2009 Deforestation Survey

Final Report

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Disclaimer

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Table of Contents

Executive Summary

Under the Kyoto Protocol New Zealand must account for deforestation emissions that occur during the period 2008-2012. Information on future rates of deforestation are needed to assist with projecting New Zealand's likely balance of emission units over the first commitment period of the Kyoto Protocol, to provide information needed to assist with future climate change negotiations and to assist with any future policy development.

This study was commissioned to:

1. Update deforestation intentions last collected in a survey in late 2008;
2. Identify and include any new information sources on deforestation;
3. Provide an estimate of the actual area deforested in the year ended December 2008 and an estimate of the actual area expected to be deforested in the year ended December 2009;
4. Quantify future deforestation intentions broken down into the following time periods: 2010-2012; and 2013-2020;
5. Provide informed comment on the uncertainty around deforestation intentions; and
6. Gather information on how forest land-owners would respond should the Forestry ETS be modified in future commitment periods to allow forest owners to deforest higher quality 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[1]), based on a telephone survey and other information gathering.

Respondents were asked for their deforestation intentions under three different scenarios:

1. Emissions Trading Scheme (ETS) – this assumes the ETS as modified by legislation in November 2009.
2. Offsets allowed – 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 No ETS legislation – this assumes that the ETS would be repealed and not replaced by any other legislation.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.

[1] Forest ownership as at 31 March 2005 is used as the basis for this study. This defines a forest estate prior to recent deforestation and aligns with the date the first deforestation intentions survey was conducted. For consistency the same forest owners have been included in the survey each year.

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 Offsets 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 Offsets or No ETS scenarios. The level of deforestation varies by region. Under the ETS scenario, 50% of deforestation by large-scale owners during 2008 to 2020 is forecast to take place in the Central North Island. This increases to 80% under the Offsets scenario.

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

	2008	***2009***	***2010 to 2012***	***2013 to 2020***		***2008 to 2012***	***2008 to 2020***
ETS (large-scale owners only)	2.5	2.5	5	9		10	19
ETS (all owners)	3.5	3.5	7	17		14	31
Offsets (large-scale owners only)	4	5	10	29		19	48
Offsets (all owners)	5	6	15	41		26	67
No ETS (large-scale owners only)	5	6	18	47		29	76
No ETS (all owners)	7	7	24	63		38	101

The overall results are similar to the 2008 survey. Under the ETS total intended deforestation, by the large-scale owners between 2008 and 2020, is 19,000 ha compared to 17,000 ha in the 2008 survey. Of this 19,000 ha intended to be deforested around 8,000 ha is post-1989 forest and 11,000 ha is pre-1990 forest. A further 12,000 ha of deforestation is assumed to be undertaken by small-scale owners.

For the ETS scenario (large-scale owners) it is estimated that, of the 19,000 ha of intended deforestation between 2008 and 2020, 70% of conversion will be to dairy, 10% to sheep & beef, and 20% to lifestyle/residential.

Retention of the deforestation liability in the modified legislation means that several large-scale deforestation projects are still on hold. Over 5,000 hectares of land that was harvested in 2008 and 2009 has been left fallow by owners who want to convert this land to alternative land-uses but it is currently uneconomic to do so.

There is considerable uncertainty about deforestation intentions. Uncertainty increases as the length of period increases. Some owners are taking a wait-and-see approach to their land use decisions. They are awaiting outcomes on issues such as whether offsets will be allowed from 2013 on, the level of emission unit prices and details of the allocation of free emission units before making actual land use decisions.

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

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 are needed to assist with projecting New Zealand's likely balance of emission units over the first commitment period of the Kyoto Protocol, to provide information needed to assist with future climate change negotiations and to assist with any future 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 2008. Deforestation intentions are required under the "modified" Emissions Trading Scheme along with the level of deforestation that would occur without an ETS;
2. Identify and include any new information sources on deforestation;
3. Provide an estimate of the actual area deforested in the year ended December 2008 and an estimate of the actual area expected to be deforested in the year ended December 2009;
4. Quantify future deforestation intentions broken down into the following time periods: 2010-2012; and 2013-2020;
5. Provide informed comment on the uncertainty around deforestation intentions; and
6. Gather information on how forest land-owners would respond should the Forestry ETS be modified in future commitment periods to allow forest owners to deforest higher quality 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[2]), 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 account for 61% of the total plantation estate and they own 78% of plantations of age 21 years and older (as at 31 March 2009). 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 2009].

	Age-class							
	1-5	6-10	11-15	16-20	21-25	26-30	> 30	Total
Owners with > 10 000 ha	152 151	184 025	222 429	130 187	201 812	135 183	44 049	1 069 836
Other	40 257	135 327	263 539	133 456	47 493	34 967	26 418	681 457
Total	192 408	319 352	485 968	263 643	249 305	170 150	70 467	1 751 293

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 in late November/December 2009[3] 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

[2] Forest ownership as at 31 March 2005 is used as the basis for this study. This defines a forest estate prior to recent deforestation and aligns with the date the first deforestation intentions survey was conducted. For consistency the same forest owners have been included in the survey each year.
[3] The survey started after 16 November 2009 when it was announced that the Climate Change Response (Moderated Emissions Trading) Amendment Bill was to be returned unchanged from the Finance and Expenditure Committee. Parliament subsequently passed the Bill on 25 November 2009.

a national level.

Alternative scenarios
Respondents were asked for their deforestation intentions under three different scenarios:

1. Emissions Trading Scheme (ETS) – this assumes that the modified legislation (as at 25 November 2009) is retained.
2. Offsets allowed – this assumes that further 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.
- Some negotiations between land-owner and crop-owner about future land use are ongoing.
- Some companies need to do further evaluation of their options under the ETS.

Inconsistent information
The information obtained from different sources was not always consistent. In particular, 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."

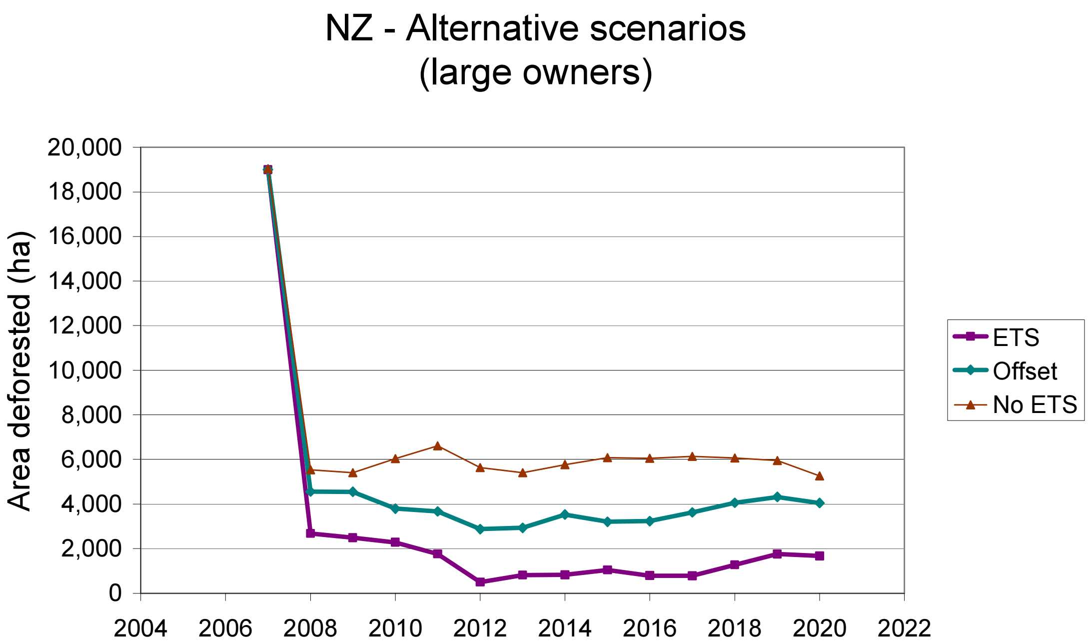
This forecast is based on current intentions. These reflect perceptions about land-use economics, Government policy implementation, emission unit price and other factors as they exist today. Clearly they are subject to change.

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 2500 ha was deforested in 2008 by large-scale owners with a further 2500 ha in 2009. From 2010 to 2020 a further 14,000 of deforestation is forecast. Of the 19,000 ha of deforestation by large-scale owners between 2008 and 2020, some 8000 ha is deforestation of post-1989 Kyoto plantations.

Retention of the deforestation liability in the modified ETS means that several large-scale deforestation projects are still on hold. The deforestation liabilities (and current commodity prices) are such that conversion is not economic. Over 5000 ha of land that was harvested in 2008 and 2009 has been left fallow by owners who want to convert but cannot afford to do so. This land is not deemed to be deforested because it has not been converted to another land-use.

The 11,000 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 reestablished 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 4000 ha with a further 5000 ha in 2009 if the ETS was amended to allow land offsets. The increase over the level of deforestation under the ETS scenario relates to some of the land harvested in 2008 and 2009 that has been left fallow but which would be converted if offsetting is allowed. From 2010 to 2020 a further 39,000 ha of deforestation is forecast.

Deforestation if ETS is repealed
Deforestation by large-scale owners would be 5000 ha 2008 and 6000 ha in 2009 if the ETS was repealed with a further 65,000 ha from 2010 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, 50% of deforestation by large-scale owners during 2008 to 2020 is forecast to take place in the Central North Island. The Central North Island percentage increases to 80% under the Offset 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 the ETS scenario, conversion is mainly to dairy followed by lifestyle/residential and sheep & beef agriculture[4] (Table 3).

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

	ETS policy	***Offset***
	%	*%*
Dairy	70	68
Sheep & beef	10	23
Lifestyle	20	9

[4] Cropping has also been included in this category.

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 because of the relative immaturity of this component of the estate.

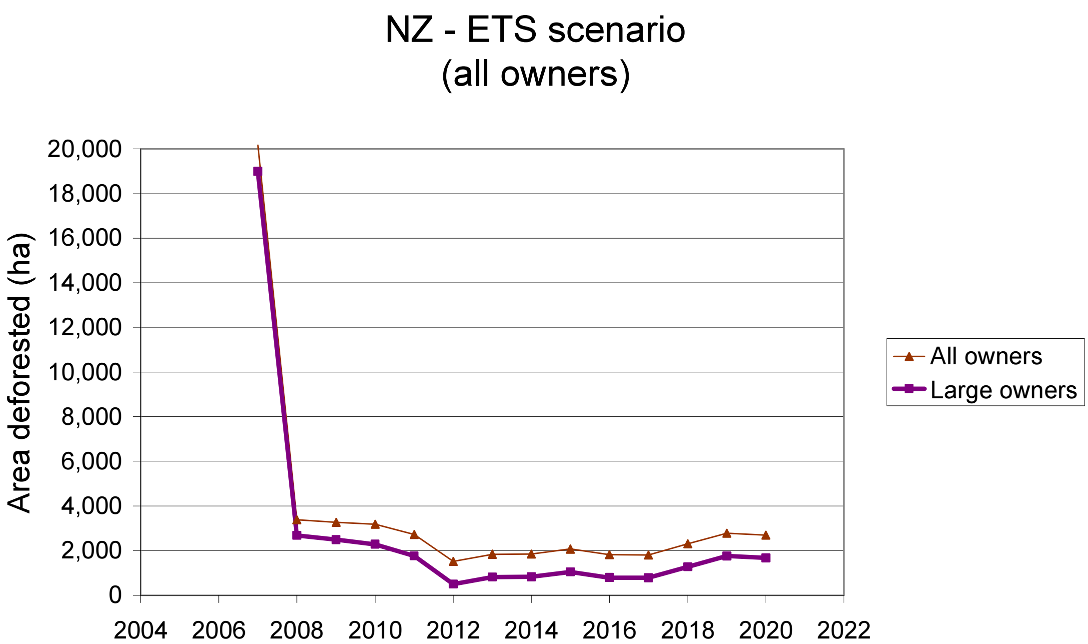
For this analysis the same general assumptions were made as for the 2007 and 2008 forecasts. A profile of the area harvested by small-scale owners was generated based on the 2006 NEFD age-class distribution for this group of owners (but with a reduction of 15% to adjust to net stocked area). Generic 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[5]. The other assumptions made for this report are that:

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

Fig. 2 shows the deforestation intentions under the ETS scenario.

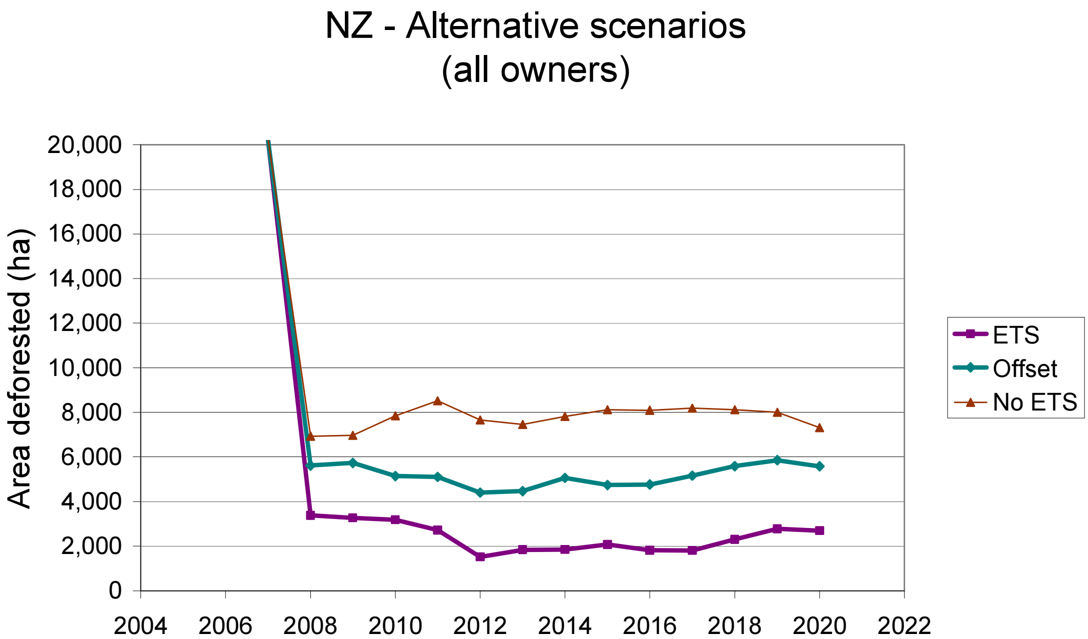
Fig. 2: Deforestation forecast for New Zealand (all owners) under ETS scenario. (Large-scale owner intentions & small-scale owners @ 20% deforestation.)



[5] 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.

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

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

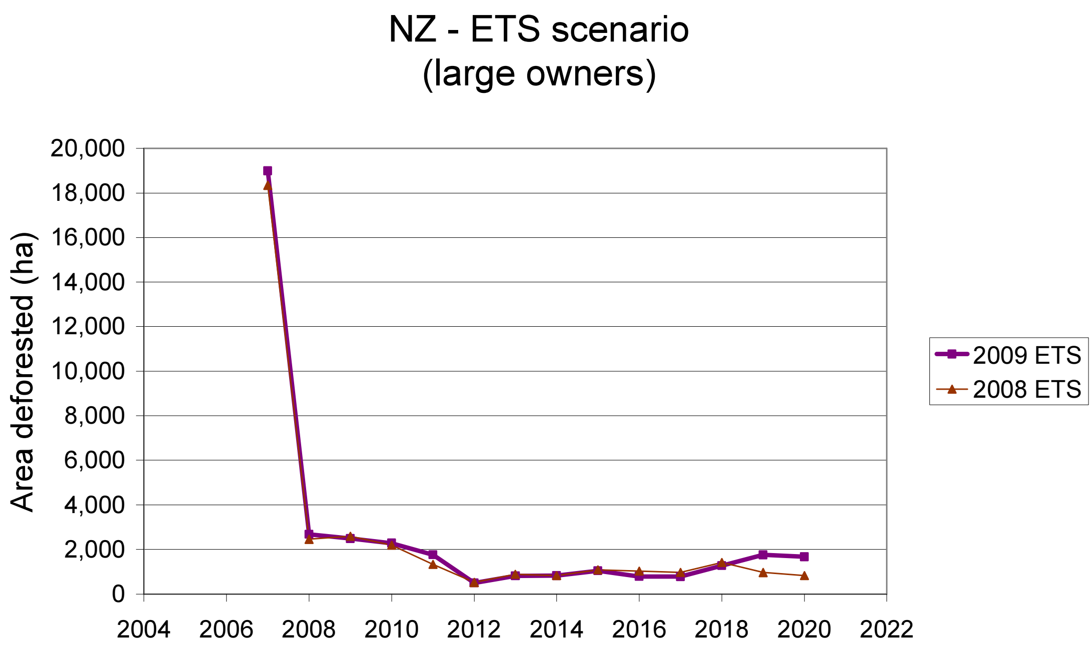


Comparison with 2008 survey.

Results of this survey have been compared with those of the 2008 survey for large-scale owners.

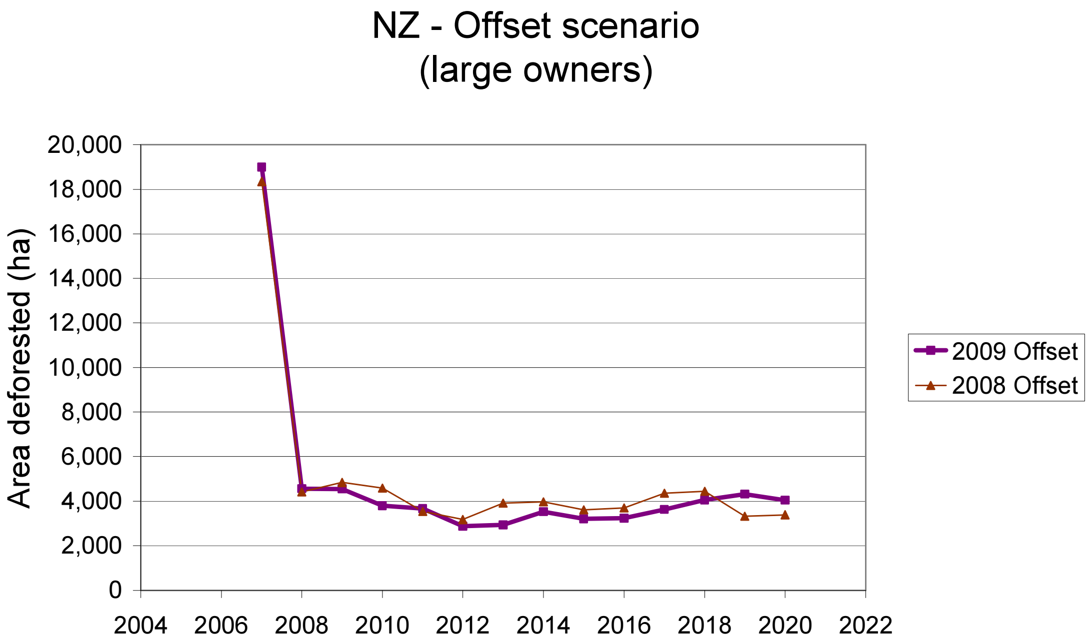
Deforestation under ETS
Total deforestation by large-scale owners for 2008 to 2020 is 19,000 ha compared to 17,000 ha in the 2008 survey.

Fig. 4: Comparison of the 2009 survey results with those from the 2008 survey (ETS) – large-scale owners.



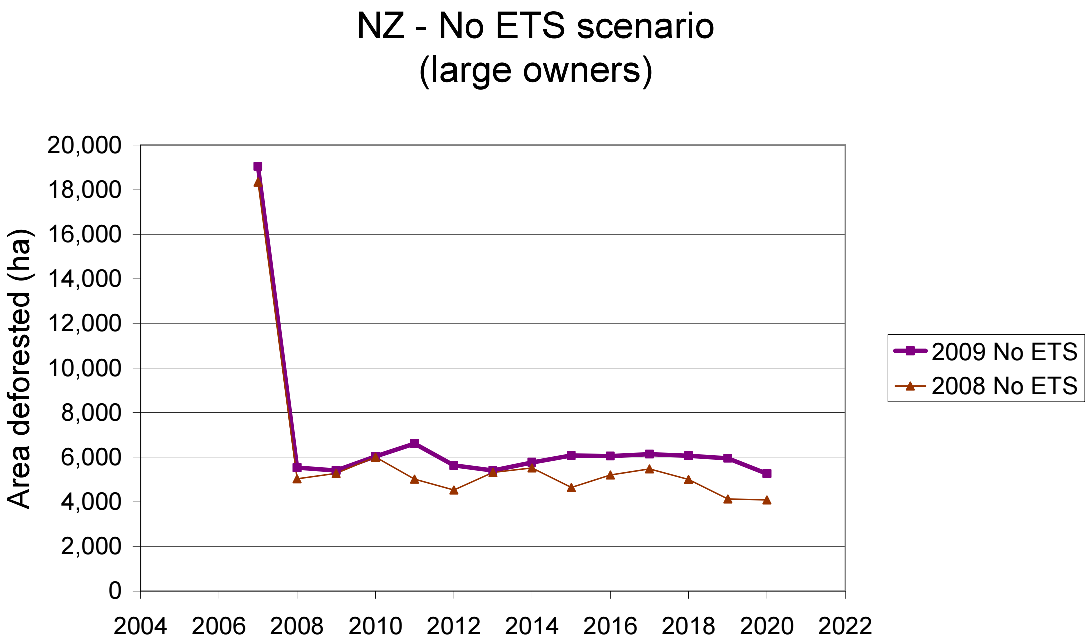
Deforestation if offsetting is allowed
Total deforestation by large-scale owners for 2008 to 2020 is 48,000 ha compared to 51,000 in the 2008 survey.

Fig. 5: Comparison of the 2009 survey results for the offsets scenario with those from the 2008 survey – large-scale owners.



Deforestation if ETS is repealed
Total deforestation by large-scale owners for 2008 to 2020 is 76,000 ha compared to 65,000 in the 2008 survey.

Fig. 6: Comparison of the 2009 survey results for No ETS with those from the 2008 survey – large-scale owners.



Reason for differences
The main difference between the 2008 and 2009 results is for the No ETS Scenario. Some 10,000 ha of the increase of 11,000 ha is due to a new project. In this project a forest grower is negotiating the early return of land to the land owner for potential conversion to alternative land uses. Under the ETS and Offset scenarios it is likely that conversion will proceed using the 9-year rule commencing in 2019. The resulting increase for these years is evident in Figures 4 and 5.

Uncertainty

There is considerable uncertainty about the intentions of forest owners. Some 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 2009 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 some owners are taking a wait-and-see approach. They are awaiting the outcome of international negotiations, for example whether offsets will be allowed from 2013 on. Some are also waiting to see final details for the allocation of free units. Some owners intend using these units to meet deforestation liabilities, although most owners see the potential sale of free units and deforestation as different business decisions.

An important factor in determining deforestation levels will be the market price of carbon units. If carbon prices are in the range \$20 to \$25/t CO_2 there will be limited deforestation. However the amended ETS has reduced the demand for carbon units and may result in market prices for carbon being lower than this. Owners are waiting to see the level of carbon prices and hence the deforestation liability that they would face.

The leadership and management of the CNI Iwi Collective (ie, ‘Treelords’ settlement) are still evaluating options for its estate. 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. However, deforestation liabilities together with the issues of water rights and environmental issues (nutrient issues in Lake Taupo and the Waikato River) make large-scale deforestation unlikely – particularly with the August 2008 deed of settlement with Waikato-Tainui granted co-management of the Waikato River.