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Manatū Ahu Matua

Deforestation Survey 2012

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Executive summary

Under the Kyoto Protocol New Zealand must account for emissions from deforestation that occurs during the period 2008-2012. Information on future rates of deforestation is needed 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 future policy development.

This study was commissioned to:

1. Update deforestation intentions last collected in a survey in late 2011. 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 2011 and an estimate of the area expected to be deforested in the year ended December 2012;
4. Quantify future deforestation intentions for 2013-2020;
5. Provide informed commentary on the uncertainty around deforestation intentions;
6. Gather information on how forest land-owners intend using 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 No ETS legislation – this assumes that the ETS is repealed and not replaced by any other legislation.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. There are similar levels of deforestation forecast under both scenarios. The level of deforestation varies by region. Under the ETS scenario, 68 percent of deforestation by large-scale owners during 2008 to 2020 is

forecast to take place in the Central North Island.

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

	2008	2009	2010	2011	2012	2013 to 2020		2008 to 2012	2008 to 2020
ETS (large-scale owners only)	4	5	4	4	6	39		23	62
ETS (all owners)	6	6	6	6	8	55		32	87
No ETS (large-scale owners only)	4	5	4	4	6	36		23	59
No ETS (all owners)	6	6	6	6	8	52		32	84

1. ETS Scenario

Under the ETS scenario total intended deforestation by large-scale owners between 2008 and 2020 is 62,000 hectares. This is substantially greater than the total of 17,000 hectares in the 2011 survey. Of the 62,000 hectares that is intended to be deforested, around 9,000 hectares is classified as post-1989 forest and 53,000 hectares pre-1990 forest. A further 25,000 hectares of deforestation is assumed to be undertaken by small-scale owners.

For the ETS scenario (large-scale owners) it is estimated that, of the 62,000 hectares of intended deforestation between 2008 and 2020, 86 percent of conversion will be to dairy, 9 percent to sheep & beef, 4 percent to lifestyle/residential and 1% to windfarm development.

No respondents for the 2012 survey intend using offset planting. There is a clear preference to meet deforestation liabilities by purchasing units rather than using offset planting.

2. No ETS scenario

Total deforestation by large-scale owners for 2008 to 2020 is 59,000 hectares compared to 58,000 hectares in the 2011 survey.

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. Clearly they are subject to change.

The survey was carried out at a time when the carbon price was in the range $2/NZU to $3/NZU. The price of CERs and ERUs was even lower – by 13 December 2012 the Westpac sell price was $0.87 for Green CERs and $0.47 for ERUs compared to $2.55 for NZUs. At prices in this range the deforestation liability is not a deterrent to land conversion.

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 5 years.

One source of uncertainty 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.

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 required 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 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 climate change policy, 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 2011. 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 2011 and an estimate of the area expected to be deforested in the year ended December 2012;
4. Quantify future deforestation intentions for 2013-2020;
5. Provide informed commentary on the uncertainty around deforestation intentions;
6. Gather information on how forest land-owners intend using 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 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 60 percent of the total plantation estate but they own 74 percent of plantations of age 21 years and older (as at 31 March 2012). 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 2012]

	Age-class (hectares)							
	1-5	6-10	11-15	16-20	21-25	26-30	> 30	Total
Owners with > 10 000 hectares	148409	157542	191633	184708	141801	150867	52872	1027832
Other	47840	80290	168097	275643	46674	41286	31839	691669
Total	196249	237832	359730	460351	188475	192153	84711	1719501

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 2012 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.

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

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."

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 $2/NZU to $3/NZU. The price of CERs and ERUs was even lower – by 13 December 2012 the Westpac sell price was $0.87 for Green CERs and $0.47 for ERUs compared to $2.55 for NZUs.

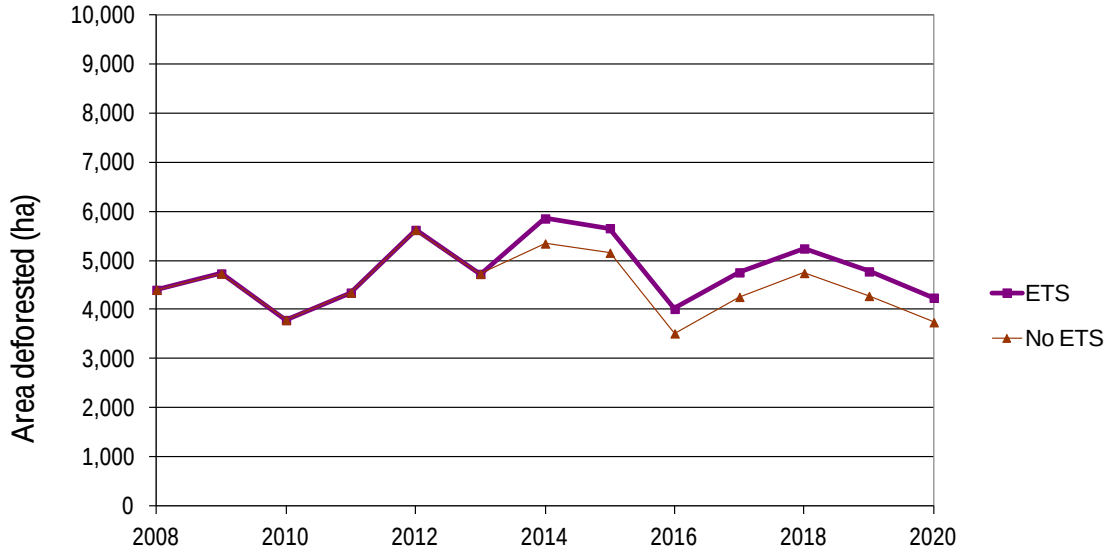
Results

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 2012 include area that has been converted to another land use as well as area that has been harvested but will be converted in 2013 or a later year. In this latter category is land that was harvested between 2008 and 2011 but left unplanted by owners who wanted to convert but did not want to pay the substantial deforestation liability that would be incurred under the prevailing carbon price during these years.

Results for the two scenarios are presented. There are some clear trends:

- The ETS scenario and No ETS scenario are identical until 2013.
- From 2014 the ETS scenario leads to higher levels of deforestation than the No ETS scenario. One respondent intends to implement an accelerated level of deforestation under the ETS scenario in response to current low carbon prices – "We want to make hay while the sun shines".

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



Deforestation under the ETS

It is estimated that about 6,000 hectares was deforested in 2012 by large-scale owners. From 2013 to 2020 a further 39,000 hectares of deforestation is forecast. Of the 62,000 hectares of deforestation by large-scale owners between 2008 and 2020, some 9,000 hectares is deforestation of post-1989 "Kyoto" plantations.

The 53,000 hectares of pre-1990 forest forecast to be deforested between 2008 and 2020

includes conversion to:

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

Impact of carbon price

The survey was carried out at a time when the carbon price was in the range $2/NZU to $3/NZU. An attempt was made to find out the breakeven carbon price; ie, the carbon price at which intended deforestation would not occur. 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 $7 to $10, another said it was $13, 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. One owner said that initially the intention had been to use offsetting but deterrents were the cost of land and the limited opportunity to on-sell tree crops on land with pre-1990 liabilities. There was no interest in offset planting once the carbon price fell beneath $5/unit.

Some other owners would not consider using offset planting even at higher carbon prices:

- "We would prefer to regenerate and deforest after 9 years."
- "It would be a nightmare with the need to buy more land elsewhere, the transaction costs and infrastructure costs as well as the loss of the 2nd tranche of units for pre-1990 forest land."

Deforestation if ETS is repealed

Deforestation by large-scale owners would be 6,000 hectares in 2012 if the ETS was repealed with a further 36,000 hectares from 2012 to 2020.

Where is most deforestation occurring?

Under the ETS scenario, 68 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. Under the ETS scenario, conversion is mainly to dairy followed by sheep & 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	9
Lifestyle	4
Windfarm	1

What are small-scale forest owners doing?

For the 2007 to 2011 forecasts, deforestation by small scale owners was calculated based on assumptions. 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.

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]).

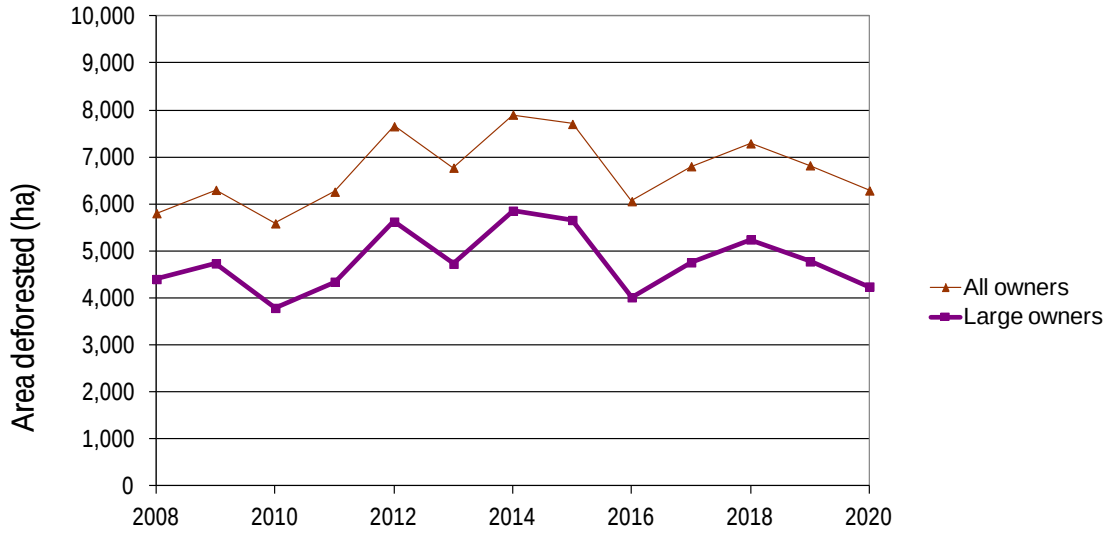
Data provided by the Ministry for Primary Industries (MPI) indicates a deforestation rate in the year to 31 March 2012 of 8 percent for softwood plantation owners with 40 to 10,000 hectares.

Overall this information indicates that the 10 percent deforestation rate previously adopted for small-scale owners under the ETS scenario was reasonable for the 2011 forecast. However given the responses of large-scale owners in the current survey, it has been assumed that 80 percent of area will replanted under both the ETS and No ETS scenarios; ie, a 20 percent deforestation rate has been applied to both scenarios.

Figure 2 shows the deforestation intentions under the ETS scenario.

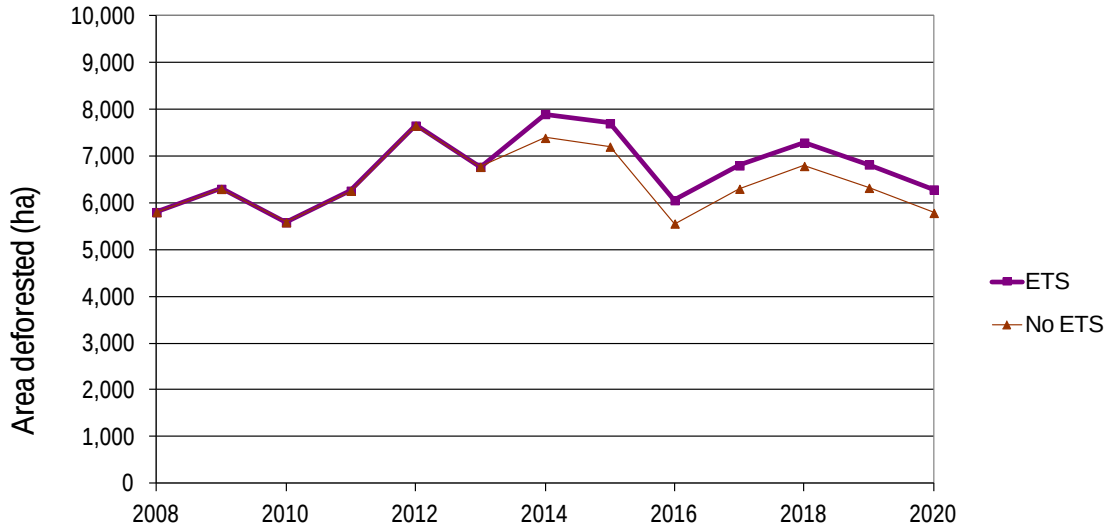
[3] Rodenberg, J; Manley B. 2011: Small forests in New Zealand. A survey of landowner objectives and management. New Zealand Journal of Forestry, 56(2): 15-19.

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



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

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



Comparison with 2011 survey

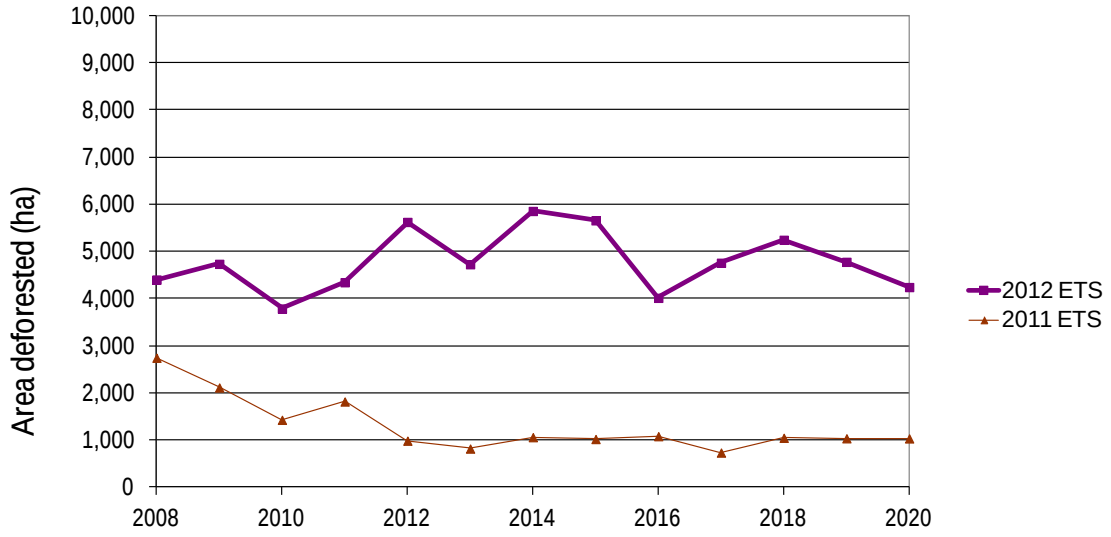
Deforestation under ETS

Total forecast deforestation by large-scale owners for 2008 to 2020 is 62,000 hectares. This is substantially greater than the total of 17,000 hectares in the 2011 survey. Figure 4 clearly shows how intentions have changed since 2011.

Forest land-owners who wish to deforest have responded to the current low carbon price and are proceeding with deforestation. Responses from some owners were:

- "We have purchased enough units to cover liabilities for all area harvested between 2008 and 2012."
- "We have secured sufficient units to convert everything harvested in the last 5 years. In addition the 2nd tranche of units for our pre-1990 forest land will provide enough units for area to be harvested until 2018."
- "We currently have enough units for 1000 ha of deforestation. We considered forward purchasing units for another 1000 ha of deforestation but have held off because of downward trends in carbon prices."

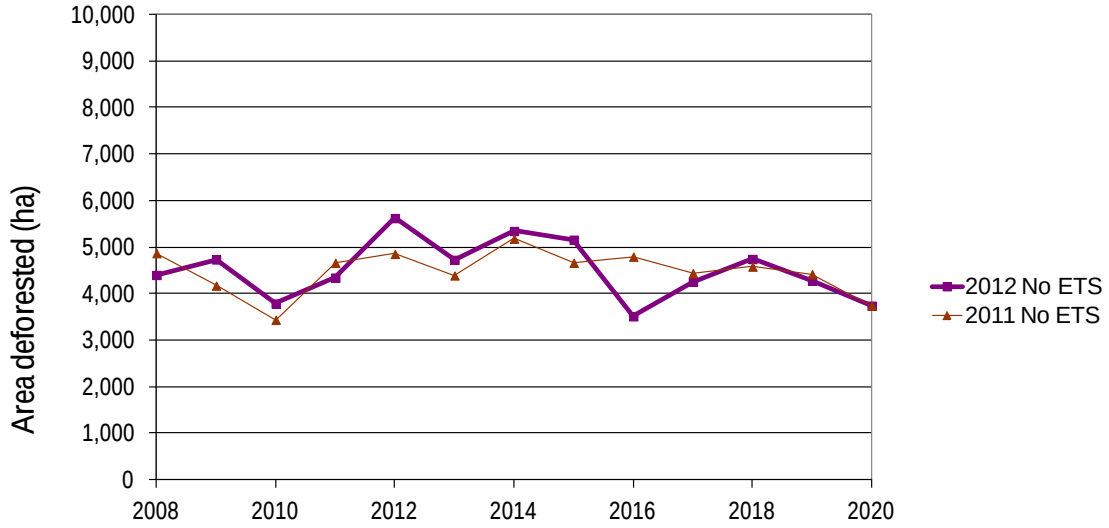
Figure 4: Comparison of the 2012 survey results with those from the 2011 survey (ETS) – large-scale owners only



Deforestation if ETS is repealed

Total deforestation by large-scale owners for 2008 to 2020 is 59,000 hectares compared to 58,000 hectares in the 2011 survey. Figure 5 shows the similarity of the 2012 results with those from the 2011 survey.

Figure 5: Comparison of the 2012 survey results for No ETS with those from the 2011 survey – large-scale owners only



Uncertainty

The deforestation intentions collected in the 2012 survey have more certainty than those from previous surveys. In the 2011 survey, the main factors causing uncertainty were:

- Whether recommendations of the ETS Review 2011 would be implemented.
- Ongoing international negotiations for any post-2012 commitments. Would there be a successor to the Kyoto Protocol and what form would it take?
- The relative profitability of different land-uses changing with changes in product prices.
- The level of carbon prices.

Although there will always be uncertainty about the relative profitability of different land uses, for the 2012 survey there is now greater certainty about the first two factors. These have had an impact on the level of carbon prices – for example the indefinite extension of the transition period and the continuation of emitters being able to surrender unlimited international units to meet ETS obligations have kept downward pressure on the price of NZUs. The carbon price is now no longer a deterrent to deforestation.

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 that is intended for deforestation for area harvested over the last five years.

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.