

# **2008 Deforestation Survey**

## **Final Report**

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**March 2009**

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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, to assist with future climate change negotiations and to assist with policy development.

This study was commissioned to:

1. Update deforestation intentions collected in a survey in late 2007;
2. Identify and include any new information sources on deforestation;
3. Provide an estimate of the area deforested in the years ended December 2007 and December 2008;
4. Quantify future deforestation broken down into the following time periods: 2009-2012; and 2013-2020;
5. Provide informed comment on the uncertainty around deforestation intentions;
6. Gather and provide information on how forest land-owners would respond to the current ETS policy and how they might respond should the ETS be modified to allow forest land-owners to deforest land and afforest an equivalent land area.

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.

This survey was carried out after the new Government announced a review of the Emissions Trading Scheme. Consequently respondents were asked for their deforestation intentions under three different scenarios:

1. Emissions Trading Scheme (ETS) – this assumes that the current legislation is retained.
2. Offsets allowed (Amended ETS) – this assumes that amendments are made to the ETS enabling offsetting; ie, landowners would be permitted without cost to deforest area provided that they afforest the same area elsewhere in New Zealand.
3. No ETS legislation – this assumes that the ETS would be repealed and not replaced by any other legislation.

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 scenario;
- 85% of area will be replanted (15% deforestation) in the Amended ETS scenario;
  - 80% of area will be replanted (20% deforestation) in the No ETS scenario.

### ***Main findings of survey***

A summary of results is presented in Table 1. There is substantially less deforestation forecast under the ETS scenario than under the Amended ETS or No ETS scenarios. The level of deforestation varies by region. Under the ETS scenario, 57% of deforestation by large-scale owners during 2008 to 2020 is forecast to take place in the Central North Island. This increases to 84% under the Amended ETS scenario.

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

	<b>2007</b>	<b>2008</b>	<b>2009 to 2012</b>	<b>2013 to 2020</b>
ETS (large-scale owners only)	18	2	7	8
ETS (all owners)	20	3	10	16
Amended ETS (Offsets) (large-scale owners only)	18	4	16	31
Amended ETS (Offsets) (all owners)	20	5	22	43
No ETS (large-scale owners only)	18	5	21	39
No ETS (all owners)	20	6	28	56

***The survey was carried out during the period after the announcement of a Government Select Committee review of the Emission Trading Scheme. It occurred at a time when forestry land-owners were still evaluating their options. Many forestry land-owners are taking a wait-and-see approach and awaiting confirmation of the final form of the ETS. Clearly the forecasts are subject to change.***

For the ETS scenario (large-scale owners) it is estimated that, of the 17,000 ha of intended deforestation between 2008 and 2020, 54% of conversion will be to dairy, 24% to sheep & beef, and 22% to lifestyle/residential. For the 51,000 ha of deforestation forecast in 2008 to 2020 under the Amended ETS scenario (large-scale owners) it is estimated that 63% of conversion will be to dairy, 28% to sheep & beef, and 9% to lifestyle/residential.

## 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, to assist with future climate change negotiations 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.

### Objectives

The key objectives for this project are to:

1. Update deforestation intentions collected in a survey in late 2007;
2. Identify and include any new information sources on deforestation;
3. Provide an estimate of the area deforested in the years ended December 2007 and December 2008;
4. Quantify future deforestation broken down into the following time periods: 2009-2012; and 2013-2020;
5. Provide informed comment on the uncertainty around deforestation intentions;
6. Gather and provide information on how forest land-owners would respond to the current ETS policy and how they might respond should the ETS be modified to allow forest land-owners to deforest land and afforest an equivalent land area.

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 another land use.
- Early liquidation of a forest (i.e. removing immature trees with conversion to another 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<sup>1</sup>), 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 the stated intentions of forest land-owners.

The dominant role that the large-scale owners will play in the medium-term New Zealand plantation harvest is illustrated in Table 2. Forest owners with over 10,000 ha accounted for 62% of the total plantation estate and they owned 79% of plantations of age 16 years and older (as at 31 March 2005). There are relatively few owners in this category. It therefore makes sense to focus on their deforestation intentions.

*Table 2: 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

In some cases forest owners only have the right to harvest the existing crop and do not have the right to replant. Consequently the survey also included large-scale forest land-owners.

Large-scale forest owners and forest land-owners (or managers) were contacted between December 2008 and February 2009 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. Results were aggregated to a national level.

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<sup>1</sup> Forest ownership as at 31 March 2005 is used as the basis for this study. This defines a forest estate prior to recent deforestation. The survey focuses on the deforestation intentions for this estate.

**Alternative scenarios**

This survey was carried out after the new Government announced a review of the Emissions Trading Scheme. Consequently respondents were asked for their deforestation intentions under three different scenarios:

1. Emissions Trading Scheme (ETS) – this assumes that the current legislation is retained.
2. Offsets allowed (Amended ETS) – this assumes that amendments are made to the ETS enabling offsetting; ie, landowners would be permitted without cost to deforest area provided that they afforest the same area elsewhere in New Zealand.
3. No ETS legislation – this assumes that the ETS would be repealed and not replaced by any other legislation.

**Year of deforestation**

Deforestation is reported as occurring in the year in which deforested land is harvested.

## **Limitations**

### **Incomplete information**

The general response to the telephone survey of the large companies was very good. Almost all 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 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.
- Companies are awaiting final details of the ETS before confirming their intentions.

### **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.

### **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.”

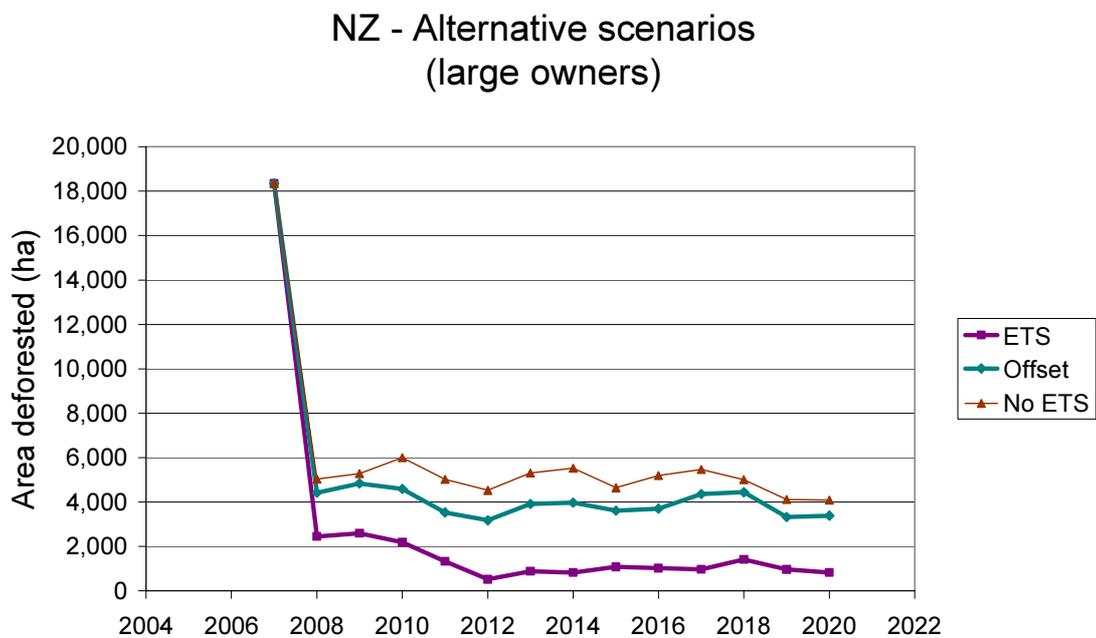
This forecast is based on current intentions. These reflect perceptions about land-use economics, Government policy implementation and other factors as they exist today. Clearly they are subject to change.

## Results

The 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 2007.
- The ETS scenario has lower levels of deforestation than the scenarios in which the ETS is amended or repealed.
- The No ETS scenario leads to higher levels of deforestation.

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



### **Deforestation under ETS**

It is estimated that about 2000 ha was deforested during 2008 by large-scale owners. From 2009 to 2020 a further 15,000 of deforestation is forecast. Of the 17,000 ha of deforestation by large-scale owners between 2008 and 2020, some 7000 ha is deforestation of post-1989 Kyoto plantations.

Implementation of the ETS has put several large-scale deforestation projects on hold. The deforestation liabilities (and current commodity prices) are such that conversion is no longer economic. Some land that was harvested in 2008 has been left fallow awaiting the outcome of the ETS review.

The 10,000 ha of pre-1990 forest forecast to be deforested between 2008 and 2020 includes:

- Residential and lifestyle land of sufficient value to make payment of the deforestation liability affordable.
- Dairy conversion necessary to complete some conversion projects commenced prior to 1 January 2008. In some cases the land-owners believe they will be able to convert without any deforestation liability.
- Area that will be replanted following harvesting and deforested at age 9 in order to minimise deforestation liabilities.

### **Deforestation if offsetting is allowed**

Deforestation by large-scale owners in 2008 would be about 4000 ha if the ETS was amended to allow land offsets. The increase of 2000 ha over the level of deforestation under the ETS scenario relates to land harvested in 2008 that has been left fallow but which would be converted if offsetting is allowed. From 2009 to 2020 a further 47,000 ha of deforestation is forecast.

Respondents had mixed views about the benefits of offsetting:

- Some land-owners are relying on offsetting to allow the completion of their deforestation projects. Without offsetting land-use conversion is not financially viable.
- Other land-owners prefer to use the “9-year rule”. One land-owner expects that the cost of offset land would be driven too high in areas where they would want to afforest. Another would prefer to get units for additional afforestation and keep deforestation and afforestation decisions separate.

### **Deforestation if ETS is repealed**

Deforestation by large-scale owners in 2008 would be about 5000 ha if the ETS was repealed with a further 60,000 ha from 2009 to 2020.

### Where is most deforestation occurring?

For all scenarios, the majority of deforestation is forecast to occur in the Central North Island. Under the ETS scenario, 57% of deforestation by large-scale owners during 2008 to 2020 is forecast to take place in the Central North Island. Canterbury (26%) and Northland (11%) are the regions with the next highest levels of forecast deforestation. The Central North Island percentage increases to 84% under the Amended ETS scenario.

### 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 both the ETS and the Amended ETS scenarios, conversion is mainly to dairy followed by sheep & beef agriculture<sup>2</sup> followed by lifestyle/residential (Table 3).

To some extent the forecasts reflect the declining market for lifestyle properties. Some respondents have delayed the timing of conversion because of current market conditions.

*Table 3: Land-use into which area deforested is being converted in 2008-2020 by large-scale owners for ETS and Amended ETS (offsets allowed) (figures are approximate).*

	<i>ETS policy</i>	<i>Amended ETS</i>
	<i>%</i>	<i>%</i>
Dairy	54	63
Sheep & beef	24	28
Lifestyle	22	9

### 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 current market conditions.

For this analysis the same general assumptions were made as for the 2007 forecast. 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.

The assumption adopted for the No ETS scenario was that 80% of the area harvested by small-scale owners will be replanted (i.e. 20% deforestation). It is unclear how the ETS will affect the deforestation intentions of small-scale owners. Many will not be affected as they are likely to be eligible for the threshold exemption for land-owners with less than 50 ha of pre-1990 forest<sup>3</sup>. The other assumptions made for this report are that:

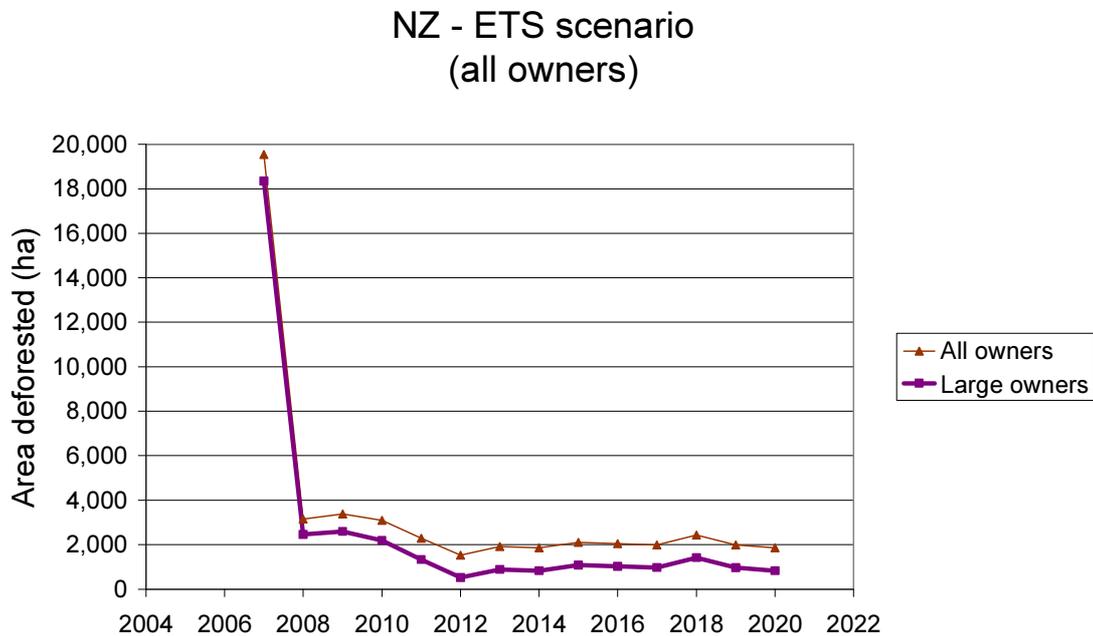
<sup>2</sup> Cropping has also been included in this category.

<sup>3</sup> 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.

- 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 scenario.

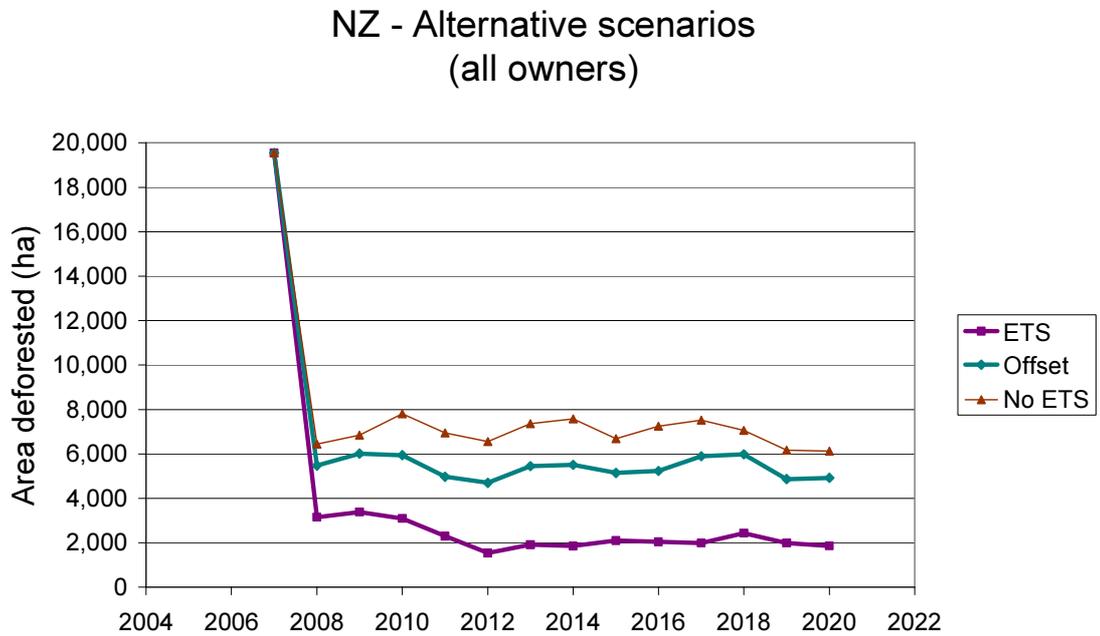
Fig. 2 shows the deforestation intentions under the ETS scenario. Deforestation by large-scale owners dominates the overall level of deforestation in initial years for this scenario, but over time deforestation by small-scale owners becomes increasingly important on a proportional basis.

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



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

Fig. 3: Forecasts for alternative scenarios<sup>4</sup> (all owners).



<sup>4</sup> 20% deforestation assumed in 2007 for small-scale owners for all scenarios

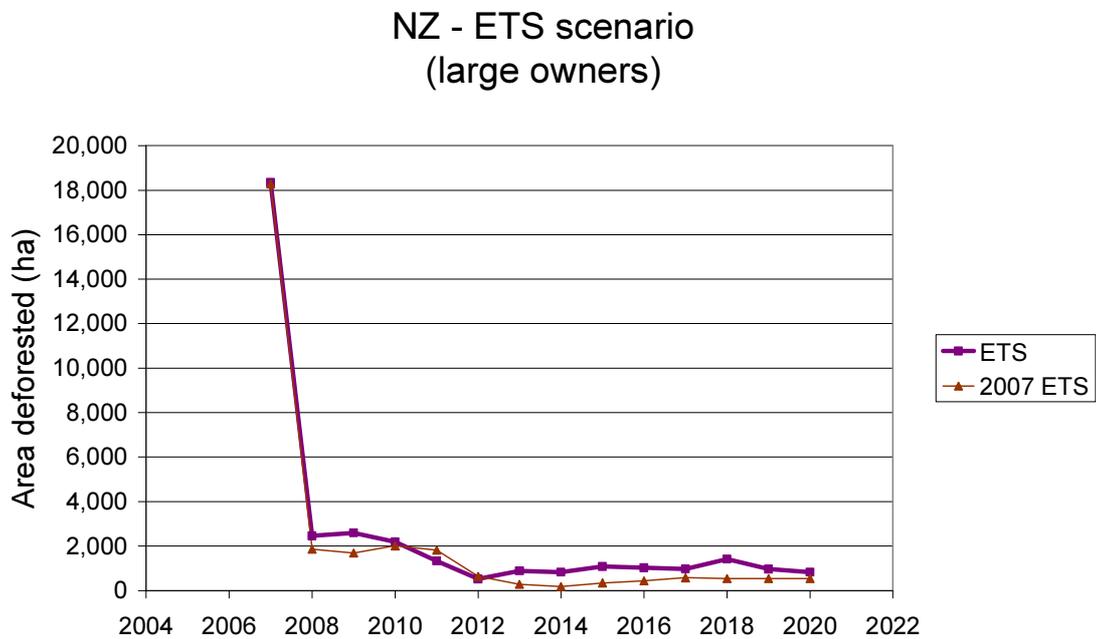
## Comparison with 2007 survey.

Results of this survey have been compared with those of the 2007 survey for large-scale owners.

### Deforestation under ETS

Total deforestation by large-scale owners for 2008 to 2020 is 17,000 ha compared to 11,000 ha in the 2007 survey.

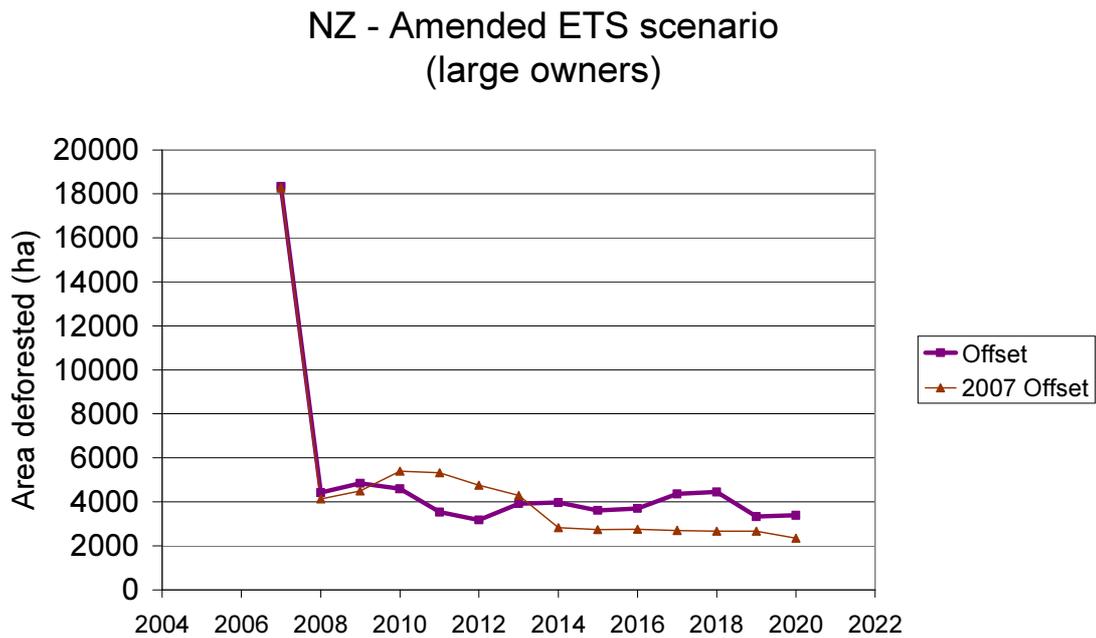
*Fig. 4: Comparison of the 2008 survey results with those from the 2007 survey (ETS) – large-scale owners.*



### Deforestation if offsetting is allowed

Total deforestation by large-scale owners for 2008 to 2020 is 51,000 ha compared to 47,000 in the 2007 survey. The amended ETS scenario in the 2007 survey was more general ('amendments that will allow the continuation of conversion projects at some cost to the land-owner').

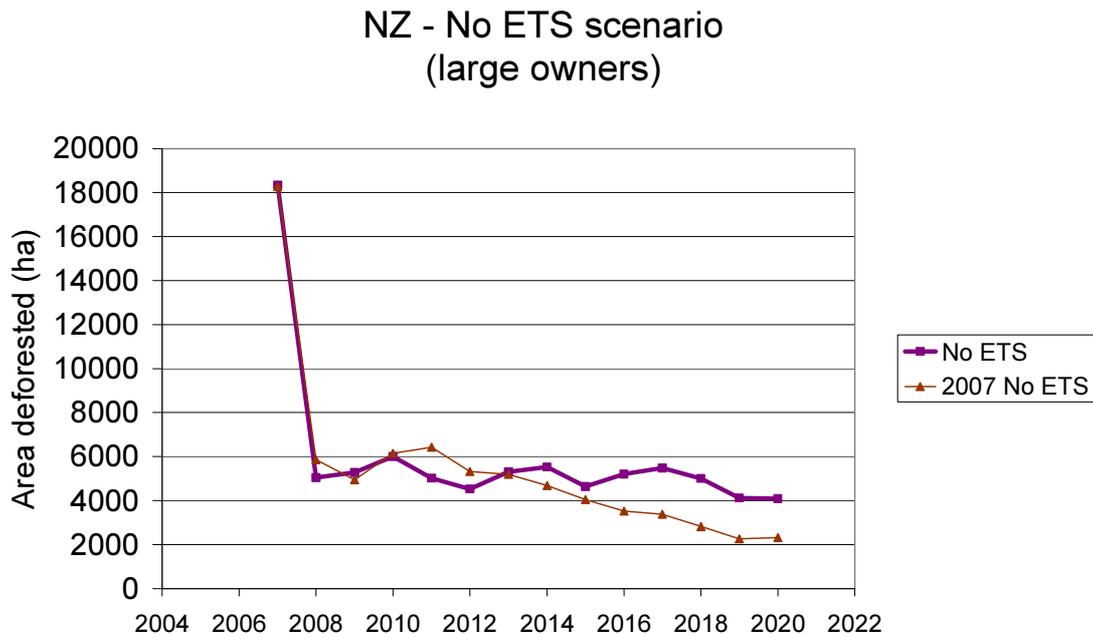
Fig. 5: Comparison of the 2008 survey results for Amended ETS (offsets allowed) with those from the 2007 survey – large-scale owners.



### Deforestation if ETS is repealed

Total deforestation by large-scale owners for 2008 to 2020 is 65,000 ha compared to 57,000 in the 2007 survey.

Fig. 6: Comparison of the 2008 survey results for No ETS with those from the 2007 survey – large-scale owners.



### Reasons for differences

One reason for the increase in deforestation intentions in this survey is that some land-owners have decided to proceed with deforestation using the 9-year rule.

Another reason is that (for the Amended ETS scenario and No ETS scenario) allowance has been made for some limited deforestation of Kaingaroa forest following handback to Maori owners after harvesting.

## Uncertainty

There is considerable uncertainty about the intentions of forest owners. Many land owners have yet to make decisions on whether to deforest or not. For example, handback (from the forestry right holder to the land owner) of much of the area harvested in 2008 is only just occurring. At this point land owners will face the decision of whether to convert and hence deforest.

It is also apparent that most owners are 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. Before this happens they do not have the information necessary to make an informed decision.

The recent settlement with the CNI Iwi Collective (ie, 'Treelords' settlement) has also created uncertainty. Under the 2006 Te Arawa Deed of Settlement, Te Arawa was to receive licensed Crown forest land to the value of \$36 million. They were also to have the opportunity to purchase the remainder of a 50,000 hectare area of licensed Crown forest land. However the settlement required "A statutory covenant will apply over the 50,000 hectares of licensed Crown forest land which will require the land to remain in forestry for a defined period of time."

The defined period of time was 28 years following the return of land. Land was to be returned to Te Arawa following harvesting of the existing crop. Consequently there would have been no deforestation of the 50,000 ha for at least the next 28 years.

However the Te Arawa Deed of Settlement has been overtaken by the overall CNI Iwi Collective agreement. Under this there is no replanting covenant. Given the deforestation that has occurred on the perimeter of Kaingaroa forest, there is the potential for parts of the forest to be converted to alternative land uses. This will not occur until iwi have agreed on specific ownership of the land and have determined what their intentions are.

The forecasts in this report are based on the assumption that most of Kaingaroa forest will be replanted but that a small amount of deforestation will occur under the Amended ETS and No ETS scenarios.