have a strong role in overseeing landowner use of their own native forest	Percent	40	38	10	9	3	100
	Count	124	118	30	28	9	309
What I do to my land and forest will matter to future generations	Percent	70	21	5	2	2	100
	Count	221	65	16	6	6	314

Table A6.2 Forest Values II question set: expanded results (Q6).

Value statement	Measure type	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree	Total
My native forest should be used to maximise income to my enterprise/ household	Percent	11	17	25	23	25	100
	Count	33	52	76	70	79	310
My forest should be left to grow as nature intended	Percent	35	36	13	12	5	100
	Count	107	110	39	38	14	308
My native forest should mainly be used to produce timber products	Percent	5	11	18	23	43	100
	Count	16	35	54	72	131	308
If carefully managed, privately owned native forest can provide products from the forest and conservation outcomes	Percent	36	45	12	5	2	100
	Count	112	141	36	14	7	310
I intend to preserve my native forest from timber harvesting	Percent	44	19	15	11	11	100
	Count	137	59	48	34	33	311

Table A6.3 Environmental Values question set: expanded results (Q7).

Value statement	Measure type	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree	Total
Development should be allowed to proceed where environmental damage from activities such as mining is possible, but very unlikely	Percent	8	25	12	27	28	100
	Count	23	77	38	82	85	305
Jobs are the most important thing in deciding how best to use our natural resources such as mineral deposits and forests	Percent	5	13	11	29	42	100
	Count	14	39	34	90	129	306
In deciding how to use our natural resources, such as mineral deposits and forests, the most important thing is the financial benefits for Australia	Percent	5	14	12	29	40	100
	Count	16	43	37	87	123	306
National Parks should be preserved for the pleasure they give to so many holiday makers	Percent	24	40	14	17	5	100
	Count	76	123	44	52	15	310
The greatest value of National Parks and nature reserves is in recreation activities such as bushwalking, camping, or just taking photographs	Percent	25	35	12	20	8	100
	Count	76	106	36	61	24	303
The great value of national parks is the opportunities they provide for people to enjoy nature	Percent	40	38	10	9	3	100
	Count	124	118	30	28	9	309
It is very important to have places where native wildlife and plants are preserved, even if I never go there to actually see them	Percent	77	17	2	2	2	100
	Count	239	51	7	7	6	310

Table A6.3 continued over page….

Table A6.3 – CONTINUED: Environmental Values question set: expanded results (Q7).

Value statement	Measure type	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree	Total
I cherish nature and preserve it as one of the most precious things in life	Percent	57	28	8	5	2	100
	Count	176	85	26	15	5	307
In deciding how to use Australia's natural resources, it is more important to consider the needs of future generations than our own	Percent	50	33	8	6	3	100
	Count	153	103	24	19	10	309
National Parks should be preserved for their sheer natural beauty	Percent	48	31	9	9	3	100
	Count	149	95	28	27	10	309

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