Ministry for Primary Industries
Manatū Ahu Matua

Deforestation Survey 2013 Final Report

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Executive summary

Information on future rates of deforestation is needed to assist with projecting New Zealand's likely emissions over the second commitment period of the Kyoto Protocol, to provide information needed to assist with future climate change negotiations and to assist with future policy development.

This study was commissioned to:

1. Update deforestation intentions last collected in a survey in late 2012. 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 2012 and an estimate of the area expected to be deforested in the year ended December 2013.
4. Quantify future deforestation intentions for 2014-2020.
5. Provide informed commentary on the uncertainty around deforestation intentions and how and why company deforestation intentions have changed since the survey conducted in late 2012.
6. Gather information on the level of avoided deforestation that would occur with the domestic land offsetting policy, and
7. Gauge how forest land-owners are likely to alter future deforestation intentions based on the Emissions Trading Scheme under different carbon price scenarios.

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

The general approach followed was 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 two different scenarios:

1. Emissions Trading Scheme (ETS) – this assumes that the ETS legislation as amended under the Climate Change Response (Emissions Trading and Other Matters) Amendment Act 2012 (enacted on 13 November 2012) continues unchanged.

   As part of this scenario respondents were asked how much area of offset planting they would undertake.

2. No ETS legislation – this assumes that the ETS is repealed and not replaced by any other legislation.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.

Main findings of survey

A summary of results is presented in Table 1. The forest owners surveyed reported identical levels of deforestation forecast under ETS and No ETS scenarios for 2014-2020. The level of deforestation varies by region with 65 percent of deforestation by

large-scale owners during 2008 to 2020 forecast to take place in the Central North Island.

Table 1: Forecast of deforestation of plantation forest for both scenarios (thousand hectare)

	2008	2009	2010	2011	2012	2013	2014 to 2020		2008 to 2020
Large-scale owners only	4	5	4	4	6	5	27		55
All owners	6	6	6	6	8	7	42		80

(rounding causes the 2008 to 2020 value for all owners being different from the sum of values)

These forecasts are based on current intentions. They reflect perceptions about land-use economics, land prices, government policy implementation, emission unit price and other factors as they exist at the time of the survey. As such, they are subject to change.

Total intended deforestation by all owners is estimated as 80,000 hectares between 2008 and 2020. During this period large-scale owners envisage 55,000 hectares of deforestation. This is less than the totals of 62,000 and 59,000 hectares reported in the 2012 survey for the ETS and No ETS scenarios respectively. Of the 55,000 hectares that is intended to be deforested, around 9,000 hectares is classified as post-1989 forest and 46,000 hectares pre-1990 forest. A further 25,000 hectares of deforestation is assumed to be undertaken by small-scale owners.

It is estimated that, of the 55,000 hectares of intended deforestation (large-scale owners) between 2008 and 2020, 86 percent of conversion will be to dairy, 10 percent to sheep & beef and 4 percent to lifestyle/residential.

No respondents to the 2013 survey intend using offset planting. There is a clear preference to meet deforestation liabilities by purchasing units rather than using offset planting.

The survey was carried out at a time when the carbon price was in the range $3/NZU to $4/NZU. The price of ERUs was much lower – in the range of 10 to 30 cents per unit. At prices in this range the deforestation liability is not a deterrent to land conversion. According to some respondents, if carbon prices were to increase above about $10 there is likely to be a reduced rate of future deforestation. However land-owners intending to deforest have acquired the units necessary to meet the deforestation liability for the majority of their area harvested over the last six years.

A significant source of uncertainty to land-owner decision-making is access to water to enable dairy conversion. While a number of the major deforestation projects already have water rights, there are a number of projects (primarily involving deforestation of areas to be harvested from 2013 on) that have yet to acquire access to water. Another source of uncertainty relates to the return of significant areas of Crown Forestry Licence (CFL) land to Maori as part of settlement of Treaty claims. In a number of cases iwi are still formulating future land-use plans.

Introduction

Background

Information on future rates of deforestation is needed to assist with projecting New Zealand's likely emissions over the second commitment period of the Kyoto Protocol, to provide information needed to assist with future climate change negotiations and to assist with future policy development.

This deforestation intentions survey collects information on the extent of forest owners' intentions to deforest or take up the offsetting provision in the Emissions Trading Scheme (ETS). This is crucial information for domestic and international climate change policy and managing the ETS financial forecast (required for the Public Finance Act). 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 last collected in a survey in late 2012. 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 2012 and an estimate of the area expected to be deforested in the year ended December 2013.
4. Quantify future deforestation intentions for 2014-2020.
5. Provide informed commentary on the uncertainty around deforestation intentions and how and why company deforestation intentions have changed since the survey conducted in late 2012.
6. Gather information on the level of avoided deforestation that would occur with the domestic land offsetting policy, and
7. Gauge how forest land-owners are likely to alter future deforestation intentions based on the Emissions Trading Scheme under different carbon price scenarios.

The scope of this survey and report 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 not to replant following harvesting with the 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[1].
- Harvested forests that are not replanted but naturally regenerate back into forest.

The Marrakesh Accord also defines afforestation and reforestation:

“Afforestation” is the direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human-induced promotion of natural seed sources; “Reforestation” is the direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land. For the first commitment period, reforestation activities will be limited to reforestation occurring on those lands that did not contain forest on 31 December 1989.

Note that these definitions do not include replanting or regeneration following harvest or natural disturbance, because these temporary losses of forest cover are not considered deforestation. Harvest followed by regeneration is considered a forest management activity.

[1] The ETS requires that reestablishment occurs within four year of harvest otherwise deforestation is deemed to have occurred.

Approach

The general approach followed is a structured review of the deforestation intentions of large-scale forest owners (owners with more than 10,000 hectares 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 relatively well understood in terms of ownership, land tenure and age-class.
- The majority of area that will be harvested over the next 10 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 New Zealand plantation harvest until 2020 is illustrated in Table 2. Forest owners with over 10,000 hectares account for 58 percent of the total plantation estate but they own 65 percent of plantations of age 21 years and older and 69% of the plantations of age 26 and older (as at 31 March 2013). There are relatively few owners in this category and therefore it makes sense to focus on their deforestation intentions.

Table 2: Plantation area by age-class and size of ownership [Source: *NEFD as at 2013*]

	Age-class (hectares)							
	1-5	6-10	11-15	16-20	21-25	26-30	> 30	Total
Owners with > 10 000 hectares	142024	147302	177496	206391	125766	145238	54810	**999027**
Other	53240	66439	154863	277410	86001	49892	41628	**729473**
Total	**195264**	**213741**	**332359**	**483801**	**211767**	**195130**	**96438**	**1728500**

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 2013 and asked about their deforestation intentions. In addition, individuals in other organisations were contacted to obtain 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.

[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.

Alternative scenarios

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

1. Emissions Trading Scheme (ETS) – this assumes that the ETS legislation as amended under the Climate Change Response (Emissions Trading and Other Matters) Amendment Act 2012 (enacted on 13 November 2012) continues unchanged.

   As part of this scenario respondents were asked how much area of offset planting they would undertake – the 2012 amendments to the ETS enable offsetting; ie, landowners are permitted (without incurring any liability) to deforest area provided that they afforest /reforest an equal area elsewhere in New Zealand.

2. No ETS legislation – this assumes that the ETS is repealed and not replaced by any other legislation.

During the survey period (6 December 2013) the Government confirmed that Kyoto Protocol units (e.g., CERs, ERUs and RMUs) cannot be used to meet New Zealand ETS surrender obligations after 31 May 2015. However respondents with deforestation intentions had generally been aware of this since December 2012 when the COP 18 meeting voted to exclude countries that did not sign up to CP2 from access to Kyoto Protocol units.

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. As such 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 land-owners are still evaluating their options.

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

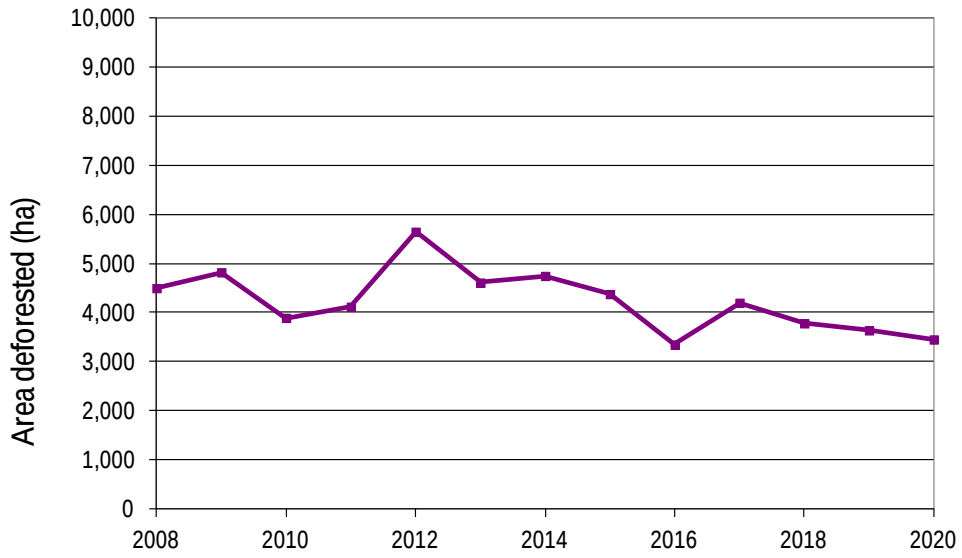
Forecasts are based on current intentions. These reflect perceptions about land-use economics, Government policy implementation, emission unit price and other factors as they exist at the time of the survey. Clearly they are subject to change.

Of some significance, the survey was carried out at a time when the carbon price was in the range $3/NZU to $4/NZU. The price of ERUs was much lower – in the range of 10 to 30 cents per unit.

Results

The combined deforestation intentions of large-scale owners are shown in Figure 1. It is important to review Figure 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 years 2008 to 2013 include area that has been converted to another land use as well as area that has been harvested but will be converted in 2014 or a later year.

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



Results for the two scenarios are identical. It is estimated that about 5000 hectares was deforested in 2013 by large-scale owners. From 2014 to 2020 a further 27,000 hectares of deforestation is forecast. Of the 55,000 hectares of deforestation by large-scale owners between 2008 and 2020, some 9000 hectares is deforestation of post-1989 "Kyoto" plantations.

The 46,000 hectares of pre-1990 forest forecast to be deforested between 2008 and 2020 includes conversion to:

- Dairy.
- Sheep and beef agriculture.
- Residential and lifestyle land.

Impact of carbon price

The survey was carried out at a time when the carbon price was in the range $3/NZU to $4/NZU. An attempt was made to find out the breakeven carbon price; i.e., the carbon price at which intended deforestation would not occur. However, most respondents who intend to deforest either had not calculated the breakeven carbon price or were not prepared to disclose it. One respondent indicated that the breakeven carbon price was $8, another said it was $10, while another said it was $10 to $15.

Intention to use offset planting

No respondents intend using offset planting. There is a clear preference to meet deforestation liabilities by purchasing units rather than using offset planting. Only one respondent indicated that they would consider offset planting. They would do so if the carbon price got over $8/unit.

Other respondents would not consider using offset planting even at higher carbon prices. One cited the difficulty is acquiring suitable land at a reasonable cost. Another stated that if carbon prices got too high they would use the "9 year rule"; i.e., regenerate and deforest after 9 years.

Where is most deforestation occurring?

Some 65 percent of deforestation by large-scale owners during 2008 to 2020 is forecast to take place in the Central North Island.

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. Conversion by large-scale owners is mainly to dairy followed by sheep and beef agriculture and then lifestyle/residential (Table 3).

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

Forest converted to	percent
Dairy	86
Sheep & beef	10
Lifestyle	4

What are small-scale forest owners doing?

For the 2007 to 2011 forecasts, deforestation by small scale owners was calculated based on modelled assumptions rather than a survey of individual owners' intentions. 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 percent to adjust to net stocked area). Generic assumptions were made about the percentage of area that would be replanted following harvest. These percentages were varied for each scenario:

- 90 percent of area will be replanted (10 percent deforestation) in the ETS scenario.
- 80 percent of area will be replanted (20 percent deforestation) in the No ETS scenario.

For the 2012 survey, given the similarity of results for the two scenarios, it was assumed that 80 percent of area will replanted under both the ETS and No ETS scenarios; i.e., a 20 percent deforestation rate was applied to both scenarios.

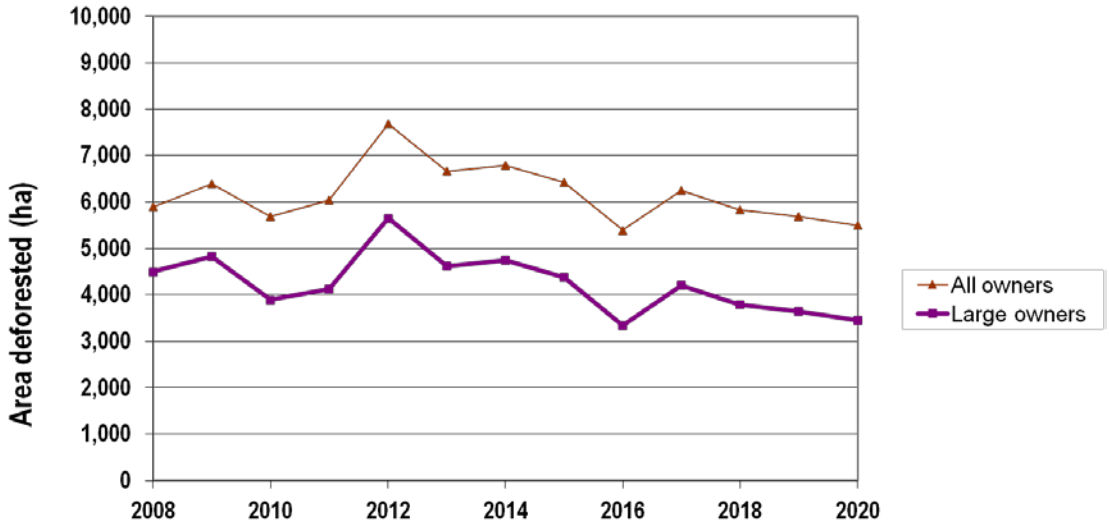
In a survey of small-scale forest owners (with 20–200 hectares of forest) 71.4 percent of respondents said they would replant on the same site, 5.4 percent said they would not replant and 23.2 percent were not sure if they would replant (Rodenberg & Manley 2011[3]).

Data provided by the Ministry for Primary Industries (MPI) indicates a deforestation rate in the year to 31 March 2012 of 8 percent for softwood plantation owners with 40 to 10,000 hectares.

Given the responses of large-scale owners in the current survey, and to maintain consistency, it has again been assumed that 80 percent of area will replanted under both the ETS and No ETS scenarios; i.e., a 20 percent deforestation rate has been applied to both scenarios.

Figure 2 shows the deforestation forecast for all owners.

Figure 2: Deforestation forecast for New Zealand (all owners). (Large-scale owner intentions and small-scale owners assuming 20 percent deforestation)



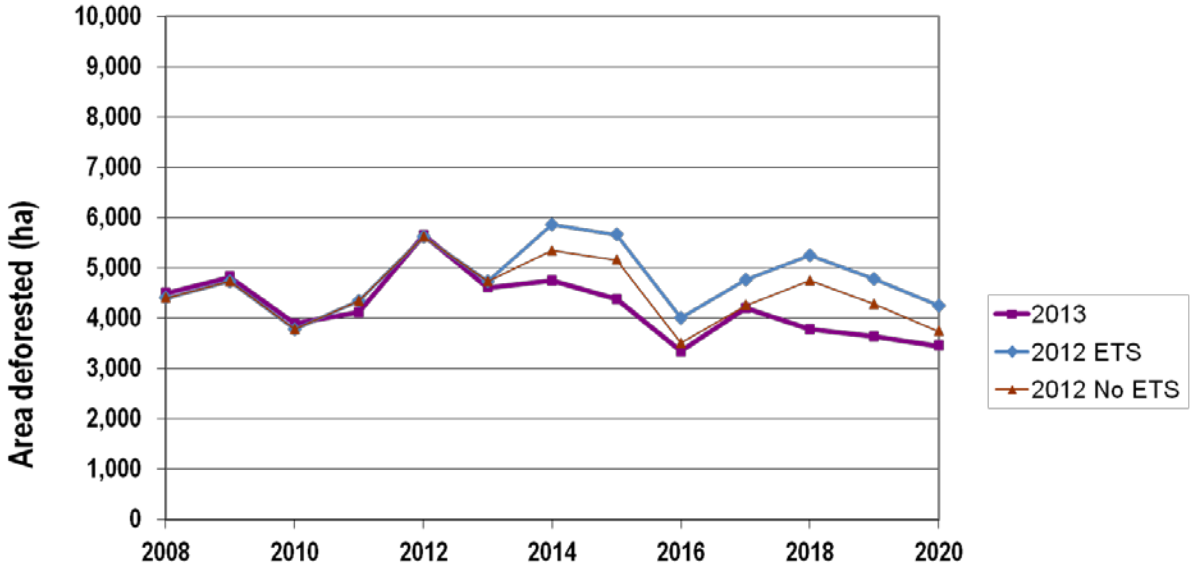
[3] Rodenberg, J; Manley B. 2011: Small forests in New Zealand. A survey of landowner objectives and management. *New Zealand Journal of Forestry*, 56(2): 15–19.

Comparison with 2012 survey

Results from the 2013 survey are compared with those of the 2012 survey in Figure 3. Total forecast deforestation by large-scale owners for 2008 to 2020 is 55,000 hectares. This is less than the totals of 62,000 and 59,000 hectares reported in the 2012 survey for the ETS and No ETS scenarios respectively. Reasons for the differences are:

- Changes in harvesting intentions and subsequent hand back of land. Some harvesting has been delayed (although in other cases harvesting has been brought forward).
- Changes in the decision to deforest.
- Delays in implementation of deforestation plans.
- Reassessment of suitability of land for conversion. Some land (e.g., on slopes) that has been converted has proven unsuitable for dairy or dairy support. This type of land is likely to be replanted or left to revert as riparian strips.

Figure 3: Comparison of the 2013 survey results with those from the 2012 survey – large-scale owners only



In the 2012 survey one respondent hoped to implement an accelerated level of deforestation under the ETS scenario in response to low carbon prices. This is now considered unlikely to happen. The reality is that for this project, as for most deforestation projects, the land-owner and the forest crop-owner are different entities. The land-owner does not get the land handed back to them until the tree crop has been harvested. In order to accelerate deforestation, the land-owner would have to get the tree crop owner to agree to harvest stands at younger ages. In general, this has not occurred. Land-owners are focusing on conversion of the large areas that had been harvested in 2008 to 2012 and left fallow until the drop in carbon prices 2011–2012 made deforestation financially viable. Consequently, despite the low current carbon prices, the ETS scenario and the No ETS scenario have identical results in the 2013 survey.

Uncertainty

While there is uncertainty about the future carbon price, the current low price has provided land-owners with the opportunity to buy the units they need to implement their intentions and has reduced the opportunity cost of using units received under the allocation plan for pre-1990 forest land. Some land-owners have now acquired units for the majority of area harvested over the last 6 years that is intended for deforestation.

There is greater uncertainty about deforestation beyond 31 May 2015 when Commitment Period 1 Kyoto Protocol units can no longer be used to meet surrender obligations. Should NZU prices reach about $10/NZU deforestation intentions are likely to reduce. Even land-owners who hold sufficient NZUs to meet deforestation liabilities will reassess plans if the opportunity cost of surrendering these NZUs becomes too high.

One source of uncertainty for deforestation is access to water to enable dairy conversion. While a number of the major deforestation projects already have water rights, there are a number of projects (primarily involving deforestation of areas harvested from 2013 on) that have yet to acquire access to water. Despite this one land-owner reported that there was a lot of interest by dairy farmers in acquiring additional land, currently in trees, that was adjacent to their properties.

Another source of uncertainty relates to the return of significant areas of CFL land to Maori as part of settlement of Treaty claims. A number of these claims have been settled while others are still in the process of being settled. Some of the settled claims are undergoing a mana whenua process to determine which hapu or iwi has ownership of each area of land. Consequently there is a large area of land, currently under trees, over which iwi have not yet developed land-use plans or are not yet in a position to implement any plans. A proportion of this land is adjacent to dairy farms and has the potential to be converted.