



# Deforestation Intentions Survey 2017

## Final Report

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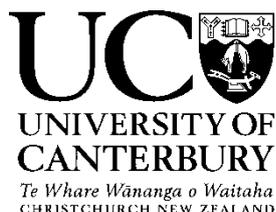
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# 1 Executive Summary

Information on future rates of deforestation of planted forest is needed to assist with projecting New Zealand's likely emissions over the second commitment period of the Kyoto Protocol and beyond given New Zealand's commitment under the Paris agreement, as well as to inform future policy development.

This study was commissioned to:

- Gather and analyse the current and future deforestation intentions of exotic forest owners/managers.
- Assess deforestation intentions from a suitable sample group to obtain reliable estimates of national deforestation of planted forest up to the year 2030.
- Gauge how forest owners are likely to alter future deforestation intentions under different carbon price and policy scenarios supplied by MPI.
- Assess the intention to implement offset planting under the flexible land use provision of the ETS.
- Provide commentary on:
  - information sourced and the methodology used;
  - key reasons and drivers behind deforestation;
  - uncertainty in the stated intentions.

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 No ETS legislation – this assumes that the ETS is repealed and not replaced by any other comparable legislation.

Results from the survey of large-scale forest owners were collated and interpreted.

Additional information was sought from forestry consultants and managers to assess the current level of deforestation for the small-scale estate. Data provided by MPI was also evaluated. Based on the available information, it has been assumed that 10% of the small-scale forest area harvested will be deforested.

## 1.1 MAIN FINDINGS OF SURVEY

Lower levels of deforestation are forecast for large-scale forest owners under the ETS scenario compared to the No ETS scenarios for 2017-2030 – 12,000 hectares versus 15,500 hectares. A summary of results for the ETS scenario is presented in Table 1.

Table 1: Forecast of area (ha) of deforestation of plantation forest (ETS scenario).

	2017	2018 to 2030	2017 to 2030
Large-scale owners only	2,000	10,000	12,000
All owners	3,500	40,500	44,000

*Note: 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 deforestation by all owners under the ETS scenario is estimated as 44,000 hectares between 2017 and 2030. During this period large-scale owners envisage 12,000 hectares of deforestation. A further 32,000 hectares of deforestation is estimated for small-scale owners. The survey was carried out at a time when the carbon price was \$19/NZU to \$20/NZU. At this price level, the deforestation liability is a deterrent to land conversion. Consequently there is an ongoing intention to use the flexible land use provision in the ETS. Large-scale owners intend to plant a carbon-equivalent area of new land to offset the conversion of almost 9000 hectares of existing forest land between 2017 and 2030. This represents 76 percent of the area of pre-1990 forest intended for deforestation by large-scale owners.

Of the 12,000 hectares that is intended to be deforested by large-scale owners, only 250 hectares is classified as post-1989 forest, the balance is pre-1990 forest. Of the intended deforestation between 2017 and 2030, 47 percent of conversion will be to dairy, 40 percent to sheep and beef, 6 percent to lifestyle/residential and 7 percent to other land-uses including infrastructure and mining.

The level of deforestation varies by region with 47 percent of deforestation by large-scale owners during 2017 to 2030 forecast to take place in Canterbury and 34 percent in the Central North Island.

Overall results for 2017 to 2030 are about 1,000 hectares lower than those reported for large-scale owners in the 2016 survey. The main differences are:

- A reduction of 2000 hectares across eight different projects because of high carbon price, increasing forest profitability, decreasing dairy profitability and the difficulty of acquiring land for offsets.
- An increase of 1000 hectares across two projects because of infrastructure (road and rail) requirements and a decision to convert to sheep and beef agriculture rather than plant mānuka.

A major source of uncertainty relates to the return of significant areas of Crown Forestry Licence (CFL) land to Māori as part of settlement of Treaty claims. In a number of cases iwi are still formulating future land-use plans.

As the large plantings of the 1990s mature, the deforestation intentions of small-scale owners will have an increasing impact on the national level of deforestation. Given the diverse ownership of the small-scale estate there is greater uncertainty about their deforestation intentions. However, as is the case for large-scale forests, most small-scale forests are being replanted after harvest.

## 2 Introduction

### 2.1 BACKGROUND

MPI requires information on exotic forest land owner's current and future deforestation intentions. This information will be used for government projections of greenhouse gas (GHG) emissions for the second commitment period of the Kyoto Protocol and beyond. Under the Kyoto Protocol and the UNFCCC, New Zealand must report CO<sub>2</sub> emissions resulting from deforestation. Therefore information on the projected deforestation will assist with GHG reporting and the Emissions Trading Scheme (ETS) financial forecast (as required for the Public Finance Act 1989). Information on deforestation also informs future policy scenarios and helps MPI assess the broader impacts of changing land use.

### 2.2 OBJECTIVES

The key objectives for this project are to:

- Gather and analyse the current and future deforestation intentions of exotic forest owners/managers.
- Assess deforestation intentions from a suitable sample group to obtain reliable estimates of national deforestation up to the year 2030.
- Gauge how forest owners are likely to alter future deforestation intentions under different carbon price and policy scenarios supplied by MPI.
- Assess the intention to implement offset planting under the flexible land use provision of the ETS.
- Provide commentary on:
  - information sourced and the methodology used;
  - key reasons and drivers behind deforestation;
  - uncertainty in the stated intentions.

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

### 2.3 WHAT IS DEFORESTATION?

There are a number of different definitions for deforestation depending upon use and context. 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.
- Harvested forests that are not replanted but naturally regenerate back into forest.

For the purposes of the ETS, deforestation is defined in the Climate Change Response Act (2002). Section 179 is reproduced in the Appendix. It legislates that deforestation is deemed to have occurred if:

- a specified stocking has not been achieved within four years of clearing by replanting or regeneration; or
- a specified canopy cover has not been achieved within 10 years of clearing.

### 3 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<sup>1</sup>), 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.
- Half of the area that will be harvested over the next 10 years, and hence be most susceptible for deforestation, is owned by relatively few owners.
- Owners have been willing to participate.
- Information is available from other sources in the forest industry that can be used to corroborate the stated intentions of forest land-owners.

Essentially the survey is a census of all large-scale forest owners. The dominant role that they will play in the New Zealand plantation harvest until 2020 is illustrated in Table 2. Large-scale forest owners account for 59 percent of the total plantation estate but they own 63 percent of the plantations of age 26 and older (as at 1 April 2017). There are relatively few owners in this category and therefore it makes sense to focus on their deforestation intentions.

Table 2: Plantation area (ha) by age-class and size of ownership [Source: NEFD as at 1 April 2017]

	Age-class							Total
	1-5	6-10	11-15	16-20	21-25	26-30	> 30	
Large-scale owners <sup>1</sup>	175307	153600	157755	190131	175550	83351	68039	<b>1003733</b>
Small-scale owners	51411	47155	74956	164011	269252	37741	50652	<b>695177</b>
<b>Total</b>	<b>226718</b>	<b>200754</b>	<b>232711</b>	<b>354142</b>	<b>444802</b>	<b>121092</b>	<b>118691</b>	<b>1698910</b>

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 2017 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.

<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 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.

Table 2 indicates that, over the next 10 years, small-scale forest owners will contribute an increasing proportion of the area that is harvested, and liable to be deforested. The large plantings by small-scale owners in the 1990s mean that they own 52 percent of the plantations of age 21 and older (as at 1 April 2017). Consequently additional information was sought to assess the current level of deforestation for the small-scale estate. Consultants and managers were asked about the proportion of the small-scale area harvested over the last one to two years that has been or will be deforested.

### 3.1 ALTERNATIVE SCENARIOS

Respondents (to the survey of large-scale owners) were asked for their deforestation intentions under two different scenarios:

1. Emissions Trading Scheme (ETS) – this assumes that the current 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; i.e., landowners are permitted (without incurring any liability) to deforest area provided that they afforest /reforest a carbon-equivalent area elsewhere in New Zealand.

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

### 3.2 YEAR OF DEFORESTATION

In this report the conversion of forest to a non-forest land use (deforestation) is reported as occurring in the year in which the harvesting activity occurred on that area of land, which is consistent with international LULUCF and Kyoto Protocol reporting and accounting. However this does differ from the definition used in the NZ ETS where the year of deforestation is determined at the point of land use change, rather than the point of harvest, but with deforestation liabilities (if any) calculated at the time the forest was cleared.

## 4 Limitations

### 4.1 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 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 land-owners are still evaluating their options.

The response by consultants and managers of small-scale forests was also very good. However much of the information provided was qualitative or anecdotal. It does not provide a basis for directly estimating the level of deforestation by small-scale owners. Rather it is

used to indicate whether the assumed rate of deforestation for small-scale forests is reasonable or not.

### 4.2 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.

### 4.3 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.

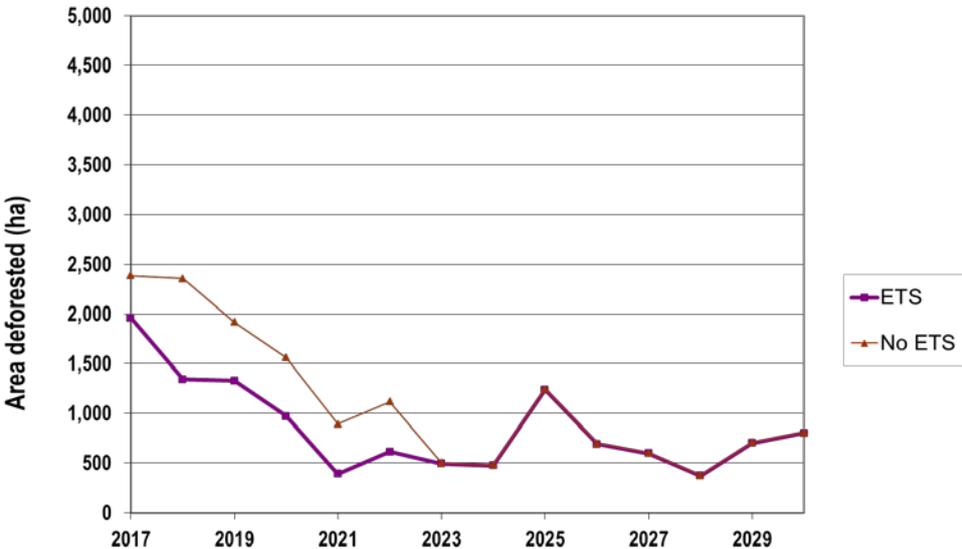
Of some significance, the survey was carried out at a time when the carbon price was in the range of \$19/NZU to \$20/NZU.

## 5 Results

Aggregated deforestation intentions of large-scale owners are shown in Figure 1. Results for the two scenarios are quite distinct. From 2017 to 2030, 12,000 hectares of deforestation is forecast under the ETS scenario while 15,500 hectares is forecast under the No ETS scenario. There is no difference between the two scenarios from 2023 on. This reflects the reality that the ETS has become the norm for respondents; i.e., that respondents aren't spending a lot of time thinking about a very hypothetical No ETS scenario. It also reflects the fact that the availability of water and regulation of nitrates and phosphates are increasingly becoming constraints for conversion.

Of the 12,000 hectares of deforestation by large-scale owners between 2017 and 2030 under the ETS scenario, only 250 hectares is estimated to be deforestation of post-1989 plantations.

Figure 1: Deforestation forecast for New Zealand (large-scale owners only). Results are shown for two different scenarios: ETS and No ETS.



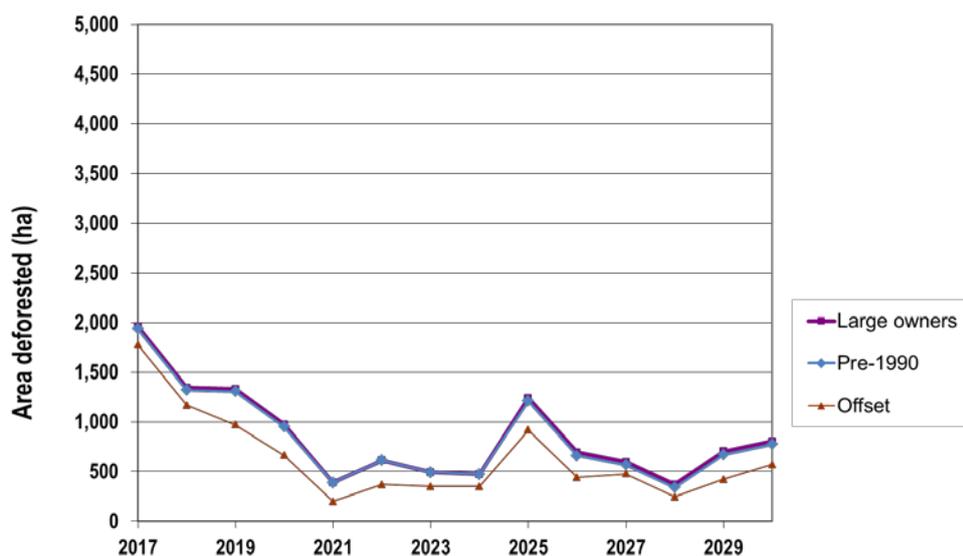
## 5.1 IMPACT OF CARBON PRICE

The survey was carried out at a time when the carbon price was in the range \$19/NZU to \$20/NZU. The difference between the responses to the two scenarios indicates that, at these carbon prices, the quantum of the deforestation liability is such that the ETS is having an impact on the level of deforestation. The impact is similar to that observed in the 2016 survey when carbon price was \$17/NZU to \$18/NZU. In the 2015 survey carbon prices of \$7/NZU to \$7.50/NZU were starting to have an impact on deforestation. In contrast, in the 2014 survey with NZUs at \$4.30 to \$5.50 and international ERUs much lower at 10 cents, the ETS had no impact on deforestation.

## 5.2 INTENTION TO USE OFFSET PLANTING

The majority of respondents who intend to deforest pre-1990 forest also plan to do offset planting. They intend using the flexible land-use provision and plant a carbon-equivalent area of new land to offset the conversion of almost 9000 ha of existing forest land between 2017 and 2030. The intention is to do offset planting for 76 percent of deforestation on pre-1990 forest land (see Figure 2). This percentage could increase as options are still being evaluated for some deforestation projects. However NZUs will be surrendered to cover some of the deforestation in 2017 and also in later years for some land intended for residential or lifestyle use.

Figure 2: Intention to do offset planting (large-scale owners only).



The 'Large owners' line shows the total intended deforestation by large-scale owners while the almost identical 'Pre-1990' line shows their intended deforestation of pre-1990 forests. A high percentage of this deforestation will be matched by 'Offset' planting.

## 5.3 WHERE IS MOST DEFORESTATION OCCURRING?

Some 47 percent of deforestation by large-scale owners during 2017 to 2030 is forecast to take place in Canterbury while 34 percent is in the Central North Island.

## 5.4 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 (or dairy support) and sheep and beef agriculture (Table 3). The 'Other' category includes land required for infrastructure as well as land clearance for mining.

Table 3: Land-use into which deforested area is being converted in 2017-2030 by large-scale owners for ETS scenario (figures are approximate)

Forest converted to	Percent
Dairy	47
Sheep & beef	40
Lifestyle	6
Other	7

## 5.5 WHAT ARE SMALL-SCALE FOREST OWNERS DOING?

Forestry consultants and managers throughout New Zealand provided information about deforestation by small-scale forest owners. Some responses:

- “Small-scale forest in the region is replanted. I can’t think of any area harvested recently that hasn’t been (or won’t be) replanted.”
- “Any woodlots that haven’t been replanted were harvested by tinpot operators and are lying fallow rather than being converted.”
- “Only the odd small woodlot (1 or 2 hectares) has been converted – 10% of area at most.”
- “Only one woodlot representing 6% of the area that we harvested over the year was converted to sheep and beef.”
- “The economics of forestry have improved and more forest growers want to enter another rotation. Of the small-scale forests harvested about 85% were replanted in radiata pine with another 5% allowed to revert or planted in mānuka. Only 10% were converted to pasture or lifestyle.”
- “Virtually everything we harvest is either replanted or allowed to regenerate naturally. The latter (which we don’t encourage) usually comes up in radiata pine or Douglas fir with some native as well but eventually is mostly stocked in plantation trees. None is converted to other land-uses.”
- “Most woodlots on the plains are being converted to grazing or house sites. Forest on the foothills is being replanted.”
- “The level of replanting is higher this year. Only 15% of the woodlot area that we harvested was converted (to sheep and beef agriculture). Most of the woodlots were post-1989.”
- “None of the area that we harvested in 2017 will be converted. Around the region we don’t see any conversion apart from rats and mice when property ownership changes.”

Some overall patterns emerge:

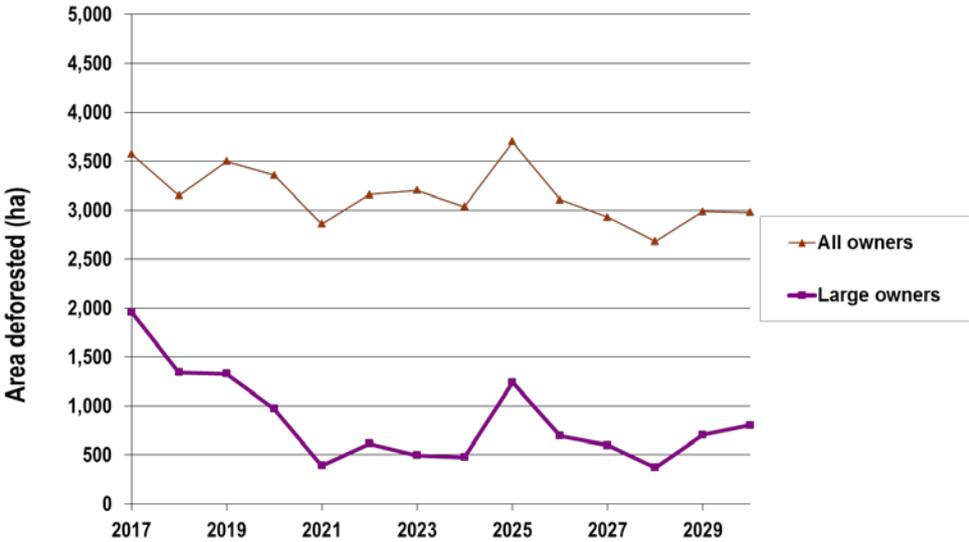
- Forestry is the highest and best use for the majority of land being harvested. The majority of this land is being replanted following harvest with a small proportion being left to revert to native forest. Most land is being replanted into radiata pine although some mānuka is being planted.
- Some land with dairy potential is being converted following harvest.
- Some land with sheep and beef potential is being converted to grassland following harvest, particularly when the net return from harvesting has been below expectation.
- Small areas are being converted for residential use or lifestyle blocks.

Data provided by the Ministry for Primary Industries (MPI) was also evaluated. Based on the available information, a 10 percent rate of deforestation has been assumed for the small-scale forest estate. A forecast of the area to be harvested by small-scale owners in 2017 to 2030 was

generated based on the New Zealand Wood Availability Forecasts (MPI, 2016<sup>2</sup>). Applying the 10 percent deforestation rate to this area gives an estimate of 32,000 hectares of deforestation by small-scale owners over the period 2017 to 2030.

Figure 3 shows the deforestation forecast for all owners. From 2017 to 2030 a total of 44,000 hectares of deforestation by all owners is forecast.

Figure 3: Deforestation forecast for New Zealand (all owners) under the ETS scenario. (Large-scale owner intentions and small-scale owners assuming 10 percent deforestation)



<sup>2</sup> New Zealand Wood Availability Forecasts 2014-2050, Prepared for Ministry for primary Industries by Indufor Asia Pacific Limited, 2016.

## 6 Comparison with 2016 survey

Results from the 2017 survey are compared with those of the 2016 survey for the ETS scenario in Figure 4. Total forecast deforestation for 2017 to 2030 by large-scale owners for the current (2017) survey is estimated as 12,000 hectares. This is a slight reduction on the total of 13,000 reported in the 2016 survey for this period.

There were changes in ten different projects resulting in the net reduction in deforestation of 1,000 hectares. In two projects the level of deforestation increased because:

- A plan to plant mānuka has been replaced by a plan to convert to sheep and beef agriculture.
- Infrastructure (road and rail) requirements.

These caused additional deforestation of 1000 hectares. In contrast eight projects had a lower level of deforestation primarily because of:

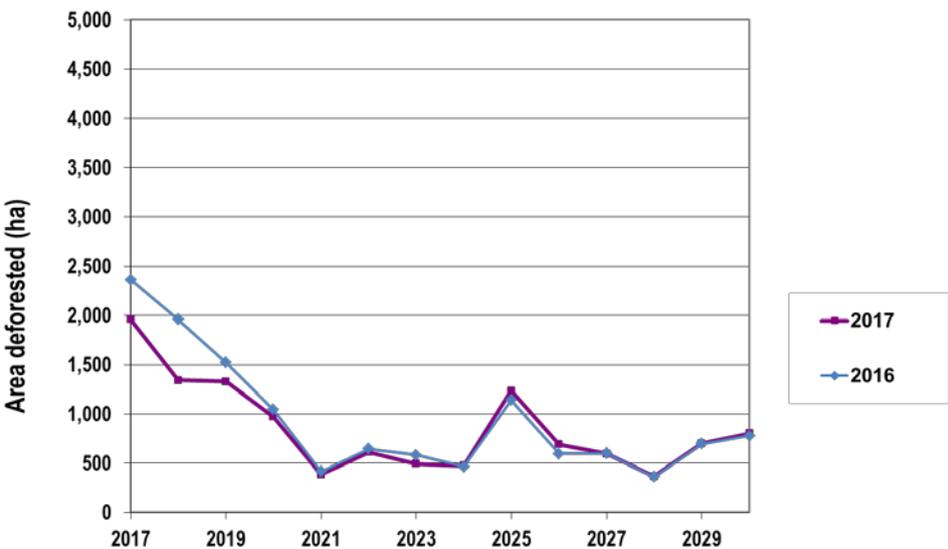
- High carbon price.
- Increasing forest profitability.
- Decreasing dairy profitability.
- Difficulty in acquiring land for offsets.

These caused a reduction of deforestation by 2,000 hectares. The majority of this area is post-1989 forest for which the plan to deforest changed due to the relativity of forest and dairy profitability.

One owner of pre-1990 forest plans a lower level of deforestation because “Rise in NZU price primarily, then tighter regional council restrictions on nitrogen, and lastly, quality of the land.”

No mention was made of the pending National Environmental Standard for Plantation Forestry being a factor in changing deforestation intentions. However one respondent said that some harvested areas might be left unplanted and allowed to revert because of implementation of the National Policy Statement for Freshwater Management by their district council.

**Figure 4: Comparison of the 2017 survey results with those from the 2016 survey – large-scale owners only (ETS scenario)**



The intention to do almost 9000 hectares of offset planting between 2017 and 2030 is similar to the result of the 2016 survey. This compares with about 4000 hectares in the 2015 survey. No respondents intended using offsets in the 2014 survey.

## 7 Uncertainty

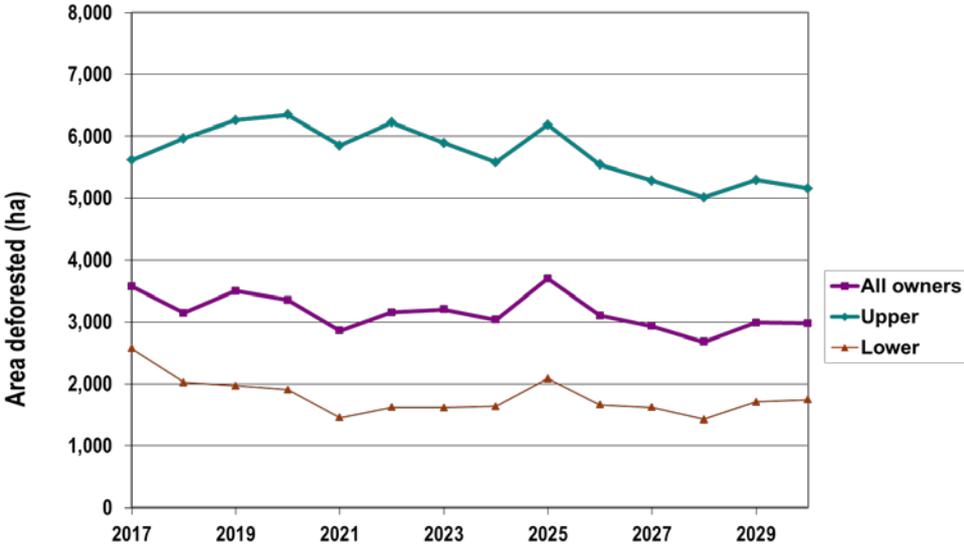
An inherent source of uncertainty is that perceptions about land-use economics, land prices, government policy implementation, and emission unit price are all subject to change. As land is handed back detailed analysis and a greater appreciation of the suitability of land for different end uses often causes intentions to change. There is an increasing focus on only converting better forest land given the cost of either the deforestation liability or the land required for offsetting.

Changes are being proposed by regional and district councils in the Central North Island including the Waikato Regional Council, the Bay of Plenty Regional Council and the Rotorua Te Arawa Lakes Programme (Bay of Plenty Regional Council, Rotorua Lakes Council and Te Arawa Lakes Trust). These changes impact on both water take and water quality and when implemented are likely to restrict conversion from forestry to agriculture. In a sense they are reducing the uncertainty about deforestation.

A major source of uncertainty relates to the return of significant areas of CFL land to Māori 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 hapū 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 or sheep and beef farms and has the potential to be converted. Although large-scale owners have 63 percent of the plantation area older than age 25 they only own 48 percent of the area older than age 20. As the large plantings of the 1990s mature the deforestation intentions of small-scale owners will have an increasing impact on the national level of deforestation. Given the diverse ownership of the small-scale estate there is greater uncertainty about their deforestation intentions. MPI has recently commissioned a survey of the deforestation intentions of post-1989 forest owners. This will enable testing of the assumption, made in this report, of a deforestation rate of 10 percent for the small-scale estate.

An estimate was made of the likely upper and lower limits of deforestation for each of the projects of large-scale owners. For small-scale owners limits were estimated using a deforestation rate of 20 percent for the upper limit and 5 percent for the lower limit – these limits are indicative of the range of the small-scale owners' deforestation rate since 2008. The resulting bounds on total deforestation by all owners are wide (Figure 5). Results should be viewed in the context of a total plantation area (as at 1 April 2017) of 1,699,000 - 1,004,000 hectares in the large-scale estate and 695,000 hectares in the small-scale estate. The total area harvested annually is currently over 40,000 hectares.

Figure 5: Deforestation forecast for New Zealand (all owners) with estimated upper and lower bounds. ETS scenario.



## 8 Appendix

### Climate Change Response Act (2002) - Section 179

#### 179 Forest land to be treated as deforested in certain cases

- (1) Without limiting paragraph (a) of the definition of deforest in [section 4\(1\)](#), a hectare of forest land must be treated as deforested for the purposes of this Act if the forest species on that hectare have been cleared and,—
  - (a) 4 years after clearing, the hectare has not—
    - (i) been replanted with at least 500 stems of forest species; or
    - (ii) regenerated a cover of at least 500 stems of exotic forest species; or
    - (iii) been replanted with at least 100 stems of willows or poplars in a manner consistent with managing soil erosion; or
    - (iv) regenerated predominantly indigenous forest species growing in a manner in which the hectare is likely to be forest land 10 years after the hectare was cleared; or
  - (b) 10 years after clearing,—
    - (i) predominantly exotic forest species are growing, but that hectare does not have tree crown cover of at least 30% from trees that have reached 5 metres in height; or
    - (ii) predominantly indigenous forest species are growing, but that hectare is not forest land; or
  - (c) 20 years after clearing, predominantly indigenous forest species are growing, but that hectare does not have tree crown cover of at least 30% from trees that have reached 5 metres in height.
- (1A) Subsection (1)(a)(iii) applies only if the EPA is satisfied that the relevant local authority has determined that the soil erosion risk of the land is at least moderate.
- (2) If forest land is to be treated as deforested under subsection (1),—
  - (a) the deforestation is to be treated as having been carried out 4 years, 10 years, or 20 years, after the clearing of the forest species, as the case may be; but
  - (b) the liability in respect of the deforestation must be calculated by reference to the age and forest species of the trees cleared 4 years, 10 years, or 20 years earlier, as the case may be.
- (3) Nothing in this section limits the EPA's ability to exercise powers under [section 121](#) in respect of the deforestation of a hectare of forest land whenever the EPA considers that—
  - (a) the hectare has been converted to land that is not forest land; and
  - (b) any obligations imposed under this Act in respect of the deforestation have not been complied with.

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