Ministry for Primary Industries
Manatū Ahu Matua

Afforestation and Deforestation Intentions Survey 2023

Final Report

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Prepared for Ministry for Primary Industries
By Professor Bruce Manley (School of Forestry, University of Canterbury)

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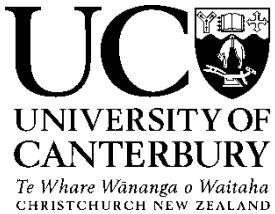

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Executive summary

MPI requires information on afforestation intentions for exotic and indigenous forest, and deforestation intentions for planted forest. Consequently, MPI has commissioned a survey of afforestation and planted forest deforestation intentions from a suitable and consistent group to obtain reliable estimates of national and regional afforestation and deforestation up to the year 2030.

The general approach followed was a telephone survey of:

- Large-scale forest owners - generally owners with more than 10,000 hectares of forest
- Forestry consultants and managers
- Other individuals or organisations identified as undertaking afforestation

A telephone survey was adopted to get a good response rate. Respondents were contacted in November/December 2023 (with some follow-up in early 2024) and asked about their afforestation and deforestation intentions.

The main survey was carried out at a time when the carbon price was in the range $69/NZU to $75/NZU. Interviews were held in November and December, after the 2023 general election in October, however at the time of the survey detail of the forestry and ETS policies of the new Government were not clear.

Exotic afforestation

From the survey results, Exotic afforestation is estimated to be 68,500 hectares in total for 2023. Some 73% of exotic afforestation from 2019 to 2023 has been in the North Island with 40% of total afforestation in the eastern regions (East Coast, Hawke's Bay, Southern North Island-East) of the North Island.

The level of afforestation achieved in 2023 (68,500 hectares) is much less than intentions stated in the 2022 survey (88,000 hectares). At the time of the 2022 survey there was uncertainty with only 70% (61,200 hectares) of intended 2023 afforestation confirmed at December 2022. In addition, the 2022 survey report included caveats relating to post-survey events:

- The release on 15 December 2022 of the Government's decision to maintain existing NZ ETS price control settings for 2023-2026, adjusted for inflation.
- The announcement on 15 March 2023 of a review of the ETS.
- Cyclone Gabrielle which caused widespread damage to parts of New Zealand in February 2023.

The 2023 intentions survey suggests that total exotic afforestation is intended to be 51,800 hectares in 2024. Of this, radiata pine is intended to be 86% of this area with eucalypts, redwood, Douglas fir and attenuata/radiata pine hybrid intended for the balance.

The 2023 intentions survey found that barriers to afforestation include:

- ETS changes and uncertainty
- Requirement for Overseas Investment Office (OIO) approval by overseas investors
- Local government regulations
- Difficulty in obtaining a resource consent
- National Environmental Standards for Commercial Forestry (NES-CF)
- Tree stock availability

More specifically, when asked about barriers to afforestation, 29 respondents (out of the 61 exotic forestry respondents who undertook afforestation in 2023) referred to changes and uncertainty about the ETS while 12 respondents mentioned changes to the OIO approval process. Nine respondents raised issues about local government regulations while an additional eight commented on the time and cost involved in getting resource consents. Four respondents were concerned that the NES-CF would create additional barriers. Nine respondents highlighted the limited tree stocks available from nurseries, particularly for redwood and the attenuata/radiata pine hybrid.

Beyond 2024, the survey found that there is even greater uncertainty, with some respondents not stating their intentions; it was found that these respondents are focusing on the logistics of implementing 2024 afforestation intentions before turning their attention to subsequent years. Afforestation intentions are dynamic with many respondents waiting to see what happens in terms of land use restrictions, ETS settings and carbon price. It is apparent that future afforestation rates will be driven by central and local government restrictions, ETS settings and carbon price, as well as the availability of key resources.

Indigenous afforestation

Indigenous afforestation is estimated, from the results of the survey, at 7,800 hectares in 2023 which is less than the intentions stated in the 2022 survey (11,100 hectares). This decrease was largely because the area of indigenous reversion achieved was 2,700 ha compared to 5,800 ha intended. In addition, the area of mānuka planted was 3,500 ha, compared to the 3,700 ha intended. The area of tall planted indigenous species planted was as intended - 1,600 ha.

The 2023 intensions survey found that total indigenous afforestation is intended to be 9,000 hectares in 2024. This consists of 1,400 ha of tall planted indigenous species, 2,100 ha of planted mānuka and 5,500 ha of natural reversion. Of the 3,500 ha of planting intended in 2024 for indigenous species (mānuka and tall tree species combined), only 2,400 ha is confirmed. The survey found that the balance is uncertain because land is yet to be acquired in some cases and funding is yet to be confirmed in other cases. There is also uncertainty over the level of natural reversion that will be achieved, with ETS eligibility to be confirmed in some cases.

Deforestation

The 2023 intentions survey found that large-scale planted forest owners intend to convert 1,100 hectares of forest between 2023 and 2030 to non-forest land uses. A majority of this is conversion of pre-1990 forests - just 30 hectares is estimated to be conversion of post-1989 plantations. As large-scale owners intend to plant 300 hectares to offset some of the area converted, the intended area of net deforestation is 800 hectares. Assuming a deforestation rate of 3.8% of the area harvested, deforestation by small-scale owners during 2023 to 2030 is therefore projected to be around 7,300 hectares in total. The survey also found that from 2023 to 2030 a total of 8,100 hectares of planted forest deforestation is forecast across both large-scale and small-scale owners. The total deforestation increases to 16,800 hectares for a sensitivity analysis in which a higher deforestation rate of 8.3% is assumed for small-scale owners.

The 2023 intentions survey found that the same level of deforestation is intended by large-scale owners as for the previous 2022 survey. The survey found that conversion by large-scale owners is mainly to infrastructure/mining with some to residential/lifestyle, dairy (or dairy support) and sheep and beef agriculture. Infrastructure/mining includes forest being acquired for a road corridor and a landfill, as well as small areas being acquired for mining.

Introduction

Background

MPI requires information on afforestation intentions for exotic and indigenous forest and deforestation intentions for planted forest. MPI has commissioned a survey of afforestation and deforestation intentions from a suitable and consistent group to obtain reliable estimates of national and regional afforestation and deforestation up to the year 2030. This survey is a repeat of the afforestation intention surveys carried out since 2020 and the deforestation intention surveys carried out since 2005.

This information will be used for government projections of greenhouse gas emissions and removals for future commitment periods, estimating New Zealand's progress towards a low emissions economy, and an indication of the impact of policy changes on the rate of afforestation. Information on afforestation and deforestation also informs future policy scenarios across MPI and helps to assess the broader impacts of land use change.

Definitions

The survey covers deforestation for planted forests only but afforestation of exotic and indigenous species by both planting and natural reversion.

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 clearfell 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 Emissions Trading Scheme (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.

The Act was amended by the Climate Change Response (Emissions Trading and Other Matters) Amendment Act 2012 to allow for conversion to not be treated as deforestation in certain cases including, under Section 179A,"in the case of pre-1990 forest land that is the subject of an offsetting forest land application that the EPA has approved under section 186B, the pre-1990 forest land that is cleared may not be treated as deforested if cleared".

Consequently, under the ETS, the area of deforestation is calculated as the area of conversion less the area of offset planting.

Afforestation

Under the definitions of the Marrakesh Accord, "both afforestation and reforestation refer to direct, human-induced conversion of land to forest from another land use. The 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. The distinction between afforestation and reforestation is that

afforestation occurs on land that has not been forest for at least 50 years, while reforestation occurs on land that has been forest more recently, though not since 31 December 1989".[1]

This survey is concerned with the afforestation/reforestation of post-1989 forest land[2]; i.e.

"Land which meets the forest land criteria, and:

- was not forest land on 31 December 1989; or
- was forest land on 31 December 1989 but was deforested between 1 January 1990 and 31 December 2007; or
- was pre-1990 forest land that was deforested on or after 1 January 2008, and any ETS liability has been paid."

Production forest vs Permanent forest

For the purposes of this survey:

- Production forest is forest that is intended for clearfell harvest.
- Permanent forest is not intended for clearfell harvest. Note that this does not necessarily mean that growers who adopt permanent forestry will choose to register forest in the ETS permanent forestry category.

[1] Section 4.2.5 – Intergovernmental Panel on Climate Change – Good Practice Guidance for Land Use, Land-Use Change and Forestry.

[2] https://www.mpi.govt.nz/dmsdocument/6991/direct

Approach

The general approach followed was a telephone survey of:

- Large-scale forest owners - generally owners with more than 10,000 hectares of forest
- Forestry consultants and managers
- Other individuals or organisations identified as undertaking afforestation

When interviewed, respondents were also asked to identify other known afforestation (actual or intended) in their region. Information was also sought from other sources (for example, mānuka honey producers and seedling suppliers) about known afforestation activity. In order to better capture planting of indigenous species, Trees That Count were included in the survey and provided aggregate data by region for many indigenous afforestation projects not otherwise captured by the survey.

A telephone survey was adopted to get a good response rate. Respondents were contacted in November/December 2023 (with some follow-up in early 2024) and asked about their afforestation and deforestation intentions. Results from individuals were aggregated.

Afforestation

Respondents were asked for the area that they had afforested in 2023 and the area that they intended to afforest each year from 2024 to 2030. Information was obtained on:

- Area
- Species
- Wood Supply Region
- Whether land availability (and other resources required) has been confirmed
- Barriers to afforestation
- Views on political risk

Deforestation

Respondents were asked for the area that they had converted to a non-forestry land-use in 2023 and the area that they intended to deforest each year from 2024 to 2030. Information was obtained on:

- Area
- Wood Supply Region
- Land-use that area will be converted into
- 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 convert area provided that they afforest/reforest a carbon-equivalent area elsewhere in New Zealand)

Year of conversion

In this report the conversion of forest to a non-forest land use is reported as occurring in the year in which the clearfelling 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 ETS where the year of deforestation is determined at the point of land use change, rather than the point of clearfell, but with deforestation liabilities (if any) calculated at the time the forest was cleared.

Limitations

Incomplete information

The general response to the telephone survey was very good. All individuals contacted, with one exception, were willing to provide information. One company refused to respond to the survey. Estimates of future afforestation by this company were made, using company responses to surveys in previous years to project out to later years from.

In some other cases, the information provided was incomplete because the company was not able to provide details. For example:

- Some respondents are still acquiring land and the other resources that they need for afforestation in 2024.
- Many respondents are focusing on the logistics of afforestation in 2024 and are still developing plans for subsequent years.
- Some forests are grown on land under a single rotation lease meaning that the replanting decision will be made by the land-owner rather than the current crop-owner.

Current intentions

Estimates provided in this report are based on intentions surveyed during November/December 2023 (with some follow-up in early 2024). These reflect perceptions about land-use economics, Government policy implementation, carbon price and other factors as they exist at the time of the survey. Clearly intentions are subject to change due to changes in drivers.

Of note here, interviews were held after the general election in November and December. Although the coalition agreement between National, Act and New Zealand First was announced on 24 November 2023, at the time of the survey, details on the forestry and ETS policies of the new Government had not been released.

The main survey was carried out at a time when the carbon price was in the range $69/NZU to $75/NZU.

Results – Afforestation

Exotic afforestation

There were 81 respondents to the survey of whom 61 undertook afforestation with exotic species in 2023. Results suggest that total afforestation for exotic species is intended to be 51,800 hectares in 2024 with 88% intended for production and 12% intended for permanent forest (Table 1 and Figure 1).

There were two general patterns to the intentions for 2024. Some respondents were accelerating their afforestation intentions because of concerns about changes. For example:

- “Our clients want to plant everything they can in 2024 in case ETS rules change.”
- “ETS changes and regional council plan changes have sparked some of our clients to accelerate the planting programme.”
- “We have brought forward a lot of planting due to concerns over what the new government may look like and possible limitations on area or LUC class that could be registered in the ETS.”

Other respondents have a large reduction in clients wanting to afforest in 2024 compared to 2023. For example:

- “The phone is dead for greenfields afforestation.”
- “Interest in afforestation has waned with government tinkering with ETS.”
- “The way that politics have been played out has dented interest. However, we still have a level of interest shown by farmers wanting to plant part of their farm.”
- “All our clients have been spooked by the ETS shenanigans over the last 12 – 24 months, not helped by the recently announced cost to participate.”
- “Our clients will do less afforestation next year because of uncertainty around the direction/rules of ETS. For existing farming entities, tougher economic conditions and lower cashflows could see new planting postponed in lieu of stock, fertilising, fencing and other direct farm management costs.”
- “Afforestation has stopped because of:
    - OIO benefit to NZ test (many clients are offshore owners)
    - Uncertainty over forestry units (ETS review)
    - ETS Admin Costs – particularly when they will extend under averaging after all units are received.
    - National proposal for a moratorium on whole farm conversions.”

The total afforestation reported by respondents to be intended for 2024 is a step down from 2023. This represents the first fall in intended afforestation since 2019, the first year for which this survey collected afforestation data.

The apparent decline in intended afforestation after 2024 reflects the factors alluded to in the quotes above. However, it arises, in part, because some respondents only provided a response through to 2024 (or, in some cases 2025). Based on the responses provided, it is reasonable to suggest that some of these respondents are focusing on the logistics of implementing 2024 afforestation intentions before turning their attention to subsequent years.

It should be noted that there is uncertainty about the split between production and permanent forestry after 2024 to the extent that this report does not distinguish between production and permanent forestry from 2025 on.

Table 1: Afforestation estimates (2022-2023) and intentions (2024-2030) for exotic species split between production forests and permanent forests from previous and current survey results.

	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	53,200	58,400	45,400	0	0	0	0	0	0
Permanent	10,900	10,200	6,400	0	0	0	0	0	0
Total	64,100	68,500	51,800	17,700	15,800	11,300	8,500	8,000	8,000

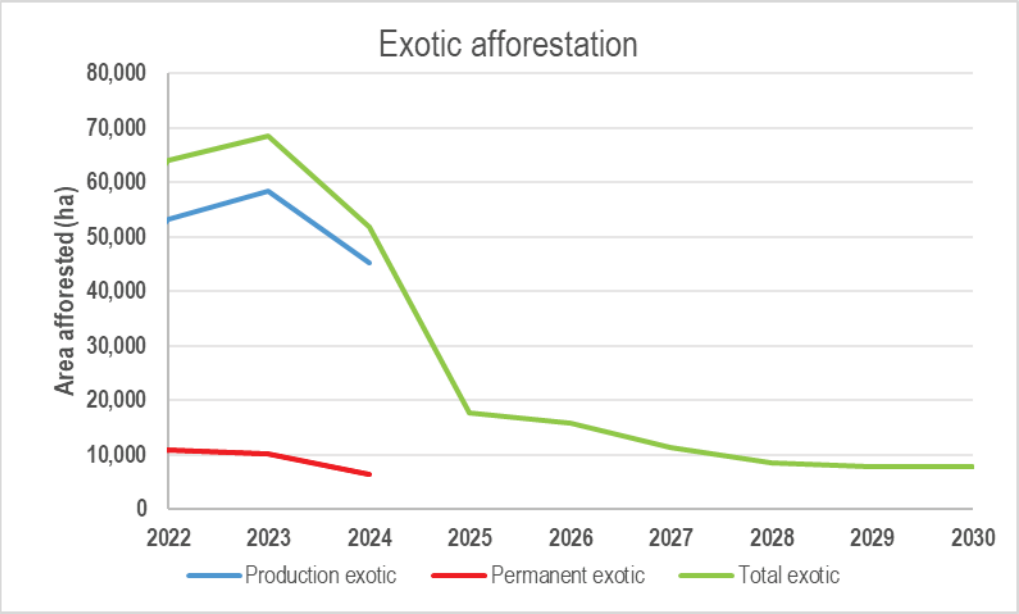

Figure 1: Afforestation intentions for exotic species split (for 2022 to 2024) between production forests and permanent forests

Which species are being used for exotic afforestation?

Radiata pine dominates exotic afforestation (Table 2) although the percentage of afforestation in radiata pine intended for 2024 has reduced to 86%. Reported intentions for 2024 indicate an increase in the percentage of afforestation of redwoods and eucalypts. The area reported by respondents as intended for afforestation using these species in 2024 shows a small increase while the area intended for afforestation in radiata pine shows a large decrease compared to 2023.

Table 2: Percentage of actual afforestation in 2021 to 2023 and intended afforestation in 2024 by species

Species	% afforestation			
	2021	2022	2023	2024
Radiata pine	94.3	90.8	90.0	85.9
Attenuata/radiata hybrid	1.6	1.4	1.5	1.8
Douglas fir	0.9	0.7	1.5	1.8
Cypress	0.2	0.5	0.6	0.7
Redwood	1.6	2.9	2.9	4.5
Eucalypts	1.3	3.0	2.9	4.5

Other species	0.0	0.7	0.6	0.8
Total	100.0	100.0	100.0	100.0

Where is exotic afforestation occurring?

Afforestation intentions were grouped by National Exotic Forest Description (NEFD) wood supply region or, in the case of Nelson/Marlborough, Otago/Southland and Southern North Island (SNI), by sub-region. SNI was split into West and East using the Ruahine, Tararua and Remutaka ranges.

The main change between 2022 and 2023 is the marked reduction in the percentage of intended afforestation in East Coast. This is likely to be a consequence of Cyclone Gabrielle. However, there is no reduction in the percentage of intended afforestation in Hawkes Bay, another region affected by Cyclone Gabrielle.

Some 73% of afforestation from 2019 to 2023 is in the North Island with 40% of total afforestation being in the eastern regions (East Coast, Hawke's Bay, Southern North Island-East) of the North Island (Table 3). Beyond 2023 there is uncertainty about the percentage of area that will be/is intended to be afforested by region. Drivers of this uncertainty include that some respondents provided forward intentions on a national basis with region yet to be determined.

Table 3: Percentage of afforestation of exotic species by NEFD wood supply region. (Column totals might not add to 100% because of rounding)

Area	% afforestation					
	2019	2020	2021	2022	2023	2019-2023
Northland	20	10	10	9	8	10
Central North Island	11	9	16	12	14	13
East Coast	9	8	12	18	6	11
Hawke's Bay	12	23	16	12	11	14
SNI East	24	19	9	12	16	15
SNI West	6	11	8	9	12	10
Marlborough	3	4	2	3	3	3
Nelson	2	1	0	1	0	1
West Coast	0	0	1	0	0	0
Canterbury	3	6	6	4	7	6
Otago	4	4	13	13	14	11
Southland	6	4	5	7	9	7
Total	100	100	100	100	100	100

Barriers to afforestation

Barriers to afforestation, as reported by responsents include:

- ETS changes and uncertainty
- Requirement for OIO approval by overseas investors
- Local government regulations
- Difficulty in obtaining a resource consent
- National Environmental Standards for Commercial Forestry (NES-CF)
- Tree stock availability

When asked about barriers to afforestation, 29 respondents (out of the 61 exotic forestry respondents who undertook afforestation in 2023) referred to changes and uncertainty about the ETS while 12 respondents mentioned changes to the OIO approval process. Nine respondents raised issues about local government regulations while an additional eight commented on the time and cost involved in getting resource consents. Four respondents were concerned that the NES-CF would create additional barriers. Nine respondents highlighted the limited tree stocks available from nurseries, particularly for redwood and the attenuata/radiata pine hybrid.

Barriers to afforestation were very different to those identified in the 2022 survey. Limited tree stocks had been far and away the greatest barrier quoted in the 2022 survey, followed by land availability and labour availability. In the current survey, tree stock availability was still a barrier to some but was not the dominant issue. One respondent mentioned labour availability being a barrier. Land availability was no longer perceived to be a barrier.

ETS changes and uncertainty took many forms. Some example responses:

- "Had 3 or 4 landowners put off by interference with ETS including changes in December 2022 to reserve price settings."
- "Review of ETS was unhelpful with 4 options including two extremes - ranging from status quo to forestry and emitters facing different incentives. People faced with uncertainty don't make decisions."
- "We are no longer purchasing land. ETS risks are too great."
- "ETS uncertainty has put people off – e.g. options 3 & 4 of the review and the introduction of new ETS fees."
- The $30/ha ETS admin fee will make some forest growing businesses technically insolvent – e.g. with young stands not earning many units. There are also growers who have pre-sold carbon units who are left with a stranded asset."
- "Our afforestation strategy is under review given the imposition of a $30/NZU admin fee that will apply past age 16 under averaging and into subsequent rotations."

One respondent was pleased that carbon price has reduced:

- "Need decoupling of forestry carbon price from ETS price. This will make land price more affordable for forestry as well as sheep & beef farming. I am an advocate of trees on farms – not farms of trees."

Comments raised about OIO approval processes include:

- "Investors are scared off – we have one investor who spent $1 million on an OIO application that was declined."
- "OIO process is now slower (6 months vs 3 months) with approval ending up with the Minister."
- "OIO and district plan changes have killed afforestation opportunities. You can't go out and buy land, get OIO consent, and a resource consent."

Concerns about local government regulations were raised mainly in the South Island including Otago, and Canterbury:

- "ORC wants 50m riparian setback from all streams (running + ephemeral) for replanting and afforestation."
- "Our Otago/Southland plans have been gutted by the ORC rules."
- "ECAN is slow in issuing consents for flow sensitive catchments."

- “ECAN has changed the interpretation of its own rules for flow sensitive catchments. You used to be able to apply for a resource consent and with a good case could reasonably expect to be successful – but not any more.”
- “ECAN Plan Change 7, although under appeal, has stopped two of our afforestation projects.”

Other respondents specifically commented on the time and cost involved in getting resource consents:

- “We are freaking out. We have no consent yet from GDC for a 2024 proposal.”
- “It is taking 10 months to get consents from GDC.”

Comments about the National Environmental Standards for Commercial Forestry include:

- “We are concerned about delegation of decision-making to local councils even though they will have to go through a planning process to make changes.”
- “Any additional consenting required under the NES-CF creates risk.”
- “We are waiting to see what rules councils will bring in.”
- “NES-CF has come in but the Council is not prepared for it and does not have check sheets prepared. We are still to get Council’s interpretation of NES-CF implementation.”
- “NES-CF changes don’t make a big difference as we are mostly on red zone so already had resource consent requirement”.

Issues raised about tree stock availability include:

- “There is a shortage of redwood tree stock – plenty of radiata pine.”
- “We are short of redwood and attenuata hybrid supply.”
- “There are some species limitations – in particular attenuata hybrid.”

Labour availability was raised by one respondent:

- “We breezed through our large 2023 planting programme. However we have now lost an experienced planting supervisor – he was ‘thrashed’ by the 2023 programme. We also need a technical forester with GIS skills.”

Political uncertainty

A number of respondents made general comments about political risk:

- “Political risk is significant. The Government had played around with the ETS in most years. Our advice to clients is to make sure it is a reasonable forestry venture. Treat carbon as the icing on the cake.”

Most respondents were aware of limits on afforestation by Land Use Capability (LUC) class to reduce whole-farm conversions proposed in the National Party election manifesto on Reducing Agricultural Emissions. Eighteen respondents commented about the proposals. Some example comments:

- “I am aware of proposed restrictions by National for afforestation of LUC 1 to 6.”
- “Carbon forestry land purchase has slowed / stopped until policies of the National government are confirmed / known.”
- “There is a scale-down in intended afforestation caused by anticipated National policy to restrict whole farm afforestation. Most of our 2023 afforestation has been afforestation of full title.”
- “We are aware of National plans but will ultimately come down to how serious the government is about the zero carbon goal for 2050 and whether it wants a policy that stimulates afforestation.”
- “I think that National will allow a market-driven system. They won’t want to buy off-shore credits so will be concerned with how best to meet NDC (Nationally Determined Contributions) commitments.”
- “It is inevitable that ETS settings will shift – however they will shift back in favour of forestry when realities of meeting the Paris Accord dawn.”

Some respondents were not concerned about political risk:

- "We are not concerned – our focus is on afforestation for wood supply and the quality of the resource."
- "We are still looking for properties."
- "Political risk is not the most important factor – we are more concerned with barriers."
- "We are not fazed by ETS uncertainty. We take a long term view. New Zealand has an ongoing need for carbon sequestration by plantations to meet its carbon zero goal. We are not investing solely for carbon."

Uncertainty about future afforestation

The survey found that there is uncertainty even for 2024 afforestation, with only 85% of intended afforestation (43,900 ha) reported confirmed at the time of the survey in November/December 2023. Beyond 2024, uncertainty was found to be even greater.

Survey results suggest that respondents are focusing on the logistics of implementing 2024 afforestation intentions before turning their attention to subsequent years. Some respondents only provided a forecast for early years, for example some only provided a forecast for 2024 or through to 2025. The afforestation rate is also shown in Figure 2 for the situations where, in addition to stated intentions, those respondents who only provided intentions for early years continued with afforestation at 100% or 50% of the rate in the last year for which intentions were provided.

Afforestation intentions are dynamic with many respondents waiting to see what happens with land use restrictions, ETS settings and carbon price. It is apparent that future afforestation rates will be driven by central and local government restrictions, ETS settings and carbon price, as well as the availability of key resources.

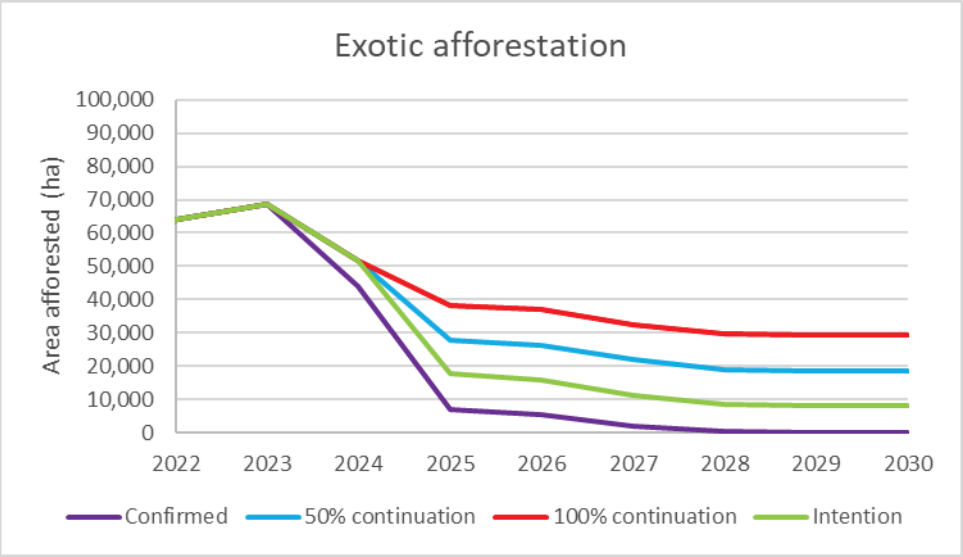

Figure 2: Afforestation intentions for exotic species also showing confirmed afforestation and afforestation if respondents who only provided intentions for early years continued afforestation at 100% or 50% of the rate in the last year for which intentions were provided.

How do intentions from this survey compare with intentions from the previous survey?

A comparison of results from this (2023) survey with those from the previous (2022) survey[3] (Figure 3) reveals that exotic afforestation achieved in 2023 was less than that intended (to occur as at 2022). The survey results showed total exotic afforestation was intended to be 88,000 ha while the afforestation achieved was 68,500 ha. At the time of the 2022 survey there was uncertainty with only 70% (61,200 ha) of intended 2023 afforestation confirmed in December 2022. In addition, the 2022 survey included two caveats:

1. *Carbon price.*

The main 2022 survey was carried out during November/December 2022 when the carbon price reduced from $88/NZU to $77/NZU. Developments since then have been:

- *The release of 15 December 2022 of the Government's decision to maintain existing NZ ETS price control settings for 2023-2026, adjusted for inflation.*
- *The announcement on March 15 2023 of a review of the ETS.*

Subsequently there has been volatility, and a substantial reduction, in carbon price. This is likely to affect the implementation of the afforestation intentions documented in this report.

2. *Cyclone Gabrielle*

With the exception of some data capture for 13anuka, the survey was carried out prior to the Cyclone Gabrielle event which caused widespread damage to parts of New Zealand in February 2023. This will have an impact, currently unknown, on the area afforested in 2023.

Afforestation intended for 2023 (as reported in the 2022 survey) is reconciled with afforestation achieved (from 2023 survey) in Table 4. Changes are apportioned to different factors. Reductions are largely attributable to those factors listed earlier in the report as barriers to afforestation.

Table 4: Reconciliation of afforestation intended for 2023 (from 2022 survey) with afforestation achieved (from 2023 survey)

2023 Afforestation Intention (2022 survey)		*88,000 ha*
Cyclone impact	-1,300 ha	
Seedling quantity & quality	-1,600 ha	
OIO application declined	-2,000 ha	
Land availability	-1,800 ha	
Local body regulations & resource consent delays	-3,200 ha	
ETS changes & uncertainty	-5,200 ha	
Clients not found or deciding not to afforest	-5,300 ha	
Delay of afforestation	-1,300 ha	
Afforestation brought forward	+2,200 ha	
2023 Afforestation achieved (2023 survey)		*68,500 ha*

[3] Manley, B. 2023.Afforestation and Deforestation Intentions Survey 2022. MPI Technical paper No. 2023/09

Other features of the comparison between this (2023) survey with those from the previous (2022) survey are:

- Intended afforestation in 2024 is lower in this survey (51,800 ha), than that stated as intended in last year's survey (59,200 ha).
- Intended afforestation for 2025 and beyond is lower than that indicated by the 2022 survey.

Both of these features are the reverse of that observed in previous surveys. They reflect the negative sentiment expressed by many participants.

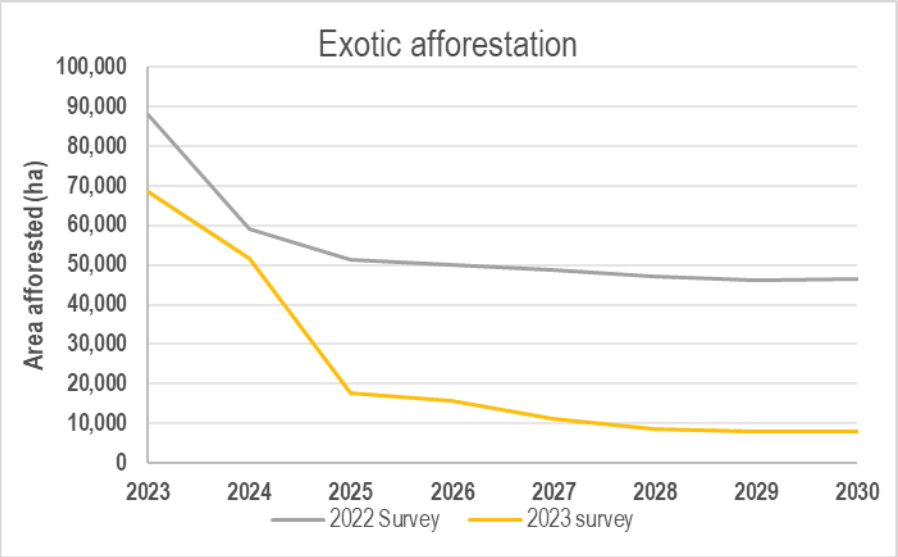

Figure 3: Afforestation intentions for exotic species from this survey (2023) compared to the intentions from the previous survey (2022)

Indigenous afforestation

Afforestation estimates from the survey for indigenous species are presented in Table 5 and Figure 4. The increase in afforestation of indigenous species intended for 2024 compared to that reported in 2023 is a consequence of an increased intention by respondents to register indigenous reversion. The tall planted category refers to afforestation that includes the planting of some tall canopy species, in many cases inter-planted with mānuka.

In the case of indigenous reversion, some respondents provided information for the year of ETS registration. This may differ from the year of establishment/afforestation. The increased area intended for 2024 should be taken with caution given that reversion can be a time consuming process and that area may not be eligible for registration in the ETS (which could impact the likelihood of the reversion being committed to). Relevant comments from some respondents include:

- "We didn't register any of the 700 ha of indigenous reversion we intended in 2023. It is a slow process getting owner agreement."
- "We didn't get one 2000 ha project across the line in 2023".
- "We registered 1000 ha of the 2500 ha that we had intended to do."

The area of tall planted indigenous species is relatively static. One comment was:

- "You are unlikely to see a large increase in the area afforested in native species under the current ETS given the costs and the relatively low carbon returns. The 1BT programme was a better fit for native species given the high up-front costs of establishment."

The survey found that the area of mānuka intended for afforestation in 2024 is well down on that afforested in 2023. Some comments from respondents about mānuka:

- "We are taking a pause. Mānuka honey prices are down and we have no spare capital."
- "Mānuka afforestation is down because of honey prices and the end of 1BT funding."

Table 5: Afforestation estimates (2022-2023) and intentions (2024-2030) for indigenous species

	2022	2023	2024	2025	2026	2027	2028	2029	2030
Tall planted	1,500	1,600	1,400	300	300	200	200	200	200
Mānuka planted	2,800	3,500	2,100	100	0	0	0	0	0
Reversion	4,100	2,700	5,500	1,400	300	300	300	100	100
Total	8,400	7,800	9,000	1,800	600	500	500	300	300

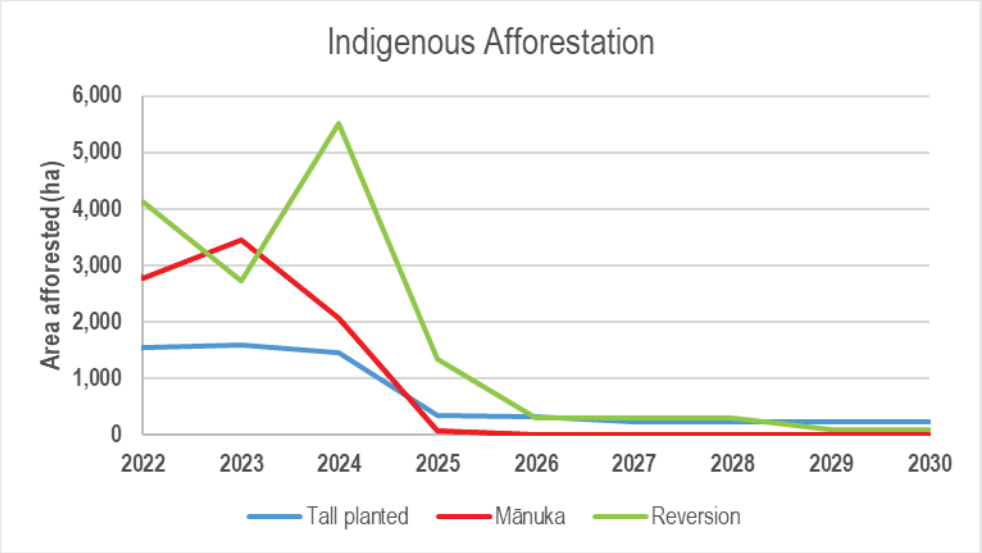

Figure 4: Afforestation intentions for indigenous species.

As with exotic afforestation, the 2023 intentions survey found that there is uncertainty about afforestation intentions, even for 2024 (Figure 5), with, for example, land and funding still being sought. Of the 3,500 ha of afforestation intended in 2024 for planted indigenous species (mānuka and tall tree species combined), the survey found that only 2400 ha is confirmed. Some respondents did not provide intentions beyond 2024 but are considered likely to continue to afforest, but are yet to finalise plans.

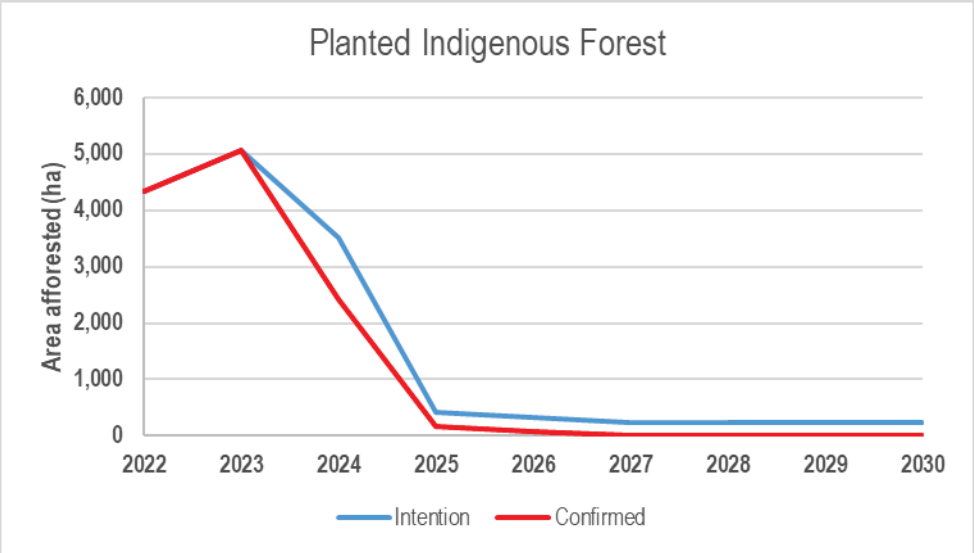

Figure 5: Afforestation intentions for planted indigenous species (mānuka and tall tree species combined) also showing confirmed afforestation.

Where is indigenous planting occurring?

Important regions for indigenous species planting are Central North Island, Hawke's Bay and Southern North Island – West (Table 6).

Table 6: Percentage of indigenous forest planting (mānuka and tall canopy species) by NEFD wood supply region. (Column totals might not add to 100% because of rounding), sourced from the 2023 survey.

Area	% area established					
	2019	2020	2021	2022	2023	2019-23
Northland	6	7	3	7	16	8
Central North Island	30	21	12	36	18	23
East Coast	2	4	5	8	15	7
Hawke's Bay	21	23	36	14	14	22
SNI East	8	2	17	6	4	7
SNI West	29	37	20	17	25	26
Marlborough	2	3	2	3	1	2
Nelson	2	1	0	1	2	1
West Coast	0	0	0	1	1	0
Canterbury	0	2	1	2	2	1
Otago	0	0	0	4	1	1
Southland	0	1	2	0	2	1
Total	100	100	100	100	100	100

How do intentions from this survey compare with intentions from the previous survey?

A comparison of results from this (2023) survey with those from the previous (2023) survey (Figure 6) reveals three main differences:

1. Comparing the results of the 2023 survey with the 2022 survey, indigenous afforestation achieved in 2023 was lower than that intended. Total indigenous afforestation was intended to be 11,100 ha while the afforestation achieved was 7,800 ha. This decrease was largely because the area of indigenous reversion achieved was 2,700 ha compared to 5,800 ha intended. In addition, the area of mānuka planted was only 3,500 ha compared to the 3,700 ha intended. The area of tall planted indigenous species planted was as intended - 1,600 ha.
2. Intended afforestation in 2024 is higher in this survey than that stated in last year's survey. This is primarily because of an increase in the intended area of indigenous reversion. Given that indigenous reversion achieved in 2023 was lower than that intended, this could be an ambitious figure.
3. Intended afforestation for 2025 and beyond is lower in this survey than in last year's survey, largely because intended mānuka afforestation is lower.

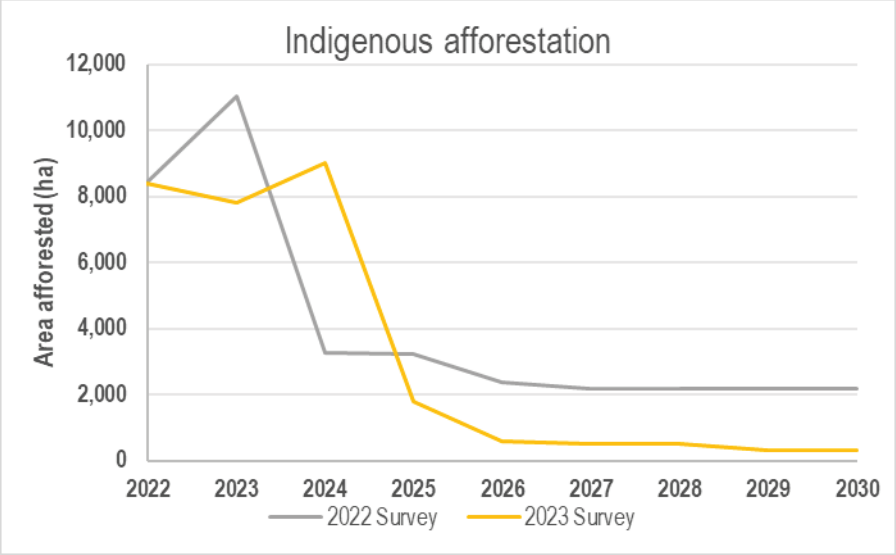

Figure 6: Afforestation intentions for indigenous species from this survey (2022) compared to the intentions from the previous survey (2021)

Results – Deforestation of planted forests

Deforestation intentions captured in this survey have not changed from the 2022 survey. Aggregated conversion intentions of large-scale owners are shown in Figure 7. From 2023 to 2030, 1,100 hectares of conversion is forecast. The majority of this is conversion of pre-1990 forests - only 30 hectares is estimated to be conversion of post-1989 plantations.

Intention to use offset planting

Some respondents who intend to convert 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 300 hectares of existing forest land between 2023 and 2030. Respondents intend to do offset planting for 24% of conversion on pre-1990 forest land (see Figure 7).

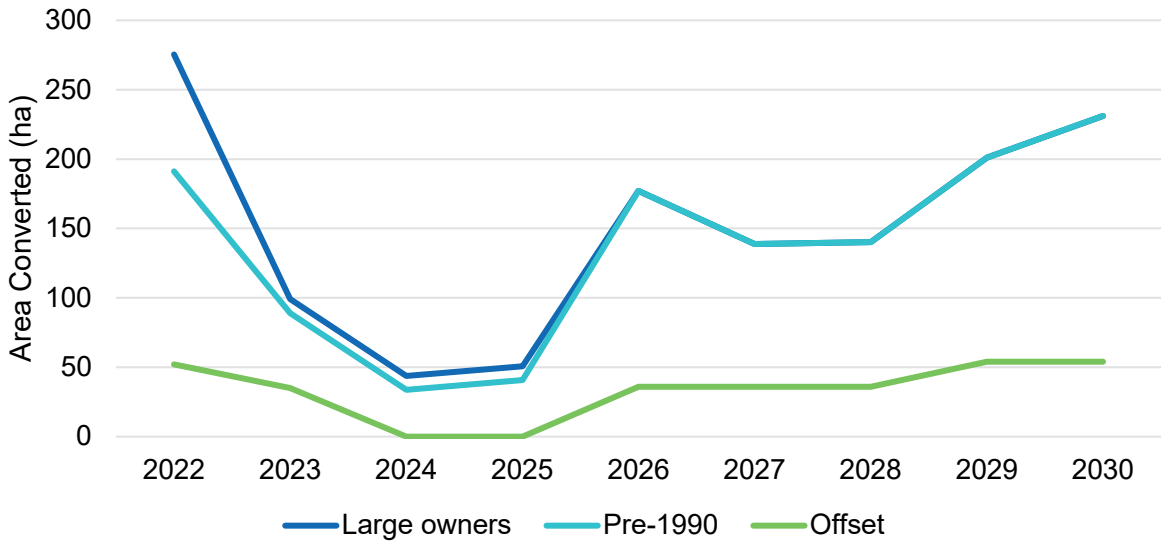

Figure 7: Forecast of conversion from forest to another land-use for New Zealand plantations (large-scale owners only). The 'Large owners' line shows the total intended conversion by large-scale owners while the almost identical 'Pre-1990' line shows their intended conversion of pre-1990 forests. Some of this conversion will be matched by 'Offset' planting. The area of pre-1990 forest to be deforested is the difference between pre-1990 conversion and offset.

Where is most conversion occurring?

The survey results show that some 74% of conversion by large-scale owners during 2023 to 2030 is forecast to take place in the Northland Wood Supply Region.

What land-uses are areas of formerly forested land being converted to?

Based on the information provided, it is possible to make a broad estimate of the land-use into which land is being converted (Table 7). The survey results showed conversion by large-scale owners is mainly to infrastructure/mining with some to and residential/lifestyle, dairy (or dairy support) and sheep and beef agriculture. Infrastructure/mining includes forest being acquired for a road corridor and a landfill, as well as small areas being acquired for mining.

Table 7: Land-use into which area is being converted in 2023-2030 by large-scale owners, from the 2023 survey (refers to 1100 hectares of conversion).

Forest converted to	%
Infrastructure/Mining	77
Residential/Lifestyle	10
Dairy (and dairy support)	9
Sheep and Beef	4

What are small-scale forest owners doing?

Forestry consultants and managers throughout New Zealand provided information through the survey about conversion by small-scale forest owners. Some overall patterns emerged:

- In most cases all land being harvested is being replanted.
- Most replanting is into radiata pine although some mānuka is being planted.
- In some regions a small proportion of land is being converted to dairy or sheep and beef agriculture. Typically, these are small blocks where forestry wasn't profitable because of size, or the owner has other land use plans.
- A small proportion of area is being left to revert either deliberately or by default. This includes area that is not being actively converted to another land-use but left to lie fallow. Sometimes this is inter-generational with the parents harvesting but the children not wanting to spend money on replanting.

Manley (2018[4]) carried out a survey of the intentions of forest owners following harvest of post-1989 forests. At the time of this survey the carbon price was in the range $20-22/NZU. Overall results (Table 8) indicated that 2.6% of area was intended to be converted while another 6.6% of area would be sold in cutover state following harvest, returned to its owner, or there was uncertainty about intentions. Results for the first three size classes are most relevant for small-scale owners. These indicated that 2.0 to 8.3% of area would be converted with uncertainty over a further 7.1 to 13.8%. The average value for the three categories with area under 1,000 ha, on an area-weighted basis, is 3.8% conversion with a further 9% uncertain.

Table 8. Summary of intentions after harvesting for all post-1989 owners [Table 14 of Manley (2018)]

	<40 ha	40-99 ha	100-999 ha	>1000 ha	Total
Replant/ mānuka /regenerate	81.2	81.1	90.9	97.2	90.8
Convert	8.3	5.1	2.0	0.3	2.6
Return/Sell/Unknown	10.5	13.8	7.1	2.5	6.6
Total	100.0	100.0	100.0	100.0	100.0

Based on available information, the 3.8% rate of conversion from Manley (2018) has been used for the small-scale forest estate in the base scenario. An estimate of the area to be harvested by small-scale owners in 2023 to 2030 was generated based on the New Zealand Wood Availability Forecasts (MPI, 2016[5]). Applying the 3.8% conversion rate to this area gives an estimate of 7,300 hectares of deforestation by small-scale owners during the period 2023 to 2030.

As a sensitivity analysis, a higher level of deforestation by small-scale owners was also evaluated. For this a rate of 8.3% deforestation has been assumed, calculated as the declared conversion rate of

[4] Manley, B. 2018. Intentions of forest owners following harvest of post-1989 forests. MPI Technical Paper No. 2018/55.
[5] New Zealand Wood Availability Forecasts 2014-2050, Prepared for Ministry for Primary Industries by Indufor Asia Pacific Limited, 2016.

3.8% from Manley (2018) plus half of the uncertain category (i.e. half of 9%). Applying the 8.3% conversion rate gives an estimate of 16,000 hectares of deforestation by small-scale owners during the period 2023 to 2030.

Figure 8 shows the forecast of deforestation for all owners. From 2023 to 2030 a total of 8,100 hectares of deforestation by all owners is forecast when the small-scale deforestation rate of 3.8% is used. This increases to 16,800 ha of deforestation when the higher rate of 8.3% is used for small-scale deforestation.

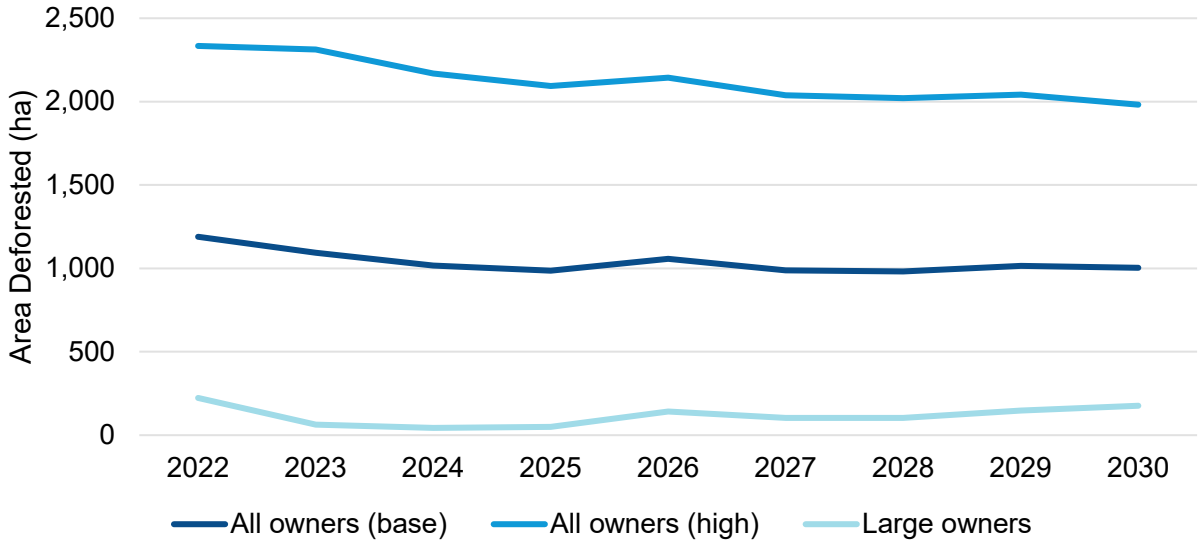

Figure 8: Forecast of deforestation from forest to another land-use for New Zealand plantations (all owners). Large-scale owner intentions are based on converted area less offset area while, for the base deforestation scenario, a 3.8% deforestation rate is assumed for small-scale owners. For the high deforestation scenario, a deforestation rate of 8.3% is assumed for small-scale owners.

Concluding remarks

Afforestation

This survey will have missed some afforestation projects – particularly smaller projects that are implemented directly by the land-owner rather than through a forestry consultant or manager. In the case of exotic afforestation, the total area of the missed projects is not expected to be material. The additional area is likely to offset some of the reported afforestation area being gross area rather than the net stocked area that will be achieved. Although net stocked area was requested in the survey, some respondents may have provided gross area. (Manley et al.[6] (2003) previously found that the net stocked area achieved in 42 afforestation projects was 93% of the area estimated to have been planted by the owner).

Deforestation

The intended deforestation by large-scale owners is the same as that recorded in the last deforestation intentions survey in 2022. Large-scale forest owners have estates that are predominantly pre-1990 forests. Given the current carbon price, the area intended for deforestation is small.

Most of the small-scale estate is post-1989 forest. A key determinant of deforestation will be the level of log prices and the rate of return achieved in the current rotation. As is the case for large-scale forests, most small-scale forests are currently being replanted after harvest.

Acknowledgements

The many respondents to this survey are thanked for their openness in freely providing information. Emma Giesen of Trees That Count is thanked for providing aggregated data for indigenous planting projects not otherwise captured in the survey.

[6] Manley, B., Somerville, O., Turbitt, M., Lane, P. 2003. Review of new forest planting estimates. New Zealand Journal of Forestry 48(3): 34–37

Appendix – Deforestation definitions in the CCRA

Climate Change Response Act (2002)

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.

179A Forest land may not be treated as deforested in certain cases

(1) Despite section 179 and the definition of deforest in section 4(1),—

(a) in the case of pre-1990 forest land, pre-1990 forest land that is cleared may not be treated as deforested for the purposes of this Act if the cleared land is exempt land or—

(i) is contiguous with the edge of pre-1990 forest land that existed on 31 December 2007; and

(ii) is an area that is less than 1 hectare or that is less than 30 metres wide at its widest point; and

(iii) is required to be or remain cleared to implement New Zealand's best practice forest management; and

(iv) is used only for the purpose of implementing New Zealand's best practice forest management:

(b) in the case of pre-1990 forest land that is the subject of an offsetting forest land application that the EPA has approved under section 186B, the pre-1990 forest land that is cleared may not be treated as deforested if cleared, —

(i) in the case where the land is converted to a use other than forest land (for example, dairy), in the period—

(A) beginning on the date that the approval is given; and

(B) ending with the earlier of 2 years after the date that the approval was given or 4 years after the date that the pre-1990 forest land was cleared; or

(ii) in the case where the land is not converted to another land use and remains forest land, in the period—

(A) beginning on the date that the pre-1990 forest land was cleared; and

(B) ending 4 years after the date that the pre-1990 forest land was cleared:

(c) in the case of post-1989 forest land, the post-1989 forest land that is cleared may not be treated as deforested if the cleared land—

(i) is contiguous with the edge of post-1989 forest land that existed on the date of registration; and

(ii) is an area that is less than 1 hectare or that is less than 30 metres wide at its widest point; and

(iii) is required to be or remain cleared to implement New Zealand's best practice forest management; and

(iv) is used only for the purpose of implementing New Zealand's best practice forest management.

(2) Subsection (1)(b) does not apply if the EPA revokes its approval of an offsetting forest land application under section 186G(1).

(3) This section applies to land that was cleared before, on, or after the commencement of this section.

Section 179A: inserted, on 1 January 2013, by section 73 of the Climate Change Response (Emissions Trading and Other Matters) Amendment Act 2012 (2012 No 89).