

2007 Deforestation Survey

Final Report

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Disclaimer

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Executive Summary

Under the Kyoto Protocol New Zealand must account for emissions from deforestation that occurs during the period 2008-2012. Information on future rates of deforestation is needed in order to assist in projecting New Zealand's likely balance of emission units over the first commitment period of the Kyoto Protocol and to assist with policy development.

This study was commissioned to:

1. Update deforestation intentions collected in a survey in late 2006;
2. Identify and include any new information sources on deforestation;
3. Provide an estimate of the area deforested in the years ended December 2006 and December 2007;
4. Quantify future deforestation broken down into the following time periods: 2008-2012; and 2013 onwards;
5. Provide informed comment on the uncertainty around deforestation intentions;
6. Gather and provide information on how forest land-owners intend to respond to the Government's announced plans.

The scope of this report is limited to New Zealand plantation forests.

The general approach taken was a structured review of the deforestation intentions of large-scale forest owners (companies with more than 10,000 ha of plantation forest as at 31 March 2005), based on a telephone survey and other information gathering.

The Government has introduced the Climate Change (Emissions Trading and Renewable Preference) Bill (2007). The Bill's principal purpose is to amend the Climate Change Response Act 2002 to introduce a greenhouse gas Emissions Trading Scheme in New Zealand. If the Bill is passed into law, owners of exotic forests first established pre-1990, that have not been granted an exemption, will have to surrender emission units to cover the emissions from deforestation.

The Bill may be subject to amendments as it proceeds through the Parliamentary process. Because the Bill is not yet law and may change (or may not be passed into law), deforestation has been forecast under three scenarios:

1. ***Emissions Trading Scheme (ETS) policy*** – this assumes that the Climate Change (Emissions Trading and Renewable Preference) Bill (2007), as submitted to the Finance and Expenditure Committee, is passed into law.
2. ***Amended ETS policy*** – this assumes that amendments are made to the Climate Change (Emissions Trading and Renewable Preference) Bill (2007) that provide forest land-owners with greater flexibility than the *Emissions Trading Scheme policy*. No assumption has been made about the specific form of “amended policy”, only that it will allow the continuation of conversion projects at some cost.
3. ***No policy intervention*** – this is a forecast of what would happen if the Government does not introduce any policy.

Results from the survey of large-scale forest owners were collated and interpreted. Allowance for deforestation by small-scale owners was made. An indicative profile of the area harvested by small-scale owners was generated based on the National Exotic Forest Description (NEFD) age-class distribution for this group of owners. Assumptions were made that:

- 90% of area harvested by small-scale owners will be replanted (10% deforestation) in the ETS Policy scenario;
- 85% of area will be replanted (15% deforestation) in the Amended ETS Policy scenario;
- 80% of area will be replanted (20% deforestation) in the No Policy scenario.

Main findings of survey

A summary of results is presented in Table 1. There is substantially less deforestation forecast under the ETS Policy scenario than under the Amended ETS Policy or No Policy scenarios. The level of deforestation varies by region. Under the ETS policy, 46% of deforestation by large-scale owners during 2008 to 2020 is forecast to take place in the Central North Island.

Table 1: Forecast of plantation deforestation (thousand ha) for each scenario.

	2006	2007	2008 to 2012	2013 to 2020
ETS Policy (large-scale owners only)	12	18	8	3
ETS Policy (all owners)	13	19	12	12
Amended ETS Policy (large-scale owners only)	12	18	24	23
Amended ETS Policy (all owners)	13	19	31	35
No policy (large-scale owners only)	12	18	29	28
No policy (all owners)	13	19	37	45

The survey was carried out during the period after the announcement of the Emission Trading Scheme but before the proposed policy has become law. It occurred at a time when forestry land-owners were:

- ***Focusing on the completion of deforestation prior to the end of 2007; and***
- ***Unsure how much it will cost them to continue with deforestation from 2008 on.***

Many forestry land-owners are taking a wait-and-see approach and awaiting (and making submissions on) the final form of the ETS. Clearly the forecasts are subject to change.

For the ETS Policy (large-scale owners) it is estimated that, of the 11,000 ha of intended deforestation between 2008 and 2020, 24% of conversion will be to dairy, 45% to sheep & beef, 28% to lifestyle and 3% to grapes. For the 47,000 ha of deforestation forecast in 2008 to 2020 under the Amended ETS Policy (large-scale owners) it is estimated that 63% of conversion will be to dairy, 29% to sheep & beef, 7% to lifestyle and 1% to grapes.

The total area of deforestation intended for 2006 to 2020 in the No Policy scenario is 7000 ha less than the estimate from the 2006 Deforestation Intentions Survey (Table 2). There are also timing differences – in particular more deforestation occurred in 2007 than was forecast in the 2006 survey. The 2006 survey took place prior to the release in December 2006 of the “Sustainable Land Management and Climate Change” report which included options for deforestation liabilities.

Table 2: Comparison of deforestation intentions under No Policy scenario (thousand ha) with 2006 survey (Base Case all owners).

	2006	2007	2008 to 2012	2013 to 2020	Total
2007 No policy (all owners)	13	19	37	45	114
2006 Base Case (all owners)	13	13	50	46	121

Introduction

Background

Under the Kyoto Protocol New Zealand must account for emissions from deforestation that occurs during the period 2008-2012. Information on future rates of deforestation is needed in order to assist in projecting New Zealand's likely balance of emission units over the first commitment period of the Kyoto Protocol and to assist with policy development.

Information on planted forest deforestation is also required to understand future scenarios for the forest industry and to assess the broader impacts of changing land use.

A key challenge for this year's deforestation intentions survey is the extent to which forest land-owners are currently reviewing their deforestation intentions in light of the Government's recently announced Emissions Trading Scheme (ETS) which will require forest owners to surrender emission units to cover carbon dioxide emissions from deforestation that occurs after 1 January 2008.

Objectives

The key objectives for this project are to:

1. Update deforestation intentions collected in a survey in late 2006;
2. Identify and include any new information sources on deforestation;
3. Provide an estimate of the area deforested in the years ended December 2006 and December 2007;
4. Quantify future deforestation broken down into the following time periods: 2008-2012; and 2013 onwards;
5. Provide informed comment on the uncertainty around deforestation intentions; and
6. Gather and provide information on how forest land owners intend to respond to the Government's announced plans to require forest land owners to purchase NZ Emission Units to cover carbon dioxide emissions from deforestation from 1 January 2008.

The scope of this project is limited to New Zealand plantation forests.

What is deforestation?

Deforestation is defined in the Marrakesh Accord as "the direct human-induced conversion of forested land to non forested land".

Deforestation includes:

- A decision to not replant following harvesting with conversion to some other land use.
- Early liquidation of a forest (i.e. removing immature trees with conversion to some other land use).

Deforestation excludes:

- Forests harvested and replanted.
- Harvested forests that are not replanted but are left and expected to regenerate back into forest species.

Approach

The general approach followed is a structured review of the deforestation intentions of large-scale forest owners (owners with more than 10,000 ha of forest as at 31 March 2005), based on a telephone survey and other information gathering. This approach was taken because:

- The New Zealand plantation forest estate is well understood in terms of ownership, land tenure and age-class.
- The majority of area that will be harvested over the next 10 - 15 years, and hence be most susceptible for deforestation, is owned by relatively few owners.
- Owners are generally open about their intentions.
- There is a large amount of information available from other sources in the forest industry that can be used to corroborate stated intentions.

The dominant role that the large-scale owners will play in the medium-term New Zealand plantation harvest is illustrated in Table 3. Forest owners with over 10,000 ha account for 62% of the total plantation estate and they own 79% of plantations of age 16 years and older. There are relatively few owners in this category. It therefore makes sense to focus on their deforestation intentions.

Table 3: Plantation area by age-class and size of ownership [Source NEFD as at 2005].

	Age-class							Total
	1-5	6-10	11-15	16-20	21-25	26-30	> 30	
Owners with > 10 000 ha	190 229	241 088	145 749	189 183	223 334	104 505	32 698	1 126 786
Other	118 750	213 437	204 164	52 903	48 824	31 354	14 962	684 394
Total	308 979	454 525	349 913	242 086	272 158	135 859	47 660	1 811 180

Large-scale forest owners and forest land-owners (or managers) were contacted between November 2007 and January 2008 and asked about their deforestation intentions. In addition, individuals in other organisations were contacted to get their views.

The information received was collated and interpreted. It was then converted into a “best estimate” of future deforestation based on current intentions. Analysis was initially done separately for each NEFD wood supply region. Results were subsequently aggregated to a national level.

Alternative scenarios

This survey was carried out during a “transition” period; i.e. after the announcement of the Emissions Trading Scheme but before the proposed policy has become law. The proposed approach for deforestation liabilities has led to a range of responses from land-owners with pre-1990 forests who intended conversion to other land-uses. There have been discussions between land-owners and Government about the proposed approach and suggestions from forest industry representatives made for alternative approaches. These alternatives take a number of forms and include:

- Allowing deforestation provided that it is offset by the planting of an equal area of non-forest land elsewhere in New Zealand;
- Different allocation rules for units by the Government to pre-1990 forest land-owners;
- Accepting a higher level of ‘business as usual’ deforestation and use of an auction system.

As a consequence of uncertainty over the final form of regulations, deforestation has been forecast under three scenarios:

1. ***Emissions Trading Scheme (ETS) policy*** – this assumes that the Climate Change (Emissions Trading and Renewable Preference) Bill (2007), as submitted to the Finance and Expenditure Committee, is passed into law.
2. ***Amended ETS policy*** – this assumes that amendments are made to the Climate Change (Emissions Trading and Renewable Preference) Bill (2007) that provide forest land-owners with greater flexibility than the *Emissions Trading Scheme policy*. No assumption has been made about the specific form of “amended policy”, only that it will allow the continuation of conversion projects at some cost to the land-owner.
3. ***No policy intervention*** – this is a forecast of what would happen if the Government does not introduce any policy.

Respondents were asked what they would do under the ETS Policy scenario. Forecasts for the Amended ETS Policy and No Policy scenarios have been made by interpreting the responses provided about intentions and how intentions have changed since the 2006 survey. Clearly there is the potential for subjectivity in this interpretation – particularly for the Amended ETS Policy scenario which is defined in a generic way.

Limitations

Incomplete information

The general response to the telephone survey of the large companies was very good. Most individuals contacted were willing to provide information. However sometimes the information provided was incomplete because the company was not willing or able to provide details. For example:

- Some companies were prepared to give a general overview of their intentions but were not prepared to provide detailed information on their harvesting (and hence deforestation) profile.
- Some companies are still 10 years away from harvesting. Understandably, their intentions are still unclear.
- Some forests are grown on land under a single rotation lease. The replanting decision will be made by the land owner rather than the current crop owner.
- Some companies are still waiting to see further details of the Emissions Trading Scheme before making a decision about future deforestation.

Inconsistent information

The information obtained from different sources was not always consistent. For example:

- Some information was for a calendar year, some was for a March year, while some was for a June year.
- There may be differences between the year in which land is sold and the year in which the crop on the land is harvested.

Current intentions

In my previous report “Review of methodology options to forecast future deforestation” I made the observation “a limitation that applies to all approaches is that forecasts are likely to be biased by the current situation or what has occurred in the recent past. Whichever approach is used, it will be difficult to accurately forecast deforestation in New Zealand.”

This forecast is based on current intentions. These reflect perceptions about land-use economics, Government policy implementation and other factors as they exist today. Clearly they are subject to change.

Results

The level of deforestation intended by large-scale owners under the ETS Policy scenario varies by region:

Northland

The area that is expected to be deforested in Northland between 2008 and 2020 is about 2700 ha. Deforestation includes area that will be converted to lifestyle, dairy and sheep & beef agriculture.

Auckland

The area that is expected to be deforested in Auckland between 2008 and 2020 is less than 100 ha. Conversion is primarily to lifestyle.

Central North Island

The area that is expected to be deforested in the Central North Island between 2008 and 2020 is about 5000 ha. Conversion is primarily to dairy and sheep & beef.

East Coast

There is no intention by large-scale forest owners to deforest any area in the East Coast region.

Hawkes Bay

The area that is expected to be deforested in the Hawkes Bay between 2008 and 2020 is about 500 ha. Conversion is primarily to lifestyle.

Southern North Island

The area that is expected to be deforested in the Southern North Island between 2008 and 2020 is about 100 ha. Conversion is primarily to lifestyle.

Nelson/Marlborough

The area that is expected to be deforested in Nelson and Marlborough between 2008 and 2020 is about 600 ha. Conversion is primarily to lifestyle and grapes.

Canterbury/West Coast

The area that is expected to be deforested in Canterbury and the West Coast between 2008 and 2020 is about 1000 ha. Conversion is primarily to dairy.

Otago/Southland

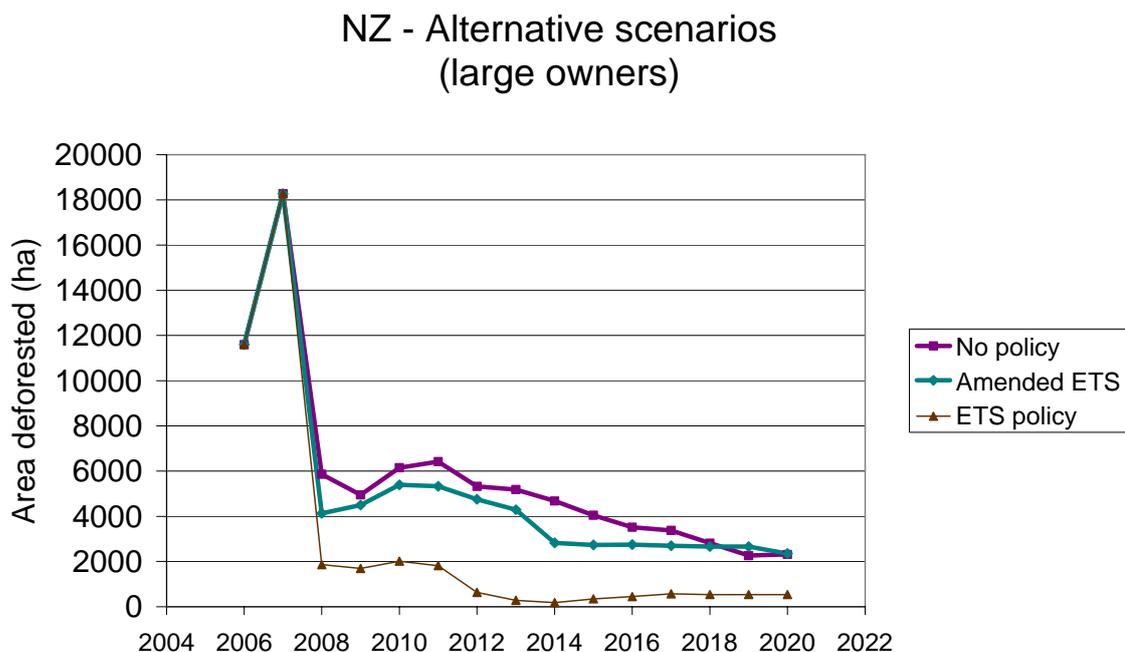
The area that is expected to be deforested in Otago and Southland between 2008 and 2020 is about 1000 ha. Conversion is primarily to dairy.

New Zealand combined results

The combined deforestation intentions of large-scale owners are shown in Fig 1. Results for each of the three scenarios are presented. There are some clear trends:

- Under all scenarios the level of deforestation from 2008 on is much lower than that of 2006 and 2007.
- The ETS Policy intervention leads to substantially lower levels of deforestation than were planned without intervention. However the forecast needs to be viewed with caution and could well be an under-estimate of what will happen. The survey occurred at a time when forestry land-owners were:
 - Focusing on the completion of deforestation prior to the end of 2007; and
 - Unsure how much it will cost them to continue with deforestation from 2008 on. Respondents were generally assuming that the cost of deforestation under ETS would be high; for example, one respondent was assuming that the cost of deforestation would be \$12,000/ha while another considered it would be in the \$13,000 to \$25,000/ha range.
- The Amended ETS Policy leads to higher levels of deforestation.
- The crossover in 2018 between the forecasts for No Policy and Amended ETS Policy is a result of timing. Under the Amended ETS Policy (and ETS Policy) some owners intend delaying deforestation.

Fig. 1: Deforestation forecast for New Zealand (large-scale owners only)



What land-use is area being converted into?

Based on the information provided, it is possible to make a broad estimate of the land-use into which deforested land is being converted. Under the ETS policy, conversion is to sheep & beef agriculture followed by lifestyle, dairy and grapes (Table 4). This ranking may appear counter-intuitive but almost half of the land that is intended for deforestation under the ETS scenario is Kyoto Forest and not subject to deforestation liabilities. Much of this land will be converted to sheep & beef agriculture.

Under the Amended ETS scenario it is evident that conversion to dairy and, to a lesser extent, sheep & beef agriculture would drive deforestation.

Table 4: Land-use into which area deforested is being converted in 2008-2020 by large-scale owners for ETS Policy and Amended ETS Policy (figures are approximate)

	<i>ETS policy</i>		<i>Amended ETS</i>	
	<i>Area (ha)</i>	<i>%</i>	<i>Area (ha)</i>	<i>%</i>
Dairy	2,700	24	29,600	63
Sheep & beef	4,900	45	13,600	29
Lifestyle	3,100	28	3,300	7
Grapes	300	3	500	1
Total	11,000		47,000	

What are small-scale forest owners doing?

It is difficult to gauge the intentions of small-scale owners because harvest levels are low at present, not just because of the relative immaturity of their component of the estate but also because many are holding off harvesting because of low export log prices.

For this analysis, a profile of the area harvested by small-scale owners was generated based on the 2006 NEFD age-class distribution for this group of owners (but with a reduction of 15% to adjust to net stocked area). Generic assumptions were made about the percentage of area that is replanted following harvest. These percentages were varied for each scenario.

In the 2006 survey the assumption adopted for the base case scenario was that 80% of the area harvested by small-scale owners will be replanted (i.e. 20% deforestation). This same assumption has been applied to the No Policy scenario.

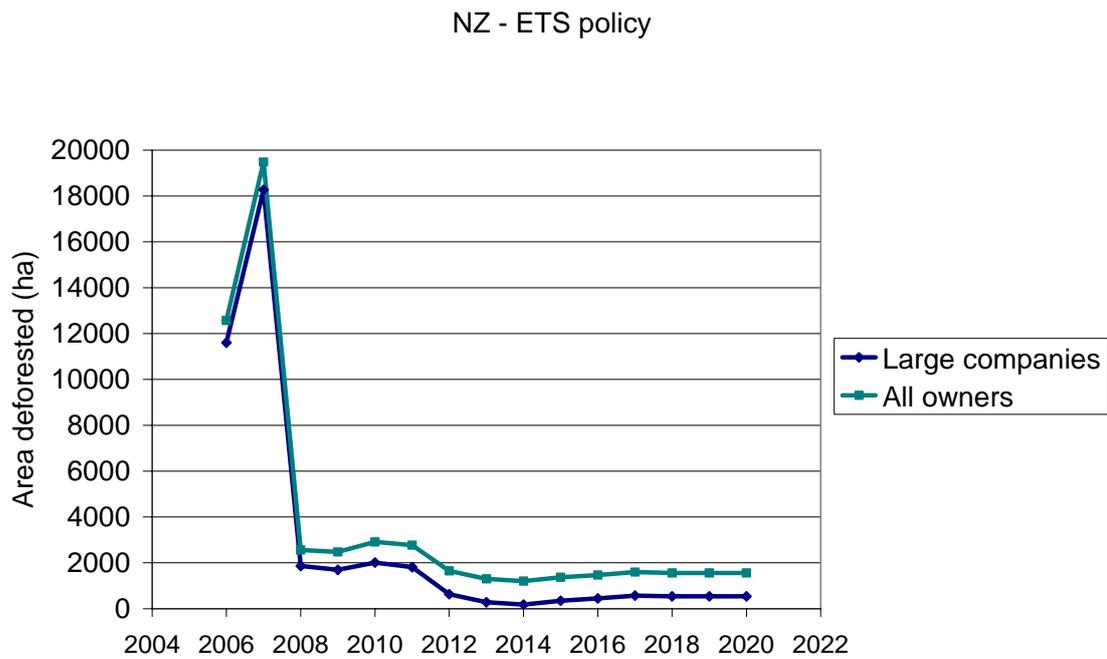
It is unclear how the proposed policy will affect the deforestation intentions of small-scale owners. Many will not be affected as they will be eligible for the threshold exemption for land-owners with less than 50 ha of pre-1990 forest¹. The assumptions made for this report are that:

- 85% of area will be replanted (15% deforestation) in the Amended ETS Policy scenario;
- 90% of area will be replanted (10% deforestation) in the ETS Policy scenario.

¹ The Engagement Document "Forestry in a New Zealand Emissions Trading Scheme" released in September 2007 contains the assumption that around 3000 owners will seek this exemption and that 20% of the exempt area will be deforested when the trees are mature.

Fig. 2 shows the deforestation intentions under the ETS Policy scenario. The intentions of large-scale owners dominate the overall level of deforestation in 2006 and 2007 for this scenario, but over time deforestation by small-scale owners becomes increasingly important on a proportional basis.

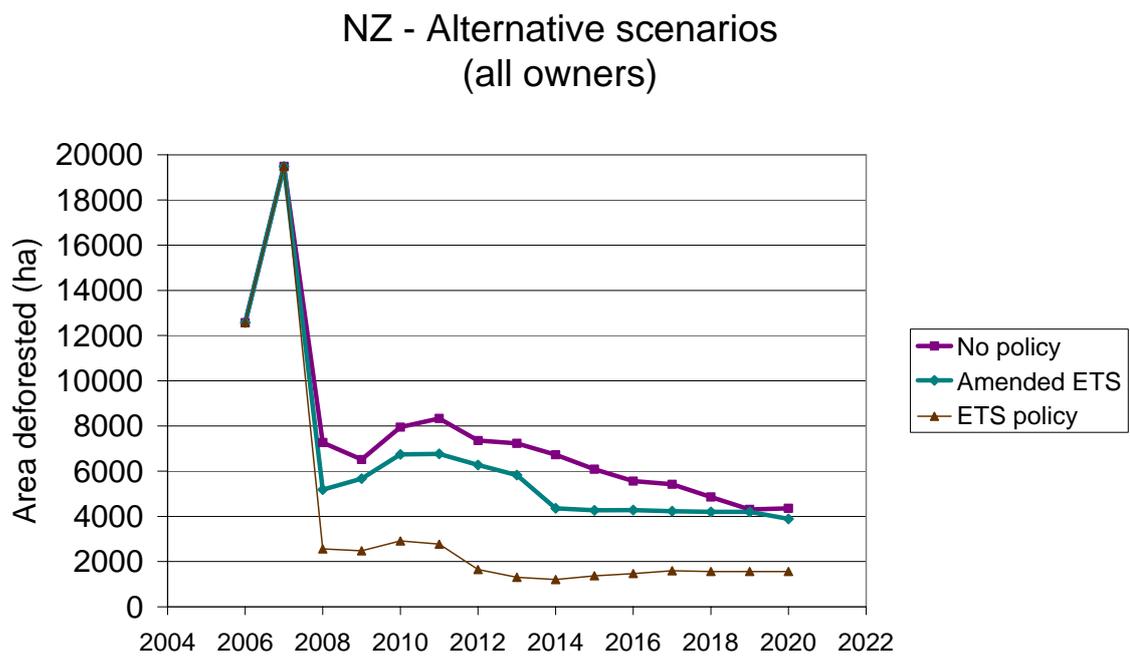
Fig. 2: Deforestation forecast for New Zealand (all owners) under ETS Policy scenario. (Large-scale owner intentions & small-scale owners @ 20% deforestation².)



Forecasts of deforestation by all owners are presented in Fig. 3 for each scenario.

² 20% deforestation assumed for 2006 and 2007 for all scenarios.

Fig. 3: Forecasts for alternative scenarios (all owners).



Comparison with 2006 survey

Results of this survey are compared with those of the base case in the 2006 survey for large-scale owners (Fig. 4) and all owners (Fig. 5). These show that:

- Deforestation in 2007 was higher than forecast in 2006.
- Deforestation for 2008 to 2011 is lower, under all scenarios, than forecast in 2006.
- Deforestation for 2012 to 2020 under the No Policy scenario is similar to the 2006 Base Case forecast.

Fig. 4: Comparison of the 2007 survey results with those from the 2006 survey (Base Case) – large-scale owners.

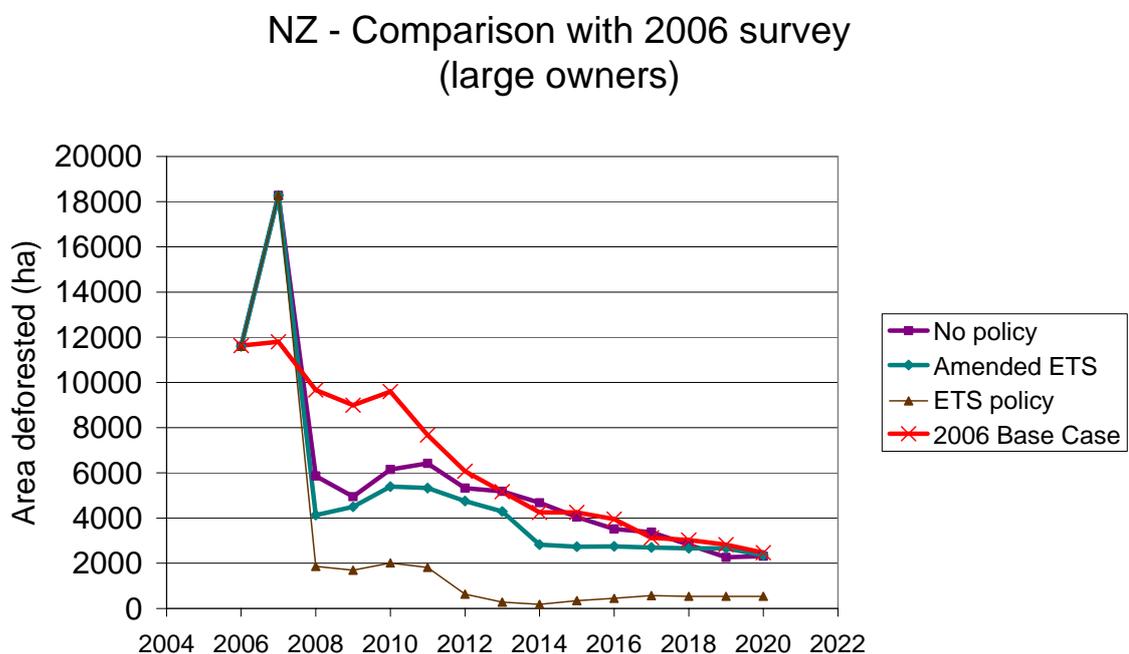
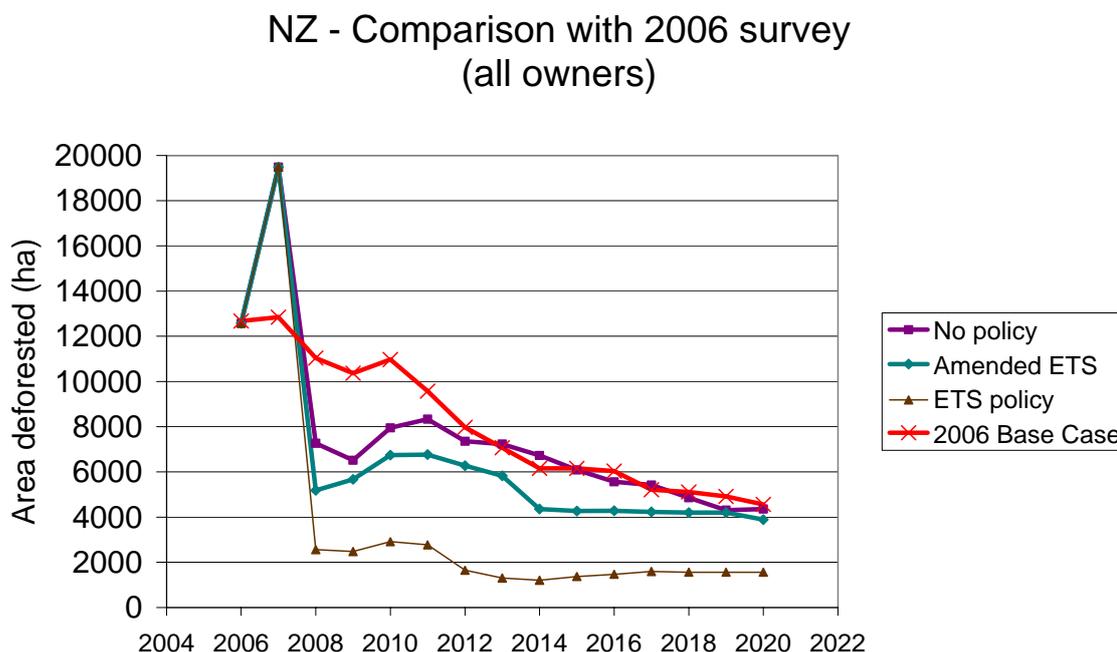


Fig. 5: Comparison of the 2007 survey results with those from the 2006 survey (Base Case) – all owners.



Reasons for the change in deforestation intentions from those reported in the 2006 survey

The No Policy scenario is the equivalent of the 2006 Base Case scenario. Table 5 shows that large-scale owners intend to deforest 7,000 ha less (between 2006 and 2020) under the No Policy scenario than under the 2006 Base Case scenario. Reasons for this are:

1. Announcement of options to manage deforestation

The *Sustainable Land Management and Climate Change* discussion document (released in December 2006) included options to manage deforestation. This is likely to have caused some changes to forest land-owners' plans. Some deforestation was brought forward so that it occurred during 2007 because the Government signalled that policy interventions were likely to take effect from the beginning of 2008.

2. Negotiations between land-owner and forest grower

- In one case, land where forestry is the indicated highest and best land-use was expected (in the 2006 survey) to be left unplanted following harvest because the land-owner had higher expectations about land rental than potential investors for the next forest rotation. It is now expected that agreement will be reached and the area will be replanted.
- In another case where deforestation was expected (in the 2006 survey), the land-owner failed to reach agreement with the crop-owner over the early return of land. It is now expected that the land will remain in trees for the foreseeable future.

3. Replanting of lifestyle blocks

- Some area that had been harvested for subdivision without the expectation of replanting has been replanted (apart from house sites).

Table 5: Comparison of deforestation intentions (thousand ha) with 2006 survey (Base Case).

	2006	2007	2008 to 2012	2013 to 2020	Total
2007 No policy (large-scale owners)	12	18	29	28	87
2006 Base Case (large-scale owners)	12	12	42	29	94
2007 No policy (all owners)	13	19	37	45	114
2006 Base Case (all owners)	13	13	50	46	121

Table 5 also indicates that, between 2006 and 2020, the same total area is forecast to be deforested by small-scale owners. This is as expected because, although there was a variation in the approach used³ to estimate the deforestation for small-scale owners, similar assumptions have been made.

The above points also apply to the ETS Policy and Amended ETS Policy scenarios. In addition, under these scenarios:

- Some area will be deforested later than was intended in the 2006 survey; i.e. some area will be replanted and deforested after 8 years.
- Some area that was forecast to be deforested in the 2006 survey will not be because of the imposition of deforestation liabilities.

³ In the 2006 forecast a profile of the area harvested by small-scale owners was generated for each region based on the 2005 NEFD age-class distribution for this group of owners and MAF estimates of harvest for 2005. For this forecast, the 2006 NEFD age-class distribution has been used to estimate the area harvested by small-scale owners at the national level. MAF estimates of harvest volumes have not been used.

Response to the Government's plans

There have been two phases in the response to Government announcements. These relate to:

- the release in December 2006 of the Deforestation options in the “Sustainable Land Management and Climate Change”;
- the announcement in September 2007 of the Emission Trading Scheme that requires forest land owners to purchase NZ Emission Units to cover carbon dioxide emissions from deforestation from 1 January 2008.

Response in 2007

Forest land-owners have responded by accelerating the level of deforestation in order to beat the 31 December 2007 deadline. Overall the level of deforestation (19,000 ha) in 2007 is well above the 13,000 ha in 2006 and the forecast of 13,000 ha for 2007 that was made at the end of 2006.

Plans for 2008 on

There have been a range of responses:

- Some land-owners have decided to continue with deforestation. Some in this category are deforesting post-1989 Kyoto forests. Some expect to get enough free credits allocated to them to cover their intended level of deforestation. Some anticipate a papakainga (housing) exemption. Others are converting to land-uses of sufficient value (e.g. lifestyle, grapes) to carry the cost of deforestation liabilities.
- Some land-owners have decided not to deforest. Some have modified their plans and will replant after harvest but deforest at age 8-years in order to reduce deforestation liabilities.
- The largest group (in terms of area) is taking a wait-and-see approach. They are awaiting the final form of the ETS including the number of free units and how they will be allocated. Many are making submissions on the treatment of pre-1990 forests – for example, the treatment of Maori land-owners, whether offsets with post-1989 forests will be allowed, and the number and whether the allocation of units will reflect the potential of land for deforestation.