NELSON/MARLBOROUGH FOREST INDUSTRY AND WOOD AVAILABILITY FORECASTS

2006

Ministry of Agriculture and Forestry
Te Manatū Ahuwhenua, Ngāherehere

ACKNOWLEDGEMENTS

The wood availability forecasts in this report were produced by Dr Bruce Manley. The Nelson and Marlborough regional information was written by Chas Perry. Bridget Geard, Judith Dennis, Paul Lane and Geoff Cameron provided underpinning forest resource and statistical data, and peer review of the forecasts and report.

The Ministry of Agriculture and Forestry thanks the forest owners, managers and consultants who provided industry data for this report, and for the forest resource data and harvesting intentions essential for producing the wood availability forecasts. Thanks also to this group for their input at several workshops, and for written comments on earlier versions of the forecasts and report.

ENQUIRIES

Please direct any enquiries regarding the content of this report to Chas Perry (tel: +64 3 543 9185 or email: chas.perry@maf.govt.nz).

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Published by
MAF Policy
Ministry of Agriculture and Forestry
Pastoral House
25 The Terrace
PO Box 2526
Wellington
New Zealand

Tel: 64 4 894 0100
Fax: 64 4 894 0742
Website: www.maf.govt.nz

ISBN: 0478 29847

Cover photo provided by Dave Hill, Weyerhaeuser New Zealand Incorporated.
Other photos provided by Weyerhaeuser New Zealand Inc and Flight Timbers Ltd.

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1 INTRODUCTION

This report provides new wood availability forecasts for the Nelson and Marlborough region. It also provides information on the planted production forest estate and processing industries in the region. The report comments on the wood availability forecasts and on the opportunities and constraints facing the region's forest industry.

The information in this report is intended to help planners, the forestry industry and the wider public in resource planning, assessing wood processing opportunities and identifying infrastructure issues.

References to the "Nelson region" include the land area of Tasman District and Nelson City. The "Marlborough region" includes the land area of Marlborough and Kaikoura Districts.

OVERVIEW

2

The Nelson/Marlborough region has a mature forest industry with a well-managed forest estate. The region also has a good mix of wood processing plants including sawmills, a laminated veneer lumber (LVL) plant, a world-scale medium density fibreboard (MDF) plant, and the largest post and pole processing plant in New Zealand.

Wood availability forecasts indicate that over the next 10 years the harvest in Marlborough has the potential to increase from the 2005 total of just over 646 000 cubic metres to between 900 000 and one million cubic metres. The size of the increase depends on the harvesting decisions of the many small-scale[1] forest growers.

For Nelson, the availability forecasts indicate little change over the next 10 years, with harvest levels in the range of 1.3 to 1.4 million cubic metres. In this region, yearly fluctuations in harvest mainly reflect the intentions of the large-scale forest growers. The wood availability from the small forests is fairly constant.

After 2015, the combined Nelson/Marlborough harvest has the potential to increase from the current level of 2.3 million cubic metres (2005) to around 3.2 to 3.5 million cubic metres. Most of the increase in wood availability in this period is from the small-scale forest growers. The actual timing of harvesting from these forests will depend on market conditions and the collective decisions of the more than 700 small-scale owners.

One scenario is that after 2015 the harvesting of these small-scale forests will increase the region's harvest volume to 3.2 to 3.5 million cubic metres as the forests planted during the 1990s start to be harvested. During the mid-1990s significant areas of forests were planted over a short period of time. For logistical and marketing reasons these forests are likely to be harvested over a 10 to 15 year period. Wood availability would then be expected to decrease.

The increase in wood availability over the next 10 years presents an opportunity for the industry to expand. However, it is important to recognise that some existing processing plants have capacity to increase production (for example, by employing an extra shift). This increase is estimated to be in the order of 500 000 cubic metres above the actual 2005 processing level.

An increase in the level of processing in the region could also come from processing a proportion of the one million cubic metres of logs currently exported, and from processing the potential million cubic metre increase in wood availability.

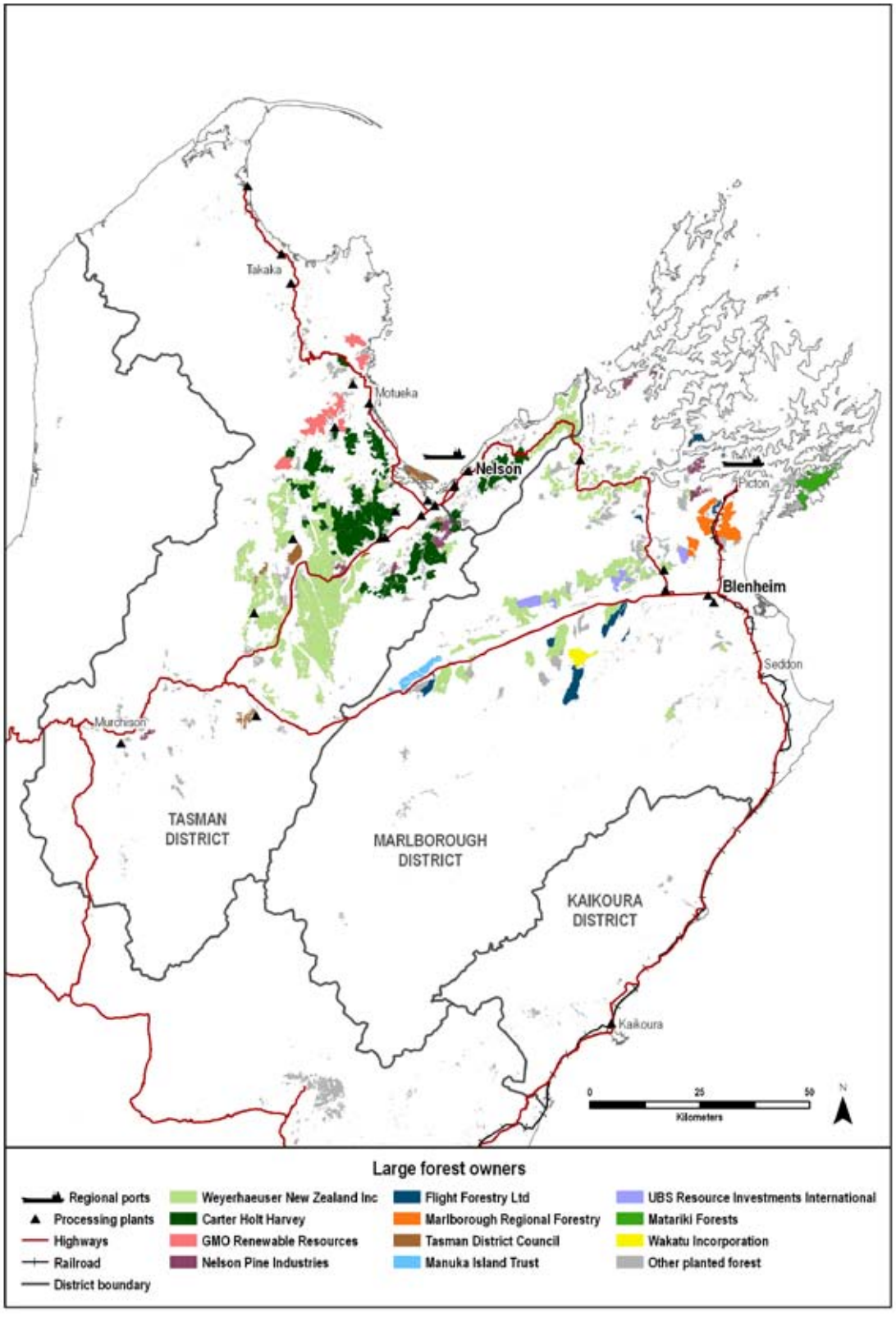
The Marlborough Forest Industry Association has been proactive in lifting the profile of the industry and providing the necessary link with local authorities in Marlborough. There is no collective body that represents the forest growing and wood processing industries in Nelson. A more coordinated approach from the Nelson forest industry would be helpful in raising the forest industry profile and in representing the forest industry to local government.

The future will present some ongoing challenges for the industry. New processing opportunities will proceed only if the regulatory environment is enabling, and if the range of processed products can successfully compete on price and quality in international markets. The forest industry needs strong, positive leadership and innovative people who are prepared to make bold investment decisions.

The future ownership of the Weyerhaeuser Joint Venture forests and sawmill and the potential sale of Nelson's

[1] For the purposes of this report, small-scale forest owners are those with less than 1000 hectares, and large-scale forest owners are those with 1000 hectares or more.

FIGURE 2.1: NELSON/MARLBOROUGH FOREST OWNERSHIP



Carter Holt Harvey forests are creating short-term uncertainty in the region's forest industry. It is possible that the industry leadership shown by the present owners of the larger forests may diminish after these sales, depending on the objectives of the new owners. However, change within the industry could also result in some positive outcomes, with new ideas and links into processing and export opportunities. The past development of the forest industry in Nelson and Marlborough provides a robust platform for the sector's future.

TABLE 2.1: NELSON/MARLBOROUGH PRODUCTION DATA, 2005

	NELSON	MARLBOROUGH	TOTAL
Stocked forest area as at 1 April 2005 (hectares)	99 786	74 101	173 887
Harvest – estimated roundwood removals, year ending December 2005[1] (cubic metres)	1 662 000	646 000	2 308 000
Area weighted average age of forest as at 1 April 2005 (years)	15.19	14.41	14.85
Sawn timber production, year ending December 2005 (cubic metres)	334 500	83 500	418 000
Estimated log input into sawmills, year ending December 2005 (cubic metres)	612 000	153 000	765 000
Export logs by port, year ending December 2005 (cubic metres)	656 500	356 300	1 012 800
Export sawn timber by port, year ending December 2005 (cubic metres)	136 900	-	136 900
Direct employment (forestry and first stage processing) (February 2005)	1 604	313	1 917

Source
Ministry of Agriculture and Forestry.
Note
1 Estimated roundwood removals are derived from a number of sources. The split between Nelson and Marlborough is based on regionally collected data.

THE FOREST GROWING SECTOR 3

FOREST OWNERS

Table 3.1 identifies the 11 owners and managers of large-scale forests (those of 1000 hectares or more) in the Nelson/Marlborough region, and the total area of small-scale forests (fewer than 1000 hectares).

WEYERHAEUSER NEW ZEALAND INCORPORATED

In Nelson and Marlborough, Weyerhaeuser New Zealand acts as manager on behalf of the Nelson Forests Joint Venture. This joint venture is an unincorporated arrangement between Weyerhaeuser and institutional investors from North America and Europe advised by UBS Brinson. Of the estate, 51 percent is owned by Weyerhaeuser and 49 percent by institutional investors. The Nelson Forests Joint Venture owns the largest forest estate in the region with a stocked area of 59 800 hectares.

Weyerhaeuser manages its forests to maximise the production of high quality timber over a range of log products to suit the diverse needs of its customers. The estate includes a Douglas-fir resource of 8700 hectares. The company has offices in Richmond (near Nelson) and in Marlborough at the Kaituna sawmill near Renwick.

In February 2006 Weyerhaeuser and the institutional investors announced that they propose to sell their Nelson and Marlborough forests and the Kaituna sawmill. No sale resulted and the partners are now considering future options.

CARTER HOLT HARVEY FORESTS

Rank Group Investments Ltd purchased Carter Holt Harvey (CHH), New Zealand's largest forestry company, in March 2006. Rank Group now owns 25 600 hectares of planted production forest in Nelson. This includes Crown forestry licences over 7300 hectares of state forests (Hira and Waimea). The forest management is mainly based on an unpruned sawlog regime with about 30 percent of the harvest production being processed in the company's Eves Valley sawmill.

TABLE 3.1: OWNERS AND MANAGERS OF PLANTED PRODUCTION FORESTS IN NELSON/MARLBOROUGH (STOCKED AREA AS AT 1 APRIL 2005)

	NELSON (HA)	MARLBOROUGH (HA)	NELSON & MARLBOROUGH COMBINED (HA)	PERCENTAGE OF TOTAL AREA
Weyerhaeuser New Zealand Inc	40 800	19 000	59 800	34
Carter Holt Harvey Forests	25 600	-	25 600	15
GMO Renewable Resources	3 700	-	3 700	2
Flight Forestry Ltd	-	5 000	5 000	3
Nelson Pine Industries Ltd	1 900	1 600	3 500	2
Marlborough Regional Forestry	-	3 100	3 100	2
Tasman District Council	2 700	-	2 700	2
Manuka Island Trust	-	2 000	2 000	1
UBS Resource Investments International	-	1 600	1 600	1
Matariki Forests	-	1 500	1 500	1
Wakatu Incorporation	-	1 300	1 300	1
Small-scale forest owners	25 100	39 000	64 100	36
Total	**99 800**	**74 100**	**173 900**	**100**

Source
Ministry of Agriculture and Forestry.

In June 2006 it became widely known that Carter Holt Harvey's Nelson forests were included in the company's forest resources that are available for sale.

› GMO RENEWABLE RESOURCES

Motueka Forest is a privately owned Crown forestry license of 3700 hectares that is managed through GMO Renewable Resources, a global investment management firm. Forest management operations are conducted by Tasman Forest Management, which is part of the Forest Management Group of forest consultants.

› FLIGHT FORESTRY LTD

Flight Forestry Ltd manages a group of forests in Marlborough owned by the Osborne Family. The forested area totals about 5000 hectares (including joint ventures) in age classes from 1 to 32 years. Over 80 percent of the forest is pruned or intended to be pruned. Radiata pine is the main species, with small amounts of Douglas-fir and cypress species planted in selected areas. The current annual harvest of 36 000 cubic metres is mainly directed to the Flight Timbers Ltd sawmill and to the associated company Zindia Ltd for export as logs.

› NELSON PINE INDUSTRIES LTD

Nelson Pine Industries Ltd is a wholly owned subsidiary of Sumitomo Forestry of Japan. The company has 3500 hectares of radiata pine forest in the Nelson/Marlborough region. Forest management has developed from an unpruned regime in the pre-1984 classes to a mixture of pruned stands on selected sites (40 percent) and unpruned stands on the balance of the area (60 percent).

The forests have a sustainable harvest volume of about 70 000 cubic metres per year.

› MARLBOROUGH REGIONAL FORESTRY

Marlborough Regional Forestry (MRF) has 3200 hectares of planted production forest. MRF is owned by the Marlborough District Council (88.5 percent) and Kaikoura District Council (11.5 percent). The forests are administered by a joint committee of both councils and managed by Merrill and Ring NZ Ltd. The forest was established between 1970 and 1989 through an annual planting programme.

The objective in establishing the forest was to develop a multi-purpose forestry asset to provide the highest return to ratepayers as well as recreation and soil conservation benefits. The sustainable annual harvest is about 60 000 cubic metres.

› TASMAN DISTRICT COUNCIL

The Tasman District Council has a total stocked forest area of 2700 hectares. The forest estate is managed on a sustained yield basis that provides an even harvest over the years and regular net returns to the ratepayers. The council's estate comprises seven forest blocks, the largest of which is Rabbit Island. The forests are mainly managed on a pruned regime and have an annual harvest of about 37 000 cubic metres.

› MANUKA ISLAND TRUST

The Manuka Island Trust owns 2400 hectares of land, 90 kilometres from Blenheim on the north side of the Wairau River. The forest area comprises 1700 hectares of radiata pine and 180 hectares of Douglas-fir. The balance is in native vegetation, most of which is reserved in two covenanted areas. The forest was planted between 1994 and 2000, with half of the radiata pine area managed for pruned sawlogs. The balance is managed on a framing (unpruned) regime. The Douglas-fir is all on steeper slopes and will be thinned to waste to produce small branched sawlogs. The forest is managed by Merrill and Ring NZ Ltd.

› UBS RESOURCE INVESTMENTS INTERNATIONAL

UBS Resource Investments International (RII) owns the RII North Bank Forest, having bought it from Scollay Holdings in 1994. The forest has a stocked area of 2200 hectares, all on the north side of the Wairau River. Harvest began in 2004 and the local forest management is undertaken by Merrill and Ring NZ Ltd.

› MATARIKI FORESTS

Matariki Forests is an unlimited liability, joint venture company incorporated in New Zealand. The shareholders are Rayonier Inc. (40 percent), the Rosenburg Real Estate Equity Fund (RREEF) (25 percent) and Australian Mutual Provident (AMP) (35 percent). Matariki Forests is New Zealand's third-largest forestry company, owning, operating and managing 143 000 hectares of forest. In Marlborough, the company owns the Crown forestry licence for Queen Charlotte Forest in the Marlborough Sounds, a total stocked area of 1500 hectares.

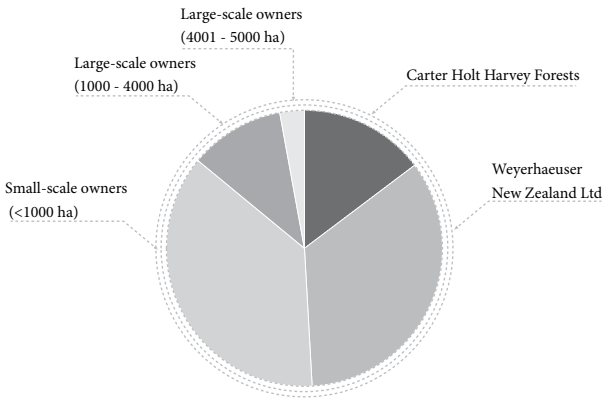
› WAKATU INCORPORATION

Wakatu Incorporation was established in 1977, bringing a large number of individual land titles together. The Incorporation manages these lands for the benefit of the shareholders, its mission statement being "A business of the land and sea – he taonga tuku iho – for profit, social and cultural growth". Wakatu Incorporation's forestry interests total just over 1300 hectares, mainly in radiata pine. Management aims are for the production of high-quality timber through intensive tending regimes.

› SMALL-SCALE FOREST OWNERS

Approximately 36 percent of Nelson/Marlborough's planted production forest is held by small-scale forest owners – mainly individuals, forestry partnerships and small companies – that own less than 1000 hectares each. The impact of these small-scale forest owners is highlighted in the wood availability forecasts, which separate them from the large-scale forest owners.

»» FIGURE 3.1: OWNERS OF NELSON/MARLBOROUGH PLANTED PRODUCTION FORESTS



»» NURSERIES

Most of the seedlings required for restocking harvested areas and planting new forests in the Nelson/Marlborough region are produced from the nurseries named below.

› HORIZON2 LTD

Horizon2 Ltd is a 50:50 joint venture between CHH Forest Genetics Ltd (owned by Carter Holt Harvey Ltd), and Trees and Technology Ltd (owned by Rubicon Ltd).

The company, which is a specialist forest biotechnology business, was formed in 2004 and has its head office at Te Teko, near Whakatane. Horizon2 produces a wide range of tree stock types and is at the forefront of radiata pine clonal development.

The Horizon2 nursery facility at Spring Grove, Nelson, comprises 16 hectares of land and has a sustainable production of 2.5 million seedlings per year. Production currently comprises mainly radiata pine, Douglas-fir and lusitanica seedlings. The company also has two seed orchards in Marlborough.

› APPLETON'S TREE NURSERY

Appleton's Tree Nursery is a family-owned business established in 1968. The nursery employs 16 full-time staff and 25 seasonal staff. Nursery operations are split between a 21-hectare ornamental nursery and a 45-hectare forestry nursery. The production forest nursery produced about 3.5 million radiata pine seedlings and cuttings in 2005. Other forestry species produced were 300 000 Douglas-fir, 150 000 redwoods, and 50 000 macrocarpa and lusitanica. The site allows considerable scope for increased production when demand requires.

»» SPECIES COMPOSITION

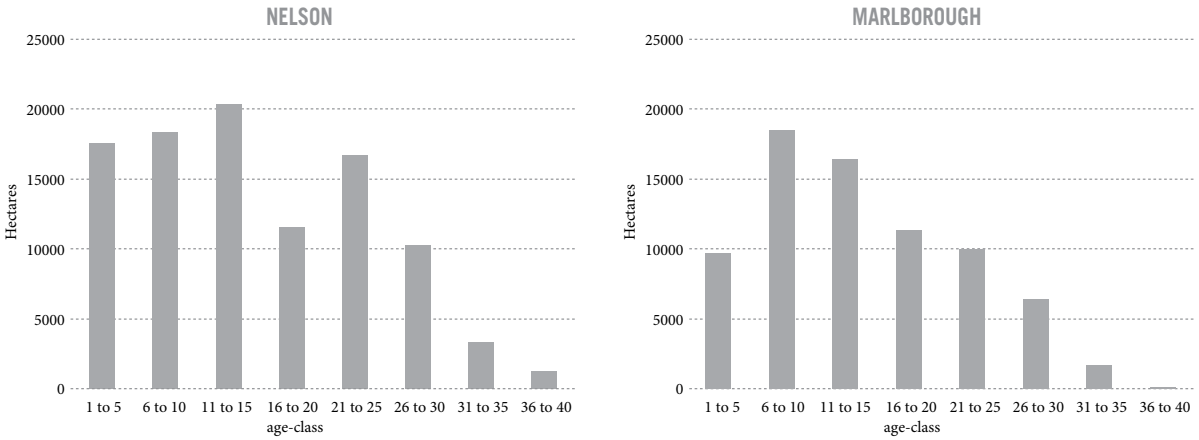
Within the Nelson/Marlborough region radiata pine is the dominant species, making up 90 percent of the planted forest area. Douglas-fir is the next most common species at 7 percent. The balance comprises cypresses, eucalypts, and other softwood and hardwood species.

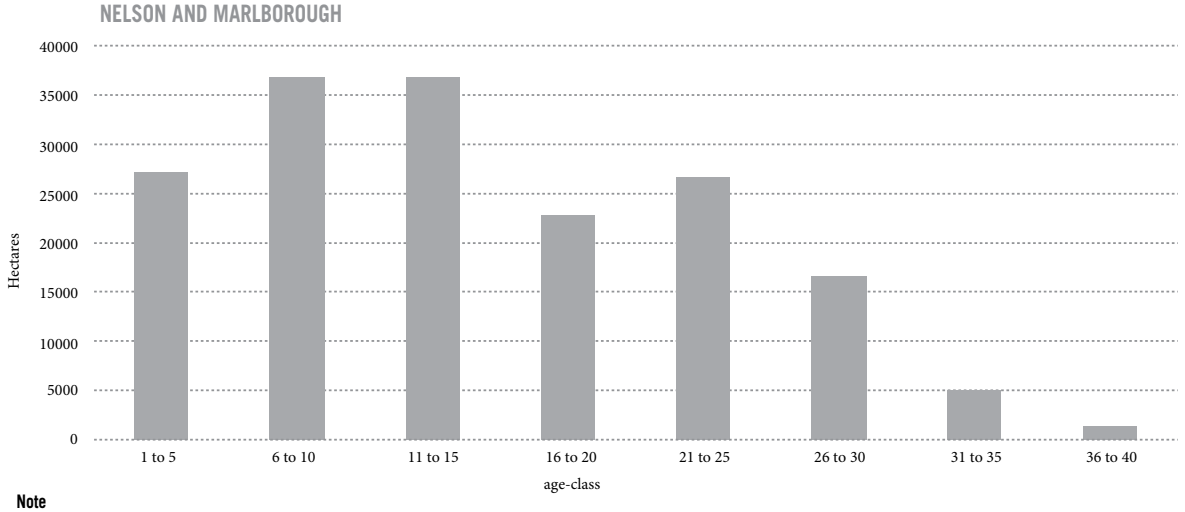
About 55 percent (87 000 hectares) of the radiata pine estate is, or is expected to be, pruned to a height of at least four metres. Approximately 11 percent (10 000 hectares) of pruned radiata pine is older than 25 years.

»» AGE-CLASS DISTRIBUTIONS

Many Nelson forests are in their second or third rotation, and the age-class distribution is fairly even. Marlborough's forest age-class distribution shows the peak in new forest area planted during the mid to late 1990s that will enable an increasing area to be harvested in the future.

»» FIGURE 3.2: AGE-CLASS DISTRIBUTION FOR PLANTED PRODUCTION FORESTS AS AT 1 APRIL 2005





Note

For detailed information on forest areas and age-class distribution by species refer to the latest edition of *A National Exotic Forest Description* (see www.maf.govt.nz).

HARVEST TRENDS

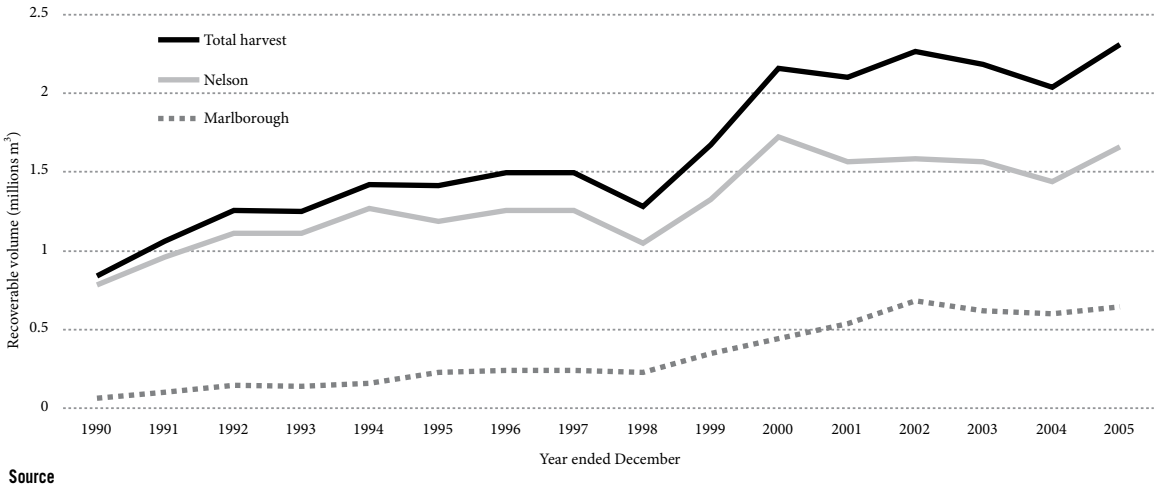
Harvest data collected from the forest industry since 1990 show the increase in harvest that has taken place in both Marlborough and Nelson (Figure 3.3). There was a major dip in production during the 1998 "Asian financial crisis" and over the last few years the harvest has been within a fairly narrow band. Recent fluctuations have been caused by the difficult marketing conditions and a significant wind-throw recovery operation in 2005.

HARVEST INTENTIONS SURVEY

A harvesting intention survey of the 11 large-scale forest growers was completed in January 2006. Growers provided data on the actual level of harvest from these forests for 2004, and the expected harvest for 2005. Their harvesting intentions for the next 10 years were recorded by species; for pruned, unpruned and chip logs; and for the area harvested. Tables 3.2 and 3.3 (page 10) provide a summary of the harvest intentions data. For detailed data by log type, see Appendix A. These figures make up the first 10 years of the wood availability forecasts for the large-scale forests in both Nelson and Marlborough.

The harvest intentions of large-scale forest owners in Nelson and Marlborough show little change in the level of harvest over the 10-year period to 2015. Their intended harvest does, however, provide a very important component of the future forest harvest. The large-scale forests are well-managed and the data provided has a high degree of reliability.

FIGURE 3.3: ESTIMATED HARVEST, NELSON AND MARLBOROUGH



Source
Ministry of Agriculture and Forestry Nelson.

TABLE 3.2: HARVEST INTENTIONS SURVEY RESULTS, LARGE-SCALE OWNERS – NELSON

YEAR ENDING DECEMBER	PINUS RADIATA (000 M³)	DOUGLAS-FIR (000 M³)	OTHER SOFTWOODS (000 M³)	OTHER HARDWOODS (000 M³)	TOTAL VOLUME (000 M³)	TOTAL AREA (HA)
2004[1]	1 341	106	6	-	1 453	2 787
2005[2]	1 275	107	8	-	1 390	2 589
2006	1 124	161	40	-	1 325	2 374
2007	1 180	130	18	-	1 328	2 534
2008	1 174	128	13	-	1 315	2 594
2009	1 112	132	50	-	1 294	2 394
2010	1 141	120	26	-	1 287	2 446
2011	1 162	120	29	-	1 311	2 473
2012	1 196	97	89	-	1 382	2 545
2013	1 074	129	0	-	1 203	2 173
2014	1 123	150	91	-	1 364	2 385
2015	1 123	113	91	-	1 327	2 305

Notes
[1] Actual harvest.
[2] Expected harvest.

TABLE 3.3: HARVEST INTENTIONS SURVEY RESULTS, LARGE-SCALE OWNERS – MARLBOROUGH

YEAR ENDING DECEMBER	PINUS RADIATA (000 M³)	DOUGLAS-FIR (000 M³)	OTHER SOFTWOODS (000 M³)	OTHER HARDWOODS (000 M³)	TOTAL VOLUME (000 M³)	TOTAL AREA (HA)
2004[1]	502	-	-	-	502	1 071
2005[2]	584	1	-	-	585	1 136
2006	585	-	-	-	585	1 071
2007	556	-	-	-	556	1 103
2008	569	-	10	-	579	1 144
2009	587	-	-	-	587	1 110
2010	514	-	-	-	514	1 002
2011	490	-	-	-	490	961
2012	445	22	19	-	487	916
2013	575	21	93	-	689	1 254
2014	590	-	-	-	590	1 141
2015	709	-	-	-	709	1 331

Notes
[1] Actual harvest.
[2] Expected harvest.

WOOD AVAILABILITY FORECASTS

4

Readers are urged to thoroughly review these wood availability forecasts before using them for planning or investment decisions, or to engage a professional forestry consultant who can interpret the forecasts in the context of any such decisions.

This chapter describes the possible range of harvest volumes that could be available from the Nelson and Marlborough regions.

The wood availability forecasts are based on each region's forest resource and the forecasting assumptions noted. The forecasts incorporate harvesting intentions of the regions' large-scale forest owners (described in the previous section), and the views of forest managers and consultants, to ensure the forecasts represent a realistic range of future wood availability scenarios.

The range of scenarios clearly indicates that there are many different ways the forests in the region may finally be harvested. The availability of wood from the large-scale owners is reasonably certain, while the forecast availability of wood from the small-scale forest owners is less certain.

A key issue is the timing of harvesting by the small-scale forest owners. The timing will be driven by a range of factors including individual forest owners' objectives, forest age, log prices, demand by local wood processing plants, and perceptions about future log prices and future wood availability.

Harvesting of forests is managed to maximise the benefits to the enterprise that owns them. Each enterprise has its own harvest strategy based on the forest owners' objectives, market conditions and the forest estate that it owns or manages. Any change in harvesting strategies by a forest owner affects the age-structure and maturity of the forests it owns. This in turn directly affects future wood availability.

There are different levels of uncertainty associated with the wood availability from each component of the estate. The volumes forecast from the large-scale owners' estate, although subject to change because of changes in harvest intentions or changes in the resource description (areas and yields), have greater certainty than those forecast from the small-scale estate. Not only are harvest intentions less clear for small-scale owners, the resource description is less accurate.

SCENARIOS FOR RADIATA PINE

The five harvest scenarios below were developed following consultation with the National Exotic Forest Description (NEFD) steering committee and feedback from interested parties in Nelson and Marlborough.

SCENARIO 1: HARVEST ALL AREAS AT AGE 30

The estate of all owners is assumed to be harvested at age 30.

SCENARIO 2: LARGE-SCALE OWNERS HARVEST AT STATED INTENTIONS, SMALL-SCALE OWNERS HARVEST AT AGE 30

Large-scale owners' wood availability is assumed to be at stated harvest intentions for 2005 to 2015. After 2015 the availability is not allowed to decrease.

The estate of small-scale owners is assumed to be harvested at age 30.

SCENARIO 3: NON-DECLINING YIELD (NDY) – TARGET ROTATION 30 YEARS

Large-scale owners' wood availability is assumed to be at stated harvest intentions (as for Scenario 2). The total wood availability of radiata pine from the region is not allowed to decrease (a non-declining yield constraint is imposed).

SCENARIO 4: SPLIT NDY – TARGET ROTATION 30 YEARS

This is the same as Scenario 3 except that the total wood availability of radiata pine from the region is allowed to

step down from 2034 to 2037 (at the end of the current rotation). From 2037, total wood availability is again constrained so that it cannot decrease.

› SCENARIO 5: TARGET ROTATION AGE VARIATIONS

This is similar to Scenario 4, but target rotation ages of 28 and 32 years are also evaluated.

»» SCENARIOS FOR OTHER SPECIES

One scenario is presented for Douglas-fir (all owners), and one for other (non-cypress) softwoods (large-scale owners only).

The scenarios for other species are based on the harvest intentions of large-scale owners for 2005 to 2015 with yield regulated in subsequent years. Target rotation ages are 40 years for Douglas-fir and 30–35 years for other softwoods.

The species categories of cypress, eucalypts and other hardwoods were excluded because yield tables have yet to be developed for them. Other softwoods (small-scale owners) were excluded because the area data available is believed to include some area in cypress species.

»» DATA

› METHOD USED TO OBTAIN AREA

Area was obtained from the NEFD as at 1 April 2005. Area for large-scale owners was used unadjusted. The area of the non-professionally managed component of the small-scale owners' estate was reduced by 15 percent. This was done because the area in this ownership category is often reported as gross area rather than net stocked area. In addition, reductions were made to the area of over-mature stands in the small-scale owner estate (as described later in the report).

› METHOD USED TO DEVELOP YIELD TABLES

In 2005, new yield tables for Nelson and Marlborough were developed in the following way.

- Large-scale owners provided yield tables for their estate.
- These were averaged on an area-weighted basis to get regional yield tables for each croptype.
- Yield tables for old radiata pine (age 16+ years, planted in 1989 and earlier), Douglas-fir and other softwoods were then calibrated to match the harvest intentions data provided by large-scale owners. The assumption is that the harvest intentions data is the most accurate information available, as it is based predominantly on detailed inventory.
- Yield tables for young radiata pine croptypes (planted in 1990 and later) were left unadjusted.
- The yield tables developed for the large-scale owners' estate were also applied to the small-scale owners' estate.

› LARGE-SCALE OWNERS' HARVEST INTENTIONS

Large-scale owners were asked to provide details of planned harvest volume by log grade and area from 2005 to 2015. These harvest intention values were then included at the beginning of the forecasts to provide the most realistic wood availability forecasts over this period.

There is a projected drop of 151 000 cubic metres in the large-scale forest harvest from 2005 to the harvest intentions in 2006. This is a result of the larger than planned harvest in Nelson during 2005, which was due partly to the salvage of wind-thrown forest, and partly to the objective of longer rotation ages (letting the trees grow older before harvest).

»» WOOD AVAILABILITY FORECASTS FOR NELSON

› ASSUMPTIONS

The wood availability forecasts for Nelson are based on the following assumptions.

- All area is replanted (with a regeneration lag of one year), apart from 1205 hectares of planned deforestation. Replanting is as follows:
  - Large-scale owners: all area is planted back into radiata pine (radiata pine planted back into the same

silviculture, Douglas-fir and other softwoods planted back 50:50 into pruned and unpruned radiata pine tending regimes).
  - Small-scale owners: all back into the same species and regime.
- The area awaiting replanting as at 31 March 2005, i.e. to be replanted in the 2005 planting season, is included as area at age 0.
- The total harvest for 2005 (all species) is 1 662 000 cubic metres (MAF estimate).
- It was assumed any area of radiata pine in the small-scale owners' estate that was aged 36 or older would not be harvested: this resulted in the removal of 234 hectares from the area file.

SCENARIO 1

This scenario has all areas harvested at age 30. It indicates the "pure" (i.e. unconstrained) availability of wood from Nelson. This is basically a reflection of the age-class distribution. Figure 4.1 shows the age-class distribution of radiata pine in Nelson, and Figure 4.2 shows the wood availability. The low point at 2017 in Figure 4.2 occurs because of the small area (1325 hectares) at age 18 (Figure 4.1). The high point at 2024 in Figure 4.2 occurs because of the large area (5733 hectares) at age 11 in Figure 4.1.

Figure 4.2 indicates that wood availability does not have the potential to increase markedly over the next 15 years.

FIGURE 4.1: AGE-CLASS DISTRIBUTION OF NELSON RADIATA PINE – COMBINED ESTATE AS AT 1 APRIL 2005

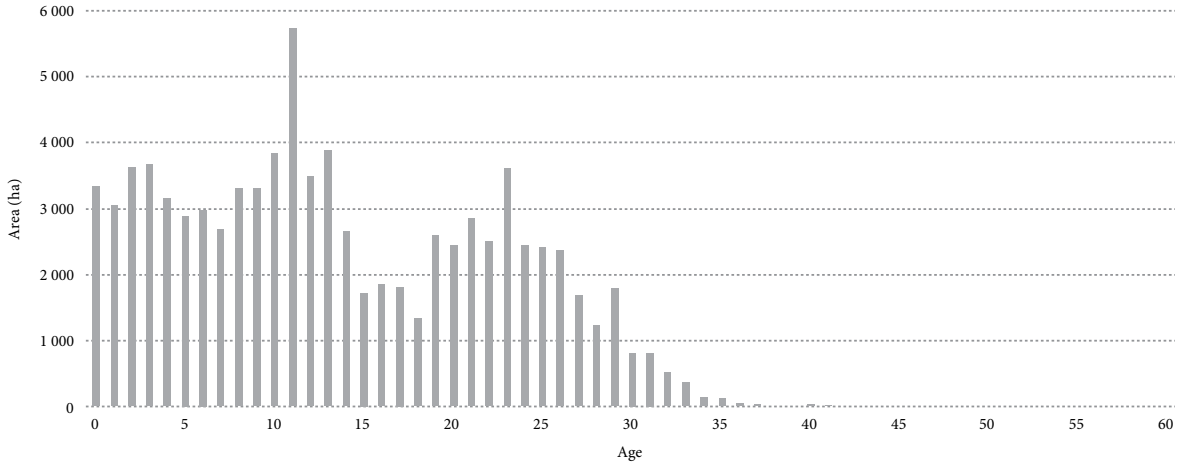


FIGURE 4.2: NELSON RADIATA PINE AVAILABILITY UNDER SCENARIO 1– COMBINED ESTATE

› SCENARIO 2

In this scenario, large-scale owners harvest at intentions and small-scale owners harvest at age 30.

LARGE-SCALE OWNERS' ESTATE

The age-class distribution of the large-scale owners' estate (Figure 4.3) indicates that there are over 1000 hectares in most age-classes up to age 29. The area at age 0 is the area awaiting replanting as at 31 March 2005, i.e. area to be replanted in the 2005 planting season.

For this scenario, the availability of wood from large-scale owners is based on stated harvest intentions for 2005 to 2015. After 2015 the availability is constrained to be non-declining (the volume available is not allowed to decrease), with a target rotation age of 30 years. The wood availability of large-scale owners (Figure 4.4) is forecast to be relatively static around 1.1 million cubic metres a year until 2027. The subsequent increase reflects the larger area in young age-classes (age 0 to 4) in Figure 4.3 as well as the higher yield (cubic metres per hectare) anticipated for younger stands.

SMALL-SCALE OWNERS' ESTATE

The age-class distribution of the small-scale owners' estate (Figure 4.5) is very irregular, with over 1000 hectares in ages 8 to 13 years (planted from 1992 to 1997) and much less area in all other age-classes. The key issue is how to forecast the availability from this estate: in particular, how

FIGURE 4.3: AGE-CLASS DISTRIBUTION OF THE NELSON RADIATA PINE ESTATE – LARGE-SCALE OWNERS AS AT 1 APRIL 2005

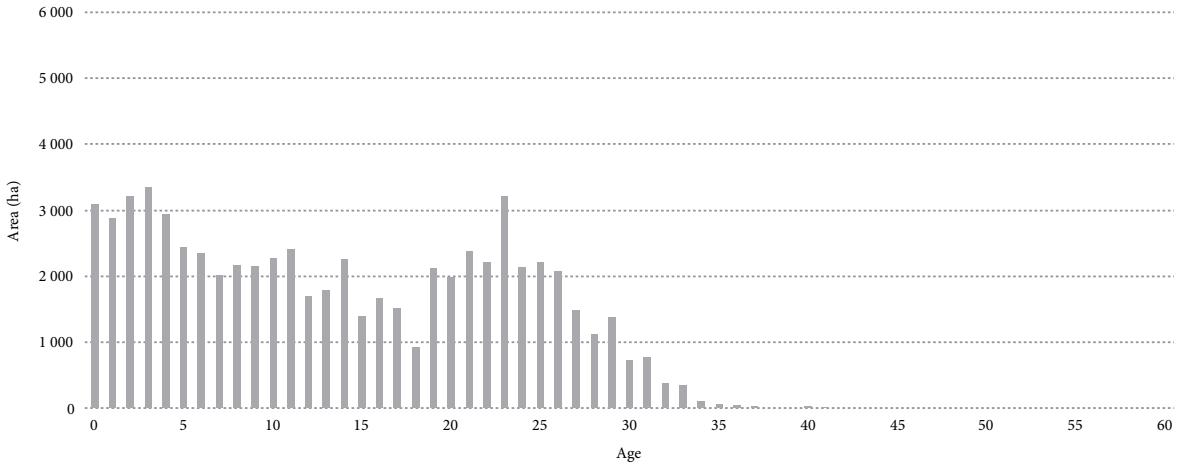
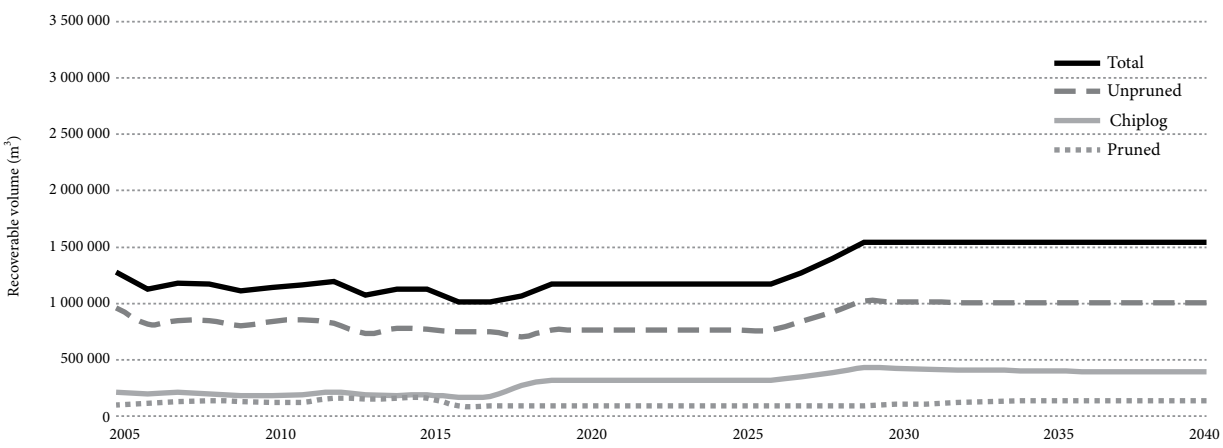


FIGURE 4.4: NELSON RADIATA PINE AVAILABILITY UNDER SCENARIO 2 – LARGE-SCALE OWNERS



the large area in ages 8 to 13 will be harvested:

- at a fixed rotation age (Scenario 2);
- over many years (Scenario 3);
- over an intermediate number of years (Scenario 4).

COMBINED ESTATE

The wood availability from all owners is presented in Figure 4.6. The wood availability from the large-scale owners' estate is the same as presented in Figure 4.4. In this scenario (Scenario 2), all area in the small-scale owners' estate is assumed to be harvested at age 30. The fluctuations in the total volume harvested reflect the variation in the age-class distribution of the small-scale owners' estate.

The large increase in volume from 2022 (Figure 4.6) occurs when the large areas from the small-scale owners' estate in young age-classes (8 to 13) is harvested. The increase in 2022 is a consequence of the 2092 hectares planted in 1992 (age 13 in Figure 4.5) being harvested at age 30 years.

Fluctuations in harvest volumes of the magnitude shown in Figure 4.6 would be impractical because of marketing and logistics realities. There would not be enough harvesting capacity to cut all the volume available during the peak period, and it would be hard to get short-term sales contracts to cover this volume.

FIGURE 4.5: AGE-CLASS DISTRIBUTION OF THE NELSON RADIATA PINE ESTATE – SMALL-SCALE OWNERS AS AT 1 APRIL 2005

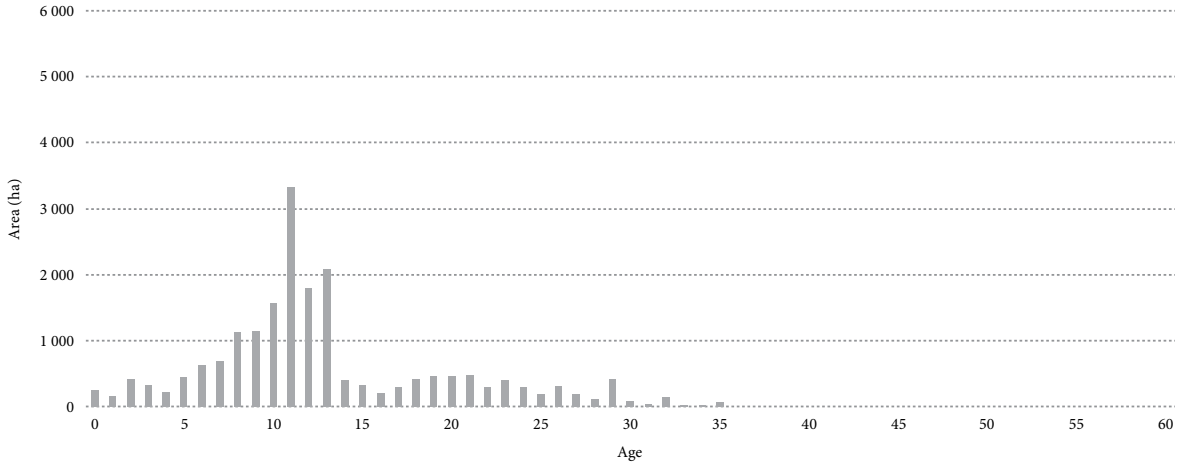
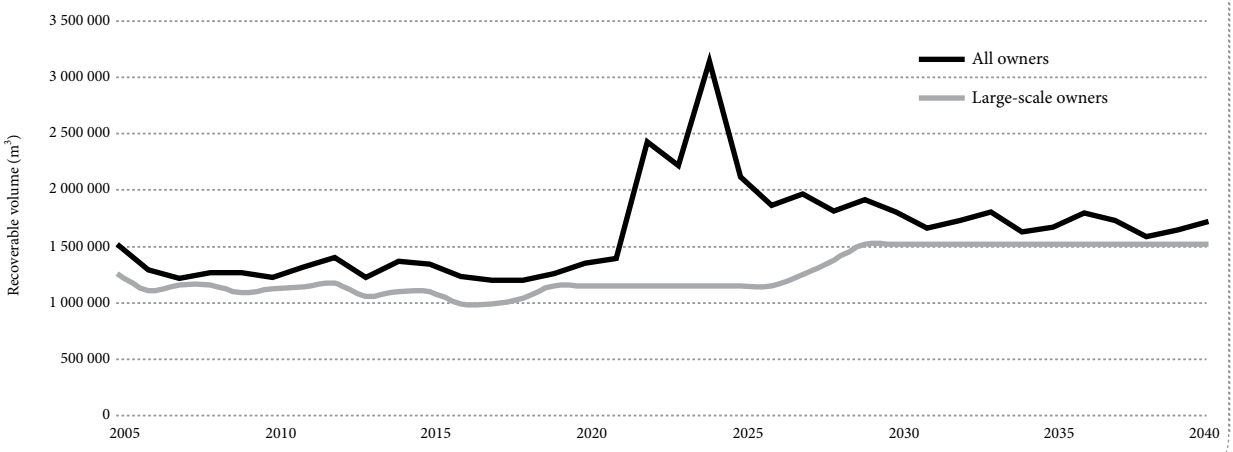


FIGURE 4.6: NELSON RADIATA PINE AVAILABILITY UNDER SCENARIO 2



SCENARIO 3

The third scenario is for non-declining yield (target rotation 30 years). Figure 4.7 indicates that, when the small-scale owners' estate is harvested to complement the large-scale owners estate, the total volume (radiata pine) available from 2006 to 2019 is 1.3 million cubic metres a year. This increases to 1.9 million cubic metres a year from 2023. There is a gradual increase because an extra constraint was added to the model so that the total volume could not increase by more than 10 percent annually. This was to simulate some of the logistical constraints faced if volume was allowed to increase unchecked.

This scenario is similar to the base case scenario adopted in the 2000 wood availability forecasts. However, it causes the small-scale owners' estate to be harvested at rotation ages that differ markedly from 30 years (Figure 4.8).

FIGURE 4.7: NELSON RADIATA PINE AVAILABILITY UNDER SCENARIO 3

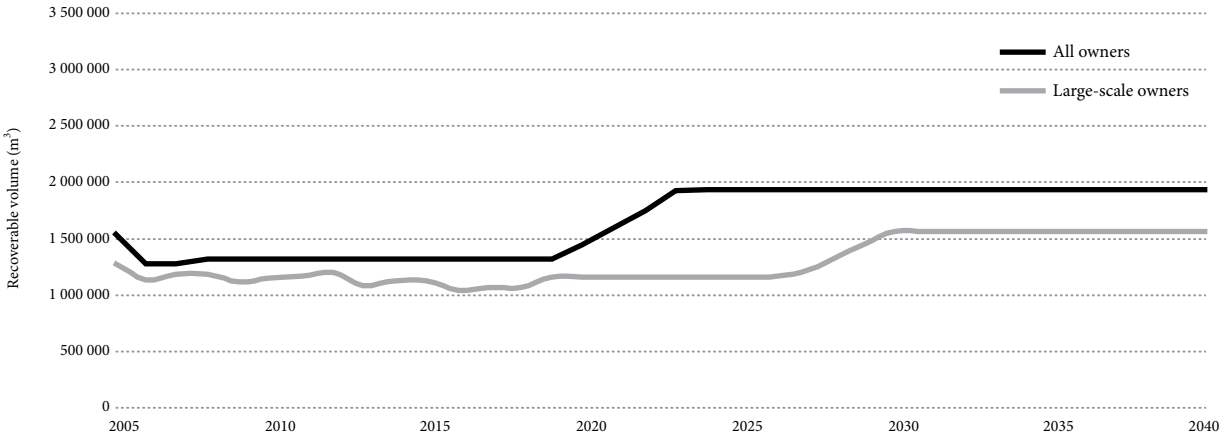
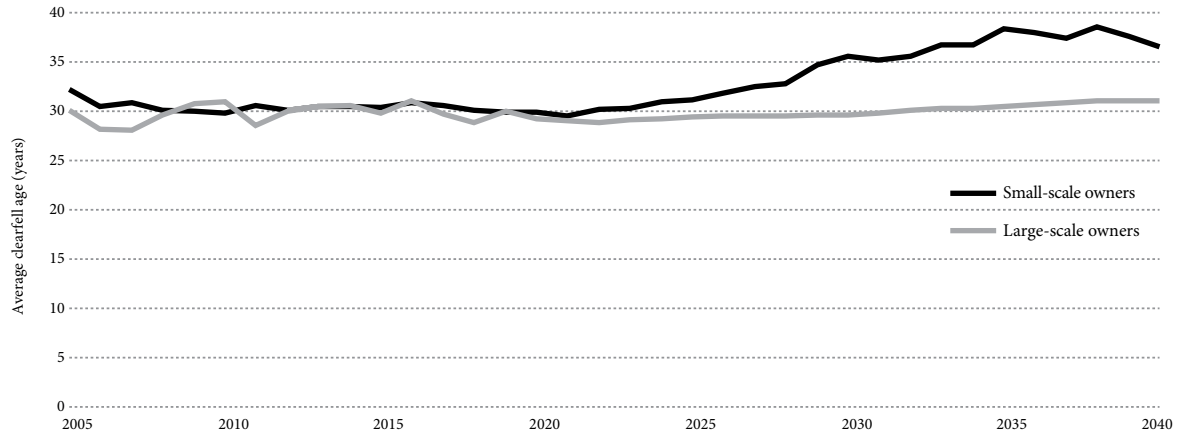


FIGURE 4.8: AVERAGE RADIATA PINE CLEARFELL AGE UNDER SCENARIO 3



› SCENARIO 4

The fourth scenario is for a split NDY (target rotation 30 years). This scenario also gives a forecast wood availability of 1.3 million cubic metres a year from 2006 to 2019 (Figure 4.9). This increases to over 2 million cubic metres a year from 2023 before reducing to 1.7 million cubic metres a year from 2036.

The main difference from Scenario 3 is that the large area of young stands in the small-scale owners' estate is assumed to be harvested over a shorter period of time. The total volume was not allowed to decrease between 2006 and 2034, that is, for the current rotation. After 2034 an annual reduction of up to 10 percent was allowed before the yield was required to be non-declining for the next rotation (from 2037). As a consequence, the average clearfell age for small-scale owners stays closer to the target of 30 years than was the case in Scenario 3 (Figure 4.10).

The total volume forecast for Scenario 4 is broken down by log grade in Figure 4.11. This shows that the pruned volume available is relatively steady throughout the forecast period despite changes in total volume.

FIGURE 4.9: NELSON RADIATA PINE AVAILABILITY UNDER SCENARIO 4

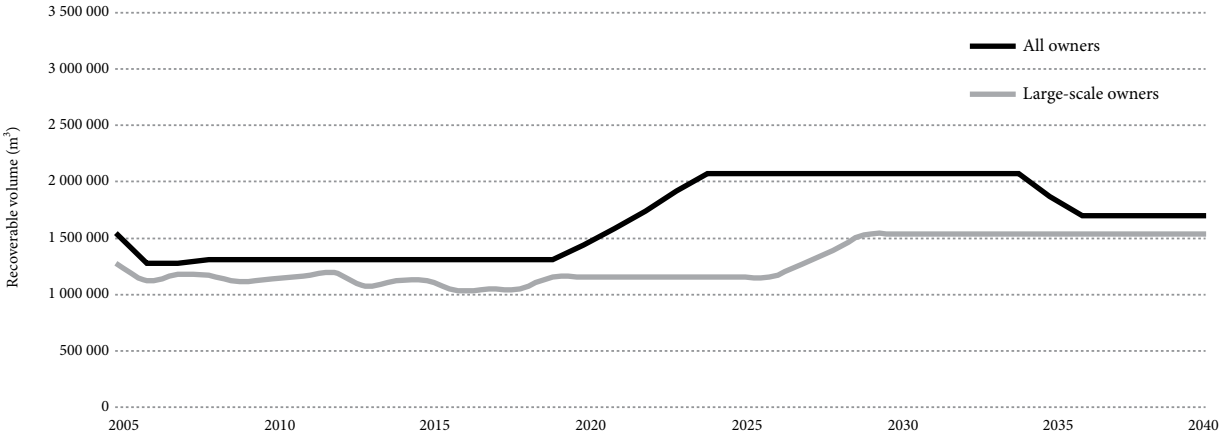


FIGURE 4.10: AVERAGE RADIATA PINE CLEARFELL AGE UNDER SCENARIO 4

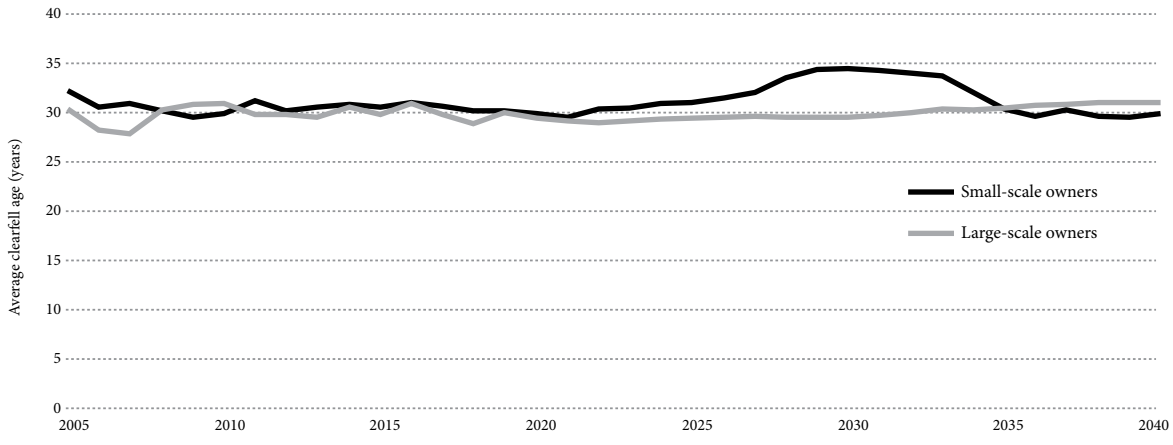


FIGURE 4.11: NELSON RADIATA PINE AVAILABILITY UNDER SCENARIO 4 – BY LOG PRODUCT

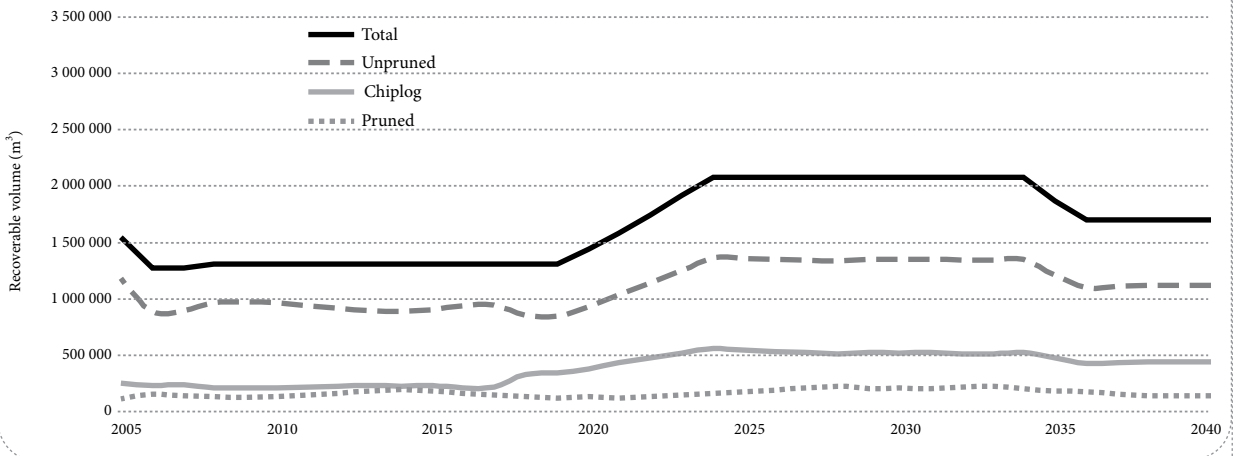


FIGURE 4.12: NELSON RADIATA PINE AVAILABILITY FOR EACH TARGET ROTATION AGE UNDER SCENARIO 5

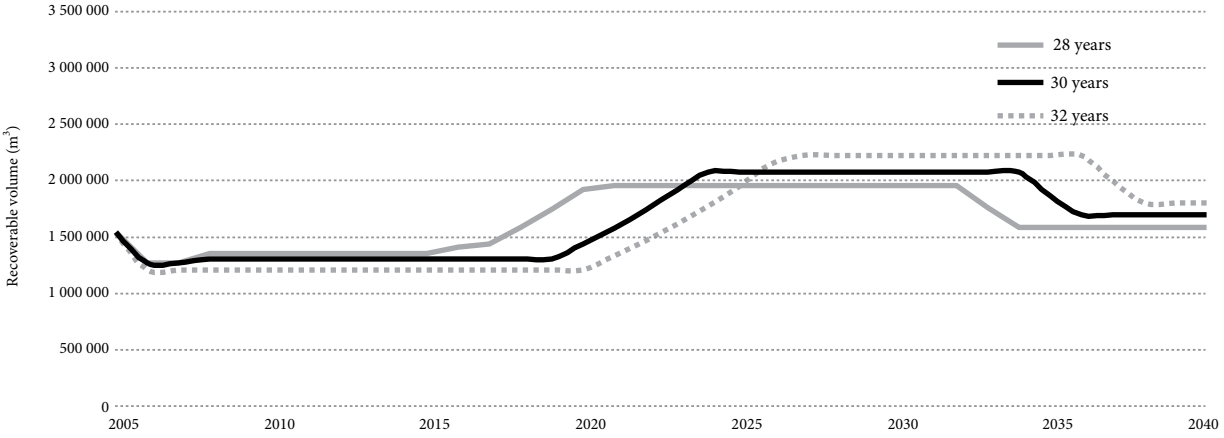
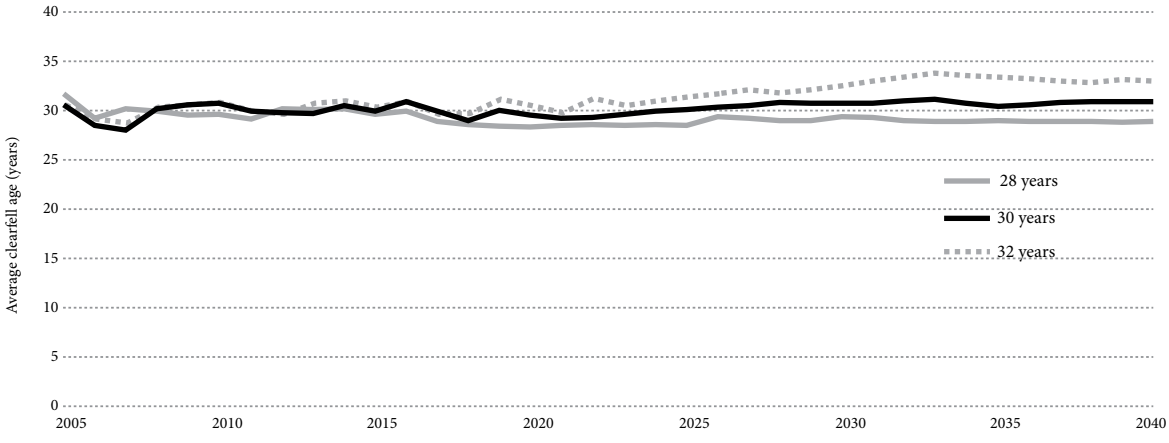


FIGURE 4.13: AVERAGE RADIATA PINE CLEARFELL AGE FOR EACH TARGET ROTATION AGE UNDER SCENARIO 5



› SCENARIO 5

Different wood availability profiles are generated if the target rotation age is changed from 30 years to either 28 or 32 years (Figure 4.12). Because of the limitations imposed by the current age-class distribution and large-scale owners' stated harvest intentions, average clearfell ages do not separate until about 2020 (Figure 4.13).

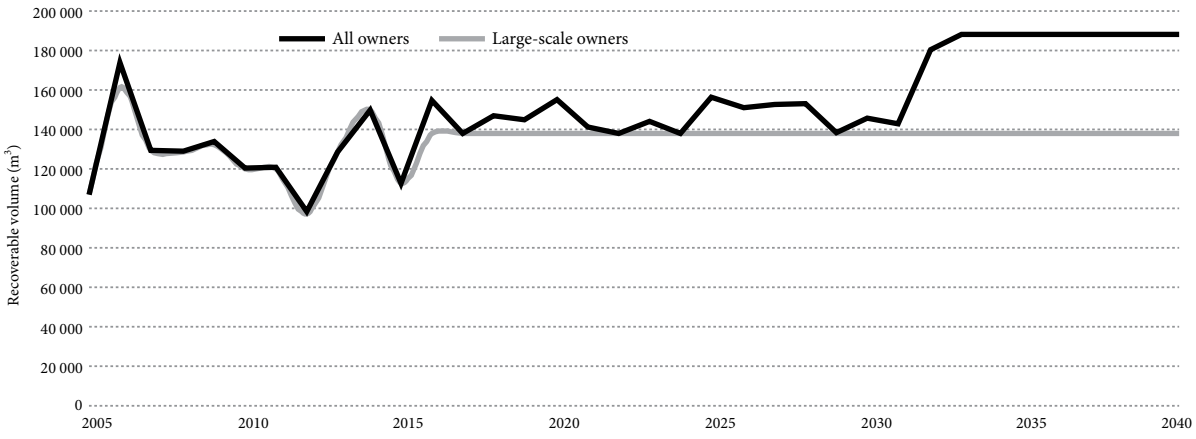
› SCENARIOS FOR OTHER SPECIES

DOUGLAS-FIR

The Douglas-fir harvest for the large-scale owners' estate is based on intentions for 2005 to 2015. From 2015 to 2040 it is constrained so recoverable volume can't decrease. An upper limit of 50 000 cubic metres a year was placed on the Douglas-fir harvest from the small-scale owners' estate.

Figure 4.14 clearly shows how large-scale owners dominate the potential supply of this species. After 2040, the volume harvested by large-scale owners drops to zero because the scenario includes the stated intention to replant with radiata pine.

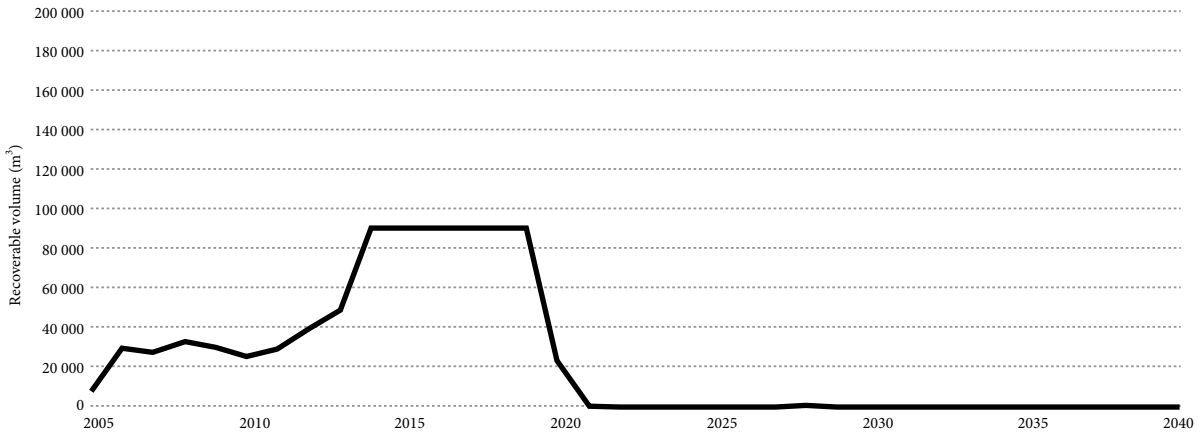
FIGURE 4.14: NELSON DOUGLAS-FIR AVAILABILITY



OTHER (NON-CYPRESS) SOFTWOODS

Other softwoods are harvested according to the stated intentions for 2005 to 2015. After that, the total harvest volume has an upper limit set of 90,000 cubic metres a year.

FIGURE 4.15: NELSON OTHER (NON-CYPRESS) SOFTWOOD AVAILABILITY – LARGE-SCALE OWNERS



WOOD AVAILABILITY FORECASTS FOR MARLBOROUGH

The Marlborough wood availability forecasts are based on the following assumptions.

- All area is replanted (with a regeneration lag of one year), as follows:
  - Large-scale owners: all area planted back into radiata pine (radiata pine planted back into the same silviculture, Douglas-fir and other softwoods planted into the pruned radiata pine regime)
  - Small-scale owners: all back into the same species and regime.
- The area awaiting replanting as at 31 March 2005 is included as area at age 0.
- The total harvest for 2005 (all species) is 646 000 cubic metres (MAF estimate).
- In the small-scale owners' estate, 627 hectares aged 30 years or more was judged unlikely to be harvested based on a review undertaken. This area was removed from the area file.

SCENARIO 1

This scenario indicates the "pure" (i.e. unconstrained) availability of wood from Marlborough when all areas are harvested at age 30. This means wood availability reflects the age-class distribution. Figure 4.16 shows the age-class distribution of radiata pine in Marlborough, and Figure 4.17, wood availability, is the mirror image of this. So the low point from 2019 to 2021 in Figure 4.17 occurs because of the small area at ages 14 to 16 in Figure 4.16; the high point from 2024 to 2025 in Figure 4.17 occurs because of the large area at ages 10 and 11 in Figure 4.16.

FIGURE 4.16: AGE-CLASS DISTRIBUTION OF MARLBOROUGH RADIATA PINE – COMBINED ESTATE AS AT 1 APRIL 2005

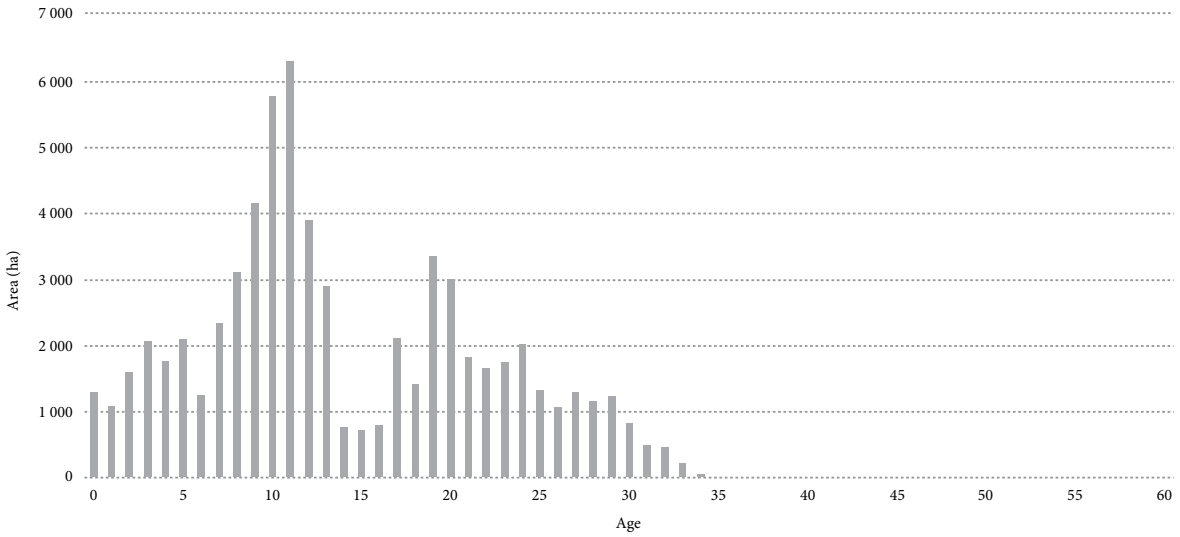
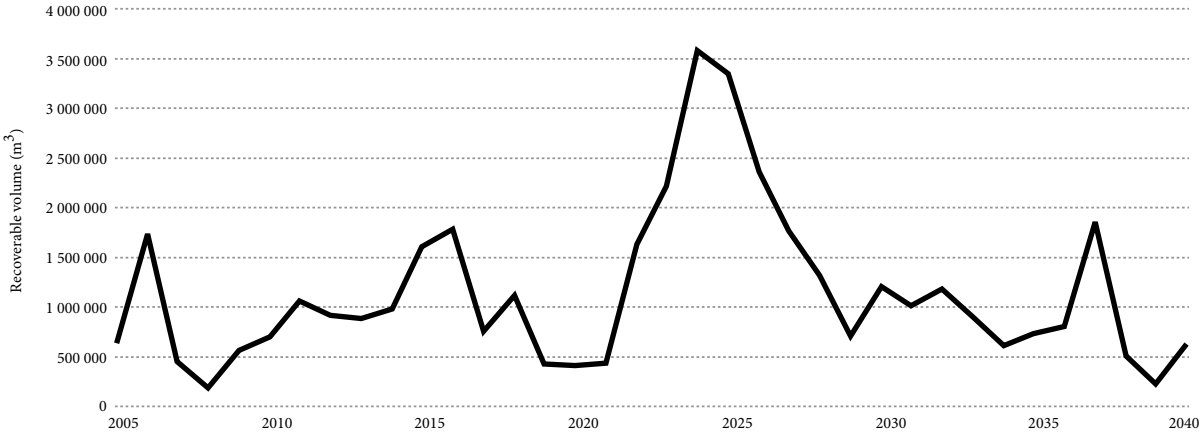


FIGURE 4.17: MARLBOROUGH RADIATA PINE AVAILABILITY UNDER SCENARIO 1 – COMBINED ESTATE



SCENARIO 2

In this scenario, the large-scale owners' estate is harvested at intentions and the small-scale owners harvest at age 30.

LARGE-SCALE OWNERS' ESTATE

The age-class distribution of the large scale owners' estate (Figure 4.18) indicates that there is variable area in each age-class. The area at age 0 is the area awaiting replanting as at 31 March 2005; i.e. area to be replanted in the 2005 planting season.

For this scenario the availability of wood from large-scale owners is based on stated harvest intentions for 2005 to 2015. Thereafter the wood availability is constrained to be non-declining (it cannot decrease) with a target rotation age of 30 years. The wood availability of large-scale owners (Figure 4.19) is forecast to be relatively static around 0.6 million cubic metres a year.

SMALL-SCALE OWNERS' ESTATE

The age-class distribution of the small-scale owners' estate (Figure 4.20) is very irregular with over 2000 hectares in ages 7 to 13 years (planted in 1992 to 1998) and much less area in all other age-classes. The key issue is how to forecast the availability from this estate; in particular, whether the large area in ages 7 to 13 will be harvested:

- at a fixed rotation age (Scenario 2);
- over many years (Scenario 3);
- over an intermediate number of years (Scenario 4).

COMBINED ESTATE

The wood availability from all owners is presented in Figure 4.21. The wood availability from the large-scale owners' estate is the same as presented in Figure 4.19. The fluctuation in the total volume harvested reflects the pattern in the age-class distribution of the small-scale owners' estate.

The large increase in volume from 2022 (Figure 4.21) occurs when the large areas in young age-classes are harvested. For example, the increase in 2022 is a

FIGURE 4.18: AGE-CLASS DISTRIBUTION OF THE MARLBOROUGH RADIATA PINE ESTATE – LARGE-SCALE OWNERS AS AT 1 APRIL 2005

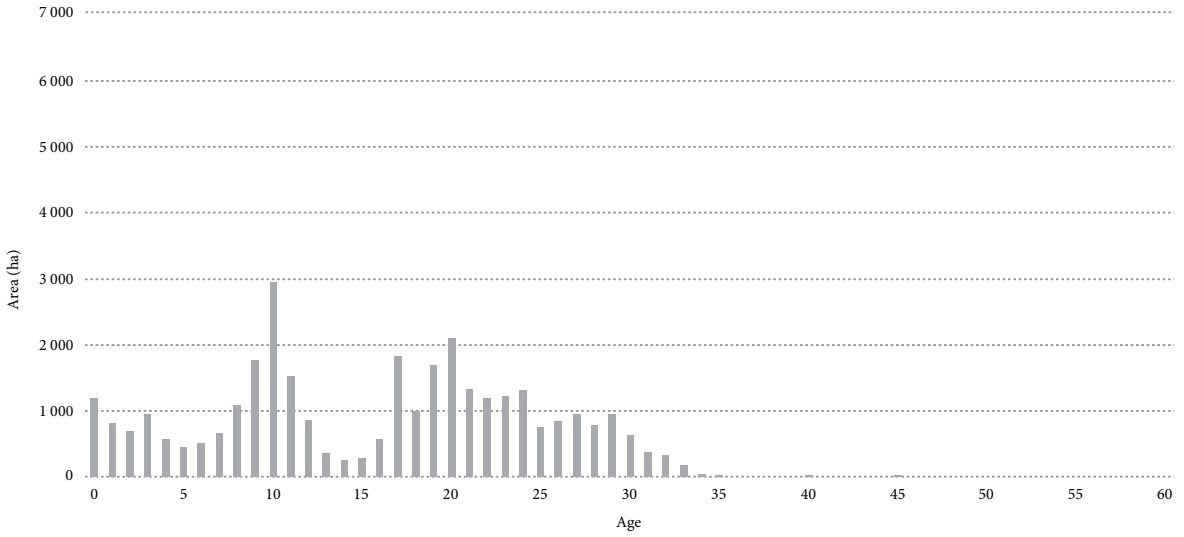
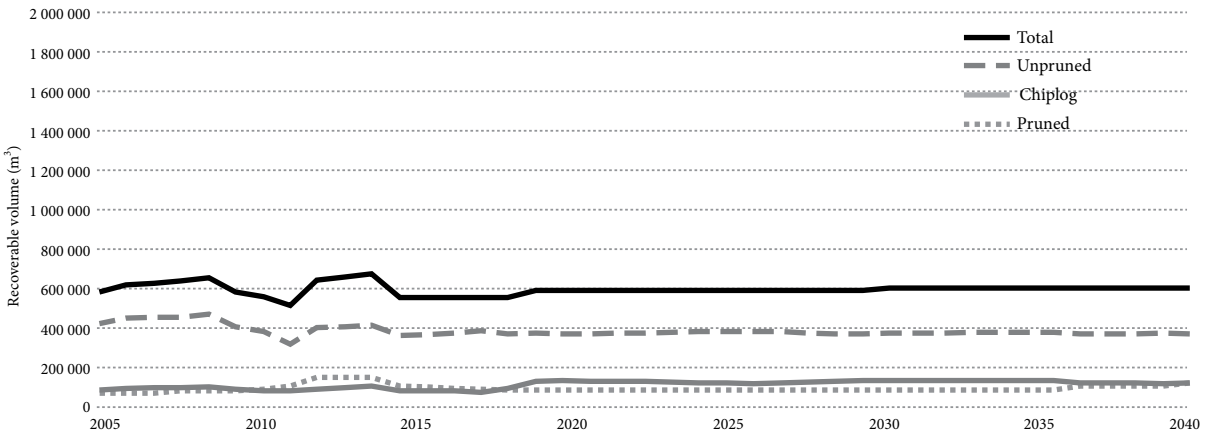


FIGURE 4.19: MARLBOROUGH RADIATA PINE AVAILABILITY UNDER SCENARIO 2 – LARGE-SCALE OWNERS



consequence of the 2527 hectares planted in 1992 (age 13 in Figure 4.20) being harvested at age 30 years. The spike in 2024 is caused by the harvest of 4748 hectares planted in 1994 (age 11 in Figure 4.20).

The spike in 2006 occurs because some area in the small-scale owners' estate is now over 30 years (see Figure 4.20). The fact that it has not already been harvested illustrates the difference between area that is potentially available for harvest and area actually being harvested. The fact that there are mature stands of radiata pine could indicate that owners have held off harvesting until log prices improve.

Volume fluctuations of the magnitude shown in Figure 4.21 would be impractical because of marketing and logistical realities.

FIGURE 4.20: AGE-CLASS DISTRIBUTION OF THE MARLBOROUGH RADIATA PINE ESTATE – SMALL-SCALE OWNERS AS AT 1 APRIL 2005

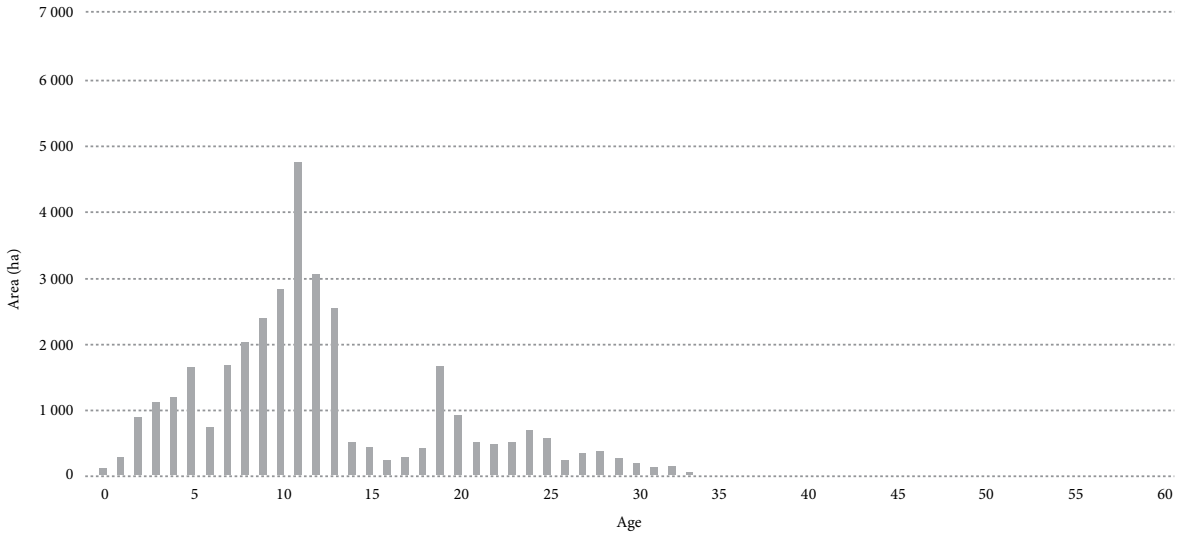
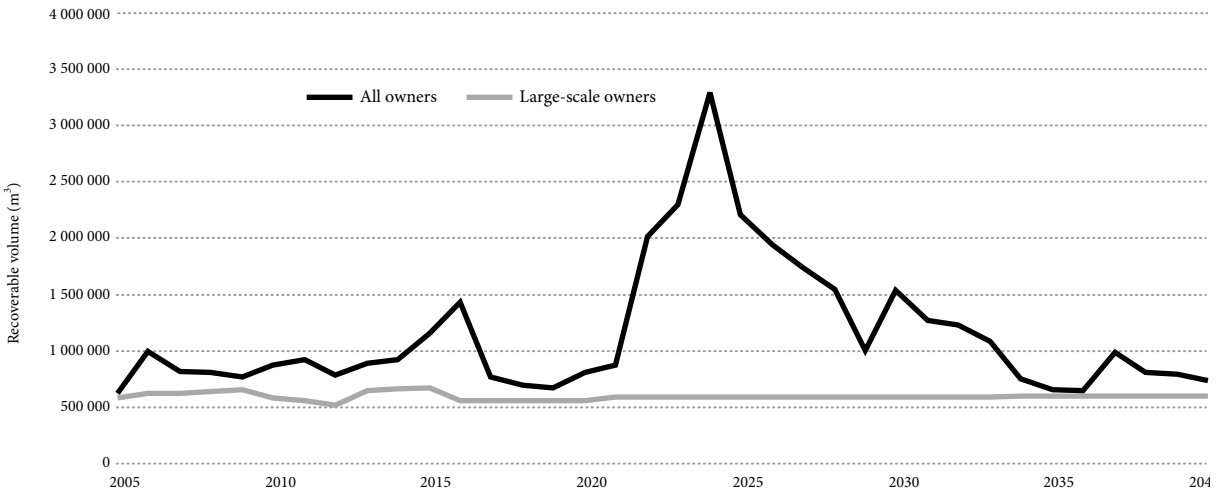


FIGURE 4.21: MARLBOROUGH RADIATA PINE AVAILABILITY UNDER SCENARIO 2



› SCENARIO 3

The third scenario is for non-declining yield (target rotation 30 years). Figure 4.22 indicates that there is the potential for the total volume (radiata pine) of the combined estate to increase to over 1 million cubic metres a year from 2010, and further increases to 1.3 million cubic metres a year from 2020.

This scenario is similar to the base case scenario adopted in the 2000 wood availability forecasts. However, the small-scale owners' estate is harvested at rotation ages that differ markedly from 30 years (Figure 4.23).

FIGURE 4.22: MARLBOROUGH RADIATA PINE AVAILABILITY UNDER SCENARIO 3

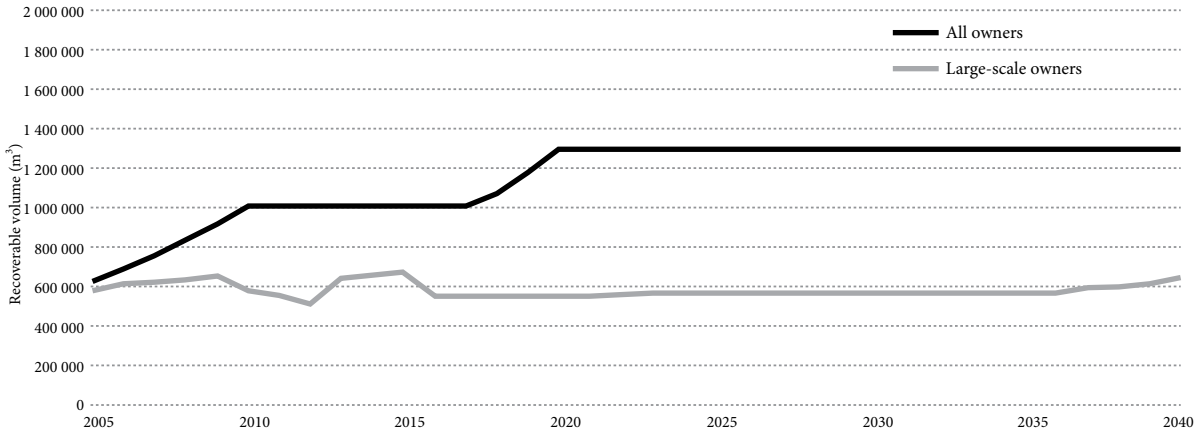
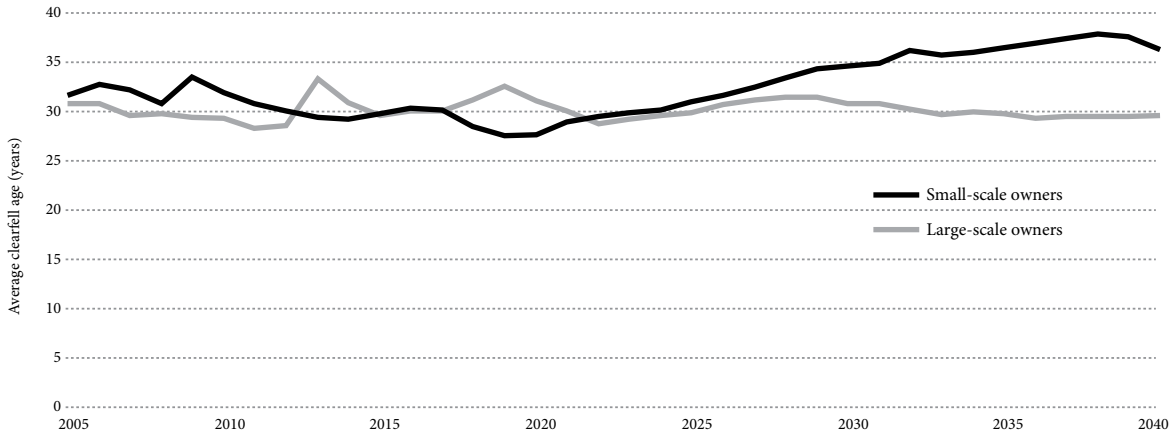


FIGURE 4.23: AVERAGE RADIATA PINE CLEARFELL AGE UNDER SCENARIO 3



› SCENARIO 4

This scenario is for spilt NDY (target rotation 30 years). It also gives a forecast wood availability of about one million cubic metres a year from 2010 (Figure 4.24). This increases to 1.5 million cubic metres a year from 2023 before reducing to 1.1 million cubic metres a year from 2034 to 2037. The main difference from Scenario 3 is that the large area of young stands in the small-scale owners' estate is assumed to be harvested over a shorter period of time. As a consequence, the average clearfell age for small-scale owners stays closer to the target of 30 years than was the case in Scenario 3 (Figure 4.25).

The total volume forecast for Scenario 4 is broken down by log grade in Figure 4.26.

FIGURE 4.24: MARLBOROUGH RADIATA PINE AVAILABILITY UNDER SCENARIO 4

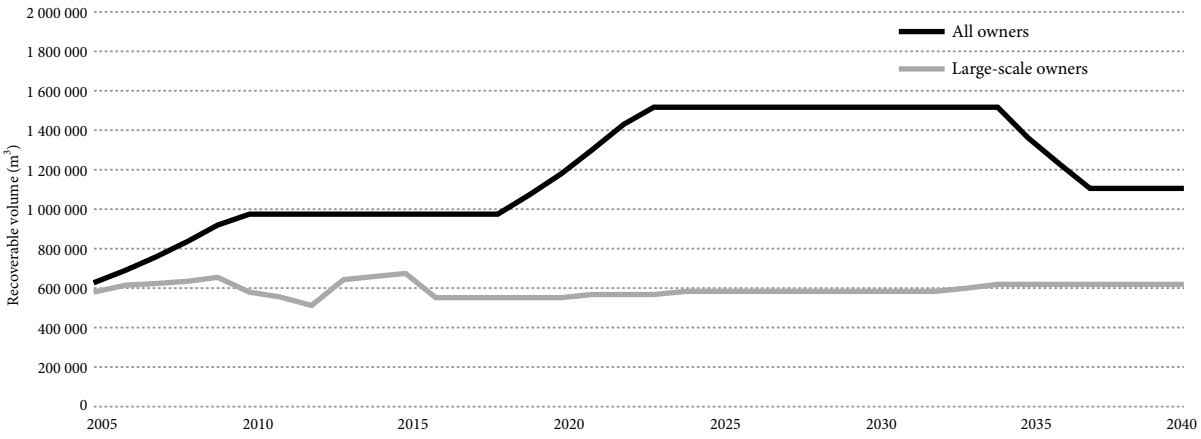


FIGURE 4.25: AVERAGE RADIATA PINE CLEARFELL AGE UNDER SCENARIO 4

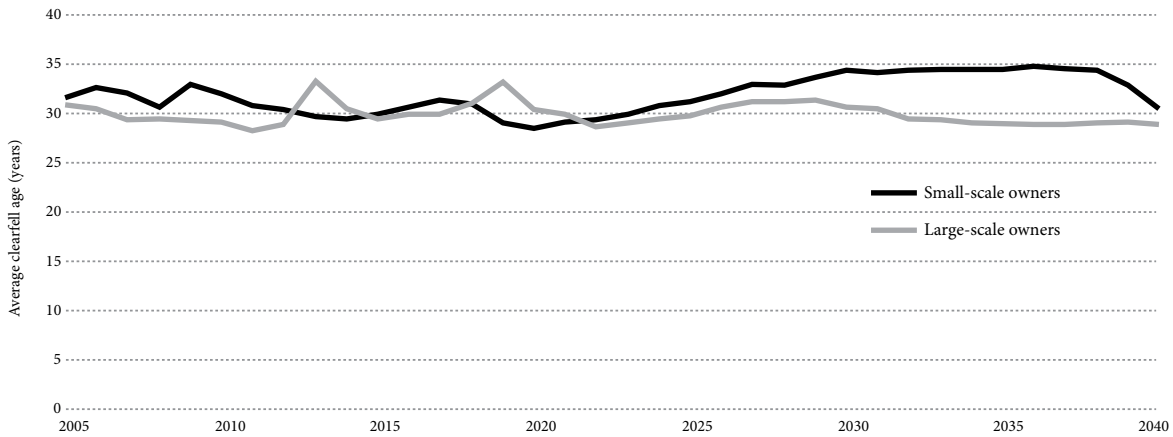
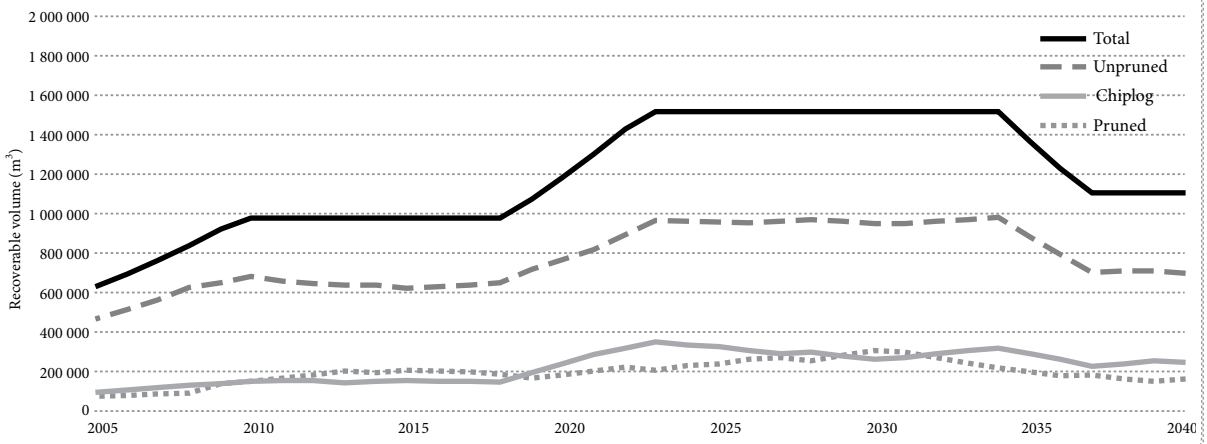


FIGURE 4.26: MARLBOROUGH RADIATA PINE AVAILABILITY UNDER SCENARIO 4 – BY LOG PRODUCT



› SCENARIO 5

Different wood availability profiles are generated if the target rotation age is changed from 30 years to either 28 or 32 years (Figure 4.27). The annual increase allowed from 2005 to 2019 has been varied in these scenarios:

› 15 percent a year for target rotation 28 years;

› 10 percent a year for target rotation 30 years;

› 5 percent a year for target rotation 32 years.

This variation was introduced in order to get separation in harvest volumes from 2006.

FIGURE 4.27: MARLBOROUGH RADIATA PINE AVAILABILITY FOR EACH TARGET ROTATION AGE UNDER SCENARIO 5

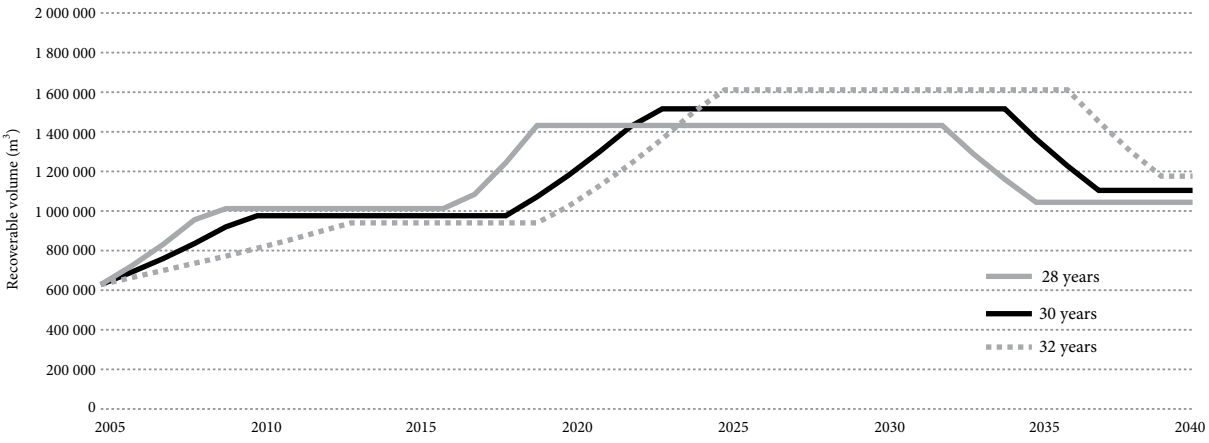
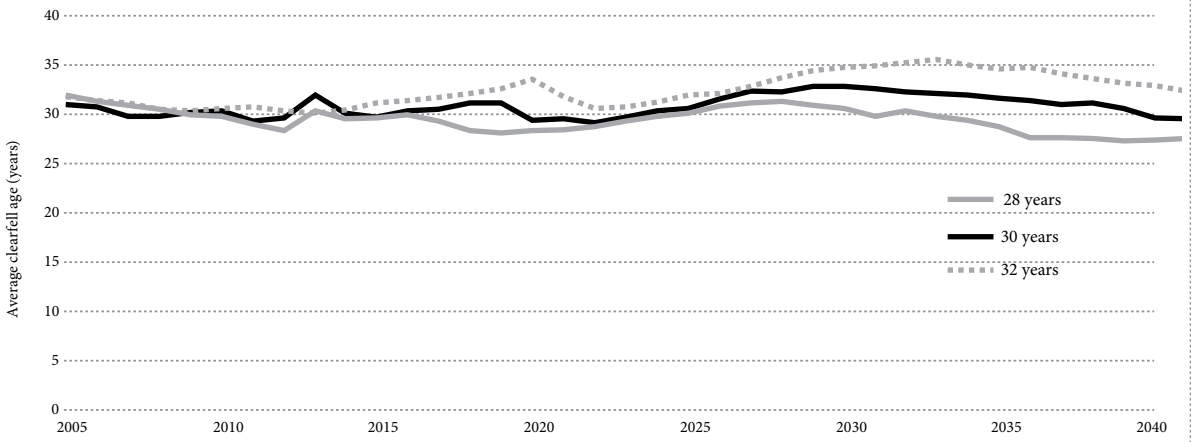


FIGURE 4.28: AVERAGE RADIATA PINE CLEARFELL AGE FOR EACH TARGET ROTATION AGE UNDER SCENARIO 5



› SCENARIOS FOR OTHER SPECIES

DOUGLAS-FIR

The Douglas-fir harvest for the large-scale owners' estate is based on intentions for 2005 to 2015. From 2015 to 2028 it is constrained to be non-declining (cannot decrease) and from 2029 there is an upper limit of 20 000 cubic metres a year.

For small-scale owners, an upper limit was placed on the Douglas-fir harvest of 5000 cubic metres a year from 2005 to 2024, and 10 000 cubic metres a year from 2025.

Figure 4.29 clearly shows how large-scale owners dominate the potential supply of this species. After 2045, the volume harvested by large-scale owners drops to zero because the scenario includes the stated intention to replant with radiata pine.

OTHER (NON-CYPRESS) SOFTWOODS

Other softwoods are harvested according to the stated intentions for 2005 to 2015. After that, total harvest volume is limited to a maximum of 30 000 cubic metres a year.

FIGURE 4.29: MARLBOROUGH DOUGLAS-FIR AVAILABILITY

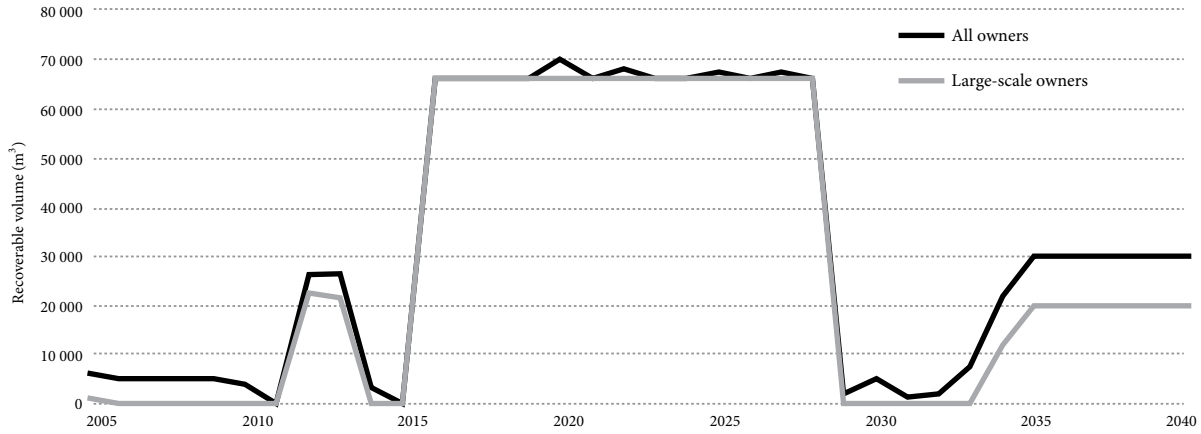
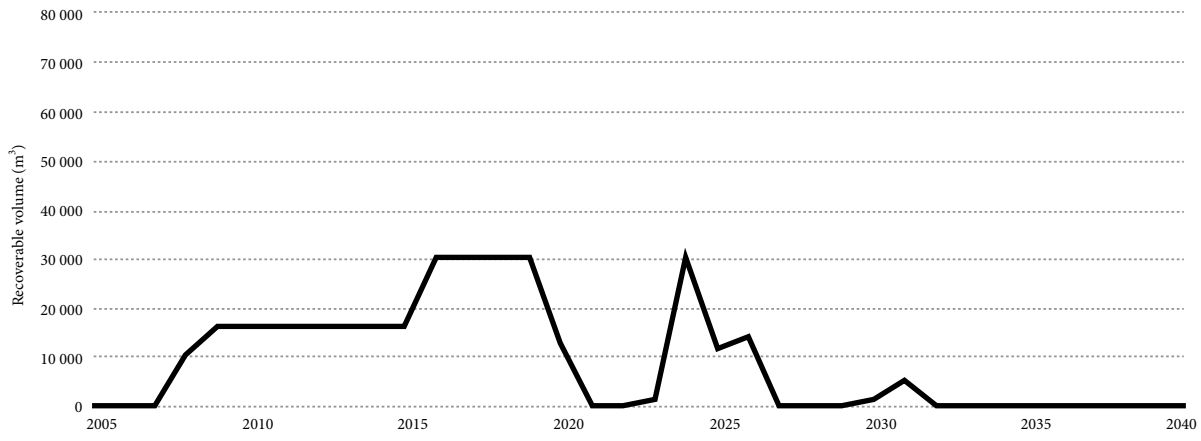


FIGURE 4.30: MARLBOROUGH OTHER (NON-CYPRESS) SOFTWOODS AVAILABILITY – LARGE-SCALE OWNERS



WOOD AVAILABILITY FORECASTS FOR THE COMBINED NELSON/MARLBOROUGH ESTATE

Combined results for Scenario 4 are presented in Figures 4.31, 4.32, and 4.33. The combined result for Scenario 5 is shown in Figure 4.34.

SCENARIO 4

This scenario is for a split NDY (target rotation 30 years). The availability of wood from large-scale owners is based on harvest intentions for 2005 to 2015. Thereafter the availability is constrained so it cannot decrease (non-declining yield constraint), with a target rotation age of 30 years. The wood availability of all owners in each region is constrained to be non-declining for the current rotation (through to 2034). Thereafter a reduction is permitted.

FIGURE 4.31: NELSON AND MARLBOROUGH COMBINED WOOD AVAILABILITY UNDER SCENARIO 4

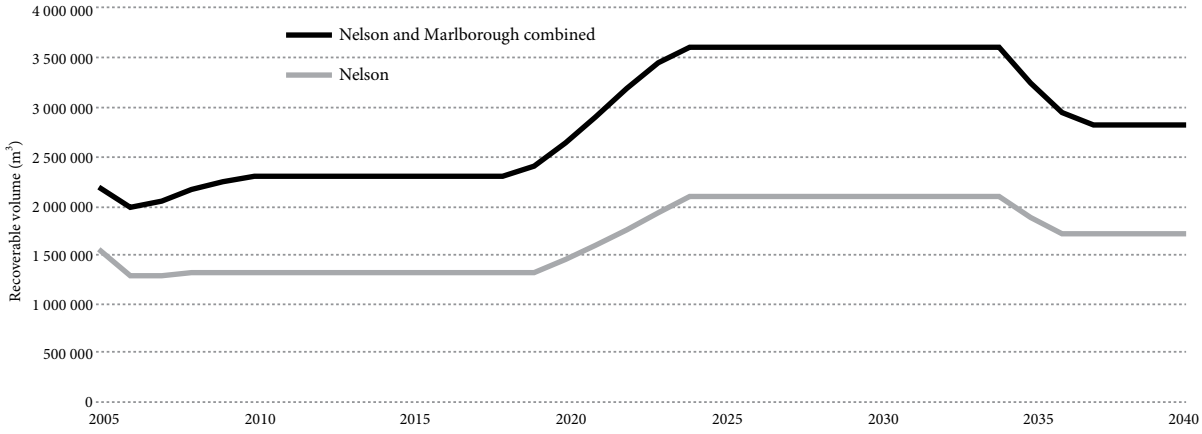


FIGURE 4.32: NELSON AND MARLBOROUGH COMBINED WOOD AVAILABILITY UNDER SCENARIO 4 – BY OWNERSHIP CATEGORY

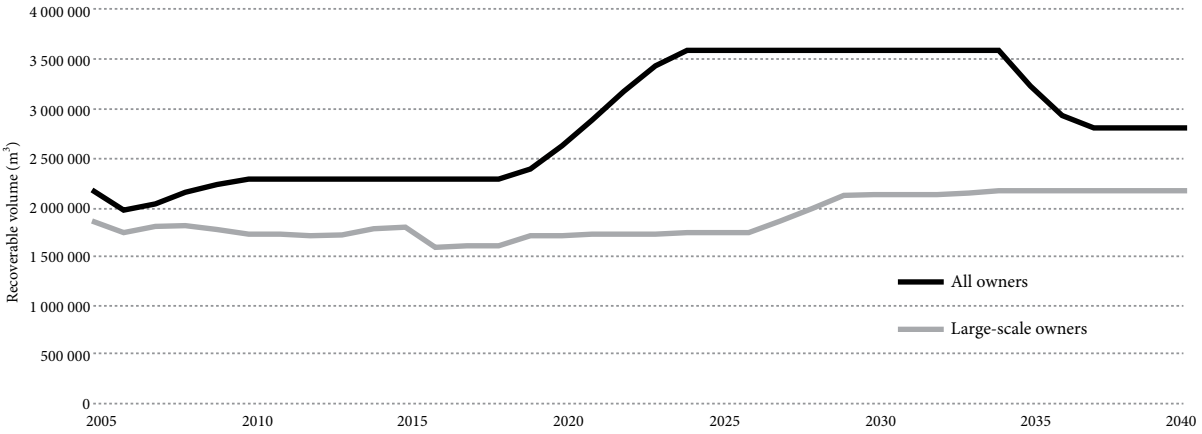
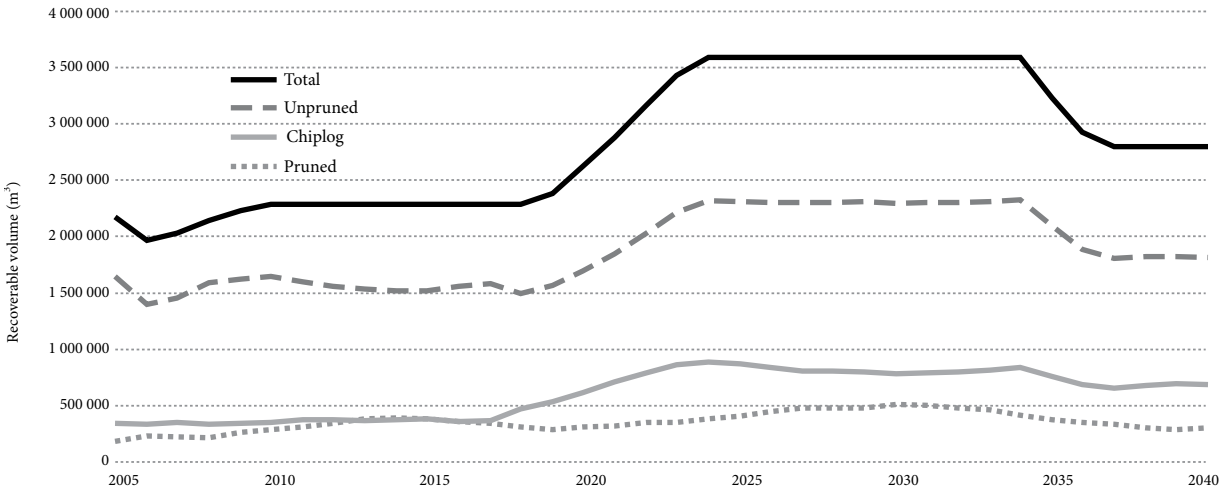


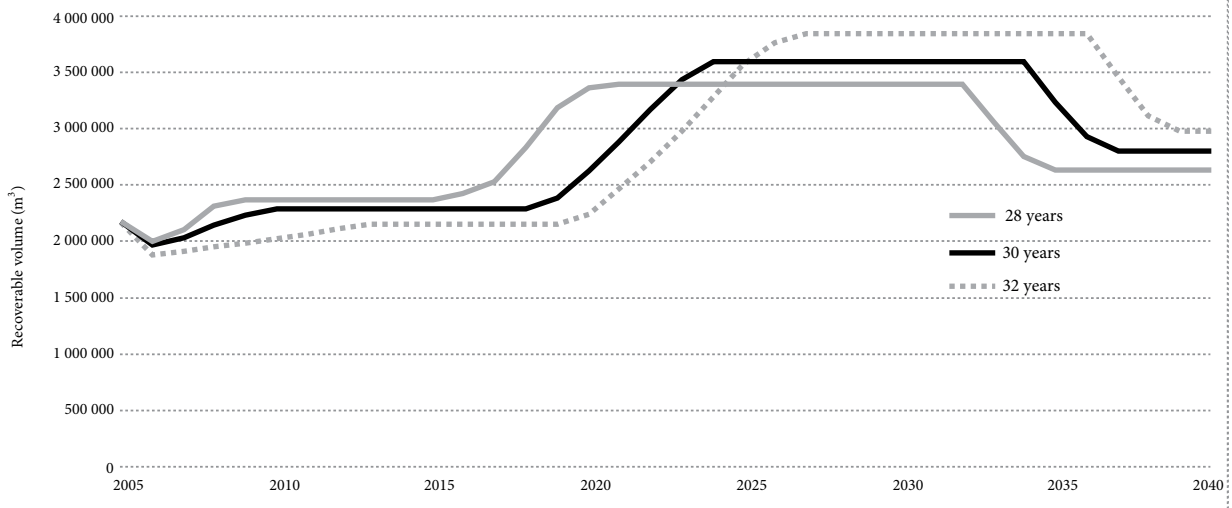
FIGURE 4.33: NELSON AND MARLBOROUGH COMBINED WOOD AVAILABILITY UNDER SCENARIO 4 – BY LOG PRODUCT



SCENARIO 5

This is similar to Scenario 4, but shows only the total availability from the combined Nelson and Marlborough estate. Target rotation ages of 28, 30 and 32 years are evaluated.

FIGURE 4.34: NELSON AND MARLBOROUGH COMBINED WOOD AVAILABILITY FOR EACH TARGET ROTATION AGE UNDER SCENARIO 5[1]



Note

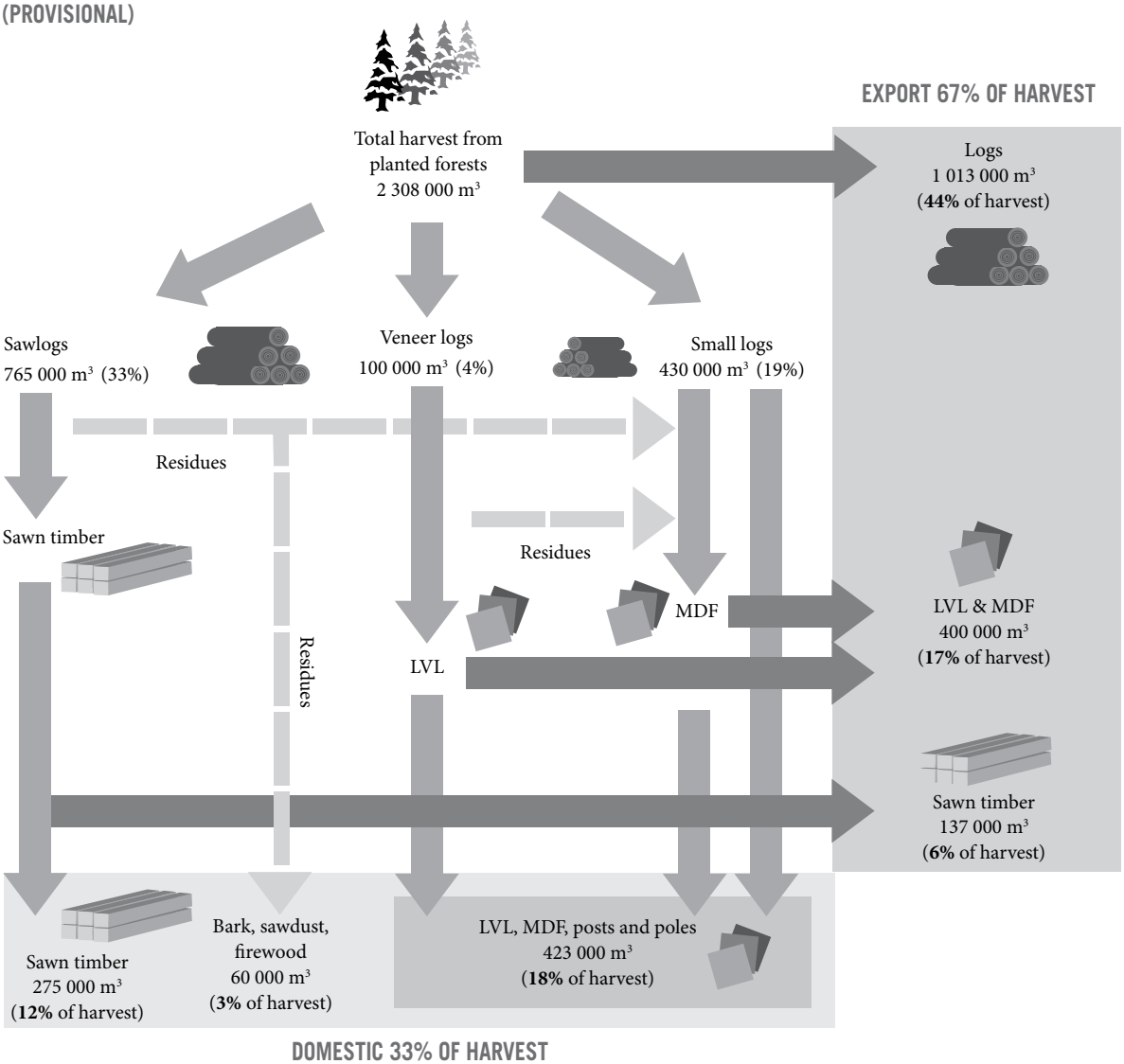
[1] Total volume from all owners is constrained to be non-declining (not allowed to decrease) from 2006 to 2034 (the current rotation only).

THE WOOD PROCESSING INDUSTRY 5

LOG FLOW IN THE NELSON/MARLBOROUGH REGION

Figure 5.1 shows the percentages of the harvest in Nelson/Marlborough which are used to derive the range of export and domestic products. Of the total 2005 harvest, 56 percent is processed into sawn timber, MDF, LVL, and posts and poles, while 44 percent is exported as logs. Sixty-seven percent of the harvest is used to produce export products and 33 percent of the harvest is used for the production of domestically consumed products. Residues are used for MDF production, garden landscaping material, and firewood. Residues also contribute significantly, as fuel, to the energy requirements of many processing plants.

FIGURE 5.1: LOG FLOW IN THE NELSON/MARLBOROUGH FOREST INDUSTRY FOR THE YEAR ENDED 31 DECEMBER 2005 (PROVISIONAL)



Note
The estimated harvest is derived from export data and forest processing data in Nelson and Marlborough. It does not include logs harvested in Nelson or Marlborough and processed on the West Coast, which are estimated to be about 50 000 cubic metres.

PRODUCTION DATA, 1996 TO 2005

SAWN TIMBER PRODUCTION

Sawn timber production between 1996 and 2005 has increased by 124 percent in Marlborough and 44 percent in Nelson. This reflects the upgrading and expansion of sawmill capacity over this 10-year period.

Detailed data on sawn timber production and exports are available at the Ministry of Agriculture and Forestry Statistics website (see Section 8 for website addresses).

SAWN TIMBER EXPORTS

Export volumes of sawn timber from the Nelson/Marlborough region have increased 47 percent over the 10-year period 1996 to 2005.

LOG EXPORTS

Log exports in the Nelson/Marlborough region have increased 68 percent over the last 10 years with a major increase in volume through Port Marlborough.

TABLE 5.1: SAWN TIMBER PRODUCTION FROM PLANTED PRODUCTION FORESTS IN NELSON/MARLBOROUGH

YEAR ENDED 31 MARCH	NELSON (M^3)	MARLBOROUGH (M^3)	TOTAL (M^3)
1996	239 350	34 180	273 530
1997	255 210	35 210	290 420
1998	291 390	39 760	331 150
1999	286 620	43 680	330 300
2000	318 640	44 680	363 320
2001	301 370	51 530	352 900
2002	299 530	56 780	356 310
2003	340 700	67 690	408 390
2004	348 090	83 800	431 890
2005	345 830	76 600	422 430

Source
Ministry of Agriculture and Forestry.

TABLE 5.2: SAWN TIMBER EXPORTS FROM NELSON AND MARLBOROUGH PORTS

YEAR ENDED 31 DECEMBER	PORT MARLBOROUGH (M^3)	PORT NELSON (M^3)	TOTAL (M^3)
1996	4 600	88 500	93 100
1997	3 800	96 200	100 000
1998	-	112 400	112 400
1999	-	78 900	78 900
2000	-	107 200	107 200
2001	-	114 900	114 900
2002	-	123 300	123 300
2003	-	113 500	113 500
2004	-	119 700	119 700
2005	-	136 900	136 900

Source
Ministry of Agriculture and Forestry.

TABLE 5.3: LOG EXPORTS FROM NELSON AND MARLBOROUGH PORTS

YEAR ENDED 31 DECEMBER	PORT MARLBOROUGH (M^3)	PORT NELSON (M^3)	TOTAL (M^3)
1996	82 700	519 500	602 200
1997	36 700	544 300	581 000
1998	47 100	336 100	383 200
1999	69 300	517 600	586 900
2000	95 500	684 100	779 600
2001	171 800	800 700	972 500
2002	279 400	646 300	925 700
2003	303 700	619 800	923 500
2004	388 800	561 400	950 200
2005	356 300	656 500	1 012 800

Source
Ministry of Agriculture and Forestry.

Detailed data on log exports is available on the Statistics page of the Ministry of Agriculture and Forestry website (see Section 8 for website addresses).

SAWMILLS AND WOOD PROCESSORS

The sawmilling industry is dominated by the Carter Holt Harvey Ltd mill at Eves Valley (owned by Rank Group Investments Ltd). There are many small mills in the region, including portable sawmills. Those with production levels above 500 cubic metres of sawn timber are listed in Table 5.4.

The total installed sawmill capacity in Nelson and Marlborough is in the order of 475 400 cubic metres of sawn timber production a year (December 2005), based on the existing shift utilisation.

CARTER HOLT HARVEY

The Eves Valley mill started up as a greenfield site in October 1985. The mill is an integrated solid wood processing unit which processes approximately 300 000 cubic metres of radiata pine sawlogs per annum and employs about 270 people.

The mill specialises in machine stress graded framing, producing both solid wood and finger-jointed products. It also produces a full range of copper chrome arsenate (CCA) treated timber products. Around 95 percent of sawmill production is dried by either high-temperature or conventional kilns. An on-site remanufacturing plant consisting of a cross-cut line and two finger jointers produces mainly framing products.

TABLE 5.4: SAWMILLS OPERATING IN NELSON AND MARLBOROUGH – YEAR ENDED DECEMBER 2005

SAWMILL	LOCATION
A. PRODUCTION LEVEL: GREATER THAN 100 000 M^3 SAWN TIMBER PER ANNUM	
Carter Holt Harvey Ltd	Eves Valley
B. PRODUCTION LEVEL: 15 001 M^3 TO 100 000 M^3 SAWN TIMBER PER ANNUM	
Flight Timbers Ltd	Blenheim
Weyerhaeuser NZ Ltd	Kaituna
South Pine (Nelson) Ltd	Stoke
Waimea Sawmillers Ltd	Tahunanui
C. PRODUCTION LEVEL: 4001 M^3 TO 15 000 M^3 SAWN TIMBER PER ANNUM	
Moutere Timbers Ltd	Harakeke
Prime Pine Ltd	Riwaka
Prime Pine Kaikoura Ltd	Kaikoura
Southwood Milling	Motueka
D. PRODUCTION LEVEL: 500 M^3 TO 4000 M^3 SAWN TIMBER PER ANNUM	
Gibson B R Ltd	Nelson
Hunter Laminates	Richmond
Rapaura Timber Ltd	Blenheim
Russ Sawmilling	Appleby
Sixtus R	Golden Bay
Taylor Timbers	Hope

Source
Ministry of Agriculture and Forestry.

Most of the mill's production is sold into the South Island housing market. Lower-grade products are sold predominantly into Asia.

› SOUTH PINE (NELSON) LTD

South Pine is a wholly owned subsidiary of the McAlpine group of companies with sawmilling and timber processing interests in Canterbury and Bay of Plenty.

The South Pine sawmill produces 65 000 cubic metres of sawn timber and 35 000 tonnes of chips annually. Recent major upgrades, including scanning, optimising sawing technology, and mechanical sorting and stacking systems, have given the mill the potential to significantly increase production when required.

South Pine's processing facilities include high-performance planing and dressing machines, CCA and boron treatment, 75 000 cubic metres of kiln drying capacity, and a cut-to-length factory. South Pine produces a diverse range of products from predominantly framing-grade logs, and small volumes of pruned logs are also cut for specific markets.

Fifty percent of product is exported to Australia and throughout Asia. The other half supplies a wide range of New Zealand customers.

› WAIMEA SAWMILLERS LTD

Waimea Sawmillers Ltd is a subsidiary of Gibbons Holdings Ltd, a privately owned group of companies which also has interests in construction, property and forestry.

The sawmill and processing complex is situated in Tahunanui, Nelson. It has the capacity to produce 48 000 cubic metres of green-sawn Douglas-fir and radiata pine timber, and 30 000 tonnes of chips per year, from a log input of approximately 100 000 cubic metres. Waimea Sawmillers Ltd is the major producer of Douglas-fir timber in Nelson/Marlborough.

Processing equipment includes four accelerated conventional-temperature (90°C to 110°C) kilns, a preservative treatment plant, an in-line boron treatment plant, high-speed moulding machines, and a remanufacturing plant producing finger-jointed and laminated material.

The company wholesales timber mainly on the domestic market and exports the balance to Australia, Asia and Pacific Rim markets.

› WEYERHAEUSER NZ LTD

Production at the Weyerhaeuser mill at Kaituna, near Blenheim, is focused on pruned logs from forests in Nelson and Marlborough. Over the last six years, the mill has doubled log input to 75 000 cubic metres a year, producing 41 500 cubic metres of sawn timber a year.

The mill exports most of its products, including mouldings and shop grade products, to the United States; F7-grade construction products go to Australia, appearance-grade to Asia, and the rest are sold on the domestic market.

› FLIGHT TIMBERS LTD

The primary business of Flight Timbers Ltd is radiata pine: milling, processing, wholesaling and exporting products. Its new mill in Blenheim started processing in 2005. It can produce 35 000 to 55 000 cubic metres of sawn timber a year on a single-shift basis. Emphasis is on cutting pruned and small-knot logs, complemented by kiln drying, machining, finger jointing, laminating and timber treatment with CCA and light oil solvent preservative (LOSP). Products are exported to Australia, Asia and Europe, and also sold in New Zealand.

› GOLDPINE

Goldpine is a family-owned business specialising in outdoor timber. Goldpine manufactures all of its products from a main production unit located 40 minutes south of Richmond in Golden Downs Forest. It has grown into New Zealand's largest producer of posts and poles using state of the art equipment and technology. It can produce more than 800 poles per day, from 3.6 metres to 15.4 metres long.

› NELSON PINE INDUSTRIES

Nelson Pine Industries was a joint venture established between Odlins Ltd, Newmans Group Ltd, and Sumitomo Forestry Ltd of Japan, to build an MDF plant at Richmond. Since January 1993, the company has been wholly owned by Sumitomo Forestry Ltd.

The plant began operation in May 1986 using a continuous press that enabled the production of a range of board thicknesses from 2.5 to 32 millimetres. A second line was installed in April 1991 and a third in 1997, making Nelson Pine Industries the world's largest single-site producer of MDF. About 85 percent of the production is exported; the main markets are Japan, China, the United States and South East Asia.

In 2002, Nelson Pine Industries commissioned its $NZ80 million LVL plant – one of only four LVL plants in New Zealand. LVL is a solid wood substitute used in furniture manufacture and building construction. The plant has the capacity to produce up to 80 000 cubic metres of product a year. Ninety percent is exported, mainly to Australia and the United States.

The Nelson Pine Industries manufacturing plants have a capacity to use about one million cubic metres of radiata pine a year, which includes wood chips purchased from sawmills in Nelson and Marlborough. The total output capacity is about 500 000 cubic metres of MDF and LVL a year.

INFRASTRUCTURE 6

PORTS

PORT NELSON

Port Nelson lies at the head of Tasman Bay, in the shelter of Nelson Haven, a broad tidal expanse bounded by the Boulder Bank. The port is dredged to a guaranteed minimum depth of 9.8 metres, and the port facilities are situated on flat reclaimed land to the south of the harbour berths. The port is jointly owned by Nelson City Council and Tasman District Council, with each local authority holding 50 percent of the shares.

Forestry remains Port Nelson's major cargo, with the export of 599 000 tonnes of logs and 444 000 tonnes of MDF, timber and LVL. This equates to 40 percent of the throughput volume in the year ending June 2005. Log export volumes are expected to be flat over the next 10 years, while the volumes of processed forest products are projected by the port company to increase by 31 percent to 583 000 tonnes. In 2005, 59 percent of log exports went to Korea, 27 percent to Japan, and the bulk of the remainder to China.

PORT MARLBOROUGH

Port Marlborough New Zealand Ltd manages shipping activities within Picton Harbour and Shakespeare Bay, and the barge unloading facility at Havelock.

The deep-water export port at Shakespeare Bay has a 200-metre wharf with a depth alongside of 15.3 metres at low tide. The Shakespeare Bay facility is currently New Zealand's deepest export berth. The quayside storage of 10 hectares of flat, open land adjacent to the berth can be accessed by road, rail and cargo shipping.

At present only logs are exported from this facility, with all sawn timber exports going through Port Nelson, approximately 1.5 hours by road from Blenheim. Sawn timber exports and possibly chip export facilities are potential developments for the port in the future.

In 2005, 71 percent of log exports went to Korea, and 29 percent to India through the newly established log export business, Zindia Ltd. This company has created a valuable outlet for larger industrial-grade logs.

Tug and barge services transport logs from forests in the Marlborough Sounds to Picton and Havelock ports for further transport to local mills for processing or for export as logs. On a few occasions logs have been barged to the North Island from the outer Marlborough Sounds.

ROAD TRANSPORT

Marlborough and Nelson forests are well serviced by state highway and local authority roads. The forestry industry has also established a very extensive forest roading infrastructure.

The funding of local road upgrades at time of harvest is an issue that the industry and the local roading authorities are continuing to work through. The Blenheim office of Transit New Zealand (called Marlborough Roads) is contracted to manage state highways and local roads within Marlborough. They have been successful in obtaining "Alternatives to Road" (ATR) funding from central government for some of the log barging operations in the Marlborough Sounds. This has helped reduce the impact on the Port Underwood road.

RAIL TRANSPORT

The main trunk line passes through the eastern part of the region, linking Picton with the West Coast through Christchurch, and with the North Island by the interisland ferry service. There is no rail link in Nelson.

Spring Creek, 22 kilometres south of Picton, is the loading (and pricing) point for forest produce leaving the region by rail. Forest produce carried by rail is mostly sawn timber, with smaller quantities of MDF mostly for North Island markets. There is potential to rail logs between Marlborough and Canterbury.

ENERGY

At present wood residues generate about 4.5 per cent of New Zealand's total primary energy supply. Combustion (burning) is the most common method used in New Zealand to generate energy from wood, with an estimated 340 gigawatt hours (GWh) of electricity and 8,700 GWh of heat produced from wood residues each year.

Wood residues provide 50 to 55 percent of the New Zealand forest industry's energy consumption. Electricity provides about 25 percent, and the balance comes from gas, coal and oil.

Any new processing development in Marlborough, or any significant expansion of existing processing plants, will need to consider the availability of electricity and other energy sources, as well as the transmission line capacity from the national grid. A large wood processing complex could use about 20 megawatts (MW).

In 2004 the the maximum demand for electricity from all users in the Nelson/Marlborough region was 190 MW. This is projected to increase to 256 MW by 2015. Installed generation capacity in the region is low (46 MW) compared with demand. No new generation capacity has been committed in this period, although several possibilities have been discussed.

OPPORTUNITIES AND CONSTRAINTS

7

OPPORTUNITIES

INCREASES IN WOOD AVAILABILITY

Wood availability forecasts indicate that over the next 10 years the harvest in Marlborough has the potential to increase from the 2005 total of just over 630 000 cubic metres to between 900 000 and one million cubic metres. The actual size of the increase will depend on the harvesting decisions of the many small-scale forest growers.

For Nelson, the availability forecasts indicate little change over the next 10 years, with harvest levels in the range of 1.3 to 1.4 million cubic metres. In this region, yearly fluctuations in harvest mainly reflect the intentions of the large forest growers. The wood availability from the small forests is fairly constant.

The Nelson/Marlborough region has the potential to increase the annual harvest from 2.3 million cubic metres in 2005 to about 3.2 to 3.5 million cubic metres towards 2020. The higher level of harvest, however, would only be sustained for about 12 years. The increases in wood availability will mainly depend on the harvesting decisions of the many small-scale forest growers and will happen earlier in Marlborough than Nelson. There are more than 700 small-scale forest owners in Nelson/Marlborough.

The increase in wood availability presents an opportunity for the industry to expand. However, it is important to recognise that some existing processing plants already have capacity to increase production (for example, by employing an extra shift). This potential increase is estimated to be in the order of 500 000 cubic metres above the actual 2005 processing level.

An increase in the level of processing in the region could also come from processing some of the million cubic metres of logs currently exported; and from the potential increase in wood availability of a further million cubic metres.

NEW PROCESSING OPPORTUNITIES

Taking into account the capacity of some existing processing plants to increase production, and the potential expansion of some processing plants, there still appears to be potential to develop an additional large processing plant in the region. A log input of 300 000 cubic metres could be achieved even if log exports stay at the 2005 level.

In the shorter term, the potential increase in harvest in Marlborough will produce more chip-wood material. The desire to improve returns for this material will make the development of a chip export operation from the Port of Picton a likely consideration.

INNOVATIVE PEOPLE

Some of the biggest gains in the forest industry in Nelson/Marlborough have come about through the vision and actions of innovative people. Such developments include:

- a world-class MDF plant;
- the development of GoldenEdge Liteboard which is 20 percent lighter than regular MDF;
- the establishment of Zindia to export logs from Marlborough direct to Indian sawmillers;
- the development of New Zealand's largest producer of posts and poles;
- the establishment of a resin plant (required for MDF production), next to the Nelson Pine Industries site.

It is likely that future opportunities will come from innovative people in the forest industry making bold investment decisions and looking for product developments that differentiate New Zealand radiata pine from competitor's products.

INDUSTRY STRUCTURE

Large-scale forest owners with over 54 percent of the Nelson/Marlborough forest area are also involved in processing and exporting. This vertical integration has provided a degree of resilience and stability to the forest industry.

The Nelson/Marlborough forest industry has a diversified processing capability, with 56 percent of the harvest processed into timber, MDF, LVL, and posts and poles. However, the overall level of processing is lower than the New Zealand average of 72 percent of the log harvest. So there is still considerable potential for growth in the wood processing sector.

› BIOFUELS POTENTIAL

Energy production from unused wood fibre has been identified as a potential opportunity for the forest industry. Under the Forest Industry Development Agenda (FIDA), the government has made $2.8 million available to fund bioenergy programmes across New Zealand. Overseas interests have also recently made inquiries about the availability of biofuels in the Nelson/Marlborough region. Higher energy costs may make this opportunity economically viable.

› RAISED INDUSTRY PROFILE

The Marlborough Forest Industry Association has lifted the profile of the forest industry through media articles, a revamped website, sponsorship and field days. In Nelson, the industry is a major sponsor of sporting, cultural and industry events; has been active in providing student scholarships; and welcomes visits to forest operations and processing plants.

The involvement of local government in forest ownership and port shareholding has raised the wider public's awareness of the economic, social and environmental benefits of forestry to the community.

However, there is no collective body in Nelson to promote forestry and represent the industry on local issues. A more coordinated approach would further lift the industry's profile throughout the value chain. It could also assist the local industry associations such as the Institute of Forestry, and the Forest Industry Engineering Association, which at times struggle to attract membership and attendance at meetings.

The possibility of establishing a collective body in Nelson has been discussed by industry representatives over the last 10 years and has lacked support, but the time may be right to reconsider it.

› POSITIVE ATTRIBUTES OF THE REGION

The Nelson/Marlborough forest industry has many attributes that could help it develop over the next 15 to 20 years as wood availability increases. The advantages of the region for the forest industry include:

- the closeness of the forest resource to processing facilities and ports;
- a forest resource that has fairly uniform characteristics;
- a mature Douglas-fir resource;
- a mature pruned radiata pine resource (with about 10 000 hectares older than 25 years);
- the strength and stiffness of locally-grown radiata pine;
- a reasonable level of infrastructure (ports, roads, engineering);
- a diversified processing industry with potential to expand;
- a well-managed forest resource;
- a highly skilled workforce experienced in cable logging;
- land available for expansion at some existing processing sites;
- the potential to increase the level of processing and the area of forest;
- an absence of major land-use change pressures, compared with some other regions.

CONSTRAINTS

The likely key constraints on the development of the forest industry in Nelson and Marlborough over the next 20 years are described below.

NATIONAL CONSTRAINTS

Several national-level constraints will affect the Nelson/Marlborough region. These include, among others:

- requirements under the Resource Management Act (RMA);
- compliance costs;
- skill shortages;
- road and sea transport costs;
- the fluctuation of the New Zealand dollar;
- the fragmentation of the industry;
- New Zealand's distance from its markets;
- increased competition from low-cost producers;
- non-tariff barriers;
- market pressure from wood substitutes.

PROCESSING EXPANSION CONSTRAINTS

Increased wood availability will not automatically lead to new processing capacity. Timber companies will establish new processing facilities only if their product ranges can compete in the international market. Will the products be any different from those produced by New Zealand's competitors? Economies of scale, increased wood processing efficiency, the use of innovative technology, improved productivity, and reduced costs are all important factors in competitiveness, as well as the type of product produced.

Attempts to zone land for forest processing, and the establishment of new greenfield facilities have often met with public resistance. This resistance has encouraged timber companies to expand existing plants rather than build new facilities.

CHANGES IN THE LOCAL INDUSTRY STRUCTURE

In the past the large forest owners and processors have provided important leadership for the forest industry. If forest sales and change of ownership result in more fragmentation of the forest industry it is likely to weaken the leadership and profile of the forest industry at a local level.

The Nelson/Marlborough forest industry could suffer some short-term uncertainty with the unknown future ownership of the Weyerhaeuser Joint Venture forests and sawmill, and the potential sale of Nelson's Carter Holt Harvey forests. These two companies own 50 percent of the forest resource and also have significant sawmilling capability. The new owners' intentions will influence the development of the industry in the region.

NEED FOR INFRASTRUCTURE DEVELOPMENT

The increase in wood availability will require more infrastructure development. An increase in harvest of 300 000 cubic metres would increase the number of logging-truck loads by about 40 a day. In Marlborough, some of this volume will be transported by barge. The increase in wood availability in Marlborough will come mostly from small-scale forest growers. The dispersed and more fragmented nature of this forest resource will have an impact on transport infrastructure.

Consideration of energy availability and supply in Marlborough needs to be part of any major processing expansion proposal. The 2005–2015 Asset Management Plans for Marlborough Lines does not include any allowance for potential increase in electricity supply. Any increase in energy demand for proposed new or expanded processing plants will need to be identified well in advance of the requirement.

Increased forest harvest volumes could create a need for covered storage for processed forest products at the Port

of Picton. At present all sawn timber is exported through Port Nelson. The storage areas for logs and processed forest products at Port Nelson are to some extent limited by the topography.

› REQUIREMENTS OF THE RESOURCE MANAGEMENT ACT

The detailed requirements for forest growing and processing under the Nelson/Marlborough Resource Management Plans can be obtained from the councils.The main points to note are as follows.

- Commercial forestry is a restricted discretionary activity in the Marlborough Sounds.
- In the Tasman District there are constraints on forestry in the Land Disturbance Area 2 which encompasses the Separation Point granite terrain.
- The planting and harvesting of production forests near rivers and the coast are governed by riparian zones and coastal marine areas which introduce constraints.
- Harvesting activity in most of Nelson/Marlborough is a permitted activity subject to constraints, such as permits for substantial earthworks and stream crossings.

Major companies in the region have actively met the challenges of the RMA by developing Best Management Practices, certification of their operations (e.g. ISO 14001) and good relationships with the local authorities.

Getting RMA approval for new processing facilities is often a costly and uncertain process which can take years. In some cases this cost and uncertainty has encouraged forest companies to expand existing plants instead of building new ones.

Resource Management Act issues that could arise in the Nelson/Marlborough forest industry in the future include:

- additional processing sites needing resource consents;
- pressure on processing sites to meet national air quality standards;
- the impact of forests on water availability;
- boundaries with rural lifestyle subdivisions providing a potential source of objectors to resource consent applications;
- the public's negative image of forestry driving objections to resource consent applications;
- fumigation requirements for export forest products;
- the impact of discharges to water from forestry activities on fresh and marine water quality.

The forest industry can help the RMA process. The Resource Management Plans for Nelson/Marlborough fall due for 10-year reviews over the next four to five years. This will provide an opportunity to ensure that potential wood processing initiatives are appropriately accommodated in these plans, and to challenge areas of concern in the existing plans.

The Marlborough Forest Industry Association consults with the local authorities and fronts for the industry in Marlborough. In Nelson there is no such local forest industry group carrying out this important role. This lack might act as a constraint.

› SHORTAGE OF SKILLED LABOUR

A training-needs analysis undertaken in 2003/04 by Forme Consultancy identified the shortage of skilled labour as "a factor having the most significant impact on future employment in the industry". It also "accepted that a poor industry image along with the need for better retention strategies and more targeted training are other factors that contribute to the shortage of skilled labour in the forest industry".

The Nelson/Marlborough Institute of Technology stopped offering the National Diploma in Forestry in 2002, because of low enrolment, and the forest harvesting course in 2003. Forestry training is now undertaken through the Forest Industries Training Education Council

(FITEC) programmes. The local forest industry is very supportive of the FITEC on-the-job training programmes, and in recent years forestry jobs have attracted people from other industries as well as school leavers.

Currently the workforce is being maintained in line with the steady harvest. However, there is doubt as to whether additional skilled workers will be found when the harvest increases in Marlborough and as some of the older workers leave the industry. There is also doubt about whether the current training structure will be able to serve the industry through these changes.

CONCLUDING COMMENTS

The forest industry in the Nelson/Marlborough region faces both opportunities and challenges over the next few decades. The region has many positive features, and wood availability forecasts show an increasing harvest over the next harvest cycle. The challenges will be greatest in Marlborough, where the industry has less wood processing infrastructure and an increasing level of wood flow from the large numbers of small-scale forest holdings. The industry here, and in many areas in New Zealand, needs to produce differentiated forest products that can sucessfully compete in international markets. Innovative people and a raised industry profile will be important ingredients for a productive future.

8

WEBSITES

FOR MORE INFORMATION

MINISTRY OF AGRICULTURE AND FORESTRY

www.maf.govt.nz

MINISTRY OF AGRICULTURE AND FORESTRY – FORESTRY STATISTICS

www.maf.govt.nz/statistics/primaryindustries/forestry/index.htm

STATISTICS NEW ZEALAND

www.stats.govt.nz

NELSON PINE INDUSTRIES

www.nelsonpine.co.nz

GOLDPINE

www.goldpine.co.nz

MARLBOROUGH FOREST INDUSTRY ASSOCIATION

www.marlboroughforestry.org.nz

PORT NELSON

www.portnelson.co.nz

PORT MARLBOROUGH

www.portmarlborough.co.nz

APPENDIX A

NELSON HARVEST INTENTIONS SURVEY RESULTS, LARGE-SCALE OWNERS (NELSON CITY AND TASMAN DISTRICT)

	ACTUAL HARVEST 2004	EXPECTED HARVEST 2005	HARVEST INTENTIONS FOR NEXT 10 YEARS									
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
RADIATA PINE												
Pruned (m^3)	99 816	98 229	112 719	126 128	132 751	129 361	123 688	118 914	160 055	154 081	161 555	159 855
Unpruned (m^3)	1 021 708	990 271	817 490	847 925	832 967	776 100	817 030	847 990	837 340	747 828	780 997	781 397
Pulp (m^3)	219 492	186 625	194 243	206 103	208 582	206 284	200 270	194 936	198 683	172 459	180 798	180 798
Total (m^3)	**1 341 016**	**1 275 124**	**1 124 452**	**1 180 156**	**1 174 300**	**1 111 745**	**1 140 988**	**1 161 840**	**1 196 078**	**1 074 368**	**1 123 350**	**1 123 050**
Area radiata (ha)	**2 614**	**2 376**	**1 951**	**2 246**	**2 304**	**2 036**	**2 171**	**2 160**	**2 221**	**1 938**	**2 013**	**2 009**
DOUGLAS-FIR												
Unpruned (m^3)	89 291	85 650	142 061	117 847	117 033	114 564	105 640	102 297	84 778	111 755	125 623	99 307
Pulp (m^3)	16 934	21 350	19 130	11 739	11 343	17 582	14 298	17 622	12 560	16 915	24 050	13 391
Total (m^3)	**106 225**	**107 000**	**161 191**	**129 586**	**128 376**	**132 146**	**119 938**	**119 919**	**97 338**	**128 670**	**149 673**	**112 698**
Area Douglas-fir (ha)	**183**	**213**	**362**	**239**	**234**	**245**	**215**	**234**	**174**	**235**	**265**	**189**
OTHER SOFTWOODS												
Pruned (m^3)	0	0	2 523	3 992	1 706	2 055	0	0	0	0	0	0
Unpruned (m^3)	2 439	4 750	27 454	10 627	7 396	29 693	18 703	16 159	50 734	0	54 600	54 600
Pulp (m^3)	3 470	3 400	9 795	3 253	4 204	18 523	6 862	13 157	38 398	0	36 155	36 155
Total (m^3)	**5 909**	**8 150**	**39 772**	**17 872**	**13 306**	**50 271**	**25 565**	**29 316**	**89 132**	**0**	**90 755**	**90 755**
Area other softwoods (ha)	**0**	**0**	**61**	**49**	**56**	**113**	**60**	**79**	**150**	**0**	**107**	**107**
OTHER HARDWOODS												
Pruned (m^3)	0	0	0	0	0	0	0	0	0	0	0	0
Unpruned (m^3)	0	0	0	0	0	0	0	0	0	0	0	0
Pulp (m^3)	0	0	0	0	0	0	0	0	0	0	0	0
Total (m^3)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Area other hardwoods (ha)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL VOLUME ALL SPECIES (M^3)	**1 453 150**	**1 390 274**	**1 325 415**	**1 327 614**	**1 315 982**	**1 294 162**	**1 286 491**	**1 311 075**	**1 382 548**	**1 203 038**	**1 363 778**	**1 326 503**

TARGET CLEARFELL AGE (VOLUME WEIGHTED AVERAGE)

Radiata pine 29 years

Douglas-fir 37 years

Other softwoods 29 years

APPENDIX B

MARLBOROUGH HARVEST INTENTIONS SURVEY RESULTS, LARGE-SCALE OWNERS (MARLBOROUGH AND KAIKOURA DISTRICTS)

	ACTUAL HARVEST 2004	EXPECTED HARVEST 2005	HARVEST INTENTIONS FOR NEXT 10 YEARS									
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
RADIATA PINE												
Pruned (m^3)	58 005	75 896	71 792	66 934	83 100	86 484	82 543	94 296	110 676	153 667	150 468	172 392
Unpruned (m^3)	378 422	420 146	427 789	413 555	409 598	412 389	350 825	332 526	284 818	350 599	362 412	445 067
Pulp (m^3)	65 591	88 154	85 550	76 025	75 950	88 281	80 677	63 496	49 967	71 032	77 472	92 047
Total (m^3)	**502 018**	**584 197**	**585 131**	**556 514**	**568 648**	**587 154**	**514 045**	**490 318**	**445 461**	**575 298**	**590 352**	**709 506**
Area radiata (ha)	**1 071**	**1 137**	**1 071**	**1 103**	**1 119**	**1 110**	**1 002**	**962**	**856**	**1 121**	**1 141**	**1 331**
DOUGLAS-FIR												
Unpruned (m^3)	0	512	0	0	0	0	0	0	19 692	18 811	0	0
Pulp (m^3)	0	705	0	0	0	0	0	0	2 805	2 697	0	0
Total (m^3)	**0**	**1 217**	**0**	**0**	**0**	**0**	**0**	**0**	**22 497**	**21 508**	**0**	**0**
Area Douglas-fir (ha)	**0**	**not given**	**0**	**0**	**0**	**0**	**0**	**0**	**38**	**32**	**0**	**0**
OTHER SOFTWOODS												
Pruned (m^3)	0	0	0	0	1 628	0	0	0	0	0	0	0
Unpruned (m^3)	0	0	0	0	7 007	0	0	0	13 164	57 644	0	0
Pulp (m^3)	0	0	0	0	1 540	0	0	0	6 139	34 978	0	0
Total (m^3)	**0**	**0**	**0**	**0**	**10 175**	**0**	**0**	**0**	**19 303**	**92 622**	**0**	**0**
Area other softwoods (ha)	**0**	**0**	**0**	**0**	**26**	**0**	**0**	**0**	**22**	**101**	**0**	**0**
OTHER HARDWOODS												
Pruned (m^3)	0	0	0	0	0	0	0	0	0	0	0	0
Unpruned (m^3)	0	0	0	0	0	0	0	0	0	0	0	0
Pulp (m^3)	0	0	0	0	0	0	0	0	0	0	0	0
Total (m^3)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Area other hardwoods (ha)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL VOLUME ALL SPECIES (M^3)	**502 018**	**585 414**	**585 131**	**556 514**	**578 823**	**587 154**	**514 045**	**490 318**	**487 261**	**689 428**	**590 352**	**709 506**

TARGET CLEARFELL AGE (VOLUME WEIGHTED AVERAGE)

Radiata pine 29 years

Douglas-fir 40 years

Other softwoods 30 years

APPENDIX C

WOOD AVAILABILITY FORECASTS – SUPPORTING TABLES

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TABLE C1: NELSON RADIATA PINE AVAILABILITY UNDER SCENARIO 1, FOR ALL OWNERS

Scenario 1 assumes an unconstrained cut. For a full description of Scenario 1 see page 13.

YEAR ENDING DECEMBER	RECOVERABLE VOLUME (000 M^3 I.B.)
2005	1 540
2006	1 097
2007	683
2008	909
2009	1 313
2010	1 308
2011	1 404
2012	2 031
2013	1 417
2014	1 607
2015	1 359
2016	1 410
2017	709
2018	993
2019	1 052
2020	1 095
2021	1 707
2022	2 425
2023	2 183
2024	3 588
2025	2 403
2026	2 060
2027	2 080
2028	1 704
2029	1 916
2030	1 856
2031	2 035
2032	2 391
2033	2 297
2034	1 977
2035	2 145
2036	1 745
2037	1 988
2038	898
2039	1 293
2040	1 496

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.

TABLE C2: NELSON RADIATA PINE AVAILABILITY UNDER SCENARIO 2

Scenario 2 assumes that large-scale owners cut at stated intentions, and small-scale owners cut at 30 years. For a full description of Scenario 2 see page 14.

YEAR ENDING DECEMBER	LARGE-SCALE OWNERS RECOVERABLE VOLUME (000 M^3 I.B.)	SMALL-SCALE OWNERS RECOVERABLE VOLUME (000 M^3 I.B.)	ALL OWNERS RECOVERABLE VOLUME (000 M^3 I.B.)
2005	1 275	265	1 540
2006	1 124	188	1 312
2007	1 180	59	1 239
2008	1 174	112	1 286
2009	1 112	178	1 290
2010	1 141	106	1 247
2011	1 162	177	1 339
2012	1 196	225	1 421
2013	1 074	167	1 241
2014	1 123	268	1 391
2015	1 123	241	1 364
2016	1 012	238	1 251
2017	1 012	208	1 221
2018	1 063	153	1 216
2019	1 170	107	1 277
2020	1 170	201	1 371
2021	1 170	244	1 414
2022	1 170	1 275	2 445
2023	1 170	1 065	2 234
2024	1 170	1 995	3 165
2025	1 170	971	2 140
2026	1 170	715	1 885
2027	1 273	713	1 986
2028	1 400	430	1 830
2029	1 541	397	1 937
2030	1 541	287	1 827
2031	1 541	140	1 680
2032	1 541	210	1 751
2033	1 541	282	1 823
2034	1 541	110	1 651
2035	1 541	155	1 695
2036	1 541	274	1 815
2037	1 541	208	1 749
2038	1 541	66	1 606
2039	1 541	126	1 666
2040	1 541	199	1 739

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.

TABLE C3: NELSON RADIATA PINE AVAILABILITY UNDER SCENARIO 3

Scenario 3 assumes a non-declining yield with target rotation of 30 years. For a full description of Scenario 3 see page 16.

YEAR ENDING DECEMBER	LARGE-SCALE OWNERS RECOVERABLE VOLUME (000 M^3 I.B.)	SMALL-SCALE OWNERS RECOVERABLE VOLUME (000 M^3 I.B.)	ALL OWNERS RECOVERABLE VOLUME (000 M^3 I.B.)
2005	1 275	270	1 545
2006	1 124	150	1 274
2007	1 180	94	1 274
2008	1 174	137	1 311
2009	1 112	199	1 311
2010	1 141	170	1 311
2011	1 162	149	1 311
2012	1 196	115	1 311
2013	1 074	237	1 311
2014	1 123	188	1 311
2015	1 123	188	1 311
2016	1 035	276	1 311
2017	1 064	247	1 311
2018	1 064	247	1 311
2019	1 152	159	1 311
2020	1 152	290	1 442
2021	1 152	434	1 586
2022	1 152	593	1 745
2023	1 152	767	1 919
2024	1 152	772	1 924
2025	1 152	772	1 924
2026	1 152	772	1 924
2027	1 192	731	1 924
2028	1 312	612	1 924
2029	1 443	481	1 924
2030	1 556	368	1 924
2031	1 556	368	1 924
2032	1 556	368	1 924
2033	1 556	368	1 924
2034	1 556	368	1 924
2035	1 556	368	1 924
2036	1 556	368	1 924
2037	1 556	368	1 924
2038	1 556	368	1 924
2039	1 556	368	1 924
2040	1 556	368	1 924

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.

TABLE C4: NELSON RADIATA PINE AVAILABILITY UNDER SCENARIO 4, BY LOG TYPE, FOR ALL OWNERS

Scenario 4 assumes a split non-declining yield with target rotation of 30 years. For a full description of Scenario 4 see page 17.

YEAR ENDING DECEMBER	TOTAL RECOVERABLE VOLUME (000 M^3 I.B.)	RECOVERABLE VOLUME BY LOG TYPE		
		PRUNED LOGS (000 M^3 I.B.)	UNPRUNED LOGS (000 M^3 I.B.)	CHIP LOGS (000 M^3 I.B.)
2005	1 545	110	1 181	254
2006	1 274	152	889	233
2007	1 274	142	896	236
2008	1 310	133	966	211
2009	1 310	129	974	207
2010	1 310	136	967	207
2011	1 310	149	941	219
2012	1 310	164	920	226
2013	1 310	181	898	231
2014	1 310	199	887	224
2015	1 310	179	902	229
2016	1 310	161	936	213
2017	1 310	145	947	218
2018	1 310	130	851	329
2019	1 310	120	849	340
2020	1 440	132	929	380
2021	1 585	119	1 035	431
2022	1 743	131	1 138	474
2023	1 917	144	1 256	520
2024	2 076	158	1 362	557
2025	2 076	174	1 356	547
2026	2 076	192	1 351	534
2027	2 076	211	1 344	522
2028	2 076	226	1 340	512
2029	2 076	203	1 351	523
2030	2 076	210	1 348	520
2031	2 076	204	1 351	522
2032	2 076	216	1 346	513
2033	2 076	223	1 343	508
2034	2 076	201	1 349	525
2035	1 868	181	1 212	476
2036	1 699	174	1 099	427
2037	1 699	156	1 110	434
2038	1 699	141	1 118	441
2039	1 699	138	1 119	442
2040	1 699	139	1 118	442

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.

TABLE C5: NELSON RADIATA PINE RECOVERABLE VOLUME AND AVERAGE CLEARFELL AGE FOR EACH TARGET ROTATION AGE UNDER SCENARIO 5, FOR ALL OWNERS

Scenario 5 assumes a split non-declining yield with target rotations of 28, 30 and 32 years. For a full description of Scenario 5 see page 19.

YEAR ENDING DECEMBER	28-YEAR ROTATION		30-YEAR ROTATION		32-YEAR ROTATION	
	RECOVERABLE VOLUME (000 M^3 I.B.)	AVERAGE AGE (YEARS)	RECOVERABLE VOLUME (000 M^3 I.B.)	AVERAGE AGE (YEARS)	RECOVERABLE VOLUME (000 M^3 I.B.)	AVERAGE AGE (YEARS)
2005	1 545	32	1 545	31	1 540	31
2006	1 274	29	1 274	29	1 214	29
2007	1 274	30	1 274	28	1 214	29
2008	1 356	30	1 310	30	1 214	30
2009	1 356	30	1 310	31	1 214	31
2010	1 356	30	1 310	31	1 214	31
2011	1 356	29	1 310	30	1 214	30
2012	1 356	30	1 310	30	1 214	30
2013	1 356	30	1 310	30	1 214	31
2014	1 356	30	1 310	31	1 214	31
2015	1 356	30	1 310	30	1 214	30
2016	1 414	30	1 310	31	1 214	31
2017	1 445	29	1 310	30	1 214	30
2018	1 589	29	1 310	29	1 214	30
2019	1 748	28	1 310	30	1 214	31
2020	1 923	28	1 440	30	1 214	31
2021	1 962	29	1 585	29	1 335	30
2022	1 962	29	1 743	29	1 469	31
2023	1 962	29	1 917	30	1 616	31
2024	1 962	29	2 076	30	1 777	31
2025	1 962	29	2 076	30	1 955	31
2026	1 962	29	2 076	30	2 150	32
2027	1 962	29	2 076	31	2 227	32
2028	1 962	29	2 076	31	2 227	32
2029	1 962	29	2 076	31	2 227	32
2030	1 962	29	2 076	31	2 227	33
2031	1 962	29	2 076	31	2 227	33
2032	1 962	29	2 076	31	2 227	33
2033	1 765	29	2 076	31	2 227	34
2034	1 590	29	2 076	31	2 227	34
2035	1 590	29	1 868	30	2 227	33
2036	1 590	29	1 699	31	2 227	33
2037	1 590	29	1 699	31	2 005	33
2038	1 590	29	1 699	31	1 804	33
2039	1 590	29	1 699	31	1 804	33
2040	1 590	29	1 699	31	1 804	33

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.

TABLE C6: WOOD AVAILABILITY AND AVERAGE CLEARFELL AGE FOR OTHER SPECIES IN NELSON

YEAR ENDING DECEMBER	DOUGLAS-FIR RECOVERABLE VOLUME (000 M³ I.B.)	DOUGLAS-FIR AVERAGE AGE (YEARS)	OTHER SOFTWOODS RECOVERABLE VOLUME (000 M³ I.B.)	OTHER SOFTWOODS AVERAGE AGE (YEARS)
2005	107	42	8	57
2006	174	41	30	47
2007	130	40	28	40
2008	129	40	33	38
2009	134	40	30	36
2010	120	40	26	36
2011	121	40	29	37
2012	98	40	40	37
2013	129	40	49	36
2014	150	40	91	36
2015	113	40	91	35
2016	155	40	91	34
2017	138	40	91	35
2018	147	41	91	35
2019	145	41	91	35
2020	155	42	23	34
2021	141	42	0	28
2022	138	43	0	0
2023	144	42	0	0
2024	138	43	0	0
2025	156	43	0	0
2026	151	42	0	0
2027	152	44	0	0
2028	153	43	1	28
2029	139	43	0	0
2030	146	43	0	0
2031	143	43	0	0
2032	180	42	0	0
2033	188	42	0	0
2034	188	42	0	0
2035	188	42	0	0
2036	188	42	0	0
2037	188	42	0	0
2038	188	42	0	0
2039	188	42	0	0
2040	188	41	0	0

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.

TABLE C7: MARLBOROUGH RADIATA PINE AVAILABILITY UNDER SCENARIO 1, FOR ALL OWNERS

Scenario 1 assumes an unconstrained cut. For a full description of Scenario 1 see page 20.

YEAR ENDING DECEMBER	RECOVERABLE VOLUME (000 M^3 I.B.)
2005	622
2006	1 722
2007	442
2008	172
2009	549
2010	689
2011	1 049
2012	904
2013	874
2014	965
2015	1 590
2016	1 767
2017	745
2018	1 106
2019	416
2020	404
2021	422
2022	1 612
2023	2 201
2024	3 560
2025	3 332
2026	2 347
2027	1 753
2028	1 307
2029	694
2030	1 191
2031	997
2032	1 171
2033	887
2034	598
2035	723
2036	793
2037	1 839
2038	499
2039	218
2040	617

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.

TABLE C8: MARLBOROUGH RADIATA PINE AVAILABILITY UNDER SCENARIO 2

Scenario 2 assumes that large-scale owners cut at stated intentions, and small-scale owners cut at 30 years. For a full description of Scenario 2 see page 21.

YEAR ENDING DECEMBER	LARGE-SCALE OWNERS RECOVERABLE VOLUME (000 M^3 I.B.)	SMALL-SCALE OWNERS RECOVERABLE VOLUME (000 M^3 I.B.)	ALL OWNERS RECOVERABLE VOLUME (000 M^3 I.B.)
2005	584	38	622
2006	620	373	993
2007	627	189	816
2008	639	172	811
2009	657	115	772
2010	584	290	874
2011	560	363	923
2012	515	267	782
2013	645	248	893
2014	660	261	921
2015	676	480	1 156
2016	556	874	1 430
2017	556	213	769
2018	556	142	697
2019	556	116	672
2020	556	254	809
2021	594	282	876
2022	594	1 419	2 013
2023	594	1 703	2 297
2024	594	2 703	3 296
2025	594	1 613	2 207
2026	594	1 351	1 945
2027	594	1 144	1 738
2028	594	949	1 543
2029	594	413	1 007
2030	594	944	1 538
2031	594	678	1 272
2032	594	639	1 233
2033	594	495	1 089
2034	603	150	753
2035	603	57	659
2036	603	43	646
2037	603	383	986
2038	603	203	806
2039	603	194	796
2040	603	131	733

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.

TABLE C9: MARLBOROUGH RADIATA PINE AVAILABILITY UNDER SCENARIO 3

Scenario 3 assumes a non-declining yield with target rotation of 30 years. For a full description of Scenario 3 see page 24.

YEAR ENDING DECEMBER	LARGE-SCALE OWNERS RECOVERABLE VOLUME (000 M^3 I.B.)	SMALL-SCALE OWNERS RECOVERABLE VOLUME (000 M^3 I.B.)	ALL OWNERS RECOVERABLE VOLUME (000 M^3 I.B.)
2005	584	45	629
2006	620	72	692
2007	627	134	761
2008	639	198	837
2009	657	263	920
2010	584	428	1 012
2011	560	453	1 013
2012	515	498	1 013
2013	645	368	1 013
2014	660	353	1 013
2015	676	337	1 013
2016	556	457	1 013
2017	556	457	1 013
2018	556	518	1 074
2019	556	625	1 181
2020	556	743	1 299
2021	556	743	1 299
2022	562	738	1 299
2023	570	730	1 299
2024	570	730	1 299
2025	570	730	1 299
2026	570	730	1 299
2027	570	730	1 299
2028	570	730	1 299
2029	570	730	1 299
2030	570	730	1 299
2031	570	730	1 299
2032	570	730	1 299
2033	570	730	1 299
2034	570	730	1 299
2035	570	730	1 299
2036	570	730	1 299
2037	597	702	1 299
2038	601	698	1 299
2039	616	683	1 299
2040	648	652	1 299

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.

TABLE C10: MARLBOROUGH RADIATA PINE AVAILABILITY UNDER SCENARIO 4, BY LOG TYPE, FOR ALL OWNERS

Scenario 4 assumes a split non-declining yield with target rotation of 30 years. For a full description of Scenario 4 see page 25.

YEAR ENDING DECEMBER	TOTAL RECOVERABLE VOLUME (000 M^3 I.B.)	RECOVERABLE VOLUME BY LOG TYPE		
		PRUNED LOGS (000 M^3 I.B.)	UNPRUNED LOGS (000 M^3 I.B.)	CHIP LOGS (000 M^3 I.B.)
2005	629	72	465	92
2006	692	76	513	102
2007	761	84	561	116
2008	837	87	623	127
2009	920	136	647	138
2010	975	150	679	146
2011	975	165	657	153
2012	975	181	642	152
2013	975	200	637	139
2014	975	193	634	148
2015	975	204	618	153
2016	975	201	626	149
2017	975	195	634	147
2018	975	183	647	146
2019	1 073	164	716	193
2020	1 180	181	763	236
2021	1 298	199	815	284
2022	1 428	219	893	316
2023	1 515	206	963	347
2024	1 515	226	958	331
2025	1 515	235	957	323
2026	1 515	258	953	304
2027	1 515	267	960	288
2028	1 515	253	966	296
2029	1 515	278	960	277
2030	1 515	306	948	261
2031	1 515	297	950	268
2032	1 515	267	960	287
2033	1 515	241	969	306
2034	1 515	216	982	317
2035	1 364	195	882	288
2036	1 227	175	792	261
2037	1 105	180	699	226
2038	1 105	162	707	236
2039	1 105	147	708	251
2040	1 105	161	698	246

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.

TABLE C11: MARLBOROUGH RADIATA PINE RECOVERABLE VOLUME AND AVERAGE CLEARFELL AGE FOR EACH TARGET ROTATION AGE UNDER SCENARIO 5, FOR ALL OWNERS

Scenario 5 assumes a split non-declining yield with target rotations of 28, 30 and 32 years. For a full description of Scenario 5 see page 27.

YEAR ENDING DECEMBER	28-YEAR ROTATION		30-YEAR ROTATION		32-YEAR ROTATION	
	RECOVERABLE VOLUME (000 M^3 I.B.)	AVERAGE AGE (YEARS)	RECOVERABLE VOLUME (000 M^3 I.B.)	AVERAGE AGE (YEARS)	RECOVERABLE VOLUME (000 M^3 I.B.)	AVERAGE AGE (YEARS)
2005	629	32	629	31	629	32
2006	723	31	692	31	665	31
2007	831	31	761	30	702	31
2008	956	31	837	30	737	31
2009	1 014	30	920	30	774	30
2010	1 014	30	975	30	812	31
2011	1 014	29	975	29	853	31
2012	1 014	28	975	30	896	30
2013	1 014	30	975	32	940	30
2014	1 014	30	975	30	940	30
2015	1 014	30	975	30	940	31
2016	1 014	30	975	30	940	31
2017	1 083	29	975	31	940	32
2018	1 246	28	975	31	940	32
2019	1 433	28	1 073	31	940	33
2020	1 433	28	1 180	29	1 024	34
2021	1 433	28	1 298	30	1 127	32
2022	1 433	29	1 428	29	1 239	31
2023	1 433	29	1 515	30	1 363	31
2024	1 433	30	1 515	30	1 500	31
2025	1 433	30	1 515	31	1 612	32
2026	1 433	31	1 515	32	1 612	32
2027	1 433	31	1 515	32	1 612	33
2028	1 433	31	1 515	32	1 612	34
2029	1 433	31	1 515	33	1 612	34
2030	1 433	31	1 515	33	1 612	35
2031	1 433	30	1 515	33	1 612	35
2032	1 433	30	1 515	32	1 612	35
2033	1 290	30	1 515	32	1 612	36
2034	1 161	29	1 515	32	1 612	35
2035	1 045	29	1 364	32	1 612	35
2036	1 045	28	1 227	31	1 612	35
2037	1 045	28	1 105	31	1 451	34
2038	1 045	28	1 105	31	1 306	34
2039	1 045	27	1 105	31	1 175	33
2040	1 045	27	1 105	30	1 175	33

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.

TABLE C12: WOOD AVAILABILITY AND AVERAGE CLEARFELL AGE FOR OTHER SPECIES IN MARLBOROUGH

YEAR ENDING DECEMBER	DOUGLAS-FIR RECOVERABLE VOLUME (000 M^3 I.B.)	DOUGLAS-FIR AVERAGE AGE (YEARS)	OTHER SOFTWOODS RECOVERABLE VOLUME (000 M^3 I.B.)	OTHER SOFTWOODS AVERAGE AGE (YEARS)
2005	6	46	0	0
2006	5	45	0	0
2007	5	44	0	0
2008	5	44	10	42
2009	5	44	16	37
2010	4	42	16	36
2011	0	0	16	34
2012	26	42	16	35
2013	27	41	16	35
2014	3	42	16	34
2015	0	0	16	33
2016	66	40	30	33
2017	66	40	30	34
2018	66	40	30	35
2019	66	40	30	34
2020	70	40	13	34
2021	66	41	0	0
2022	68	41	0	0
2023	66	41	1	30
2024	66	42	30	30
2025	68	42	11	30
2026	66	43	14	30
2027	68	43	0	0
2028	66	42	0	0
2029	2	41	0	0
2030	5	41	1	30
2031	1	41	5	30
2032	2	41	0	0
2033	8	41	0	0
2034	22	41	0	0
2035	30	41	0	0
2036	30	41	0	0
2037	30	41	0	0
2038	30	42	0	0
2039	30	42	0	0
2040	30	43	0	0

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.

TABLE C13: COMBINED NELSON AND MARLBOROUGH RADIATA PINE AVAILABILITY UNDER SCENARIO 4, BY LOG TYPE, FOR ALL OWNERS

Scenario 4 assumes a split non-declining yield with a target rotation of 30 years. For a full description of Scenario 4 see page 29.

YEAR ENDING DECEMBER	TOTAL RECOVERABLE VOLUME (000 M^3 I.B.)	RECOVERABLE VOLUME BY LOG TYPE		
		PRUNED LOGS (000 M^3 I.B.)	UNPRUNED LOGS (000 M^3 I.B.)	CHIP LOGS (000 M^3 I.B.)
2005	2 174	182	1 645	346
2006	1 966	229	1 401	335
2007	2 035	226	1 458	352
2008	2 146	220	1 589	338
2009	2 230	265	1 621	344
2010	2 285	286	1 646	353
2011	2 285	314	1 598	373
2012	2 285	346	1 562	378
2013	2 285	380	1 535	370
2014	2 285	392	1 521	372
2015	2 285	383	1 520	382
2016	2 285	362	1 562	362
2017	2 285	340	1 581	365
2018	2 285	313	1 498	475
2019	2 383	285	1 566	534
2020	2 621	313	1 692	616
2021	2 883	318	1 850	715
2022	3 171	350	2 031	790
2023	3 433	350	2 219	867
2024	3 591	385	2 320	888
2025	3 591	409	2 313	870
2026	3 591	450	2 304	838
2027	3 591	478	2 304	810
2028	3 591	479	2 306	808
2029	3 591	481	2 310	801
2030	3 591	516	2 296	781
2031	3 591	501	2 301	790
2032	3 591	484	2 307	800
2033	3 591	464	2 312	814
2034	3 591	417	2 331	842
2035	3 232	375	2 093	764
2036	2 926	349	1 891	688
2037	2 803	336	1 809	660
2038	2 803	302	1 825	677
2039	2 803	285	1 826	693
2040	2 803	300	1 816	688

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.

TABLE C14: COMBINED NELSON AND MARLBOROUGH RADIATA PINE RECOVERABLE VOLUME AND AVERAGE CLEARFELL AGE FOR EACH TARGET ROTATION AGE UNDER SCENARIO 5, FOR ALL OWNERS

Scenario 5 assumes a split non-declining yield with target rotations of 28, 30 and 32 years. For a full description of Scenario 5 see page 30.

YEAR ENDING DECEMBER	28-YEAR ROTATION		30-YEAR ROTATION		32-YEAR ROTATION	
	RECOVERABLE VOLUME (000 M^3 I.B.)	AVERAGE AGE (YEARS)	RECOVERABLE VOLUME (000 M^3 I.B.)	AVERAGE AGE (YEARS)	RECOVERABLE VOLUME (000 M^3 I.B.)	AVERAGE AGE (YEARS)
2005	2 174	32	2 174	31	2 169	31
2006	1 997	30	1 966	29	1 878	30
2007	2 105	30	2 035	29	1 915	30
2008	2 312	30	2 146	30	1 951	30
2009	2 370	30	2 230	30	1 987	30
2010	2 370	30	2 285	31	2 026	31
2011	2 370	29	2 285	30	2 067	30
2012	2 370	29	2 285	30	2 109	30
2013	2 370	30	2 285	31	2 154	30
2014	2 370	30	2 285	30	2 154	31
2015	2 370	30	2 285	30	2 154	31
2016	2 427	30	2 285	31	2 154	31
2017	2 528	29	2 285	30	2 154	30
2018	2 835	28	2 285	30	2 154	31
2019	3 181	28	2 383	31	2 154	32
2020	3 356	28	2 621	29	2 238	32
2021	3 395	28	2 883	29	2 462	31
2022	3 395	29	3 171	29	2 708	31
2023	3 395	29	3 433	30	2 979	31
2024	3 395	29	3 591	30	3 277	31
2025	3 395	29	3 591	30	3 567	32
2026	3 395	30	3 591	31	3 763	32
2027	3 395	30	3 591	31	3 840	32
2028	3 395	30	3 591	31	3 840	33
2029	3 395	30	3 591	32	3 840	33
2030	3 395	30	3 591	32	3 840	33
2031	3 395	30	3 591	32	3 840	34
2032	3 395	30	3 591	32	3 840	34
2033	3 055	29	3 591	32	3 840	35
2034	2 750	29	3 591	31	3 840	34
2035	2 634	29	3 232	31	3 840	34
2036	2 634	28	2 926	31	3 840	34
2037	2 634	28	2 803	31	3 456	33
2038	2 634	28	2 803	31	3 110	33
2039	2 634	28	2 803	31	2 979	33
2040	2 634	28	2 803	30	2 979	33

Note
I.B. denotes inside bark, ie, the recoverable volume of wood excluding bark.