



# **NORTHLAND FOREST INDUSTRY AND WOOD AVAILABILITY FORECASTS**

**2009**



## ACKNOWLEDGEMENTS

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# INTRODUCTION

This publication provides updated wood availability forecasts and associated commentary for the Northland wood supply region. Both have been produced in association with the region's major forest owners, forest industry leaders and forest consultants. The forecasts show the range of harvest volumes potentially available from the planted forest estate of large and small-scale growers in the period to 2040.

Descriptive information is also provided on the main plantation forest estate owners and wood processing industries in the region. Opportunities and constraints facing the regional forest industry are discussed.

The information contained in this report is intended to assist the forestry industry, planning practitioners, and infrastructure and service providers in assessing wood processing opportunities, resource management planning, and infrastructure issues. It will also assist the public in understanding the nature of the forest industry in the Northland region.

This report is one of a series of publications on regional forest industries and wood availability forecasts being produced by the Ministry of Agriculture and Forestry (MAF).

Readers intending to use these wood availability forecasts for planning or investment decisions are urged to thoroughly review the forecasts or engage the services of a professional forestry consultant who is able to interpret the forecasts in the context of specific planning or investment decisions.

# OVERVIEW

# 2

The Northland wood supply region extends from Rodney District in the south to the Far North District at the northern tip of the North Island. The region includes the Rodney, Kaipara, Whangarei and Far North local government districts. Two regional councils cover the region: Northland and Auckland (which covers Rodney District).

The topography of the region is typically rolling hill country, but ranges from sand dune flats to low mountains, and the landform is dissected by streams, rivers and tidal inlets and harbours. Planted forests occur on sand dune areas (west of Auckland and north of Kaitia) which were initially planted for their protection value as well as production potential. However, the majority of the forests are on clay soils. These clay soils range from fertile ex-farm soils to highly-weathered, poorly drained infertile soils.

The Northland wood supply region has a well-established forestry sector, with plantation forests spread throughout the region. The State played a large role in the early establishment of a number of forests, and was supported by large private companies in the 1970s. Now, the forestry sector is dominated in the Far North by Juken New Zealand Limited's (JNL) Aupouri Forest and other leasehold forests such as Ōtanga. Further south, Taumata Plantations and Matariki have their forests, both wholly owned and leasehold. Māori Incorporations are beginning to play an important role in the sector throughout the region. A hardwood (Acacia) resource has also been established under Japanese ownership.

The region's wood processing sector is based on the JNL triboard mill, veneer plant and sawmill at Kaitia, the laminated veneer lumber (LVL) mill of Carter Holt Harvey (CHH Ltd) at Marsden Point, the large CHH sawmill near Whangarei and the Marasumi chip mill near

Portland. Sawlogs and pulpwood are shipped from the region via the deepwater port at Marsden Point, and via the rail line to the Central North Island.

Forestry has traditionally played a significant role in Northland, from the first log "exports" with Captain Cook, to the early kauri sawmilling days. It is again rising to prominence as the significant local exotic forest resource approaches maturity.

To assist with future regional forest industry planning, MAF compiled a series of wood availability scenarios for Northland covering the period 2008–2040. The forecasts have been produced in association with the region's major forest growers and consultants. The forecasts show the range of harvest volumes potentially available from the planted forest estate of both large and small-scale growers. The forecasts are supply-based, but incorporate the long-term intentions of the larger-scale owners.

The forecasts indicate that the availability of radiata pine from the Northland forest estate will increase over the next 10 to 12 years, despite a drop-off in the large-scale forest owners' harvest volumes after 2015. While the overall forecasts indicate an increasing supply during this period, it is important to recognise that short-term fluctuations are possible, due to changes in market conditions.

The region's forestry sector has some distinctive local characteristics:

- › The total exotic forest area in the region is 202 286 hectares (MAF, 2007) or 11.3 percent of the national total, and the second largest estate in the North Island.
- › Large-scale forests owners (over 1000 hectares) account for about 65 percent of the forest area, with half of the remaining 30 percent of forest area held in forests of 40 hectares or less.

- › The forests are dominated by radiata pine which covers 97 percent of the region's estate, compared to about 90 percent nationally.
- › Radiata pine wood density is considered to be high over the entire Northland estate. High-density wood characteristics are favoured by solid wood processors for the production of framing timber and the manufacture of high-strength structural elements.
- › Four of the largest forest owners are overseas corporates.
- › Five forestry investment syndicates are represented in the ownership of the estate.

»» TABLE 2.1: KEY STATISTICS FOR NORTHLAND FOREST INDUSTRY<sup>1</sup>

STATISTIC	VALUE
Stocked plantation forest area as at 1 April 2007 (ha)	202 286
Harvest – estimated roundwood removals <sup>3</sup> – year ending March 2008 (m <sup>3</sup> )	2 098 700
Area weighted average age of plantation forest as at 1 April 2007 (years)	16.4
Sawn timber production – year ending March 2008 (m <sup>3</sup> )	358 780
Estimated log input to sawmills <sup>4</sup> – year ending December 2007 (m <sup>3</sup> )	510 000
Log exports <sup>2</sup> – year ending March 2008 (m <sup>3</sup> )	719 128
Sawn timber exports <sup>2</sup> – year ending March 2008 (m <sup>3</sup> )	31 831
Direct employment, forestry and first-stage processing as at February 2007 <sup>5</sup> (FTE)	1962

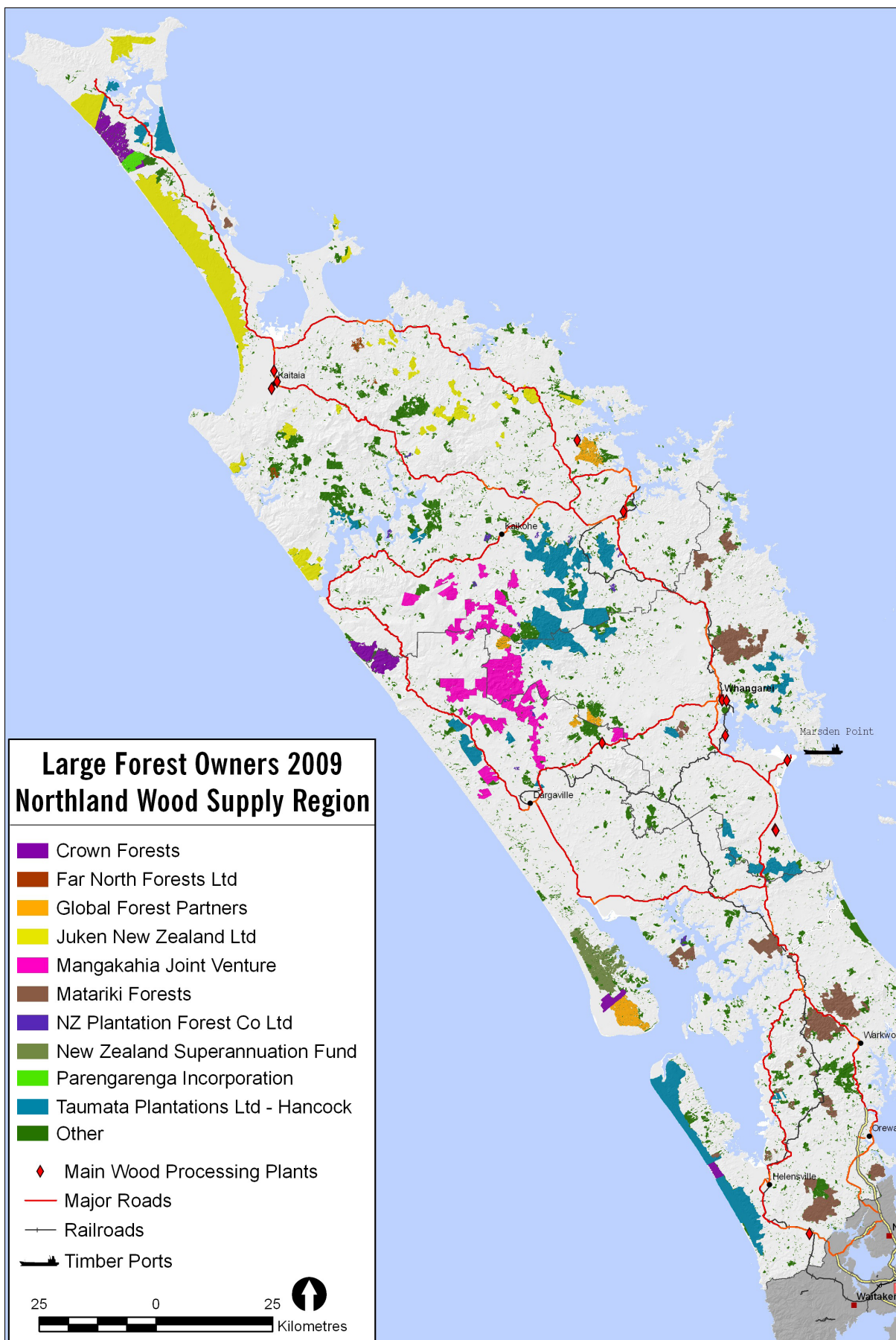
**Sources**

1. All statistics from Ministry of Agriculture and Forestry unless indicated otherwise.
2. Overseas Trade, Statistics New Zealand.

**Notes**

3. Estimated roundwood removals are derived from sawmill production and log exports. They do not account for inter-regional log flows.
4. This is an estimate of the sum of the individual processing plants roundwood input capacities.
5. Excludes employment associated with the transportation of logs and forest produce.

»» FIGURE 2.1: MAP OF THE NORTHLAND FOREST INDUSTRY





# THE PLANTATION FOREST INDUSTRY

3

## »»» FOREST DEVELOPMENT

Exotic production forests were first planted by the NZ Forest Service (NZFS) in Northland during the 1920s. A range of species were trialled in kauri cut-over at Waipaoa Forest before settling on radiata pine. Planting continued during the depression years of the 1920s and 1930s. Woodhill Forest near Helensville was planted as a sand dune stabilisation project in the 1930s by the NZFS, and planting continued through to the 1980s. Aupouri forest was planted during the 1960s, also by the NZFS, with the aim of stabilising the sand dunes and protecting farmland adjacent to the forest. An additional benefit was the regional employment that the afforestation scheme provided. A further push by the government in the 1970s and 1980s saw considerable areas of forest established on marginal farmland, scrublands and on Māori land, often in the form of joint ventures between the owners and a forestry organisation.

The sale of the state forest assets in 1987 saw the cutting rights to the government-owned forests sold to several private companies, in the form of Crown Forest Licences (CFLs). In the Far North, Juken New Zealand acquired the Aupouri and Otangaroa Forests. CCH Ltd and Rayonier New Zealand Limited purchased the remainder of the Northland cutting rights. The exceptions were the Crown joint venture and lease forest areas which are still managed on behalf of the Crown. In recent years, both CHH Forests and Rayonier New Zealand have either sold or joint-ventured their cutting rights to several overseas-owned investment funds.

There were 202 286 hectares of production forest in Northland as at April 2007.

## »»» NURSERIES

Two commercial nurseries in Northland provide seedlings for the plantation forestry sector. The largest nursery in the Northland region is the Arborgen Kaikohe Nursery at Kaikohe. Purchased by Arborgen, the US-based forestry biotechnology company from Rubicon in 2007, this nursery grows bare-rooted radiata pine cuttings, control-pollinated and open-pollinated radiata pine seedlings, and Cupressus lusitanica cuttings.

The Northland Forest Nursery Ltd is a smaller operation and is also based in Kaikohe.

## »»» LARGE-SCALE FOREST OWNERS

There are 13 owners in the region with forest holdings over 1000 hectares in size, totalling about 135 200 hectares. Table 3.1 shows there are four forest owners in the region with over 10 000 hectares of forest each. A further four owners have holdings between 5000 and 10 000 hectares, and five owners have forest holdings between 1000 and 5000 hectares.

»»» TABLE 3.1: LARGE FOREST OWNERS AND MANAGERS, WITH APPROXIMATE NET STOCKED AREA AS AT APRIL 2007

FOREST OWNER	NET STOCKED AREA (HA)
Taumata Forests Ltd	35 000
Juken New Zealand Ltd	26 000
Mangakahia Joint Venture	21 000
Matariki Forests Ltd	17 000
Global Forest Partners LP	6 000
Far North Afforestation Ltd	6 000
Crown (MAF)	6 900
NZ Superannuation Fund	6 100
Taitokerau Forests Ltd	4 500
Holyoake Industries Ltd	2 500
NZ Plantation Forest Co Ltd	1 700
Parengarenga Incorporation	1 300
White Cliffs Forests Ltd	1 200
<b>Total</b>	<b>135 200</b>

#### › TAUMATA PLANTATIONS LTD

Taumata Plantations Ltd was formed to purchase the North Island forests sold by CHH Ltd in 2007. The sale did not include any of the CHH processing facilities. Taumata Plantations Ltd is managed by Hancock Forest Management (NZ) Ltd (HFMNZ). In Northland, the Taumata estate is spread from Woodhill in the Rodney District to forests in the Far North.

In addition, the assets of Taumata include 50 percent of the Mangakahia Forest Joint Venture. The crown forest licences, lease and freehold forests are increasingly mature. HFMNZ have Forest Stewardship Council (FSC) certification for their national estate.

#### › JUKEN NEW ZEALAND LTD

Juken New Zealand Ltd (JNL) is owned by Wood One Co Ltd, a Japan-based company mainly engaged in the housing material business. It has a national estate of about 75 000 hectares in Northland, Gisborne and the Wairarapa. In the Northland region, it manages the crown forest licences for Aupouri Forest and Otangaroa forests purchased in 1990, as well as some freehold forest and leases purchased in the Northern Pulp receivership sale. The forests are all in the Far North District. The management of the JNL Northland estate is primarily focussed on supplying the requirements of their manufacturing facility – a triboard mill, sawmill and veneer plant all located at Kaitaia in the Far North. The estate is mature. JNL gained FSC certification for their Northland resource in 2009.

#### › GLOBAL FOREST PARTNERS LP

Global Forest Partners LP (GFPLP) is a US-registered investment adviser and one of the oldest and largest timber investment management organisations in the world. GFPLP hold a 50 percent stake in the Mangakahia Forest Joint venture with Taumata Plantations Ltd, and manages additional forest assets purchased from RNZ Ltd

in Northland. The ex-NZFS forests in this estate are mature, and the forests in the freehold Mangakahia Joint Venture are increasingly mature.

#### › MATARIKI FORESTS LTD

Rayonier New Zealand manages the 143 000 hectare Matariki Forest national estate. The business is a subsidiary of Rayonier Inc., a publicly listed company in the United States. Matariki was formed in 2005 to purchase 94 300 hectares of commercial plantations from CHH and to acquire Rayonier's forestry holdings in New Zealand. Matariki is a consortium consisting of Rayonier (40 percent), AMP Capital Investors (35 percent) and RREEF Infrastructure (25 percent).

Rayonier is a specialist "timberlands" company: originally it bought 100 000 hectares of crown forest licences in Gisborne, Northland, southern and central North Island, Nelson and Invercargill in 1992 before selling around half this area in the mid 1990s.

In 2005 Matariki Forests purchased 95 000 hectares of CHH forests in the Northland, Auckland (including Coromandel), Hawkes Bay and Canterbury wood supply regions.

Matariki's 17 000 hectare Northland estate covers the crown forest licences purchased by RNZ Ltd in Northland, less the forest rights joint-ventured to UBS RII and on-sold to GFPLP, plus the CHH Northland estate purchases. The Matariki forests are mature, and include Glenbervie, Waitangi and Riverhead Forests.

#### › CROWN FORESTRY

The MAF Crown Forestry group manage, via forest management contracts, four Crown lease forests (planted on Māori land) and a former Crown Forest on Crown land (Waipoua Forest) where the land was returned to iwi in 2008 under a Treaty of Waitangi settlement. The forests

are all mature or approaching maturity and harvesting operations are ongoing. In two of the lease forests, the leases have been varied so that the land is handed back to the Māori owners (in a replanted state) after the harvesting of the first rotation crop. In the case of Waipoua Forest, the Crown now holds a 35-year forestry right with the area of the forestry right reducing as the crop is harvested. The new owners of the land are subsequently replanting the forests.

#### ➤ FAR NORTH AFFORESTATION LTD

Far North Afforestation Ltd is a private forest management company with forests solely in the Northland region. They specialise in individual freehold-title forestry investment blocks. The forests are approaching maturity.

#### ➤ NZ SUPERANNUATION FUND

The NZ Super Fund Timber Investment No. 3 purchased the Northland and Auckland assets of Evergreen Forests Ltd from James Fielder Funds Management Ltd in 2004. The Northland forest asset (Rototuna Forest) is located on the Poutō Peninsula on the Kaipara Harbour. The majority of the resource is early to mid-rotation (83 percent planted between 1995 and 2003). The resources are managed by GMO Renewable Resources, an international asset management company.

#### ➤ TAITOKERAU FORESTS LTD

Taitokerau Forests Ltd is a company formed in 1986 to establish forests on multiple-owned Māori lands under forestry rights. The estate is located in central Northland and on the Poutō Peninsula and comprises multiple blocks. The forests are not yet mature, and will be due for harvest in the next 5 to 10 years.

#### ➤ HOLYOAKE INDUSTRIES LTD

In 1988 Holyoake Industries began a forest establishment programme that saw several thousand hectares of production forest established in Northland. Holyoake

Industries specialises in commercial ventilation and air conditioning and have established their forest to offset carbon emissions. The forests are still immature, and will be due for harvest in about 10 years.

#### ➤ PĀRENGARENGA INCORPORATION

The Pārengarenga Incorporation owns the assets being returned from the Pārengarenga Crown Lease after harvesting. Current holdings are in excess of 1300 hectares of immature forest and will increase as the Crown harvests the rest of the Pārengarenga block and releases the land to the owners.

#### ➤ NZ PLANTATION FOREST CO LTD

The NZ Plantation Forest Company is a joint venture between Chuetsu Pulp & Paper Co Ltd, Hokuetsu Paper Mills Ltd, Marusumi Paper Co Ltd and Marubeni Corporation. The objective is to grow and harvest exotic hardwood species on a short rotation for chipping. The company had stated a goal to eventually establish 10 000 hectares of Acacia forest, but the project appears to have slowed in recent years. In 2005, the first shipment of chips from the acacia plantation was dispatched to Japan for pulping. The National Exotic Forest Description (NEFD) as at 1 April 2007 (MAF, 2008) shows in excess of 4000 hectares of non-eucalyptus hardwood species planted in the Northland wood supply region, primarily in the Far North and Kaipara Districts.

#### ➤ WHITE CLIFFS FORESTRY LTD

White Cliffs Forestry Ltd is a family-owned business with a forest estate in two blocks. The 1400 hectare Utakura Forest is in the Far North District; harvesting began in 2001 and is planned to reach 60 000 cubic metres per year by 2020. Ōmahuta forest, owned by White Cliff's subsidiary Mamaku Sawmilling Co Ltd, is at the base of the Mangamuka ranges in the Far North District and is about 1000 hectares in area.

### ► OTHER OWNERS

The NEFD (MAF, 2008) reports that as of 1 April 2007, there are 1875 plantation forest owners in the region. Of those, 1620 or 86 percent own forests less than 40 hectares, with an average size of 19.2 hectares. There are 147 owners with between 40 and 99 hectares of forest, and 86 owners have between 100 and 499 hectares. Nine owners have forest blocks between 500 and 999 hectares; 30 percent of the estate is in blocks 999 hectares and smaller.

The NZ Farm Forestry Association has three branches in the Northland region, but no figures are available on membership numbers or the area managed.

### ►► SPECIES COMPOSITION

Radiata pine accounts for 196 299 hectares (97 percent) of the plantation estate in the Northland region. Roughly half of the area of radiata pine has been pruned to a height of 4 metres or higher. Of the non-radiata resource, some 4 400 hectares of other hardwood plantations have been established. A significant proportion of that area has been established in the last 10 years, much as a short rotation pulp crop. Little else is known about this area.

Other species are not well represented, with other softwoods (927 hectares) and Eucalyptus species (430 hectares) representing less than 1 percent of the total area.

►► TABLE 3.2: PLANTATION FOREST AREAS BY SPECIES AND LOCAL AUTHORITY AS AT 1 APRIL 2007 (HECTARES)

LOCAL AUTHORITY	RADIATA PINE	DOUGLAS-FIR	CYPRESS	OTHER SOFTWOODS	EUCALYPTUS	OTHER HARDWOODS	TOTAL
Far North District	91 544	4	110	302	108	2532	94 600
Whangarei District	34 342	0	62	293	124	499	35 320
Kaipara District	38 328	0	29	160	156	940	39 613
Rodney District	32 015	0	42	172	42	482	32 753
<b>Region Total</b>	<b>196 229</b>	<b>4</b>	<b>243</b>	<b>927</b>	<b>430</b>	<b>4453</b>	<b>202 286</b>

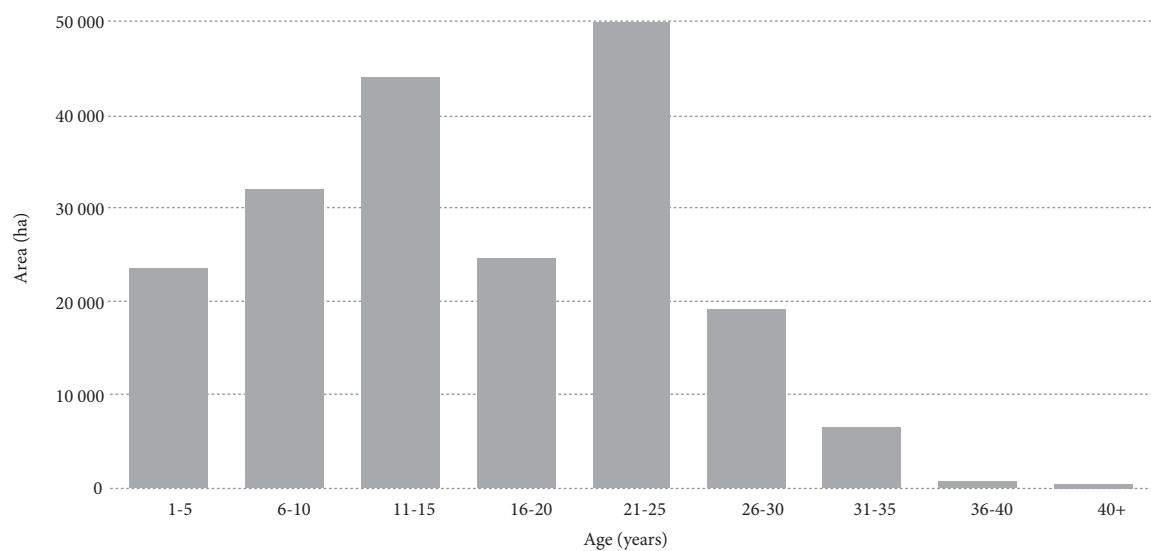
**Source**

NEFD as at 1 April 2007 (MAF, 2008).

### AGE-CLASS DISTRIBUTIONS

The age profile in the Northland region is now relatively mature, with an average age of 16.4 years across all species and territorial authorities. This has arisen through infrastructure restrictions (particularly roading), although at least one of the forestry companies has a target rotation age of 34 years.

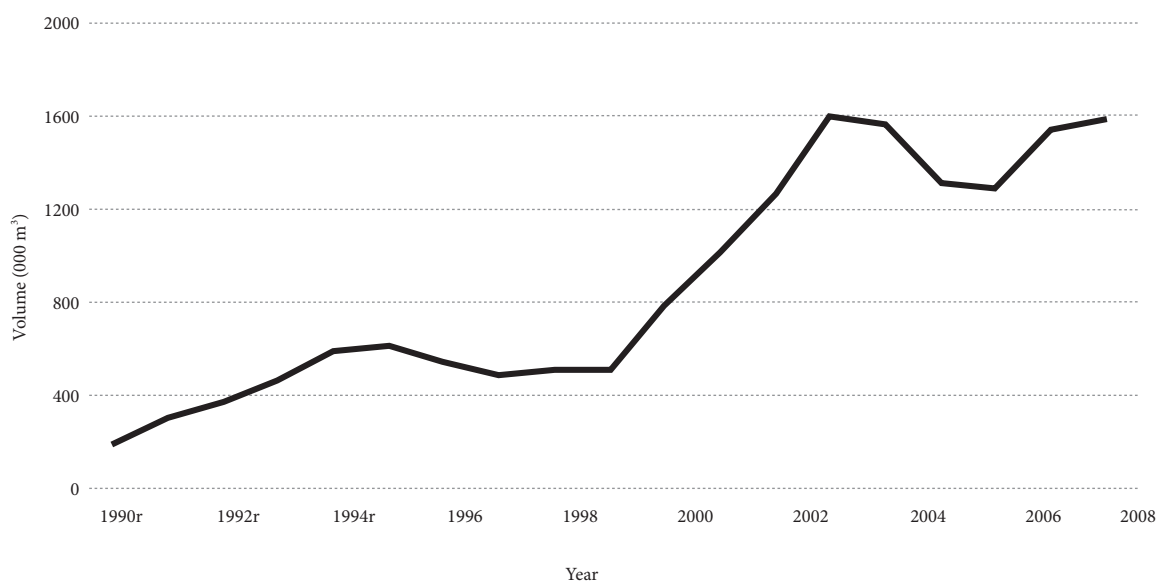
FIGURE 3.1: AREA AGE CLASS DISTRIBUTIONS FOR NORTHLAND PLANTATION FORESTS, ALL SPECIES



### »» HARVEST TRENDS

Figure 3.2 shows the significant increase in harvest levels in Northland since 1990. From 1990 to 1994, the harvest climbed from 150 000 cubic metres per year to 600 000 cubic metres per year. Between 2000 and 2004, the harvest increased to about 1.6 million cubic metres per year. Since that time, the harvest has fluctuated between 1.2 million cubic metres and 1.6 million cubic metres per year.

»» FIGURE 3.2: HARVEST TRENDS FROM PLANTATION FORESTS SINCE 1990



**Symbol**  
r=revised

**Source**  
Ministry of Agriculture and Forestry statistics.

### »» HARVESTING INTENTIONS SURVEY

A harvesting intentions survey of the large-scale forest owners in the region (owners and managers with forest estates greater than 1000 hectares) was completed in early 2008. The companies provided data on their actual harvest volumes for 2006 and 2007, and their intentions out to 2014. The data was provided only for radiata pine, and was broken down into pruned and unpruned sawlogs and pulp logs.

The harvest intentions of the large-scale growers indicate that there will be an increase in volume available from about 2.2 million cubic metres in 2008 to about 3.2 million cubic metres by 2014. After that, the production levels are expected to decline to about 3 million cubic metres per year.

»» TABLE 3.3: HARVESTING INTENTIONS SURVEY RESULTS (IN CUBIC METRES)

	RADIATA PINE (PRUNED STANDS)	RADIATA PINE (UNPRUNED STANDS)	RADIATA PINE (PRODUCTION THINNED)	(TOTAL VOLUME) <sup>1</sup>	TOTAL AREA (HA)
2004	138 890	184 110	52 000	323 000	804
2005	481 444	367 298	59 327	848 742	1 778
2006	1 035 135	731 504	30 318	1 766 639	4 095
2007	1 064 245	810 652	15 000	1 874 897	3 793
2008	1 134 705	1 062 596	7 500	2 197 302	4 369
2009	1 106 468	1 426 530	-	2 532 998	4 735
2010	1 140 128	1 747 066	-	2 887 193	5 425
2011	1 183 154	2 031 676	-	3 214 830	5 828
2012	886 077	2 364 746	-	3 250 824	5 546
2013	995 217	2 129 301	-	3 124 518	5 005
2014	1 091 764	2 097 972	-	3 189 736	4 913

**Note**

1. Production-thinned figures excluded from total because companies no longer plan for this.

**Source**

Individual forest owners covered by the harvesting intentions survey.

# WOOD AVAILABILITY FORECASTS

# 4

These forecasts show the range of harvest volumes potentially available from the planted production forests in the Northland wood supply region for the period 2008 to 2040.

The wood availability forecasts are based on the region's existing forest resource and the forecasting assumptions described later in this section. The forecasts have been developed incorporating the planned harvesting intentions of the region's large-scale forest owners (those with 1000 hectares of forest or more) from 2008 to 2014:

- › Taumata Plantations;
- › Juken New Zealand;
- › Mangakahia Joint Venture (Taumata & GFP);
- › Matariki Forests Ltd;
- › Crown Forestry;
- › Far North Afforestation;
- › NZ Superannuation Fund;
- › Global Forest Partners (GFP);
- › Taitokerau Forests;
- › Holyoake Industries;
- › Pārengarenga Incorporation;
- › White Cliffs Forestry.

The forecasts incorporate the views of the region's forest owners, managers and consultants to ensure they represent a realistic range of future wood availability scenarios.

A key issue is the timing of harvesting by the small-scale forest owners, which 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 supply.

The scenarios indicate there are many different ways for the forest estate in Northland to be harvested. Forests are managed to maximise the benefits to the enterprise that

owns them. Each enterprise has its own harvest strategy based on the owners' objectives, market conditions and the forest estate that it owns or manages. Any change in harvesting strategies by forest owners affects the age structure and maturity of the forests it owns. This in turn feeds back directly into future wood availability.

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

## »» SCENARIOS FOR RADIATA PINE

Five wood availability scenarios have been modelled for radiata pine in this analysis. The scenarios show the range of potential ways for harvesting the forests in the region in the future.

The scenarios were developed following consultation with the NEFD Steering Committee. Feedback was received from major forest owners and consultants in the Northland wood supply region to ensure the forecasts were reasonable.

Listed years are assumed to be calendar years. For example, 2007 indicates the 12 months to 31 December 2007.

### › SCENARIO 1: HARVEST ALL AREAS AT AGE 30

All owners are assumed to harvest their forests at age 30. This scenario shows the potential future harvest in any given year, based on the area of radiata forest that reaches 30 years of age in that year.



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

Large-scale owners' wood availability is assumed to be at stated harvest intentions for 2007 to 2015. After 2016, the large-scale owners' wood availability is modelled not 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 modelled to be non-declining in perpetuity.

► **SCENARIO 4: SPLIT NON-DECLINING YIELD (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 assumed to step down from 2034 (at the end of the current rotation). Thereafter, a reduction is assumed.

► **SCENARIO 5: TARGET ROTATION AGE VARIATIONS**

This is similar to scenario 4 except target rotation ages of 28 and 32 years are also modelled.

►► **DISCUSSION ON SCENARIOS**

With the exception of scenario 1, the small-scale forest owners have been modelled separately from the large-scale owners. Future harvesting from the small-scale owners is generally less certain than for the latter.

In scenarios 1 and 2 (Figures 1A and 1B, respectively), forests owned by small-scale owners are assumed to be harvested at 30 years. In the case of scenario 1, all forests (large and small-scale) are harvested at 30 years. These two scenarios show the “potential” availability of mature forest in any given year and directly reflect the area of

forest in each age-class in the Northland region. For practical reasons already described, it is unlikely that the future harvesting would occur like this. These two scenarios simply show the potential magnitude of harvesting under favourable market conditions in any given year.

Scenarios 3 to 5 (Figures 1C and 1D, respectively) are based on yield regulation. Under these scenarios, future harvesting is generally constrained to be non-declining, that is, each year the volume must either be the same or higher than in the previous year. Yield regulation provides a more orderly harvesting volume profile that takes into account, to some extent, logistical and market constraints. These scenarios avoid the large year-to-year fluctuations seen in scenario 1.

A fundamental property of the forests in Northland (as in many other regions in New Zealand) is the large area of forests established during the 1990s. Scenarios 4 and 5 allow for the harvesting of these forests by applying a non-declining yield constraint for the period 2007 to 2034. Then once the “bulge” of forests planted during the 1990s has been harvested, the model allows the volume to decline again.

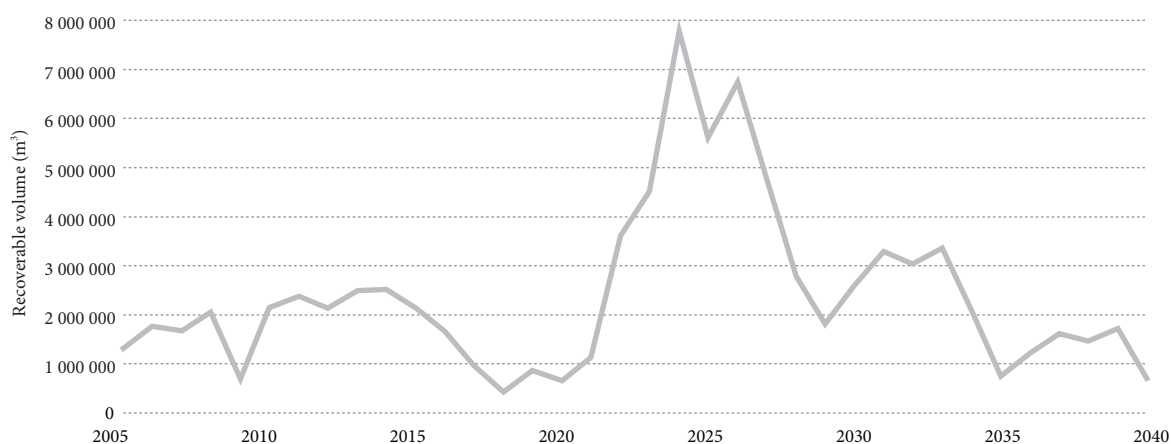
The main limitation of scenarios 3 to 5 is that log prices and other market factors are a significant determinant of harvesting in any given year. When log prices increase, harvesting will generally increase; when log prices fall, the level of harvesting will generally fall. It is beyond the scope of this analysis to predict future timber prices.

Figure 1 shows the sequence of models (scenarios) that are presented throughout the remainder of this report.

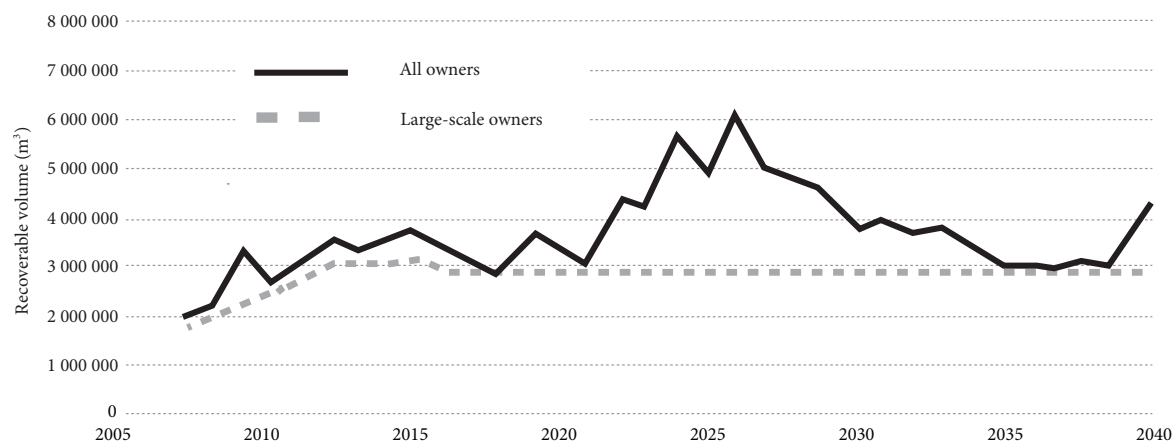
The sequence of wood availability scenarios presented in this report for radiata pine (scenario 5) is the same as scenario 4 except it shows the availability profiles of varying harvest ages.

#### FIGURE 4.1: THE SEQUENCE OF WOOD AVAILABILITY SCENARIOS PRESENTED FOR RADIATA PINE

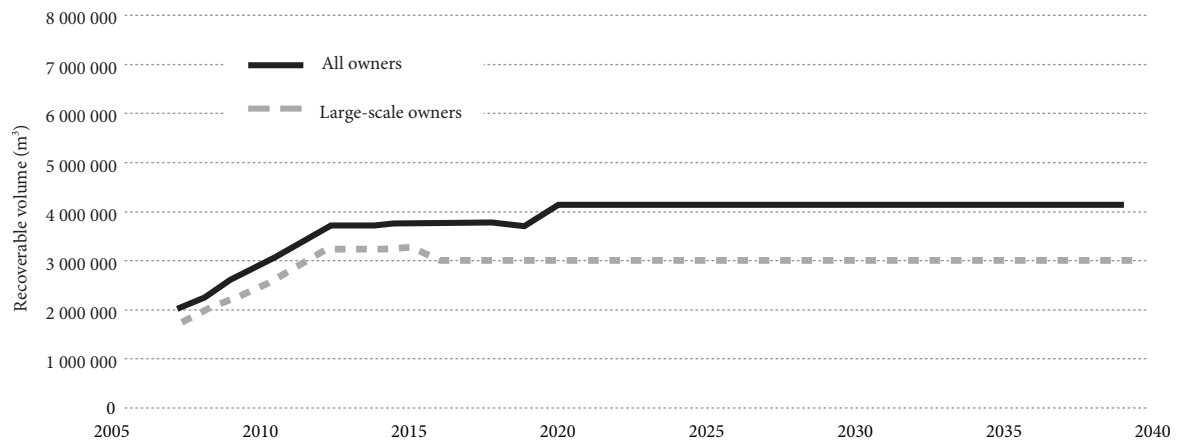
##### 4.1A – SCENARIO 1 EXAMPLE: HARVEST ALL TREES AT AGE 30



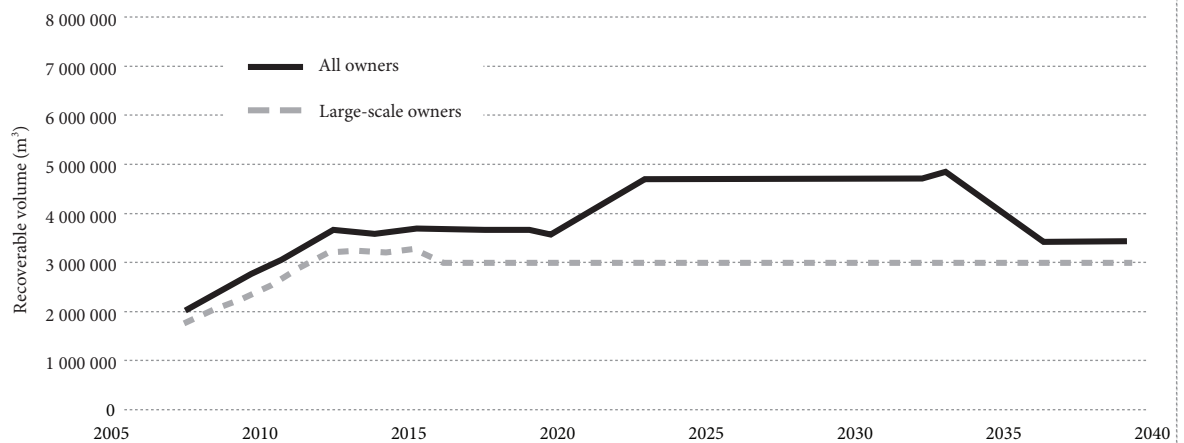
##### 4.1B – SCENARIO 2 EXAMPLE: LARGE-SCALE OWNERS HARVEST AT STATED INTENTIONS, SMALL-SCALE OWNERS HARVEST TREES AT AGE 30



#### ► 4.1C – SCENARIO 3 EXAMPLE: NON-DECLINING YIELD WITH TARGET ROTATION 30 YEARS



#### ► 4.1D – SCENARIO 4 EXAMPLE: SPLIT NON-DECLINING YIELD WITH TARGET ROTATION 30 YEARS



## »» DATA

### » METHOD USED TO OBTAIN FOREST AREAS

The areas were obtained from the NEFD as at 1 April 2007 (MAF, 2008). The small-scale owners' estate was reduced by 15 percent. This was done because the area in this ownership category is often reported on the basis of gross area rather than net stocked area.

### » METHOD TO DEVELOP YIELD TABLES

In 2008 new yield tables for Northland were developed in the following manner:

- » 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 (age 18+ years, planted in 1989 and earlier) radiata pine were then calibrated to match the harvest intentions data provided by large-scale owners: that is, 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 also adjusted in consultation with large-scale owners.
- » 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 2007 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.

### » SMALL-SCALE OWNERS' HARVEST INTENTIONS

The major companies and consultants involved with the small-scale growers were asked to comment on likely

harvest volumes. No accurate log grade breakdown was available, so the breakdown derived from the large-scale owners was used. No predictions beyond 2008 were available from these owners.

## »» WOOD AVAILABILITY FORECASTS FOR THE NORTHLAND REGION

### » ASSUMPTIONS

The wood availability forecasts for the Northland region are based on the following assumptions:

- » Replanting – All area is replanted (with a regeneration lag of 1 year).
- » The area awaiting replanting as at 31 March 2007 is included as area at age 0: that is, area to be replanted in the 2007 planting season.
- » Species/regime – Area is replanted into the same species and regime except that:
  - 25 percent of area harvested in the large-scale owners' estate from pruned stands is replanted into the young pruned croptype, with the other 75 percent replanted into the young unpruned crop type;
  - 75 percent of area harvested from pruned stands in the small-scale owners' estate is replanted into the young unpruned croptype.

These changes reflect the intention of owners, particularly large-scale owners and managers, to prune less in the future.

»» TABLE 4.1: RADIATA PINE VOLUMES HARVESTED 2007 AND 2008 IN NORTHLAND WOOD SUPPLY REGION

HARVEST YEAR	LARGE-SCALE OWNERS (M³)	SMALL-SCALE OWNERS (M³)	TOTAL (M³)
2007	1 767 000	256 000	2 023 000
2008	2 053 000	240 000	2 293 000

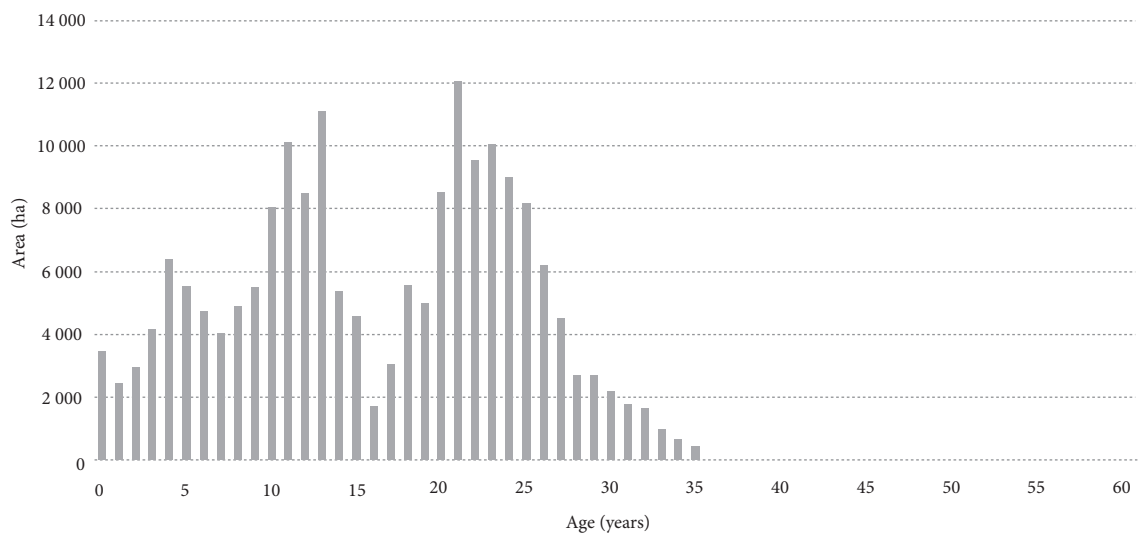
For the over-mature stands in the NEFD database it was assumed that trees aged 36 years or older (785 hectares in total), and half the area in the small-scale estate between ages 31 and 35 (703 hectares) will not be harvested and therefore removed from the model.

#### ► SCENARIO 1: HARVEST ALL FOREST AT AGE 30

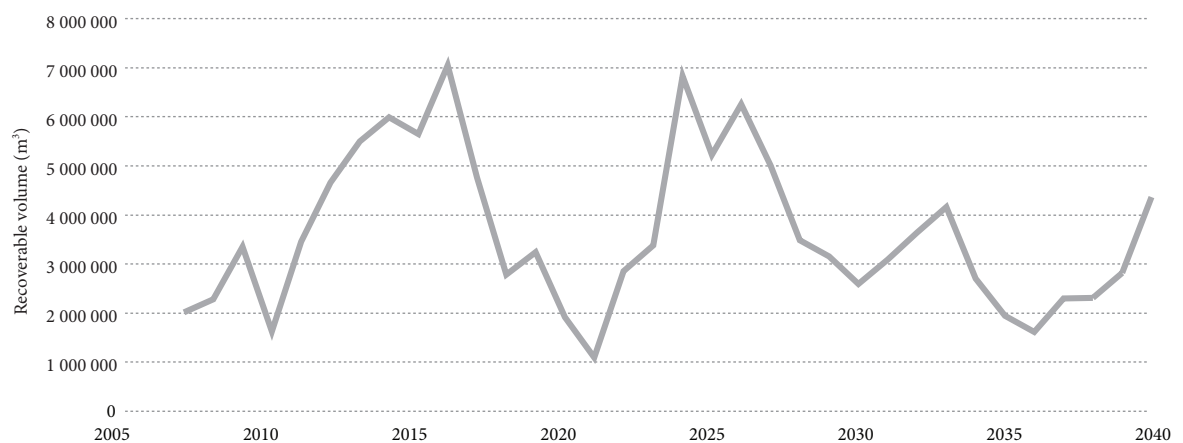
The scenario with all forest harvested at age 30 indicates the “pure” (unconstrained) availability of wood from

Northland. It is essentially a translation of the age-class distribution into volume. Figure 4.2 shows the age-class distribution of radiata pine in the Northland, while Figure 4.3 shows the wood availability. The low point at 2021 (in Figure 4.3) occurs because of the small area (1711 hectares) at age 16 (planted in 1991) in Figure 4.2. The high point at 2016 in Figure 4.3 occurs because of the large area (12 075 hectares) at age 21 (planted in 1986) in Figure 4.2.

►► FIGURE 4.2: AGE-CLASS DISTRIBUTION OF NORTHLAND RADIATA PINE – COMBINED ESTATE AS AT 1 APRIL 2007



►► FIGURE 4.3: RADIATA PINE AVAILABILITY IN THE NORTHLAND REGION UNDER SCENARIO 1



### ► SCENARIO 2: LARGE-SCALE OWNERS HARVEST AT INTENTIONS, SMALL-SCALE OWNERS HARVEST TREES AT AGE 30

In this scenario, large-scale owners harvest in line with their stated intentions and small-scale owners harvest trees at age 30.

#### LARGE-SCALE OWNERS

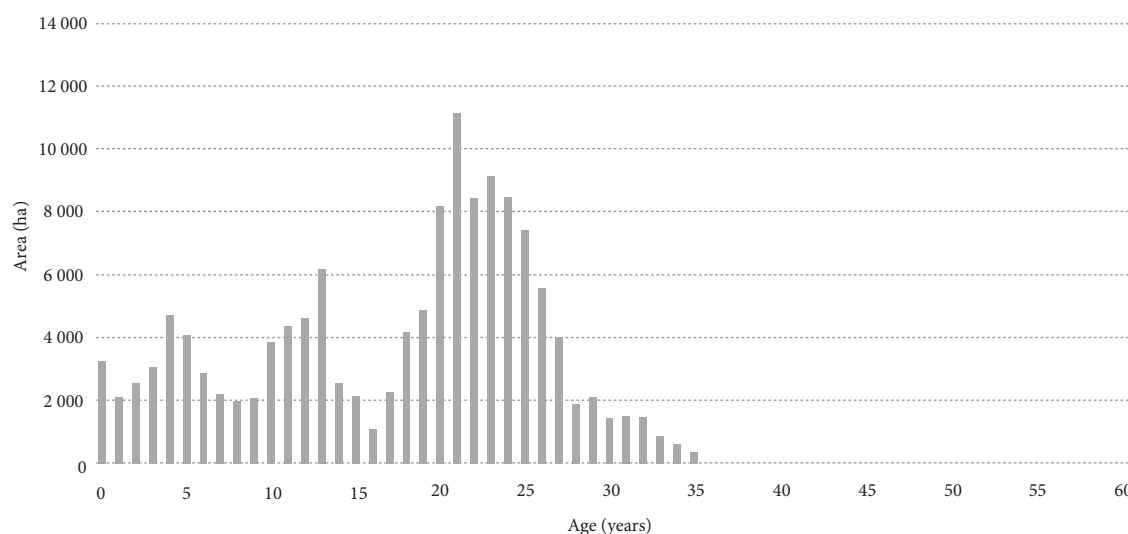
The total area included in the model for large-scale owners is 138 000 hectares. The age-class distribution of the large-scale owners' estate (Figure 4.4) is far from normal (uniform). There are relatively large areas between ages 20 and 25 (planted between 1982 and 1987). The area at age 0 is awaiting replanting as at 31 March 2007 (that is, area to be replanted in the 2007 planting season).

For this scenario the availability of wood from large-scale owners is based on stated harvest intentions for 2007 to 2015. Log grade minimum small-end diameters are: Pruned 35 cm; Unpruned 20 cm; Pulplog 10 cm.

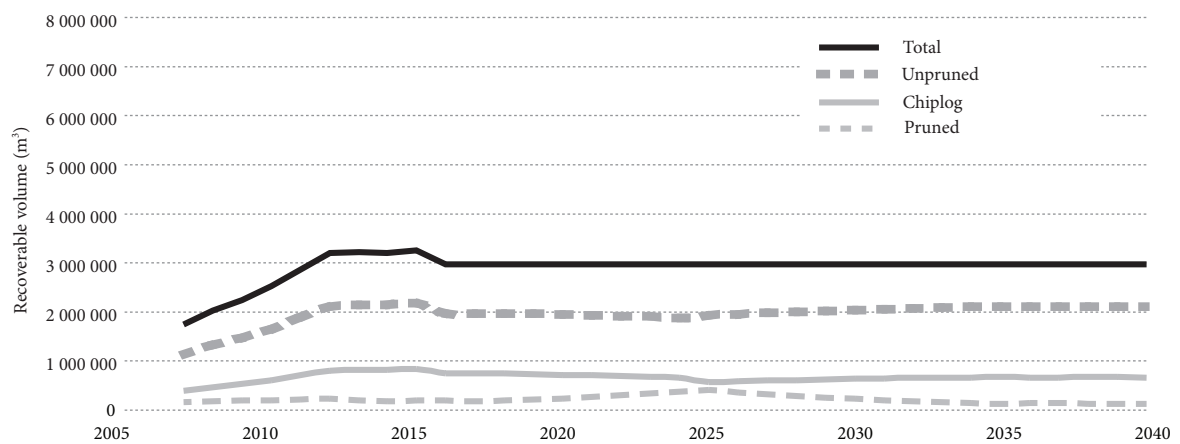
A reduction is permitted between 2015 and 2016.

Thereafter the availability is constrained to be non-declining with a target rotation age of 30 years. The wood availability from large-scale owners (Figure 4.5) is forecast to increase rapidly and exceed 3.2 million cubic metres per year from 2012, before reducing to 3.0 million cubic metres per year from 2016. The reduction between 2015 and 2016 reflects the age-class distribution; that is, the spike in 1982 to 1987 planting with less area planted in subsequent years. This reduction is consistent with supplementary information provided by large-scale owners on harvest intentions from 2016 to 2025.

►► FIGURE 4.4: AGE-CLASS DISTRIBUTION OF THE RADIATA PINE ESTATE IN THE NORTHLAND REGION – LARGE-SCALE OWNERS AS AT 1 APRIL 2007



»» FIGURE 4.5: RADIATA PINE AVAILABILITY IN THE NORTHLAND REGION UNDER SCENARIO 2 – LARGE-SCALE OWNERS

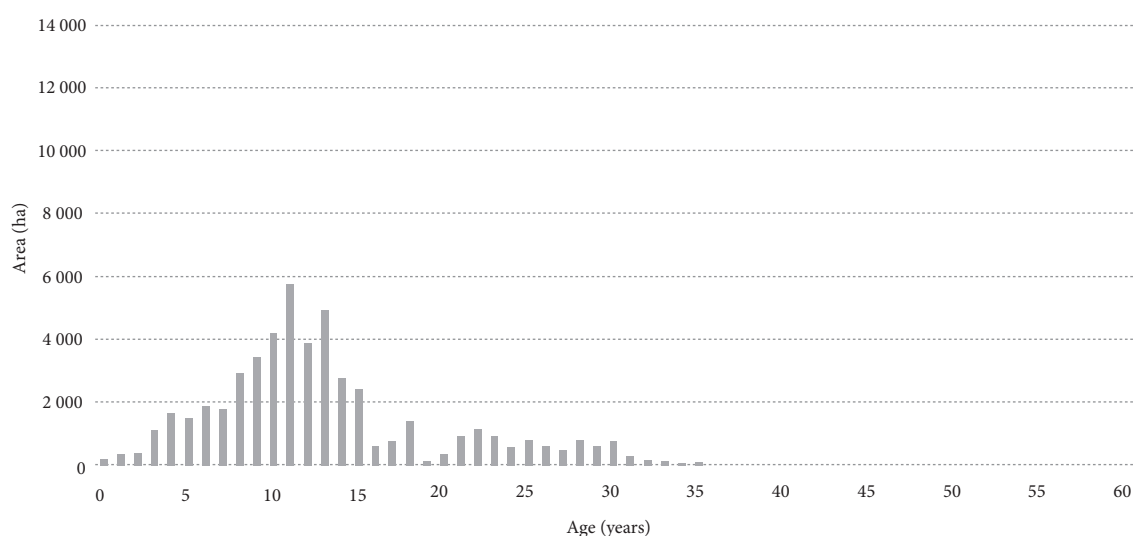


#### » SMALL-SCALE OWNERS' ESTATE

The age-class distribution of the small-scale owners' estate (Figure 4.6) is irregular with over 2000 hectares in each of ages 8 to 15 years (planted in 1992 to 1999) and less area in all other age-classes. The key issue is how to forecast the wood availability from this estate, in particular: whether the large area in ages 8 to 15 will be harvested:

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

»» FIGURE 4.6: AGE-CLASS DISTRIBUTION OF THE RADIATA PINE ESTATE IN THE NORTHLAND REGION – SMALL-SCALE OWNERS ONLY



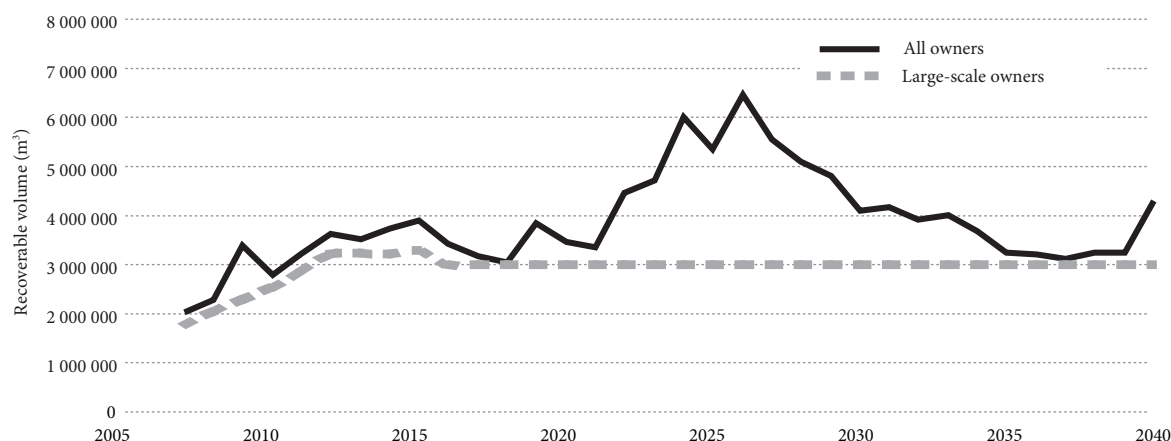
#### » COMBINED ESTATE

The wood availability from all owners is presented in Figure 4.7 with that of large-scale owners the same as in Figure 4.5. In scenario 2, forest 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 4.7) occurs when the large areas from the small-scale owners' estate in young age-classes (planted from 1992) are harvested. For example, the increase in 2022 results from the 2436 hectares planted by small-scale owners in 1992 (age 15 in Figure 4.5) being harvested at age 30 years.



»» FIGURE 4.7: RADIATA PINE AVAILABILITY IN THE NORTHLAND REGION UNDER SCENARIO 2 – COMBINED ESTATE



Fluctuations in harvest volumes of the magnitude shown in Figure 4.6 would be impractical because of marketing and logistics realities (immediate availability of logging crews, transport capacity, and wood processing capacity).

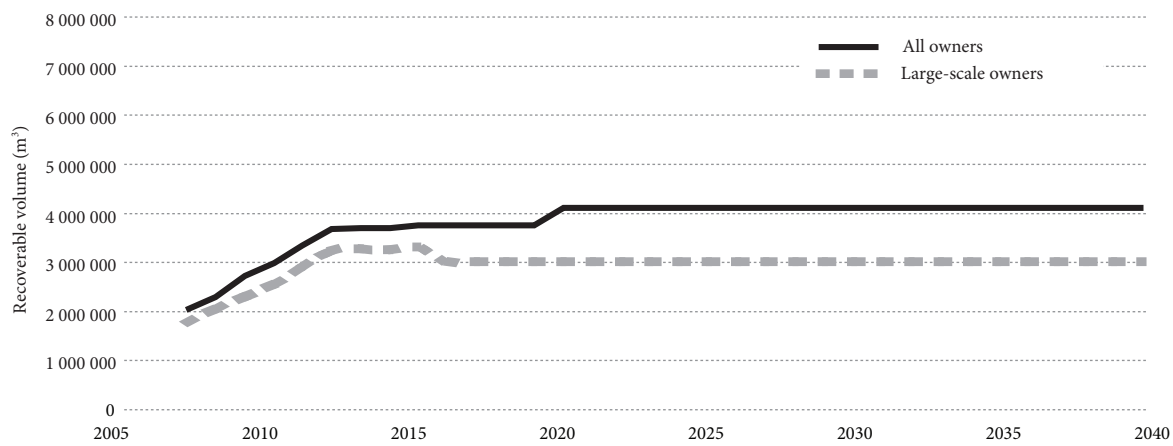
#### » SCENARIO 3: NON-DECLINING YIELD (TARGET ROTATION 30 YEARS)

The third scenario assumes a non-declining yield, with a target rotation age of 30 years. Figure 4.8 indicates that when the small-scale owners' estate is harvested to complement the large-scale owners' estate, the total volume (radiata pine) has the potential to increase substantially. The potentially available volume increases to over 4 million cubic metres per year from 2020. An extra constraint was modelled so the total volume was not allowed to increase by more than 10 percent annually from 2015 on.

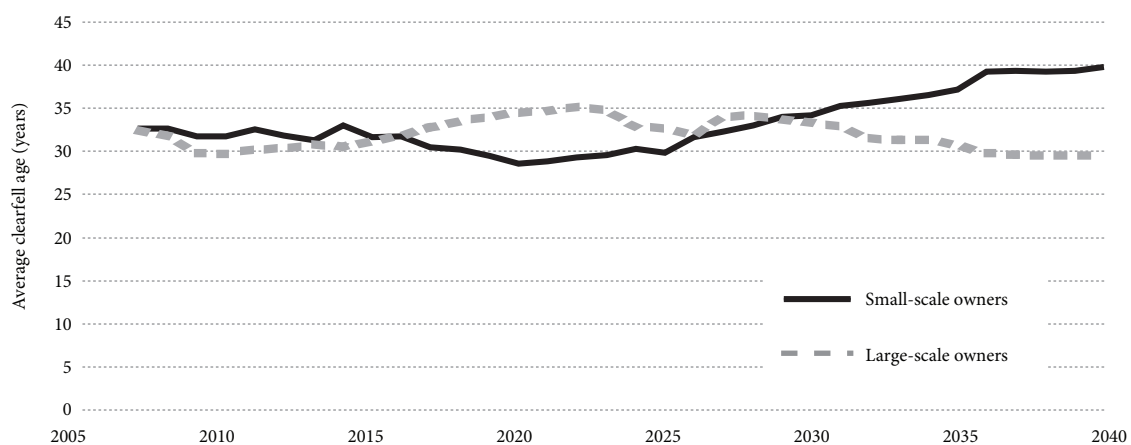
This scenario is similar to the base case scenario adopted in the National Exotic Forest Description, National and Regional Wood Supply Forecasts 2000, (MAF, 2000). The increase in average rotation age for the large-scale owners' estate to 35 years (Figure 4.9) is a consequence of the non-

normal age-class distribution (Figure 4.4). However under this scenario the small-scale owners' estate are harvested at rotation ages that differ markedly from 30 years (Figure 4.9).

»» FIGURE 4.8: RADIATA PINE AVAILABILITY IN THE NORTHLAND REGION UNDER SCENARIO 3



»» FIGURE 4.9: AVERAGE RADIATA PINE CLEARFELL AGE BY OWNERSHIP CATEGORY UNDER SCENARIO 3



#### ► SCENARIO 4: SPLIT NON-DECLINING YIELD (TARGET ROTATION 30 YEARS)

The fourth scenario is based on a split non-declining yield, with a rotation age of 30 years. This scenario gives a forecast wood availability that is similar to scenario 3 through to 2019 (Figure 4.10). Wood availability increases to 4.7 million cubic metres per year from 2023, before reducing to 3.4 million cubic metres per year from 2037.

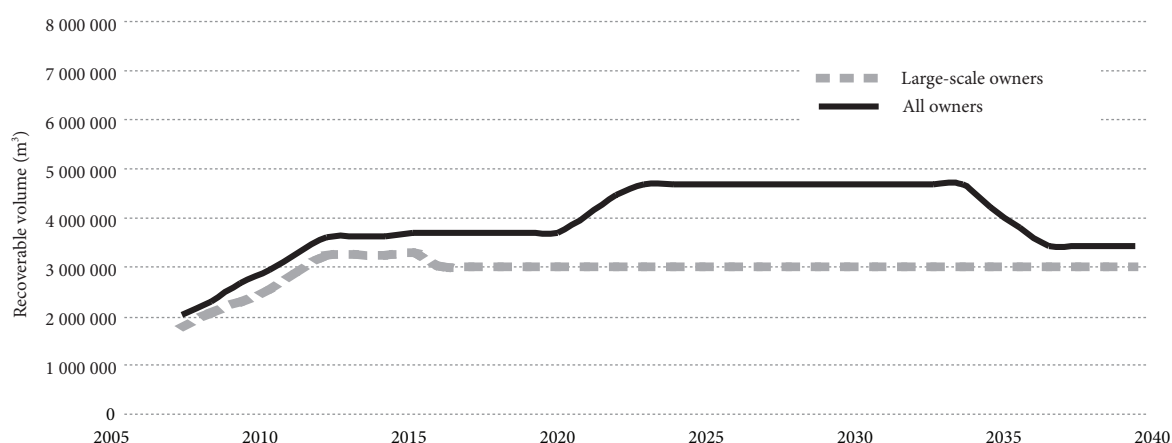
The main difference from scenario 3 is that the large area of young stands in the small-scale owners' estate is

assumed to be harvested over a shorter period of time.

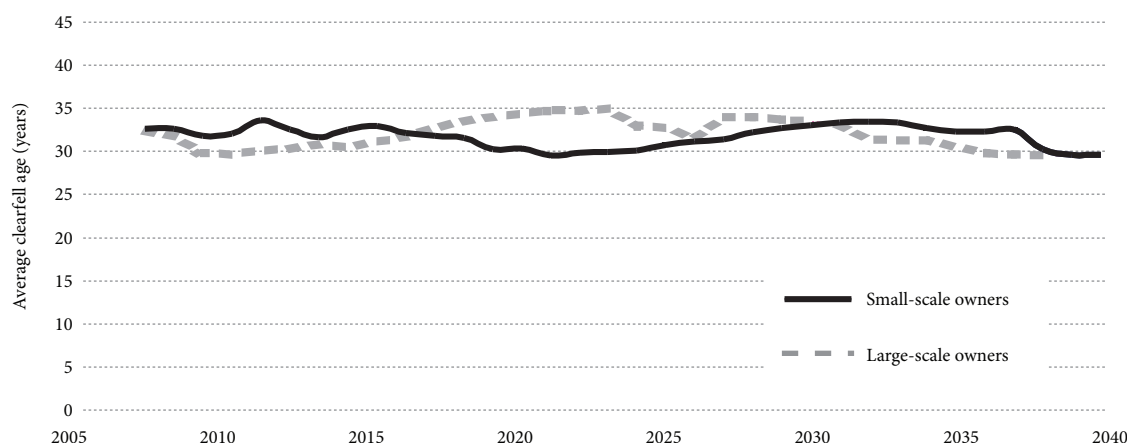
The total volume was constrained to be non-declining from 2007 to 2034; that is, for the current rotation.

Thereafter 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 (Figure 4.11) than was the case in scenario 3.

►► FIGURE 4.10: RADIATA PINE AVAILABILITY IN THE NORTHLAND REGION UNDER SCENARIO 4

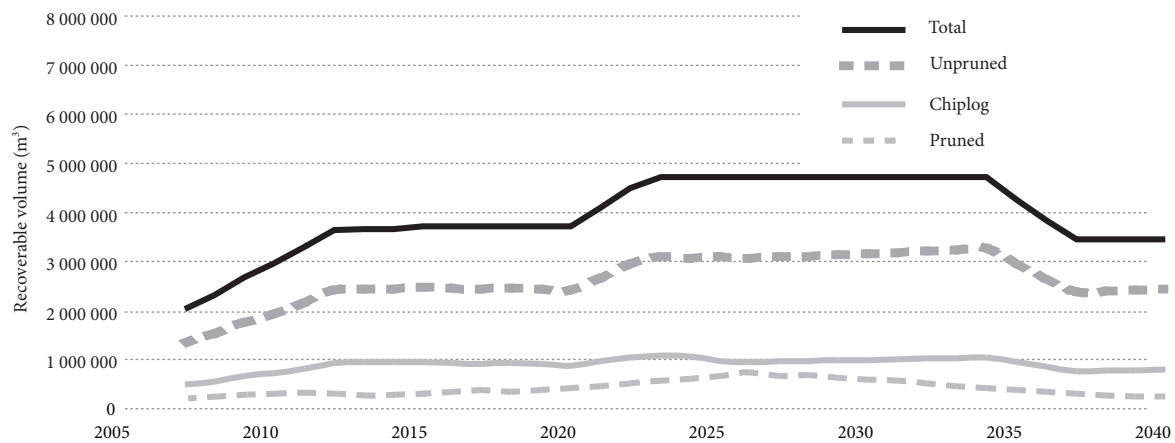


►► FIGURE 4.11: AVERAGE RADIATA PINE CLEARFELL AGE BY OWNERSHIP CATEGORY UNDER SCENARIO 4



The total volume forecast for scenario 4 is broken down by log grade in Figure 4.12.

»» FIGURE 4.12: RADIATA PINE AVAILABILITY IN THE NORTHLAND REGION UNDER SCENARIO 4, BY LOG PRODUCT



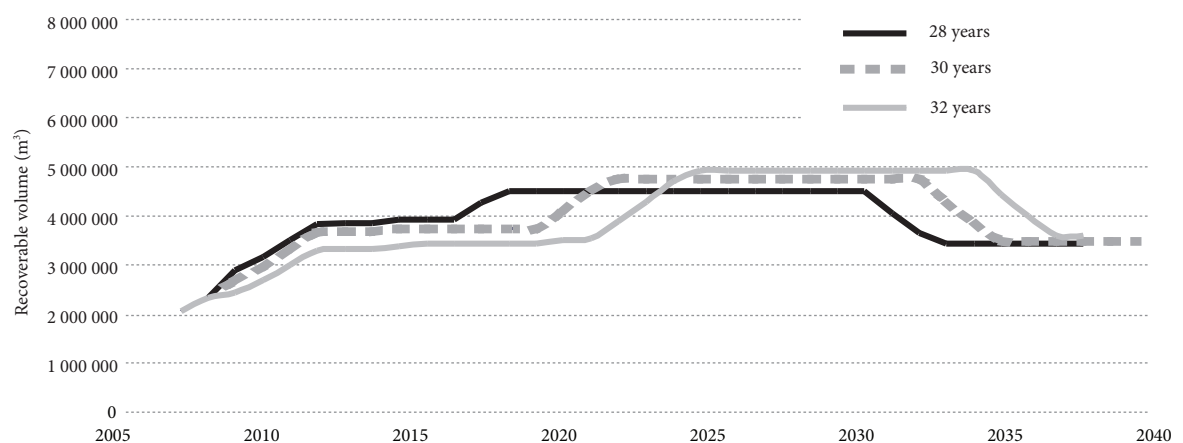
#### ► SCENARIO 5: TARGET ROTATION AGE VARIATIONS

Different wood availability profiles are generated if target rotation age is changed from 30 years to either 28 or 32 years (Figure 4.13). Because of the limitations imposed by the current age-class distribution and large-scale owners' stated harvest intentions, it takes some time to achieve separation of average clearfell age (Figure 4.14).

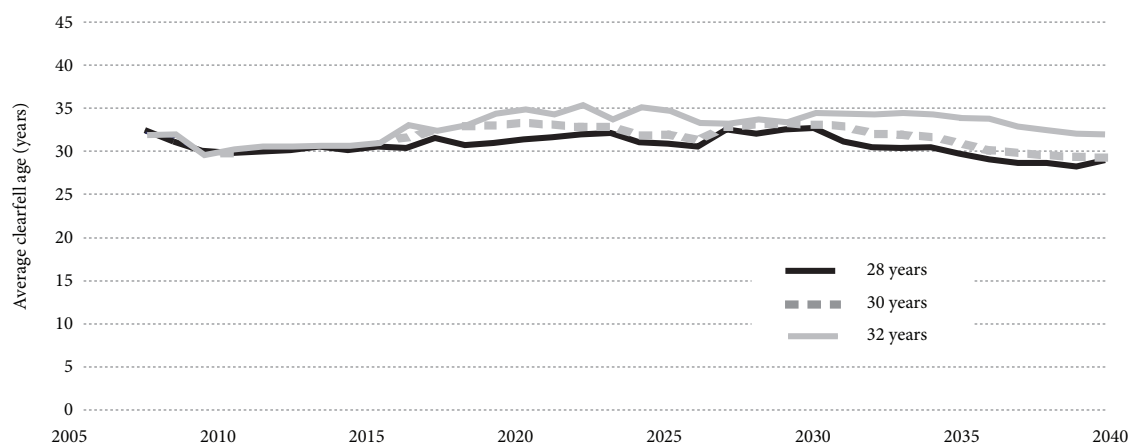
For the 32-year variation, the harvest from the large-scale owners' estate in 2009 to 2015 was reduced to 90 percent of harvest intentions.

Figure 4.13 shows the potential for a significant increase in the Northland harvest volumes. There is a range of possibilities for timing the increase and for the level of the potential harvest volume.

»» FIGURE 4.13: RADIATA PINE AVAILABILITY IN THE NORTHLAND REGION UNDER SCENARIO 5



»» FIGURE 4.14: AVERAGE RADIATA PINE CLEARFELL AGE FOR EACH TARGET ROTATION AGE UNDER SCENARIO 5



# THE WOOD PROCESSING INDUSTRY

5

Tree felling, sawmilling and forestry have been undertaken for a considerable period of time in the Northland region. Kauri forests were harvested for ship repair and ship building and timber export to Australia before the 1840s. As a consequence the sawmilling industry has evolved from a base of a large number of small sawmills. Some small sawmills still remain in operation.

Exotic forests have been harvested in Northland since the 1950s, but the industry has only become relatively significant over the last 10 years. Figure 5.1 shows exotic sawn timber production has increased from about 60 000

cubic metres sawn outturn in 1997 to 330 000 in 2008.

This is a result of the maturing estates established in the 1970s and 1980s, notably JNL's Aupouri Forest and the forests previously owned by CHH Ltd.

Sawmilling and processing capacity has been boosted in recent years by the addition of a veneer mill and sawmill to the JNL triboard facility at Kaitaia. This plant is largely self-sufficient from its own and neighbouring forests in the Far North. In addition, the building of the Marsden Point LVL plant by CHH Ltd and the expansion of the TDC Sawmill at Whangarei now also owned by CHH Ltd, had a major impact on local processing capability. Figure 5.2 shows the increasing exports from 1996 to 2008 as processing capacity increased and the owners began exporting to international markets. Figure 5.3 shows the corresponding drop in log exports.

A small indigenous milling industry exists, based largely around the salvage of "fossil" kauri forests buried and preserved thousands of years ago. The timber is generally used in products such as high-quality furniture. Several other small sawmilling operations also specialise in using exotic hardwood (notably Eucalyptus species) and non-radiata softwoods, such as macrocarpa in small quantities.

Pulp logs in Northland have traditionally been exported or transported to the Kinleith or Tasman pulp and paper mills in the Central North Island. A chipping facility established in Whangarei produces exotic hardwood chips for export.

»» TABLE 5.1: SAWN TIMBER PRODUCTION IN NORTHLAND (IN CUBIC METRES)

YEAR ENDED 31 MARCH	INDIGENOUS FORESTS (M³)	PLANTATION FORESTS (M³)	TOTAL (M³)
1996	1 886	80 992	82 877
1997	2 435	60 056	62 491
1998	1 190	59 542	60 732
1999	648	65 254	65 902
2000	678	71 766	72 444
2001	610	123 544	124 154
2002	696	144 388	145 084
2003	859	189 078	189 937
2004	813	223 569	224 382
2005	1 198	264 339	265 537
2006	673	240 681	241 354
2007	760	300 450	301 211
2008 (Provisional)	777	329 115	329 892

Source  
Ministry of Agriculture and Forestry.

»»» TABLE 5.2: SAWN TIMBER EXPORTS FROM PORT OF WHANGAREI (IN CUBIC METRES)

YEAR ENDED 31 DECEMBER	WHANGAREI PORT (M³)
1996	14
1997	37
1998	71
1999	0
2000	438
2001	1 693
2002	3 986
2003	11 166
2004	17 963
2005	15 219
2006	25 450
2007	20 475
2008 (Provisional)	31 831

**Source**  
Ministry of Agriculture and Forestry.

»»» TABLE 5.3: LOG EXPORTS FROM PORT OF WHANGAREI (IN 000 CUBIC METRES)

YEAR ENDED 31 DECEMBER	WHANGAREI PORT (M³)
1996	348
1997	243
1998	243
1999	299
2000	574
2001	738
2002	920
2003	1 222
2004	1 022
2005	533
2006	479
2007	639
2008 (Provisional)	719

**Source**  
Ministry of Agriculture and Forestry.

### »» SAWMILLS AND WOOD PROCESSORS

The sawmilling industry is dominated by CHH and Rosvall Sawmilling in Whangarei, who together accounted for more than half of the region's sawn timber output in the year to 31 March 2008.

The region's long history of indigenous milling has left a legacy of many smaller sawmills still in operation around the Northland region – nearly 30 mills in total. Those with annual production over 5000 cubic metres are listed in Table 5.1.

The total sawn timber outturn reported from the region for the year ending December 2008 was about 360 000 cubic metres.

### »» SAWMILLS

#### > CARTER HOLT HARVEY WHANGAREI

Following the expansion of the TDC Sawmill in Whangarei in 2006, the site and facilities were purchased by CHH Ltd which has continued with that expansion, investing over NZ\$20 million. The existing output from the plant (on a two-shift operation) is estimated to be over 100 000 cubic metres outturn per annum, and there is the potential to expand the capacity to over 400 000 cubic metres outturn per annum.

The complex consists of the original or Base Mill which takes large logs, and the new mill or Fortress Mill which takes smaller logs with a maximum large end diameter of 42 cm. The Fortress Mill also has drying facilities with a wood waste-fuelled boiler.

»» TABLE 5.4: SAWMILLS OPERATING IN NORTHLAND

#### SAWMILL

##### A. PRODUCTION LEVEL: OVER 25 000 M<sup>3</sup> SAWN TIMBER PER ANNUM

CHH (formerly TDC Sawmills)  
Mount Pōkākā Timber Supplies  
Rosvall Sawmill Ltd

##### B. PRODUCTION LEVEL: 10 000–25 000 M<sup>3</sup> SAWN TIMBER PER ANNUM

Bay Lumber  
Juken New Zealand  
Kaihū Valley Sawmill  
Northpine Ltd

##### C. PRODUCTION LEVEL: 5000–9999 M<sup>3</sup> SAWN TIMBER PER ANNUM

CBM Sawmills  
ETC (2006) Ltd

#### Source

Individual sawmillers.

#### LOCATION

Whangarei  
Kerikeri  
Whangarei

Kerikeri  
Kaitiāia  
Mamarānui  
Waipū

Whangarei  
Whangarei

#### > ROSVALL SAWMILL LTD

Rosvall Sawmill is a modern sawmill, with a complex of Windsor drying kilns, a pressure treatment plant and a planer mill for finishing grades. The mill has a close association with a retail timber and hardware outlet in Whangarei. The mill targets pruned logs for clearwood and moulding grades, and services both domestic and international markets. The mill has an annual outturn of between 20 000 and 30 000 cubic metres per annum.

#### > BAY LUMBER LTD

Bay Lumber has operated near Kerikeri since 2002 and produces an outturn of less than 20 000 cubic metres sawn timber per annum.

#### > JUKEN NEW ZEALAND LTD

Juken New Zealand added a sawmill to their triboard manufacturing site in 2000. See comments below.



#### ➤ NORTHPIKE LTD

Northpine Ltd operates a sawmill, treatment facility and dry mill at Waipū south of Whangarei, and targets mainly the domestic market through their building supplies outlet. The sawn outturn is typically less than 20 000 cubic metres per annum, but the facility is being upgraded.

#### ➤ KAIHŪ VALLEY SAWMILL LTD

Operating near Dargaville, this mill produces less than 10 000 cubic metres sawn outturn per annum, and operates a timber treatment facility.

### ➤➤➤ PANEL AND VENEER PLANTS

#### ➤ JUKEN NEW ZEALAND LTD

JNL has two wood processing plants located on separate sites in Kaitia. The older of the two mills (the triboard mill) has been operational since 1987 and manufactures reconstituted wood panel products. These are medium density fibre (MDF) board, strand board and triboard. Triboard is a unique product which is a combination of a strand board core with an MDF fibre layer on either side. Currently about 80 percent of the production is sent to the parent company in Japan (Wood One Ltd) to produce components for housing, for example, flooring, closet, shelving, doors, door frame and window frame. For the non-Japanese market (domestic sales) the primary uses are: flooring, fire doors, commercial shelving, panel house construction and office partitioning.

The more recent mill (the Northland mill) has been operational since 2001.

It produces peeled veneer of varying densities, thicknesses and sizes from pruned and unpruned logs. Current markets are to plywood and laminated veneer lumber manufacturers in NZ, and overseas, and to the

other Juken mills in Gisborne, Masterton, the Philippines and Shanghai. The Northland mill also has a sawmill facility capable of producing dried lumber.

Wood supply to both mills is from JNL's Northland forests.

Both mills have FSC chain-of-custody certification to process and distribute FSC products. Both mills also have ISO 14000 and ISO 9001 certification.

#### ➤ CARTER HOLT HARVEY FUTUREBUILD

The LVL plant at Whangarei was opened in 2001 as New Zealand's first. It now has an annual production of about 80 000 cubic metres of LVL products. The output is targeted primarily at structural and construction markets in New Zealand, Australia, the United States, Asia and the Middle East.

### ➤➤➤ OTHER PROCESSING PLANT

#### ➤ MARUSUMI WHANGAREI CO LTD

This company is jointly owned by Marusumi Paper Company Ltd and Marubeni Corporation of Japan. Operating since 1996, this facility chips log material sourced from the Northland region and exports it to Japan from the port at Marsden Point. Additionally, the chip export facility buys and exports sawmill chip. The plant is linked by rail to yards in the north and south of the region, but has no rail link to the chip export facility since it was moved from Whangarei Port to Marsden Point.

# INFRASTRUCTURE

# 6

## »» PORT

Northland is now served by a single port. Marsden Point has three berths able to accommodate vessels up to 11.8 metres draft, and has dedicated log and chip storage and handling facilities. Logs, LVL, veneer and chips are all exported from here. The current annual log export capacity of the facility is 2 million cubic metres.

The port facilities at Marsden Point are only accessible by road, but rail access is being actively considered with the Oakleigh to Marsden Point route now formally designated for future rail use (Ontrack media statement, March 2009).

Two other facilities exist in the harbour, namely two oil jetties to service the New Zealand Refining Company, and a dedicated cement jetty to service the Golden Bay Cement Company.

The port operations are run by Northport, a joint venture between the Northland Port Corporation and the Port of Tauranga.

The Port of Whangarei was closed to commercial traffic in April 2007.

## »» ROAD TRANSPORT

Northland's road network comprises 70 percent of unsealed roads compared with the national average of 30 percent. The basic road network recently had a significant upgrade when the Ministry of Economic Development allocated NZ\$71 million for the improvement of key forestry arterial routes in Northland and the East Coast during 2002 to 2007. In Northland the funds were used by the regional councils to upgrade 230 km of central and western Northland roads. An additional NZ\$30 million was allocated in 2008 to continue the projects over the next three years.

Northland's foundation rock materials are generally of poor quality, and this contributes to the relatively high cost of road construction and maintenance in the region. Greater use of rail or barging for heavy freight may assist in alleviating damage from heavy transport; however, in many cases alternatives to road transportation are not viable.

A forestry Transport Working Group is working with Land Transport New Zealand and the local district and regional councils, to ensure that the needs of forestry roading requirements are known.

## »» RAIL TRANSPORT

The rail freight network in Northland extends north from Auckland through Helensville and terminates at Ōtiria, west of Kawakawa. A branch line extends from Waitōtara to Dargaville.

The rail network has been previously used to transport wood chips from the Marusumi (Portland) chip mill to the chip export facilities at the Whangarei Port and from the TDC sawmill to Central North Island pulp mills. However, since the closure of the Whangarei Port, rail transport to the new port has not been possible and all freight has been transported on road. The Ōtiria, Dargaville and Helensville rail yards have also been used as railheads for pulp log transport to the Portland chip mill, and the Kinleith Pulp Mill in the Central North Island. Other factors have led to a reduction in the use of the rail network. The availability of rolling stock for transport of logs appears to be constraining the immediate increase in the use of the rail network.

Rail access to Marsden Point has been proposed, and land for the rail corridor has been formally designated for rail use.

### »» COASTAL BARGING

Coastal barging has been suggested as an alternative to road and rail transport of logs, but no progress has been made to date.

### »» ENERGY

Northland has two main generation plants – Ngāwhā Geothermal (10MW to be upgraded to 25 MW by August 2008), Wairua Hydro (5.4 MW) – and a small landfill gas generation plant (2 MW) at Redvale in Rodney District. This capacity is currently able to supply only 5 percent of Northland's power requirements, and therefore the region is reliant on the transmission of electricity up to and across the Auckland isthmus. Security of supply is an issue with major industries such as the New Zealand Refining Company and Golden Bay Cement. These are reliant on the stability of electricity supply to run their plants.

The Northland and North Auckland electricity generation and line capacity issue has been identified and was addressed in Transpower New Zealand's 2007 Grid Upgrade Plan. This Plan identifies sections of the grid south of Northland that constrain the ability to sustain a steady power supply to Northland. The Northern Grid Upgrade is planned to be in place by 2013 (Transpower, 2008).

Genesis Energy applied for resource consent to construct a combined cycle gas turbine-powered 480MW plant north of Helensville in May 2008.

Recent work undertaken in Northland sawmills, in association with the Energy Efficiency and Conservation Authority (EECA) Bioenergy Gateway programme, has identified options for sawmills to become significantly less reliant on the national grid through the use of wood-fuelled steam and electricity generation facilities (EECA, 2009). The "embedded networks programme" also allows

any surplus of electricity to be sold back into the national grid.

### »» LABOUR

#### » AVAILABILITY

The forestry sector is an important employer in Northland. However, the work skills and attitudes required mean that forestry employers find it difficult to attract new staff. This is a nationwide problem.

Employment in the harvesting sector is relatively stable, but silviculture workers are difficult to attract and retain. Career opportunities do exist in technical and practical forestry as well as in the processing sector in Northland. Young people with particular skills or aptitudes have a range of opportunities in forestry or the wood processing sector. The Forest Industries Training and Education Council (FITEC) has been active in promoting forestry as a career choice, and the sector needs to actively follow this message through.

#### » EDUCATION AND TRAINING

New Zealand has one professional forestry degree programme, offered by the School of Forestry, at Canterbury University. A forestry Diploma is offered at Waiariki Polytech, Rotorua. Both are national facilities and are outside the region.

There is a formal NZQA-recognised practical forestry training institution based on the Northland Polytech. The Northtec training facility has practical forestry courses run from Whangarei as well as Kaitiāia, Kerikeri, Dargaville and Kaikohe. Northtec also has a separate contract for forestry training with MSD in association with Ngātihine.

FITEC has a forest industry trainer covering Northland. Contractors usually have to train new staff in association with the FITEC trainer.

# OPPORTUNITIES

## AND CONSTRAINTS

7

### »»» OPPORTUNITIES

#### » WOOD AVAILABILITY

The wood availability forecasts indicate that the Northland region will see an increase in wood availability across the whole region over the next five years. There is potential for the regional harvest to increase from the current level of about 2 million cubic metres to about 3.8 million cubic metres per year by 2012, and increase again up to about 4.1 million cubic metres around 2020. Much of this increasing wood availability is from small-scale private growers, and so some variability in harvest levels over this period can be expected.

#### » NEW WOOD PROCESSING OPPORTUNITIES

A large portion of the increase in available wood in Northland is currently uncommitted, and is therefore available for future processing options in Northland. A major strategic advantage for the Northland region is the relatively high wood density and the increasing age of the resource. This effectively allows forest processors to target structural lumber. Densities above 475 kg/m<sup>3</sup> are considered typical in the Northland region; logs with wood of this density typically produce a greater proportion of higher-strength timber and veneer.

The presence of a significant wood processing industry in the Northland region ensures that there is a core industry in place to support future processing options. They may wish to grow to world scale. Councils have shown support for forestry processing and have been proactive in zoning land suitable for large-scale processing near existing facilities.

#### » WOOD-BASED ENERGY GENERATION

Opportunities exist for a residue-based fuel industry. New processing facilities could offset internal energy usage with residue-fuelled electricity generation plant, or supply process heat to allied processing facilities in the same

vicinity. Wood-based electricity generation within Northland will actively benefit the stability of the existing electricity supply in the region.

#### » REGIONAL CO-ORDINATION: ENTERPRISE NORTHLAND FORESTRY DEVELOPMENT GROUP

Several years ago, after completing a NZTE-funded strategy, the Enterprise Northland Forestry Development Group decided that their work was completed. The main group folded but a number of sub-groups continued. These are:

- › the RMA Forestry Group, focusing on good practice in forest operations;
- › the HSE Forestry group that focuses on health and safety, including the impact of drugs and alcohol;
- › a Transport Working Group that allows industry to input into transport strategies and expenditure programmes for the central government forestry roading fund.

### »»» CONSTRAINTS

#### » CURRENT ENERGY TRANSMISSION CAPACITY

Transpower has acknowledged several constraints to a stable and secure electricity supply beyond the Auckland isthmus in recent planning documents. Until these are remedied they could act as a deterrent to new plant establishment, or existing plant expansion that does not involve a significant proportion of internal generation. This is unlikely to be a significant long-term issue if the proposed Central North Island and Northland network upgrades are progressed. Additional generation capacity, such as the proposed 480 MW combined cycle gas turbine generation plant near Helensville, will alleviate this situation as well.

#### » ROADING AND LAND TRANSPORT

The local council road network will come under increasing pressure as new forests begin production, with

possible friction between forest owners and other stakeholders. Log-haul distances are still an issue with some significant forest areas located a long way from ports and processing facilities.

The region's forest owners will also face difficult in-forest roading conditions, as much of the forecast available wood will be accessed for the first time. This will require large capital roading programmes for the forest owners. The limited construction season in Northland places extra pressure on machines, skilled operators and resource consent processing to complete the work in a limited time frame.

#### ► HARVESTING CAPACITY

A significant increase in harvesting volume translates to considerable capital requirements for machinery, and the need for skilled and experienced labour to ensure safe operation. This is likely to pose a challenge for the next five years, as the industry has effectively down-sized in recent times and much harvest skill and capacity has moved offshore.

#### ► FOREST OWNER OPTIONS

Markets and processing capacity in the region will ultimately influence the harvest rate in Northland. However, as smaller forests contribute to a greater proportion of the total, it is likely that harvest levels will be more volatile. The resulting uncertainty could reduce long-term capital intensive commitments to harvesting and processing facilities unless the marketing of small-scale woodlots becomes a co-operative venture.

#### ► SKILLED LABOUR

As in all regions experiencing a large increase in potential volume, the availability of skilled labour to operate logging equipment efficiently and safely in hazardous conditions could become a constraint.

Forestry courses are run by Northland Polytechnic from several centres around Northland; the Regent Training Centre operates forestry and logging training courses from Whangarei and Kerikeri. A continuing partnership between the forest industry and training providers will be necessary to ensure that skilled labour is available, and advancement opportunities exist for workers within the forest industry.

The capital-intensive infrastructure and skilled labour base will need to be developed and maintained to provide certainty and stability in the workforce.

### »» CONCLUDING COMMENTS

The forecasts indicate that the availability of radiata pine from the Northland forest estate will increase steadily: from the current level of about 2.3 million cubic metres to around 3.6 million cubic metres per year by 2012. After that, wood availability remains fairly constant until about 2020, beyond which wood availability is expected to increase to around 4.7 million cubic metres per year after 2023.

Most of the potential increase in wood availability from 2008 to 2012 will come from the region's large-scale forest growers, who established forests during the 1980s. However, from 2020 most of the increase will come from the region's small-scale forest growers who established forests during the 1990s. The actual timing of the harvest from these forests will depend on market conditions and on the decisions of a large number of small-scale owners. Market conditions and logistical constraints (availability of logging crews, transport capacity, and wood processing capacity) will limit how quickly the additional available wood from the region's forests can be harvested.

Northland's district and regional planning bodies have been aware of the potential wood availability increases for some time. They have been working with the established forest owners and managers to ensure the infrastructure is in place to deal with the effects of an increased harvest.

The region has obtained additional government funding to upgrade its arterial roading infrastructure ahead of the expected increase in logging traffic. The port facility at Marsden Point is capable of handling full-sized cargoes, and is well served for log, forest product and container shipping services.

The Northland Regional Council has also supported the development of the forest industry through the Enterprise Northland business development groups which co-ordinate industry representation.

The degree to which the Northland region is able to benefit from the increasing wood availability in coming years will largely depend on the approach adopted by the incumbent processing operators to maintain and further develop export markets for their products; and for the region to attract additional processing capacity. While there are some challenges ahead, the Northland region is starting from a good base.



## 8

# WEBSITE ADDRESSES

## FOR MORE INFORMATION

### »»» FOREST OWNERS/MANAGERS

[www.rayonier.com](http://www.rayonier.com)

[www.pfolsen.com](http://www.pfolsen.com)

[www.hnrg.com](http://www.hnrg.com)

[www.gfplp.com](http://www.gfplp.com)

[www.maf.govt.nz/forestry/crown-forestry](http://www.maf.govt.nz/forestry/crown-forestry)

[www.fna.co.nz](http://www.fna.co.nz)

[www.whitecliffs.co.nz/forestry](http://www.whitecliffs.co.nz/forestry); [www.whitecliffs.co.nz/mamaku](http://www.whitecliffs.co.nz/mamaku)

[www.gmo.com/America/About/People/\\_Departments/Forestry](http://www.gmo.com/America/About/People/_Departments/Forestry)

[www.arborgen.co.nz/kaikohenursery.htm](http://www.arborgen.co.nz/kaikohenursery.htm)

### »»» WOOD PROCESSORS

[www.chh.com](http://www.chh.com)

[www.rosvall.co.nz](http://www.rosvall.co.nz)

[www.triboard.com](http://www.triboard.com)

[www.baylumber.co.nz](http://www.baylumber.co.nz)

[www.marubeni.com](http://www.marubeni.com)

### »»» INFRASTRUCTURE

[www.gridnewzealand.co.nz/gnz-projects](http://www.gridnewzealand.co.nz/gnz-projects)

[www.northportcorp.co.nz](http://www.northportcorp.co.nz)

[www.bioenergy-gateway.org.nz](http://www.bioenergy-gateway.org.nz)

[www.ontrack.govt.nz](http://www.ontrack.govt.nz)

### »»» INDUSTRY TRAINING

[www.fitec.co.nz](http://www.fitec.co.nz)

[www.fore.canterbury.ac.nz](http://www.fore.canterbury.ac.nz)

[www.forestryschool.ac.nz](http://www.forestryschool.ac.nz)

[www.northland.ac.nz](http://www.northland.ac.nz)

### »»» FORESTRY ADVICE AND CO-ORDINATION

[www.nzif.org.nz](http://www.nzif.org.nz)

[www.nzffa.org.nz](http://www.nzffa.org.nz)

[www.enterprisenorthland.co.nz/dev\\_groups/forest/background.htm](http://www.enterprisenorthland.co.nz/dev_groups/forest/background.htm)

### »»» GOVERNMENT DEPARTMENTS

[www.maf.govt.nz](http://www.maf.govt.nz)

[www.doc.govt.nz](http://www.doc.govt.nz)

[www.eeca.govt.nz](http://www.eeca.govt.nz)

[www.statistics.govt.nz](http://www.statistics.govt.nz)

### »»» LOCAL AND REGIONAL AUTHORITIES

[www.nrc.govt.nz](http://www.nrc.govt.nz)

[www.arc.govt.nz](http://www.arc.govt.nz)

[www.fndc.govt.nz](http://www.fndc.govt.nz)

[www.kaipara.govt.nz](http://www.kaipara.govt.nz)

[www.wdc.govt.nz](http://www.wdc.govt.nz)

[www.rodney.govt.nz](http://www.rodney.govt.nz)

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Energy Efficiency and Conservation Authority (2009) *Wood Energy Grant Scheme*. <http://www.eeca.govt.nz>. Accessed 5 February 2009.

Enterprise Northland Forestry Development Group (2004) *Strategic Review of the Northern Forest Industry 2004*; Prepared by CFK, March 2004

Ministry of Agriculture and Forestry (2000) *National Exotic Forest Description, National and Regional Wood Supply Forecasts 2000*, MAF, Wellington.

Ministry of Agriculture and Forestry (2007) *National Exotic Forest Description as at 1 April 2006*; MAF, Wellington.

Ministry of Agriculture and Forestry (2008) *National Exotic Forest Description as at 1 April 2007*; MAF, Wellington.

Transpower New Zealand Ltd (2008). *Annual Planning Report 2008 (Incorporating the Grid Reliability Report and the grid Economic Investment Report)*, Transpower New Zealand Limited, March 2008.

Ontrack Media release (2009) *KiwiRail releases Marsden Point rail designation documents*. <http://www.ontrack.govt.nz/news>. Accessed May 2009.



# APPENDIX

# 10

»» TABLE 1: NORTHLAND HARVEST INTENTIONS SURVEY RESULTS, LARGE-SCALE OWNERS

	EXPECTED HARVEST	HARVEST INTENTIONS FOR SUBSEQUENT 10 YEARS									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>RADIATA PINE</b>											
Pruned (m <sup>3</sup> )	33 000	74 169	192 922	216 744	229 850	233 673	241 522	264 243	222 080	210 800	227 912
Unpruned (m <sup>3</sup> )	241 730	626 284	1 270 862	1 300 096	1 449 278	1 619 348	1 889 112	2 089 015	2 176 982	2 205 431	2 232 258
Pulp (m <sup>3</sup> )	48 270	148 289	302 855	535 791	601 470	696 619	767 034	869 876	845 750	812 158	830 405
Total volume harvested (m <sup>3</sup> )	<b>323 000</b>	<b>848 742</b>	<b>1 766 639</b>	<b>2 052 632</b>	<b>2 280 598</b>	<b>2 549 641</b>	<b>2 897 669</b>	<b>3 223 135</b>	<b>3 244 811</b>	<b>3 228 389</b>	<b>3 290 575</b>
Total area harvested (ha)	804	1 778	4 095	4 106	4 285	4 602	5 281	5 678	5 360	5 122	5 094

»»TABLE 2: NORTHLAND RADIATA PINE AVAILABILITY UNDER SCENARIO 1 (UNCONSTRAINED CUT), FOR ALL OWNERS

YEAR ENDING DECEMBER	RECOVERABLE VOLUME (000 M <sup>3</sup> IB)
2007	2 023
2008	2 293
2009	3 374
2010	1 629
2011	3 480
2012	4 691
2013	5 539
2014	6 038
2015	5 693
2016	7 109
2017	4 799
2018	2 798
2019	3 260
2020	1 924
2021	1 092
2022	2 872
2023	3 403
2024	6 884
2025	5 264
2026	6 306
2027	5 048
2028	3 505
2029	3 173
2030	2 607
2031	3 107
2032	3 667
2033	4 189
2034	2 715
2035	1 954
2036	1 616
2037	2 307
2038	2 321
2039	2 832
2040	4 393

**Note**

IB denotes inside bark: the recoverable volume of wood excluding bark.

►►► **TABLE 3: NORTHLAND RADIATA PINE AVAILABILITY UNDER SCENARIO 2**

Assumes that large-scale owners cut at stated intentions, and small-scale owners cut at 30 years.

YEAR ENDING DECEMBER	RECOVERABLE VOLUME		
	LARGE-SCALE OWNERS (000 M³ IB)	SMALL-SCALE OWNERS (000 M³ IB)	ALL OWNERS (000 M³ IB)
2007	1 767	256	2 023
2008	2 053	240	2 293
2009	2 281	1 116	3 397
2010	2 550	253	2 803
2011	2 898	346	3 244
2012	3 223	418	3 641
2013	3 245	291	3 536
2014	3 228	529	3 757
2015	3 291	622	3 913
2016	2 996	444	3 440
2017	2 996	187	3 183
2018	2 996	63	3 058
2019	2 996	861	3 857
2020	2 996	479	3 475
2021	2 996	369	3 365
2022	2 996	1 495	4 491
2023	2 996	1 741	4 737
2024	2 996	3 043	6 039
2025	2 996	2 381	5 377
2026	2 996	3 496	6 492
2027	2 996	2 588	5 584
2028	2 996	2 120	5 116
2029	2 996	1 826	4 822
2030	2 996	1 125	4 121
2031	2 996	1 200	4 196
2032	2 996	938	3 934
2033	2 996	1 023	4 019
2034	2 996	707	3 703
2035	2 996	258	3 254
2036	2 996	230	3 226
2037	2 996	125	3 121
2038	2 996	252	3 248
2039	2 996	256	3 252
2040	2 996	1 319	4 315

**Note**

IB denotes inside bark: the recoverable volume of wood excluding bark.

»»TABLE 4: NORTHLAND RADIATA PINE AVAILABILITY UNDER SCENARIO 3

Assumes a non-declining yield with target rotation of 30 years.

YEAR ENDING DECEMBER	RECOVERABLE VOLUME		
	LARGE-SCALE OWNERS (000 M³ IB)	SMALL-SCALE OWNERS (000 M³ IB)	ALL OWNERS (000 M³ IB)
2007	1 767	256	2 023
2008	2 053	240	2 293
2009	2 281	433	2 714
2010	2 550	433	2 983
2011	2 898	433	3 331
2012	3 223	433	3 656
2013	3 245	433	3 678
2014	3 228	450	3 678
2015	3 291	450	3 741
2016	2 996	746	3 741
2017	2 996	746	3 741
2018	2 996	746	3 741
2019	2 996	746	3 741
2020	2 996	1 094	4 090
2021	2 996	1 094	4 090
2022	2 996	1 094	4 090
2023	2 996	1 094	4 090
2024	2 996	1 094	4 090
2025	2 996	1 094	4 090
2026	2 996	1 094	4 090
2027	2 996	1 094	4 090
2028	2 996	1 094	4 090
2029	2 996	1 094	4 090
2030	2 996	1 094	4 090
2031	2 996	1 094	4 090
2032	2 996	1 094	4 090
2033	2 996	1 094	4 090
2034	2 996	1 094	4 090
2035	2 996	1 094	4 090
2036	2 996	1 094	4 090
2037	2 996	1 094	4 090
2038	2 996	1 094	4 090
2039	2 996	1 094	4 090
2040	2 996	1 094	4 090

**Note**

IB denotes inside bark: the recoverable volume of wood excluding bark.

►►►TABLE 5: NORTHLAND RADIATA PINE AVAILABILITY UNDER SCENARIO 4, BY LOG GRADE, FOR ALL OWNERS

Scenario 4 assumes a split non-declining yield with target rotation of 30 years.

YEAR ENDING DECEMBER	TOTAL (000 M³ IB)	RECOVERABLE VOLUME BY LOG GRADE		
		PRUNED LOGS (000 M³ IB)	UNPRUNED LOGS (000 M³ IB)	CHIP LOGS (000 M³ IB)
2007	2 023	199	1 327	496
2008	2 293	249	1 497	545
2009	2 664	274	1 735	655
2010	2 933	298	1 911	723
2011	3 281	320	2 147	813
2012	3 606	298	2 384	923
2013	3 628	268	2 412	947
2014	3 628	278	2 406	943
2015	3 691	306	2 438	946
2016	3 691	337	2 425	929
2017	3 691	370	2 408	909
2018	3 691	346	2 423	919
2019	3 691	381	2 406	906
2020	3 691	419	2 397	875
2021	4 060	461	2 639	961
2022	4 466	507	2 915	1 045
2023	4 695	556	3 061	1 079
2024	4 695	612	3 028	1 056
2025	4 695	662	3 071	961
2026	4 695	728	3 027	938
2027	4 695	656	3 078	959
2028	4 695	682	3 062	951
2029	4 695	614	3 106	973
2030	4 695	589	3 123	980
2031	4 695	564	3 139	989
2032	4 695	508	3 176	1 008
2033	4 695	457	3 209	1 026
2034	4 695	411	3 238	1 042
2035	4 225	370	2 915	938
2036	3 803	333	2 624	845
2037	3 422	300	2 360	761
2038	3 422	270	2 378	772
2039	3 422	243	2 396	781
2040	3 422	235	2 401	784

**Note**

IB denotes inside bark: the recoverable volume of wood excluding bark.

»»TABLE 6: NORTHLAND 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.

YEAR ENDING DECEMBER	28-YEAR ROTATION		30-YEAR ROTATION		32-YEAR ROTATION	
	RECOVERABLE VOLUME (000 M <sup>3</sup> IB)	AVERAGE AGE (YEARS)	RECOVERABLE VOLUME (000 M <sup>3</sup> IB)	AVERAGE AGE (YEARS)	RECOVERABLE VOLUME (000 M <sup>3</sup> IB)	AVERAGE AGE (YEARS)
2007	2 023	33	2 023	32	2 023	32
2008	2 293	31	2 293	32	2 293	32
2009	2 851	30	2 664	30	2 410	30
2010	3 120	30	2 933	30	2 652	30
2011	3 468	30	3 281	31	2 965	31
2012	3 793	30	3 606	31	3 258	31
2013	3 815	31	3 628	31	3 292	31
2014	3 815	30	3 628	31	3 292	31
2015	3 878	31	3 691	31	3 348	31
2016	3 878	31	3 691	32	3 397	33
2017	3 878	32	3 691	33	3 397	33
2018	4 224	31	3 691	33	3 397	33
2019	4 449	31	3 691	33	3 397	35
2020	4 449	32	3 691	33	3 397	35
2021	4 449	32	4 060	33	3 472	34
2022	4 449	32	4 466	33	3 502	36
2023	4 449	32	4 695	33	3 852	34
2024	4 449	31	4 695	32	4 237	35
2025	4 449	31	4 695	32	4 661	35
2026	4 449	31	4 695	31	4 877	33
2027	4 449	33	4 695	33	4 877	33
2028	4 449	32	4 695	33	4 877	34
2029	4 449	33	4 695	33	4 877	34
2030	4 449	33	4 695	33	4 877	35
2031	4 449	31	4 695	33	4 877	35
2032	4 449	31	4 695	32	4 877	34
2033	4 004	31	4 695	32	4 877	35
2034	3 604	31	4 695	32	4 877	34
2035	3 394	30	4 225	31	4 877	34
2036	3 394	29	3 803	30	4 877	34
2037	3 394	29	3 422	30	4 389	33
2038	3 394	29	3 422	30	3 950	33
2039	3 394	28	3 422	30	3 555	32
2040	3 394	29	3 422	29	3 555	32

**Note**

IB denotes inside bark: the recoverable volume of wood excluding bark.