



Deforestation Survey Final Report 2010

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Contents

Page

Executive summary	1
Main findings of survey	2
Introduction	3
Background	3
Objectives	3
Approach	4
Alternative scenarios	4
Year of deforestation	5
Limitations	6
Incomplete information	6
Inconsistent information	6
Current intentions	6
Results	7
Comparison with 2009 survey	11
Uncertainty	14

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 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.

This study was commissioned to:

1. Update deforestation intentions collected in a survey in late 2009. Deforestation intentions are required under the current 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 area deforested in the year ended December 2009 and an estimate of the area expected to be deforested in the year ended December 2010;
4. Quantify future deforestation intentions broken down into the following time periods: 2011-2012; 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 followed is a structured review of the deforestation intentions of large-scale forest owners 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 that the current legislation continues unchanged.
2. Offset planting allowed – this assumes that amendments are made to the ETS enabling offsetting; i.e. landowners would be permitted without cost to deforest area provided that they afforest an equal area elsewhere in New Zealand.
3. No ETS legislation – this assumes that the ETS is repealed and not replaced by any other legislation.

Results from the survey of large-scale forest owners were collated and interpreted. Allowance was made for deforestation by small-scale owners. 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 Offset Planting 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 No ETS scenario. Although the level of deforestation is higher under the Offset Planting scenario compared to the ETS scenario, the increase would be offset by afforestation of new land.

The level of deforestation varies by region. Under the ETS scenario, 47% of deforestation by large-scale owners during 2008 to 2020 is forecast to take place in the Central North Island. This increases to 72% under the Offset Planting scenario.

Table 1: Forecast of deforestation of plantation forest (thousand hectare) for each scenario

	2008	2009	2010	2011 to 2012	2013 to 2020	2008 to 2012	2008 to 2020
ETS (large-scale owners only)	3	2	2	5	7	12	19
ETS (all owners)	3	3	3	7	15	16	31
Offset Planting (large-scale owners only)	3	3	3	8	19	17	36
Offset Planting (all owners)	3	5	4	11	31	23	54
No ETS (large-scale owners only)	5	5	4	12	35	26	61
No ETS (all owners)	6	6	6	16	51	34	85

Under the ETS total intended deforestation by large-scale owners between 2008 and 2020 is 19,000 ha, the same as in the 2009 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, 65% of conversion will be to dairy, 14% to lifestyle/residential, 13% to windfarm development and 8% to sheep & beef.

The survey was carried out in an environment where there is uncertainty about what will happen beyond 2012. This uncertainty arises because of factors such as potential changes to the ETS legislation following the ETS review in 2011 and whether ongoing international negotiations will result in offset planting being allowed from 2013 on.

This forecast is based on current intentions. These reflect perceptions about land-use economics, land prices, 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 is 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 2009. Deforestation intentions are required under the current 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 area deforested in the year ended December 2009 and an estimate of the area expected to be deforested in the year ended December 2010;
4. Quantify future deforestation intentions broken down into the following time periods: 2011-2012; 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 2005¹), 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 77% of plantations of age 21 years and older (as at 31 March 2010). 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 2010]

	Age-class							Total
	1-5	6-10	11-15	16-20	21-25	26-30	> 30	
Owners with > 10 000 ha	145 037	177 365	220 515	137 192	182 232	143 288	46 384	1 052 013
Other	34 364	122 920	215 559	200 518	48 532	36 848	26 837	685 578
Total	179 401	300 285	436 074	337 710	230 764	180 136	73 221	1 737 591

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 November/December 2010 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.

ALTERNATIVE SCENARIOS

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

1. Emissions Trading Scheme (ETS) – this assumes that the current legislation continues unchanged.

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.

2. Offset planting allowed – this assumes that amendments are made to the ETS enabling offsetting; i.e. landowners would be permitted without cost to deforest area provided that they afforest an equal area elsewhere in New Zealand.
3. No ETS legislation – this assumes that the ETS is repealed and not replaced by any other legislation.

YEAR OF DEFORESTATION

In this report deforestation is reported as occurring in the year in which land intended to be converted into another land use (deforestation) is harvested. The year of harvest is the year in which any deforestation liability is calculated.

Limitations

INCOMPLETE INFORMATION

The general response to the telephone survey of the large companies was very good. 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.
- The focus of companies is deciding what to do under the current ETS. What they would do under the No ETS scenario is hypothetical.

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 a 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.”

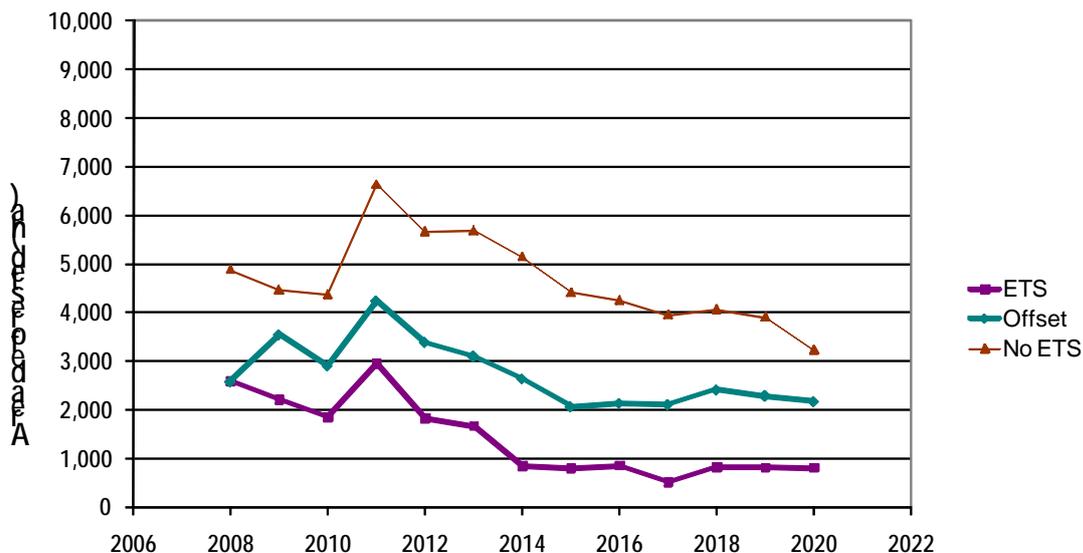
This forecast is based on current intentions. These reflect perceptions about land-use economics, Government policy implementation, emission unit price and other factors as they exist today. Clearly they are subject to change.

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:

- The ETS scenario has lower levels of deforestation than the scenarios in which the ETS is amended to allow offset planting or is repealed. It is important to review Fig. 1 in the context of the convention adopted that deforestation is reported as occurring in the year in which land intended to be converted into another land use (deforestation) is harvested. The forecast for 2008, 2009 and 2010 includes area that has been converted as well as area that has been harvested but will be converted in 2011 or a later year.
- Under the offset planting scenario there is an additional 17,000 ha of deforestation between 2008 and 2020 compared to the ETS scenario. However this additional deforestation would be offset by 17,000 ha of afforestation.
- The No ETS scenario leads to the highest levels of deforestation.

Figure 1: Deforestation forecast for New Zealand (large-scale owners only). Under the offset planting scenario 17,000 ha of new planting would be done to offset area deforested between 2008 and 2020.



Deforestation under the ETS

It is estimated that about 2000 ha was deforested in 2009 by large-scale owners with a further 2000 ha in 2010. From 2011 to 2020 a further 12,000 ha 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.

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 for part of a company’s forest estate. The deforestation liability will partially be met by allocation units received for the owner’s total estate.
- Land that will be used for a windfarm.

Impact of carbon price

The survey was carried out at a time when the carbon price was about \$20/t CO₂. An attempt was made to find out whether intentions would change if carbon prices were lower or higher. However only a limited response was received - some respondents said that it was too hypothetical to speculate on what they would do if carbon prices changed. The limited feedback received indicates that at a carbon price of about \$10/t CO₂ it would become financially viable to convert some better land to dairy and pay the deforestation liability.

Deforestation if offset planting is allowed

Deforestation by large-scale owners in 2009 would be 3000 ha with a further 3000 ha in 2010 if the ETS was amended to allow land offset planting. The increase over the level of deforestation under the ETS scenario relates to some of the land harvested in 2009 and 2010 that has been left unplanted but which would be converted if offsetting is allowed. From 2011 to 2020 a further 27,000 ha of deforestation is forecast.

The total area of deforestation forecast for the offset planting scenario between 2008 and 2020 is 36,000 ha. This would be partially offset by the planting of 17,000 ha of afforestation; ie, 17,000 ha of conversion from forest to non-forest land would be offset by the change in land use of an equivalent area from non-forest to forest.

Deforestation if ETS is repealed

Deforestation by large-scale owners would be 5000 ha 2009 and 4000 ha in 2010 if the ETS was repealed with a further 47,000 ha from 2011 to 2020.

The ETS deforestation liability means that several large-scale deforestation projects have been on hold. The deforestation liabilities (and current commodity prices) are such that conversion is not economic. Over 5000 ha of land that was harvested between 2008 and 2010 has been left unplanted by owners who want to convert but cannot afford to do so under the current ETS. The requirement for land to be re-established within four years of harvest means that area harvested in 2008 will need to be re-established in 2011 or 2012 or be deemed to be deforested.

Where is most deforestation occurring?

Under the ETS scenario, 47% 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 72% under the Offset Planting 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 windfarm development and then sheep & beef agriculture (Table 3).

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

	ETS policy	Offset Planting
	%	%
Dairy	65	79
Lifestyle	14	9
Windfarm	13	7
Sheep & beef	8	5

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.

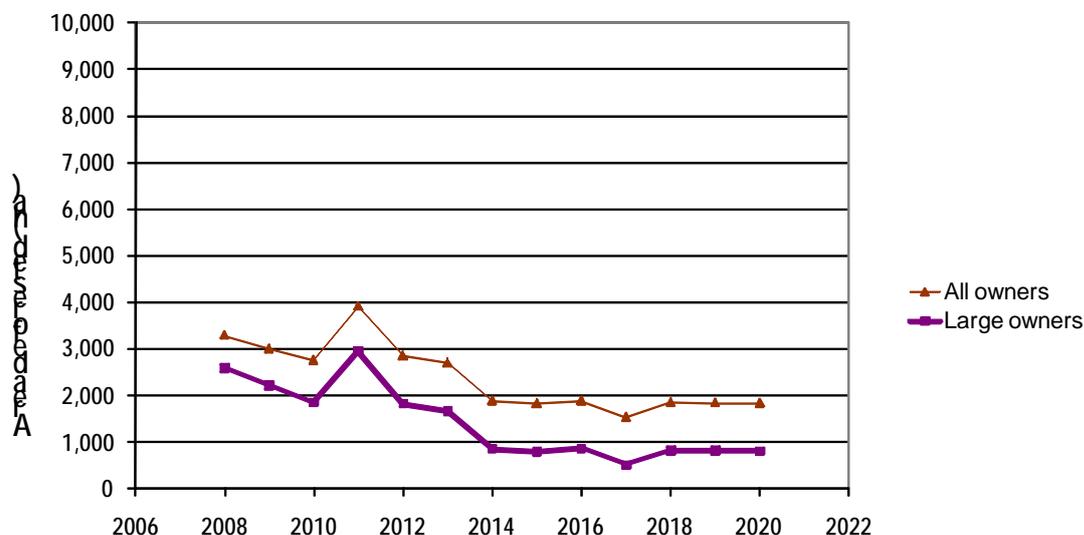
The same general assumptions were made this year as they were for the 2007, 2008 and 2009 forecasts. A profile of the area harvested by small-scale owners was generated based on the 2006 NEFD age-class distribution for this group of owners (but with a reduction of 15% to adjust to net stocked area). Generic assumptions were made about the percentage of area that is replanted following harvest. These percentages were varied for each scenario:

- 90% of area will be replanted (10% deforestation) in the ETS scenario.
- 85% of area will be replanted (15% deforestation) in the Offset Planting scenario.
- 80% of area will be replanted (20% deforestation) in the No ETS scenario.

Data provided by MAF indicates a deforestation rate of 7.3% for softwood plantation owners with 40 to 10,000 ha. The deforestation rate for owners with less than 40 ha could be higher as they are eligible for the threshold exemption for land-owners with less than 50 ha of pre-1990 forest. Overall this indicates that the 10% deforestation rate adopted for small-scale owners under the ETS scenario is reasonable.

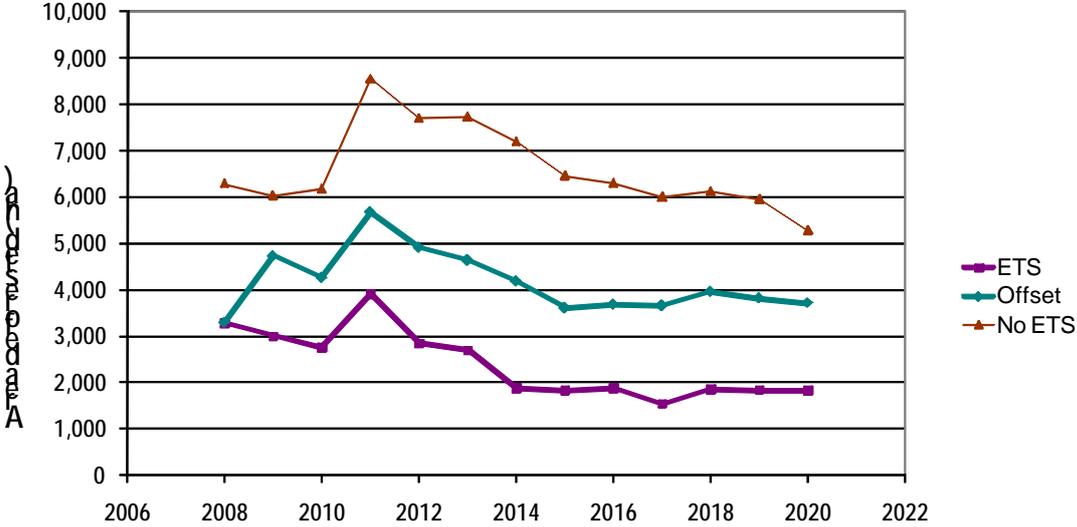
Fig. 2 shows the deforestation intentions under the ETS scenario.

Figure 2: Deforestation forecast for New Zealand (all owners) under ETS scenario. (Large-scale owner intentions & small-scale owners @ 10% deforestation.)



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

Figure 3: Forecasts for alternative scenarios (all owners). Under the Offset Planting scenario 23,000 ha of new planting would be done to offset some of the area deforested between 2008 and 2020.

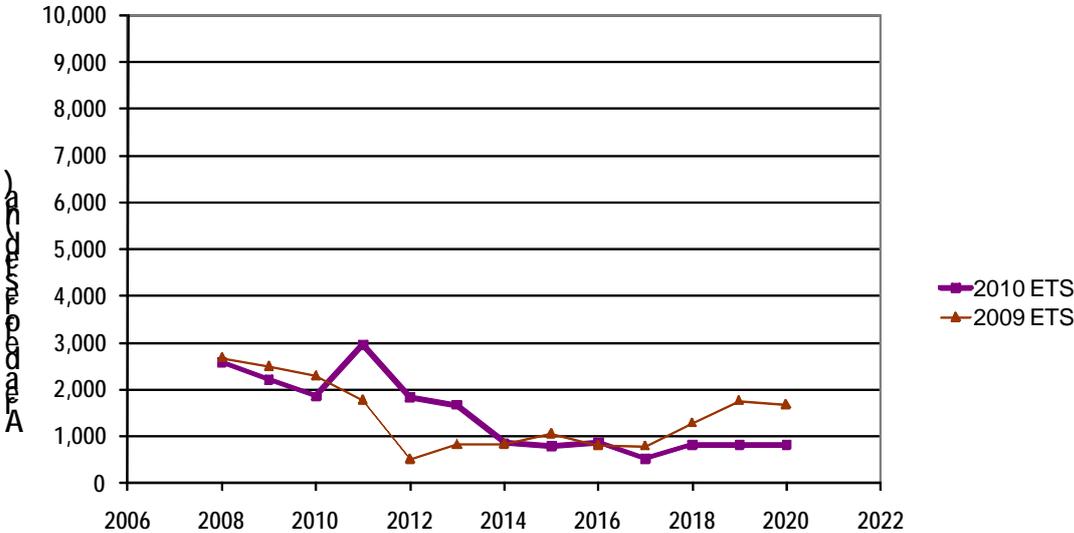


Comparison with 2009 survey

Deforestation under ETS

Total deforestation by large-scale owners for 2008 to 2020 is 19,000 ha. This is the same total as for the 2009 survey. Although the totals are the same there are differences over time (Fig. 4). A number of owners have now decided not to deforest because of a greater awareness of the penalties faced. However a project involving deforestation for a windfarm is additional to the projects reported in 2009.

Figure 4: Comparison of the 2010 survey results with those from the 2009 survey (ETS) – large-scale owners

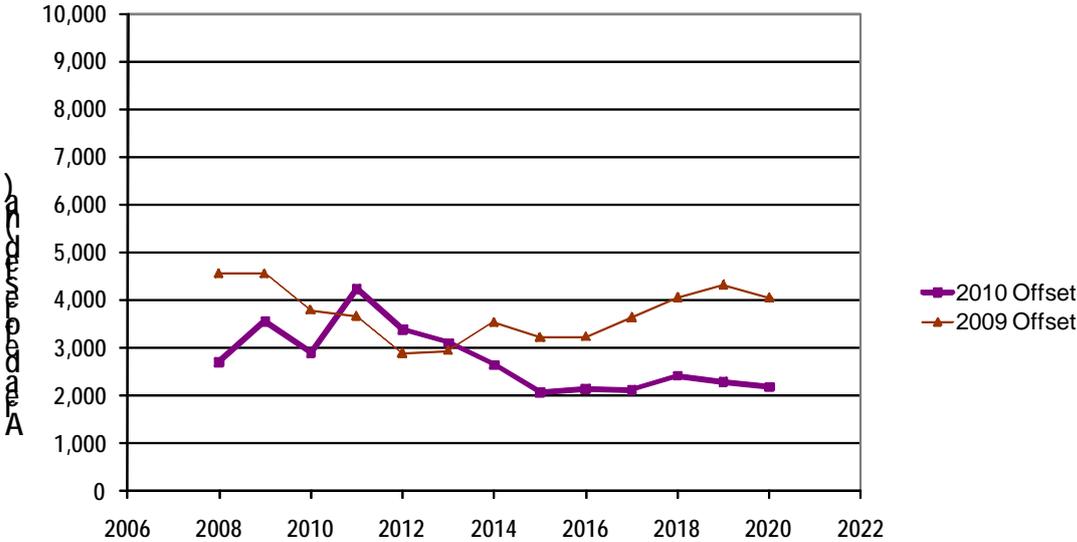


Deforestation if offset planting is allowed

Total deforestation by large-scale owners for 2008 to 2020 is 36,000 ha compared to 48,000 in the 2009 survey. The reduction is a consequence of:

- a change in land ownership in one project - a company that, prior to the ETS, intended to deforest has sold its land to a company that plans to replant.
- greater recognition that offset planting will only be economically viable if conversion is to dairy rather than sheep & beef.

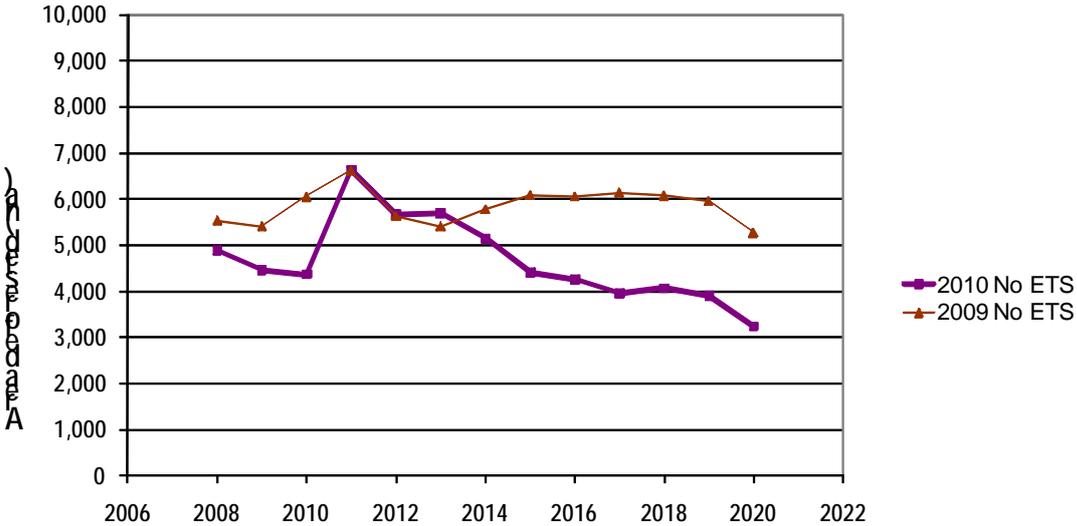
Figure 5: Comparison of the 2010 survey results for the Offset Planting scenario with those from the 2009 survey – large-scale owners



Deforestation if ETS is repealed

Total deforestation by large-scale owners for 2008 to 2020 is 61,000 ha compared to 76,000 in the 2009 survey. The reduction is a consequence of a change in land ownership in one project and revision of both the total area suitable for conversion and the timing of deforestation in another project.

Figure 6: Comparison of the 2010 survey results for No ETS with those from the 2009 survey – large-scale owners



Uncertainty

Land owners are making decisions in an environment where there is certainty about deforestation liabilities if they deforest today but uncertainty about what will happen beyond 2012. This uncertainty arises because of factors such as:

- The ETS review in 2011 and potential changes to the ETS legislation.
- Ongoing international negotiations about what will happen post-2012. Will there be a successor to the Kyoto Protocol and what form will it take? For example, will offset planting be allowed from 2013 on?
- The level of NZU prices.
- The relative profitability of different land-uses changing with changes in product prices.

Some owners are taking a wait-and-see approach. For example, as land is handed back to them by the forestry right holder, some land owners are leaving the land unplanted (but not converted) as long as they are able to in the hope that the ETS legislation will change or that offset planting will be allowed from 2013 on.

The current level of deforestation liabilities is such that the level of deforestation of pre-1990 forests is low. An important factor in determining future deforestation levels will be the market price of carbon units. If carbon prices are in the range \$20 to \$25/t CO₂ there will be limited deforestation. However if carbon prices were to fall to about \$10/t CO₂ then higher levels of deforestation are likely.