



CENTRAL NORTH ISLAND FOREST INDUSTRY AND WOOD AVAILABILITY FORECASTS 2009



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Kajavala Forestry log yard at Kawerau. Photo: John Stulen/FICA.

INTRODUCTION

This publication provides new wood availability forecasts and associated commentary for the Central North Island (CNI) wood supply region. Five scenarios have been modelled to indicate the potential range of future wood availability. They have been prepared in co-operation with major forest owners, forest industry leaders and forest harvesting consultants.

Descriptive information is also provided on the major 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 forest 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 CNI 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 who intend using the wood availability forecast for planning or investment decisions are urged to thoroughly review the forecast, or to 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 CNI wood supply region includes the land areas of the Waipa, South Waikato, Rotorua, Western Bay of Plenty, Tauranga, Whakatane, Opotiki, Taupo, Ruapehu, Waitomo and Otorohanga local government districts. It is covered by the Hawkes Bay Regional Council, Bay of Plenty Regional Council, Horizons Regional Council and Environment Waikato.

The CNI is New Zealand's largest wood producing region, with 533 000 stocked hectares or around 30 percent of New Zealand's forest area. Currently (as at 2009) it produces 45 percent of the national harvest. The forestry sector plays a major role in the region's economy, being well established and founded on several large-scale forest estates and large processing sites. Historically, it has been the focal point for the exotic forest industry for around 100 years. Since the 1980s the industry has seen changes in ownership, objectives and land use.

As in the rest of New Zealand, the CNI forest estate is dominated by radiata pine, making up 92 percent of the resource; Douglas-fir contributes 4 percent.

The wood processing sector has six pulp mills and four paper mills, several large sawmills and a number of medium to small mills, as well as various industries dependent on the products or by-products from these industrial plants.

To assist with future forest industry planning in the CNI region, MAF has compiled wood availability forecasts covering the period 2008 to 2040. These forecasts have been produced to show the range of harvest volumes potentially available from the planted estate, comprising large and small-scale growers.

The forecasts indicate that the availability of radiata pine

from the CNI forest estate will steadily increase. Between 2007 and 2015 there is the potential for a gradual increase in the CNI region harvest from 7.8 million cubic metres to around 10.2 million cubic metres per year. Then there is further potential for volume increases to around 12.7 million cubic metres per year after 2020. Most of the potential increase in wood availability during this second period is from the 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 the decisions of a large number of small-scale owners.

The latest statistics for the 2008 year (Table 2.1) show that the forecast increase in wood availability and harvest is underway.

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

- › The total exotic forest area in the region is 532 891 hectares or around 30 percent of the national total.
- › Over half of the forest is located in the Taupo and Whakatane districts.
- › Large-forest owners (over 1000 hectares) account for 89 percent of the forest area.
- › About 42 000 hectares (stocked), or 9 percent of the resource, is held in forests smaller than 40 hectares.
- › A further 20 000 hectares is held in forests between 40 and 1000 hectares in size.
- › The region's forests are dominated by radiata pine: 92 percent of the region's estate, compared with 89 percent nationally.

»» TABLE 2.1: KEY STATISTICS FOR THE CENTRAL NORTH ISLAND FOREST INDUSTRY¹

STATISTIC	VALUE
Stocked plantation forest area as at 1 April 2008 (hectares)	532 891
Harvest – estimated roundwood removals: year ending March 2008 ³ (cubic metres)	9 170 000
Area-weighted average age of plantation forest as at 1 April 2008 (years)	15.3
Sawn timber production: year ending March 2008 (cubic metres)	1 816 005
Estimated log input to sawmills: year ending December 2008 (cubic metres)	3 286 000
Estimated wood processing capacity ⁴ (cubic metres roundwood)	6 710 000
Log exports: year ending March 2008 ² (cubic metres)	2 458 667
Sawn timber exports: year ending March 2008 ² (cubic metres)	693 770
Direct employment, forestry and first-stage processing ⁵ as at February 2007 (FTE)	7 891

Sources

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

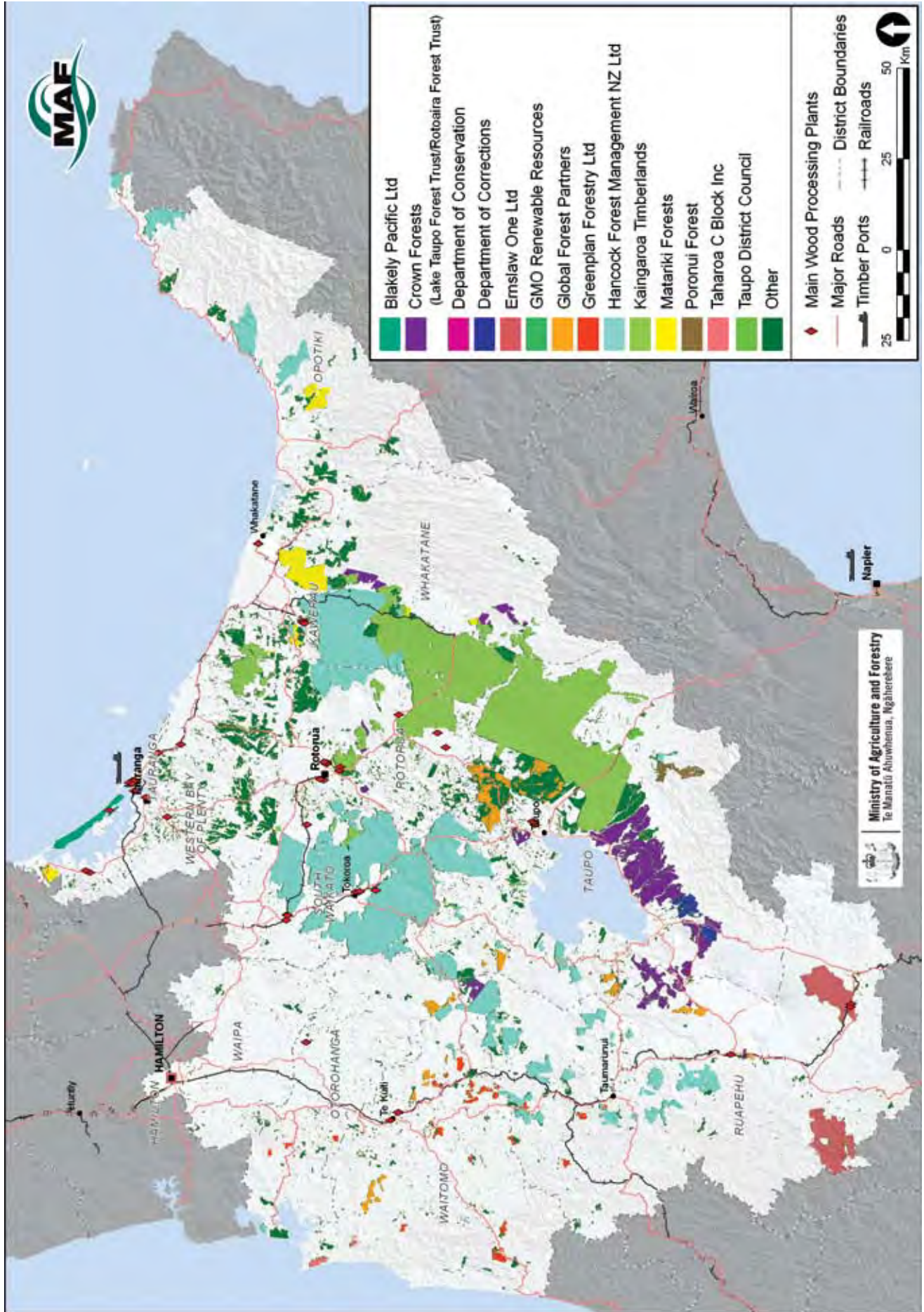
Notes

- 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 individual processing plants roundwood input capacities.
5 Excludes employment associated with the transportation of logs and forest produce.



Whakarewarewa Forest vista. Photo: John Vaney/MAF.

FIGURE 2.1: MAP OF THE CENTRAL NORTH ISLAND FOREST INDUSTRY



THE PLANTATION FOREST INDUSTRY

3

»» FOREST DEVELOPMENT

The CNI plantation forests were first developed on a small scale on the Kaingaroa Plains: in 1898, 54 acres were planted. In 1913 a Royal Commission on Forestry was established, and, as a direct result, a scheme was submitted in 1915 to plant 258 000 acres of the Kaingaroa Plains. World War I prevented action being taken until 1923, when the commencement of “an extensive planting era” took place. In the meantime, the State Forest Service had been established in 1919.

The Crown, in the form of the Forest Service, developed Kaingaroa Forest on the tussock-dominant Kaingaroa Plains. It also developed a number of other smaller forests such as Whakarewarewa and Rotoehu, where radiata and other pine species were planted in areas where indigenous forest had been cleared. The State planted a range of pine species and other conifers to suit the sites available and to achieve diversity of species.

On the other side of the central plateau around Tokoroa, a private company (the forerunner of NZ Forest Products Ltd) also began acquiring land and planting radiata pine over large areas during the 1920s.

Significant areas of the CNI were planted in forest by the State and by private companies during the Great Depression (1928–1933), but the research, planning and preparation had been undertaken before that time.

In 1937 it was discovered that the trace element cobalt remedied “bush sickness” in livestock, particularly cattle on the pumice lands of the CNI region. This meant that agriculture became a viable option on areas previously regarded as unsuitable for grazing, and the prospects for further large-scale afforestation disappeared.

The existing large-scale forest development in the CNI meant that after the second world war, the area around

Rotorua became the focus for forest research and for government-sponsored forestry training. The North Island State sawmill at Waipa was also established during the 1940s as an experimental mill. A South Island State sawmill had already been established at Conical Hill, near Tapanui.

The availability of such a large resource led to the development of two pulp and paper plants during the 1950s: one at Kawerau utilising the state forests, the other at Kinleith utilising the private forests.

During the 1960s, 1970s and 1980s a number of small-scale forests were established under the Forestry Encouragement Grant Scheme. The Crown was active in promoting forest development, and assisting Māori Trusts to develop exotic forests on their land through joint ventures.

»» NURSERIES

The CNI region has six large nurseries growing exotic plantation forest species, and one large nursery specialising in native plants. Annual sales are around 16.5 million radiata pine, 0.3 million Douglas-fir, and 0.2 million of a variety of other species. Stock types include seedlings and cuttings; the numbers produced are sufficient to plant around 20 000 hectares.

» ARBORGEN AUSTRALASIA

ArborGen Australasia is a wholly owned subsidiary of the United States tree improvement and treestock production business ArborGen LLC; it owns two nurseries in the region. Its Tokoroa nursery produces 6 million bare-rooted seedlings and its Te Teko nursery produces 2 million container-grown seedlings per year.

ArborGen purchased a nursery company, including Te Teko nursery, called Horizon2, in 2007 from Rubicon, a forest technology company. Horizon2 itself was formed in

2004 as a result of merging what were originally the biotech and nursery businesses of Carter Holt Harvey and Fletcher Challenge Forests. ArborGen is a specialist forest biotechnology business and the largest producer of elite treestocks in Australasia. It also owns nurseries at Kaikohe, Gisborne and Nelson.

› SCION

Scion owns a nursery to raise plants for research projects. Stock includes radiata pine, Douglas-fir, and eucalypt species for progeny and propagation trials, and various weed species for herbicide trials. Both bare-rooted as well as container-grown crops are produced. The nursery also conducts research on propagation methods for species other than radiata pine. In addition, radiata pine seedlings and cuttings, eucalypt species, redwoods, natives, and other species are raised on contract for commercial clients. At current production levels, the nursery raises 2 million seedlings, of which 80 percent are bare-rooted and 20 percent are container-grown. Radiata pine makes up half of the production.

› KAINGAROA TIMBERLANDS

The Kaingaroa Timberlands nursery at Te Ngae produces approximately 5.5 million bare-root radiata pine seedlings and cuttings per year. In addition it grows Douglas-fir and cypress species which together amount to less than 5 percent of its total production. Stock is grown primarily for the Kaingaroa Timberlands estate. Kaingaroa Timberlands also grows clonal varieties of radiata pine for Forest Genetics Ltd. Some of this stock is deployed to the Kaingaroa Timberlands estate, and the balance is sold to other Forest Genetics clients.

› CAMBRIDGE

Cambridge Forest and Native Nursery was established by the NZ Forest Service in 1973. Currently privately owned, its annual production is 3 million trees of mixed species.

Radiata pine is produced from open-pollinated and control-pollinated seed, and as aged cuttings of improved genetic quality. Redwood is produced from clonal and seedling material with improved wood properties and durability. A large range of eucalypt and cypress clones is grown for timber and ornamental uses. The nursery also produces a range of hedging, ornamental and New Zealand native species.

› FOREST GENETICS

Forest Genetics Ltd is based in Rotorua and supplies genetically improved clonal varieties of radiata pine. It also contracts several other nurseries to produce bare-root as well as container-grown clonal stock, for supply to forest growers all over New Zealand. Current production exceeds one million plants per year. This is expected to increase progressively, depending on market conditions.

› WAIMARINO TREE RESOURCE

Waimarino Tree Resource is a small forestry business located at Raetihi. The main division of the business is a high-altitude forest nursery growing mainly radiata pine. The nursery also grows smaller numbers of frost-hardy species including Douglas-fir, *Cupressus lusitanica*, macrocarpa, and *Eucalyptus nitens*. The nursery is the highest-altitude forestry nursery in the country; it is situated on typical Waimarino market gardening land with fertile volcanic ash and loam soils.

› TAUPO NATIVE PLANT NURSERY

The Taupo Native Plant Nursery is a significant supplier of native plant material in the region. It has been in existence for over 40 years. It was originally part of the Department of Conservation and is now in private ownership. It was the first specialist native plant nursery in New Zealand and remains the leader in this field to this day. In addition to its production of native plants, this nursery also produces a limited amount of exotic planting material including cypresses, redwoods and eucalypts. Currently

this nursery produces over 2 million plants annually for a client base that is New Zealand-wide.

»»» FOREST OWNERS

The CNI region has a large concentration of forests and associated industries. Previously the four largest growers controlled over 90 percent of the total plantation estate in the region; even today the four largest groups (listed in Table 3.1) control 77 percent of the region's forest estate.

In the early 1990s, the major CNI forest owners were the State (through the NZ Forestry Corporation), Elders Resources NZFP, Fletcher Challenge and Carter Holt Harvey. All these owners were based in New Zealand and

all owned processing plants in the region. The last three were vertically integrated companies owning forests, solid-wood mills, and pulp and paper plants.

During the last 10 years, there has been a significant change in ownership structure. There has been a move away from vertical integration to separate ownership of processing plants and forests. There has also been a separation of tree crop and land ownership, especially in the former state forests where the State has retained ownership of the land but sold the trees and provided access by a Crown Forest Licence (CFL) process.

The significant change in tree crop ownership has come about as overseas pension and endowment funds have replaced New Zealand-domiciled corporate owners. Tree crop ownership is an important part of an international portfolio investment strategy for these funds.

At the same time wood processing facilities, that had previously been part of the vertically integrated companies, have been sold off and now either operate as stand-alone companies or as part of a large non-forest-owning group.

In future, some of these trends may reverse as Māori become large-scale forest owners following Treaty of Waitangi settlements (whereby the ownership of land immediately comes back to Māori with the option to gradually take up tree crop development). A settlement was signed in June 2008 between the Crown and central North Island iwi, collectively covering eight tribes. This deal termed "Treelords" saw 176 000 hectares of CFL land, along with accumulated rentals, move into Māori ownership. Under this arrangement they are obliged to rent the land back to the existing CFL holders under similar arrangements for 35 years, while gaining the annual income stream from this.

»»» TABLE 3.1: OWNERS AND MANAGERS OF PLANTATION FORESTS IN THE CENTRAL NORTH ISLAND REGION

FOREST OWNER	NET STOCKED AREA (HA)
Hancock Timber Resources Group (Tiaki, Pru Timber, Teal, Taumata)	207 000
Kaingaroa Timberlands	174 000
Ernslaw One Ltd	16 000
Crown Forestry (Lake Taupo, Rotoaira, other forests)	15 000
Lake Taupo and Lake Rotoaira Forest Trusts	14 000
Matariki	12 000
Global Forest Partners	10 000
Greenplan Forestry Investments	7 000
Department of Corrections	4 000
Blakely Pacific	4 000
GMO Renewable Resources	3 000
Department of Conservation	2 000
Poronui Station	1 000
Taupo District Council	1 000
Taharoa C Block Incorporation	1 000
Small-scale owners	62 000
Total	533 000

› HANCOCK TIMBER RESOURCE GROUP

The Hancock Timber Resource Group (HTRG) was founded in 1985. It is based in Boston, Massachusetts, USA and is a division of Hancock Natural Resource Group, Inc., a registered investment adviser and wholly owned subsidiary of Manulife Financial Corporation. As a TIMO (Timberland Investment Management Organisation), Hancock develops and manages globally diversified timberland portfolios for a number of pension plans, high net-worth individuals, and foundations and endowments. The New Zealand forest assets of HTRG were previously owned by Fletcher Challenge Forests and Carter Holt Harvey and have been acquired since 2003.

HTRG's interests in the region are represented by a number of companies, each in turn representing a number of pension plans, as follows:

› TIAKI PLANTATION COMPANY

In April 2004 the Tiaki Plantation Company acquired a number of forests in the Bay of Plenty–Taupo area. They include Tarawera and Matahina forests, and several smaller forests. The purchase involved the existing tree crop with no right to replant, the land being owned by other entities. The owned resource therefore diminishes as it is harvested, with some 30 000 hectares of trees currently owned.

› PRU TIMBER

In February 2004 two funds managed by Prudential Timber Investments (Viking Global New Zealand Limited and Ontario Teachers' Pension Plan) acquired a significant portion of the Fletcher Challenge Forests estate. The forests form a mosaic from the coastal Bay of Plenty inland to Taupo. HTRG acquired Prudential Timber Investments' interests in 2005. Currently these interests involve 51 000 hectares of tree crop cutting rights.

› TEAL

In 2005 HTRG bought the cutting rights to 6075 hectares of "Teal" forest, being the older half of Tahorakuri forest, an ex-Fletcher forest divested by Fletcher in 2003. The area of tree crop owned is currently 4500 hectares.

› TAUMATA

HTRG acquired the New Zealand Carter Holt Harvey estate from Rank Group in December 2006. In the CNI region this estate includes Kinleith Forest, Eastern Bay of Plenty ex-Caxton leases, and forests in the King Country. The owning entity is Taumata Plantations Ltd. The purchase included freehold land and land held under Forestry Rights, the latter with no right to replant. The area of tree crop owned is currently 121 500 hectares.

With the expiry of some cutting rights following harvest, HTRG's CNI productive forest assets are approximately 65 000 hectares of forest on freehold land and 143 000 hectares of forest owned under lease or cutting rights, giving a total productive forest estate of approximately 207 000 hectares.

› KAINGAROA TIMBERLANDS

Kaingaroa Timberlands is majority-owned by Harvard Management, the investment arm of the Harvard Endowment Fund, which purchased the estate in December 2003. In October 2006 the NZ Superannuation Fund bought a minority interest in the estate from Harvard Management.

The estate comprises Kaingaroa Forest and a number of smaller forests including Whakarewarewa and Rotoehu. Management of the estate is undertaken by Timberlands Ltd. Most of the estate is held under a number of Crown Forestry Licences. Treaty of Waitangi settlements have resulted in most of the land now being owned by a number of Māori iwi in the region.

The New Zealand Government created the estate from the 1890s and progressively expanded it over the following decades. Much of the estate lies on the Volcanic Plateau where cobalt deficiency initially precluded the development of farming.

The estate was managed by the NZ Forest Service until 1987 and then the Forestry Corporation of New Zealand, on behalf of the Crown. It was then sold to a joint venture comprising principals Citic (a Chinese Government-owned company) and Fletcher Challenge Forests, which owned the estate for seven years until the present ownership.

The estate currently comprises a forest area of 188 000 hectares of which 174 000 hectares are stocked. Other significant assets include a forest nursery at Te Ngae, Rotorua.

The company at present harvests some 2.0 million cubic metres of radiata pine annually. A smaller volume (around 9 percent of total harvest) is from Douglas-fir and other pines. Much of the estate is now growing its third crop of trees.

› ERNSLAW ONE LIMITED

Ernslaw One Ltd acquired WPI, including the forests in April 2008. The forests (Karioi and Waimarino) are now managed as part of Ernslaw One's North Island forest estate. The land is held under Crown Forestry Licence (Karioi) and lease plus freehold (Waimarino). The planted area is approximately 15 500 hectares comprising radiata pine and a small area of Douglas-fir and other pines.

› CROWN FORESTRY

The Crown owns and administers, through Crown Forestry (a group within the Ministry of Agriculture and Forestry), a number of forests in the region. Most of the forests are held under lease on Māori land; in some cases

Māori are in the process of taking the land back and developing the next crop with their own resources. Management of the forests is undertaken by independent forest management groups under contract to Crown Forestry.

The forests are generally mature and the majority of them are likely to be harvested over the next 10 to 15 years. Typically, following harvest, the land will be passed back to the Māori owners.

The largest estates are the Lake Taupo and Lake Rotoaira forests lying to the east and south, respectively, of Lake Taupo. The land is leased from the Lake Taupo and Lake Rotoaira Forest Trusts.

Lake Taupo Forest has a planted area of around 21 000 hectares, and is effectively made up of two parts:

- › **CROWN FOREST** (9400 hectares planted): this is the forest on land which is leased by the Trust to the Crown.
- › **TRUST FOREST** (11 250 hectares planted): this is second-rotation forest on land which has been handed back from the lease. By 2021 all of Lake Taupo Forest will be owned by the Trust.

The current harvest is around 500 000 cubic metres per year, a rate which could be sustained indefinitely.

Lake Rotoaira Forest has a planted area of around 9000 hectares, and is effectively made up of two parts:

- › **CROWN FOREST** (5570 hectares planted): this is the forest on land which is leased by the Trust to the Crown,
- › **TRUST FOREST** (3130 hectares planted): this is second-rotation forest on land which has been handed back from the lease. By 2026 all of Lake Rotoaira Forest will be owned by the Trust.

The current sustainable harvest is around 220 000 cubic metres per year.

› LAKE TAUPO AND LAKE ROTOAIRA FOREST TRUSTS

The Lake Taupo Forest Trust (LTFT) administers 66 Māori Land blocks covering 31 000 hectares, most of which has been planted in forest. The Lake Rotoaira Forest Trust (LRFT) administers another 85 Māori Land blocks, 71 of which have also been planted. Many of these blocks have significant conservation areas which remain unplanted and in natural vegetation for environmental reasons, providing habitat for rare species and particularly contributing to the protection of Lake Taupo, Lake Rotoaira and associated rivers and tributaries. These Trust blocks were leased to the Crown for forestry purposes in the late 1960s (the forest referred to above). The first rotation is managed by the Crown and land is returned to each Trust after clearfelling. Replanting and management of the second and subsequent rotations is the responsibility of each Trust. Day-to-day forest management of the entire estate is undertaken by NZ Forest Managers Ltd based in Turangi.

› MATARIKI FORESTS LTD

Matariki Forests is a joint venture between Rayonier NZ Ltd, RREEF Infrastructure Investments (the global alternative investments business of Deutsche Asset Management) and, since 2006, AMP Capital Investors. The national estate encompasses forests purchased from CHH Forests in October 2005.

The Matariki estate in the CNI comprises some 12 000 hectares of forest, mainly radiata pine but also eucalypt. Some of the area is freehold land as well as land held under lease, Forestry Right, and Crown Forestry Licence.

› GLOBAL FOREST PARTNERS

Global Forest Partners LP (GFP) is one of the oldest and largest timber investment management organisations in the world. It is registered in the United States and manages timber funds on behalf of institutional and other investors.

Forestry assets managed by GFP in the CNI comprise a number of Crown Forestry Licence forests (in the western part of the region) and a freehold forest estate (formerly owned by Fletcher Challenge Forests) in the central and northern part of the region. The total assets comprise 9700 hectares, mainly in radiata pine but also including Douglas-fir and other species.

› GREENPLAN FORESTRY INVESTMENTS

The company was established in 1993 to provide forest investment opportunities for individuals and small groups.

Since its inception, Greenplan has established more than 6800 hectares of forest (predominantly radiata pine) in 63 separate forest partnerships involving over 6500 individual investors. The company is based in Te Kuiti and its forest investments have been in the King Country. Greenplan does not expect to begin harvesting for at least another 10 years. A secondary market in shares allows investors to enter and exit the scheme.

› DEPARTMENT OF CORRECTIONS

The Department of Corrections has developed forests on the Hautu and Tongariro prison farms over many years. The Department undertakes establishment with tending operations and harvesting managed by NZ Forest Managers Ltd. The plantations comprise 4290 planted hectares, predominantly radiata pine with some Douglas-fir.

› BLAKELY PACIFIC

Blakely Pacific Ltd is a forestry company with its roots in the Northwest of the United States. Its head office is in Seattle. The company owns 3500 hectares of plantation forest, mainly radiata pine, on Matakana Island and relatively small “tree farms” around the Bay of Plenty.

› GMO RENEWABLE RESOURCES LTD

GMO Renewable Resources Ltd (GMO) was formed in 1997 and manages timber funds on behalf of institutional and other investors. The parent company, GMO LLC, is a global investment management firm registered in the United States, with over 30 years' experience.

Forestry assets owned by GMO in the CNI comprise forests on freehold land and joint ventures on Māori and freehold land. The total assets comprise 3300 hectares, mainly of radiata pine with small areas of other species.

› DEPARTMENT OF CONSERVATION

As a result of allocating the NZ Forest Service and Lands and Survey estates to the Forestry Corporation and Department of Conservation (DOC), some 1800 hectares

of exotic forest was assigned to DOC. The resource is predominantly radiata pine but with significant areas of eucalypts and Douglas-fir. There are smaller areas of other species. The resource is unlikely to be replanted after harvest, but allowed to revert back to indigenous forest.

› PORONU I STATION

The 7000-hectare Poronui Station lies in the Taharua Valley in the south-eastern part of the region. It is run as a wilderness lodge. A significant proportion of the station was established in plantations in the latter 1980s to the mid-1990s by Caxton Paper Mills. Following the sale of some of these plantations, the current plantation area comprises several hundred hectares of eucalypt. In recent times, part of the eucalypt plantation has been converted to an alternative land use.

››› TABLE 3.2: PLANTATION FOREST AREA BY SPECIES AND LOCAL AUTHORITY (HECTARES)

TERRITORIAL AUTHORITY	RADIATA PINE	DOUGLAS-FIR	CYPRESS	OTHER SOFTWOODS	EUCALYPTS	OTHER HARDWOODS	TOTAL
Hamilton City	1	0	0	0	0	0	1
Waipa District	2 124	3	0	73	0	213	2 413
Otorohanga District	4 698	243	4	64	4	75	5 088
South Waikato District	65 380	859	21	104	1 584	85	68 033
Waitomo District	22 932	1 989	0	236	94	83	25 334
Taupo District	165 281	7 969	308	677	1 958	1 735	177 928
Tauranga District	184	0	0	0	0	28	212
Ruapehu District	47 285	575	146	866	42	14	48 928
Western Bay of Plenty District	20 649	69	64	239	513	246	21 780
Rotorua District	47 596	3 521	209	672	2 510	514	55 022
Kawerau District	0	0	0	0	30	6	36
Whakatane District	98 584	7 470	217	159	3 316	219	109 965
Opotiki District	18 011	0	1	8	103	28	18 151
Region total	492 725	22 698	970	3 098	10 154	3 246	532 891

Source

National Exotic Forest Description (NEFD) as at 1 April 2008 (MAF 2009).

► TAUPO DISTRICT COUNCIL

The Taupo District Council owns 1060 planted hectares of plantation in the Taupo basin; 70 percent is in Rangitaiki Forest under a land lease from the Crown. There are 167 hectares of maturing Douglas-fir and the balance is radiata pine.

► TAHAROA C INCORPORATION

Taharoa C Incorporation is a Hamilton-based incorporation set up under the Te Ture Whenua Māori Act, 1993. It has about 1500 shareholders who are the traditional owners of the Taharoa C block to the south of Kawhia Harbour. Amongst other assets, the incorporation owns 1000 planted hectares of mainly radiata pine in that block.

»»» OTHER OWNERS

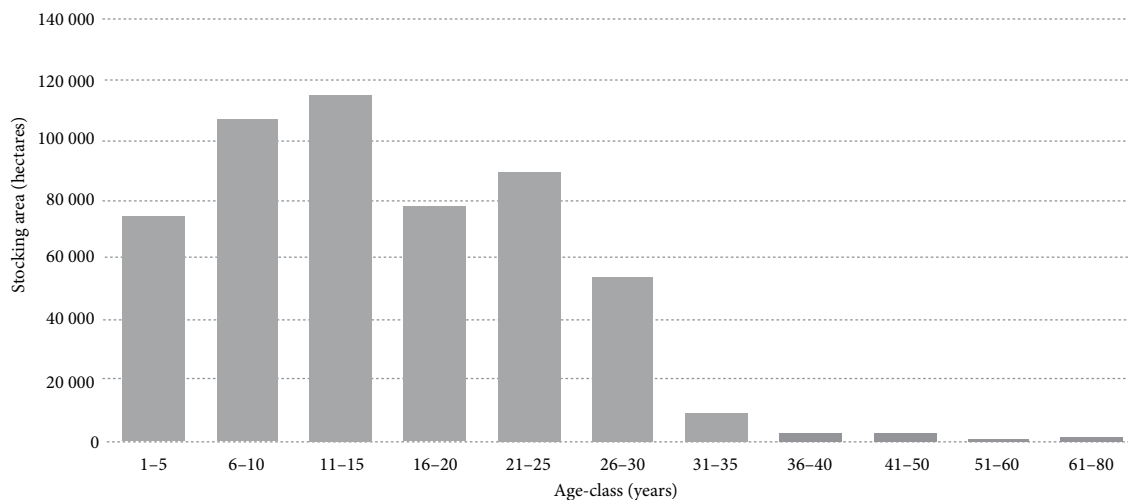
The *National Exotic Forest Description (NEFD) as at 1 April 2008* (MAF 2009) records that small-scale owners (with fewer than 1000 hectares each) own 73 317 hectares

(13.8 percent) of the CNI forest estate. For the current modelling scenario, this area has been reduced by 15 percent to allow for the difference between net stocked area and total area reported. There are about 1900 small-scale owners, although the *NEFD* does not show the number of owners with blocks less than 40 hectares. The impact that these owners will have on the wood supply in the region is discussed in Chapter 4.

»»» SPECIES COMPOSITION

Radiata pine makes up 92 percent (493 000 hectares) and Douglas-fir accounts for 4 percent (23 000 hectares) of the forest area in the CNI region. There are 17 000 hectares of other exotic hardwood and softwood species in the region (they have not been modelled in this analysis). The forest areas (rounded to the nearest 1000 hectares) are taken from a *NEFD as at 1 April 2008* (MAF 2009). Of the radiata pine estate, 50 percent (245 000 hectares) has been pruned to four metres or more.

»»» FIGURE 3.1: AGE-CLASS DISTRIBUTION OF PLANTED FORESTS IN THE CENTRAL NORTH ISLAND REGION



Source
NEFD as at 1 April 2008 (MAF 2009).

»»» AGE-CLASS DISTRIBUTION

The average age of planting in the CNI region is 15.3 years compared with the national average 15.2 years. There is a peak in new forest area planted during the mid-1980s and again in the mid to late 1990s. This new area, along with improved genetics in the estate and the trend to higher final-crop stockings, provides the potential for the harvest volume to increase during the next 20 years.

For detailed information on forest areas and age class distributions by species, refer to the publication *NEFD as at 1 April 2008*, which is accessible at www.maf.govt.nz/mafnet/publications/nefd/national-exotic-forest-2008/index.htm.

»»» ROUNDWOOD REMOVALS

Roundwood removal statistics are derived from a combination of log export and sawmill production information within the region. Any flow of logs into and

out of the region is not accounted for in these statistics.

The estimates of Table 3.3 are thus derived indirectly from regional wood processing and log exporting activities.

The 1998 “Asian Crisis” lowered demand for export logs in 1999: this is seen in the fall in roundwood removals from the CNI region in that year. Improving log markets during the next few years saw the harvest increase, albeit at the cost of a reducing clearfell age. Since 2003 the harvest has decreased, largely because of the deliberate efforts of some of the larger owners to increase harvest age in response to the increased market awareness of improved wood properties with increasing age. Less favourable market conditions in export log markets have also been a factor during this time.

The large processing plants in the CNI act as “wood magnets” for volume from outside the region; the region processes more than it grows. There are inter-regional wood flows, particularly from the southern North Island and Auckland wood supply regions, but it is difficult to estimate the volumes involved. This means that Table 3.3 shows a conservative figure for the amount of wood processed in the CNI region.

»»» TABLE 3.3: ESTIMATED ROUNDWOOD REMOVALS FROM THE CENTRAL NORTH ISLAND (000 CUBIC METRES)

YEAR ENDED 31 MARCH	VOLUME
1998	10 260
1999	9 260
2000	10 020
2001	10 080
2002	10 760
2003	11 290
2004	10 440
2005	9 280
2006	8 900
2007	9 030
2008	9 170

Source
Ministry of Agriculture and Forestry.



Carter Holt Harvey Pulp and Paper Mill, Kinleith. Photo: Beca AMEC.

WOOD AVAILABILITY FORECASTS

4

Five scenarios have been modelled to indicate the potential wood availability from the planted production forests in the CNI regions for the period 2008 to 2040.

The wood availability forecasts are intended to describe the possible range of harvest volumes available from the CNI. They are based on the region's forest resource and the forecasting assumptions described later in this report.

The forecasts have been developed incorporating the harvesting intentions of the following large-scale forest owners (those with 1000 hectares or more):

- › Hancock Natural Resource Group;
- › Kaingaroa Timberlands;
- › Ernslaw One Ltd;
- › Lake Taupo and Lake Rotoaira Forestry Trusts;
- › Crown Forestry;
- › Matariki;
- › Global Forest Partners;
- › Blakely Pacific;
- › Department of Corrections;
- › Taharoa C.

The forecasts incorporate the views of the region's forest owners, managers and consultants. This feedback was critical for ensuring that the forecasts represent a realistic range of future wood availability scenarios.

A key issue, especially in the later years of this model, 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 supply.

The scenarios indicate that there are many different ways the forest estate in the CNI region can be harvested. Generally forests are managed to maximise benefits to the enterprise that owns them, and the owners decide what those benefits will be (one or more or all of economic,

environmental and social). 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 wood availability from each component of the estate. The volumes forecast from large-scale owners' forests are subject to change because of changes in harvest intentions or changes in the resource description (areas and yields). Nevertheless, 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.

»» HARVEST INTENTIONS SURVEY

The harvest intentions survey was undertaken in 2007. Large-scale forest owners and managers responded to a survey and provided data on the expected harvest for 2006, and their harvesting intentions for the next nine years, by species, with annual volumes allocated to the pruned, unpruned and pulp log grades. The areas expected to be harvested each year were also provided.

Table 4.1 provides a summary of the large-scale owners' harvest intentions data. For detailed data by log type, see the Appendix. These figures make up the first 10 years of the wood availability forecasts for the large-scale forests in the CNI region.

The harvest intentions of large-scale forest owners in the CNI region show a steady increase in harvest volumes from 2007, levelling off to around 9 000 000 cubic metres in 2012.

»» SCENARIOS FOR RADIATA PINE

Five wood availability scenarios have been modelled for radiata pine in this analysis. They show a range of potential ways the forests in the region could be harvested in the future.

The scenarios were developed in consultation with the NEFD Steering Committee. Feedback received from interested parties who own the forests in the CNI ensures the scenarios are reasonable.

» SCENARIO 1: HARVEST ALL FORESTS AT AGE 28

All forests are assumed to be harvested at age 28. This scenario shows the potential future harvest in any given year, based on the area of radiata pine forest that reaches the assumed rotation age in that year.

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

Large-scale owners' wood availability is assumed to be at

stated harvest intentions for 2006 to 2015. (Years are assumed to be to 31 December, for example, 2006 indicates the year to 31 December 2006) After 2015, the large-scale owners' wood availability is not allowed to decrease. Small-scale owners are assumed to harvest forests aged 30.

» SCENARIO 3: NON-DECLINING YIELD (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 constrained to be non-declining in perpetuity.

» SCENARIO 4: SPLIT NON-DECLINING YIELD (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 (at the end of the current rotation).

»» TABLE 4.1: LARGE OWNERS HARVEST INTENTIONS SURVEY RESULTS BY SPECIES AND LOG GRADE (CUBIC METRES)

YEAR ENDING 31 DECEMBER	RADIATA PINE (PRUNED)	RADIATA PINE (UNPRUNED SAWLOG)	RADIATA PINE (PULP)	DOUGLAS-FIR (UNPRUNED)	DOUGLAS-FIR (PULP)	OTHER SPECIES (UNPRUNED)	OTHER SPECIES (PULP)	TOTAL ALL SPECIES
2006	1 124 248	4 675 955	1 436 151	205 784	60 707	32 522	186 268	7 721 635
2007	1 174 780	4 582 420	1 339 111	227 997	75 252	31 995	174 253	7 605 809
2008	1 175 451	4 645 099	1 359 101	194 691	55 008	31 995	186 492	7 647 838
2009	1 228 599	4 577 529	1 489 253	180 891	52 168	30 478	173 089	7 732 007
2010	1 288 416	4 761 198	1 461 216	143 268	36 116	11 315	161 880	7 863 409
2011	1 296 059	5 136 755	1 598 772	164 487	63 043	275	75 554	8 334 944
2012	1 400 410	5 702 717	1 877 416	134 511	49 140	270	68 376	9 232 840
2013	1 397 674	5 843 331	1 847 927	155 131	50 243	2 640	68 023	9 364 968
2014	1 379 866	5 914 507	1 812 987	149 244	41 723	1 980	56 230	9 356 537
2015	1 281 949	6 084 931	1 992 165	152 195	47 018	300	52 830	9 611 387

Source

Individual large-scale forest owners covered by the Harvest Intentions Survey (MAF 2007).

Thereafter, a reduction is permitted.

SCENARIO 5: TARGET ROTATION AGE VARIATIONS

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

»» DISCUSSION ON SCENARIOS

Except in scenario 1, forests of the small-scale forest owners have been modelled separately from those of large-scale owners. Future harvesting from the former is generally less certain than for the latter.

In scenarios 1 and 2 (Figures 4.1A and 4.1B, respectively), forests owned by small-scale owners are assumed to be harvested at a fixed age – 28 years in scenario 1 and 30 years in scenario 2. In the case of scenario 1, all forests (large and small-scale) are harvested at 28 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 CNI region. For practical reasons already described, it is unlikely that 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 4.1C and 4.1D, 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 the CNI (although not as pronounced as in many other regions in New Zealand) is the increased area of forests established by small-scale owners during the 1990s. Scenarios 4 and 5 allow for the harvesting of these forests

by applying a non-declining yield constraint for the period 2006 to 2034. Then once the “bulge” of forests planted during the 1990s have been harvested, the model allows the volume to decline again.

The main limitations of scenarios 3 to 5 are 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 log prices.

Figure 4.1 shows the sequence of models (scenarios) that are presented throughout the rest of this report.

»» SCENARIOS FOR DOUGLAS-FIR

One scenario is presented for Douglas-fir (all owners). This is similar to scenario 3 for radiata pine. It is based on the harvest intentions of large-scale owners for 2006 to 2015 with yield regulated in subsequent years. Target rotation age is 45 years for Douglas-fir.

Wood availability from other species has not been modelled.

»» DATA

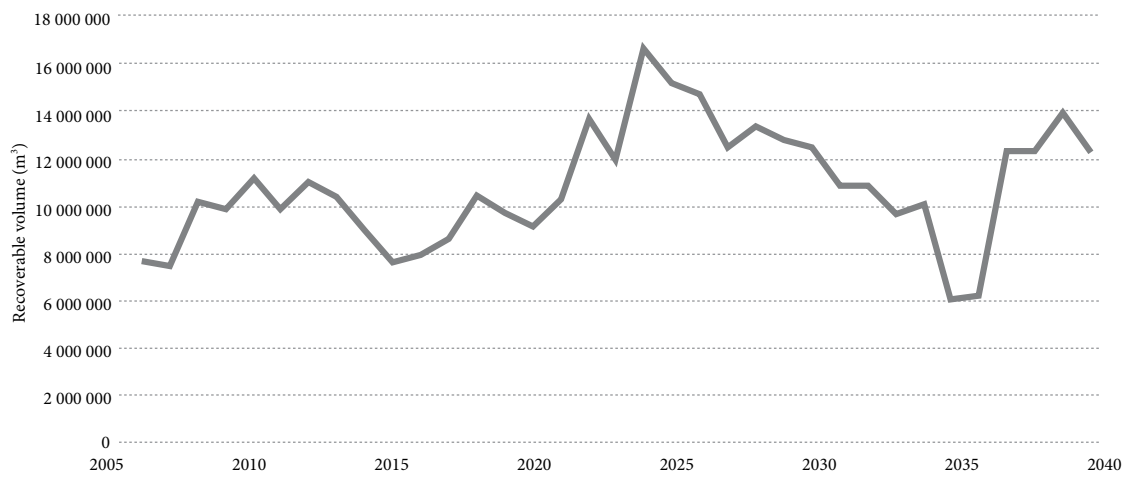
» METHOD USED TO OBTAIN FOREST AREAS

Area was obtained from the *NEFD as at 1 April 2006* (MAF, 2007). This was adjusted using updated information received about the silvicultural intentions of one large-scale owner¹. In addition, an area of 6000 hectares in young age-classes was removed to allow for deforestation of young stands between 1 April 2006 and 31 December 2007.

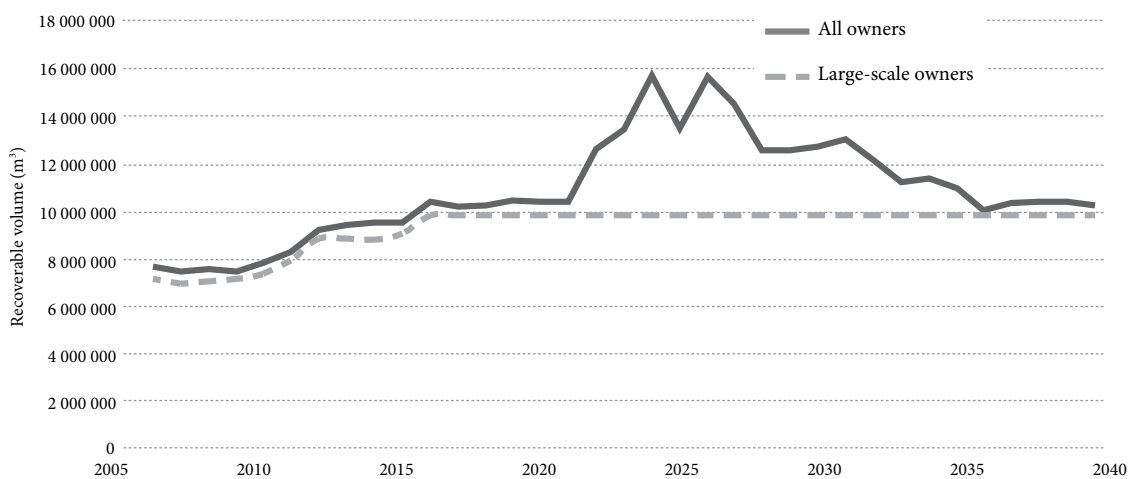
¹ The company assigns all replanted area to the NEFD minimum tending (without production thinning) croptype and reallocates to other croptypes once tending has been done. For this exercise, area was assigned to croptypes that reflect silvicultural intentions.

»» FIGURE 4.1: THE SEQUENCE OF WOOD AVAILABILITY SCENARIOS PRESENTED IN THIS REPORT FOR RADIATA PINE (SCENARIO 5 IS THE SAME CONCEPT AS SCENARIO 4 EXCEPT IT SHOWS WOOD AVAILABILITY PROFILES OF VARYING HARVESTING AGES)

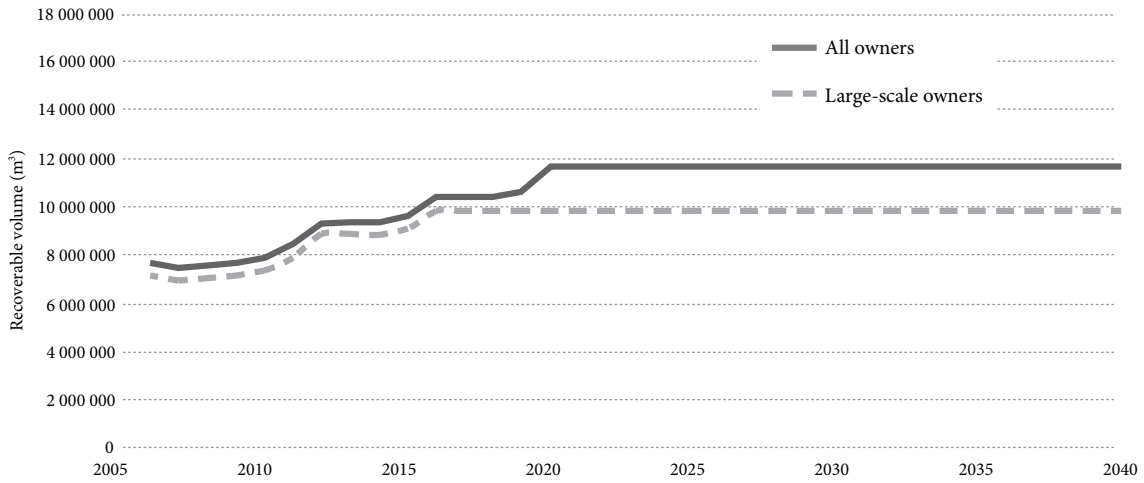
»» 4.1A—SCENARIO 1 EXAMPLE: HARVEST ALL FOREST AT AGE 28



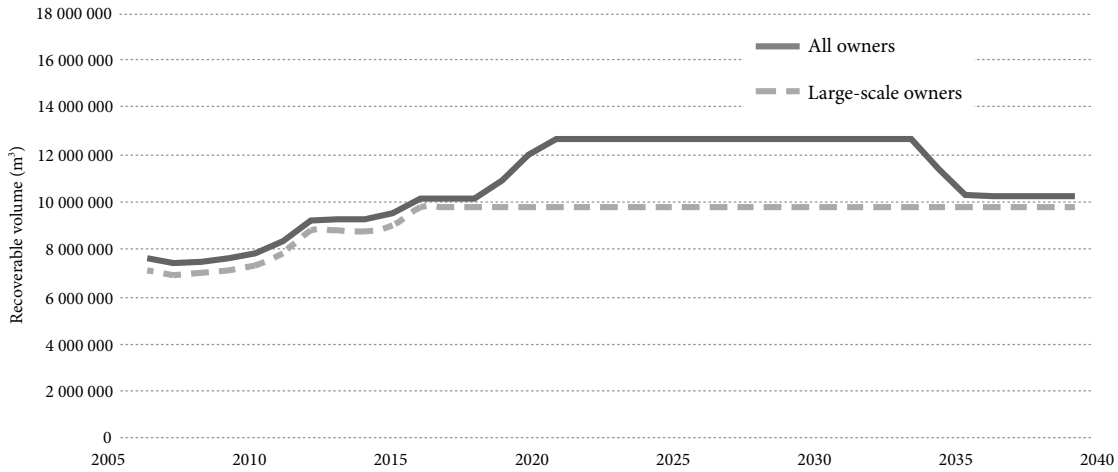
»» 4.1B—SCENARIO 2 EXAMPLE: LARGE-SCALE OWNERS HARVEST AT STATED INTENTIONS, SMALL-SCALE OWNERS HARVEST FOREST AGED 30



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



The small-scale owners' estate (apart from that of the investment syndicates and other professionally managed forests) was reduced by 15 percent. This was done because the area in this ownership category is often reported on a gross area rather than net stocked area basis.

»» METHOD TO DEVELOP YIELD TABLES

In 2007 new yield tables for the CNI were developed in the following manner:

- › large-scale owners provided yield tables for their estate;
- › these data were averaged on an area-weighted basis to get regional yield tables for each croptype;
- › yield tables for old (age 16+ years, planted in 1989 and earlier) radiata pine and Douglas-fir were then calibrated to match the harvest intentions data provided by large-scale owners. So the assumption is that the harvest intentions data represent 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, using the same percentage adjustments used for older stands;
- › the yield tables developed for the large-scale owners' estate were then applied to the small-scale owners' estate also.

»» LARGE-SCALE OWNERS' HARVEST INTENTIONS

Large-scale owners were asked to provide details of planned harvest volume by log grade and area from 2006 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.

»» ASSUMPTIONS

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

› REPLANTING

- › The forest area was obtained from the *NEFD as at 1 April 2006* (MAF, 2007).
- › All area in the large-scale owners' estate that is clearfelled is replanted (with a regeneration lag of one year) apart from 8000 hectares in 2006 and 2007 combined.
- › Of the area clearfelled in the small-scale owners' estate, 90 percent is replanted.
- › The area to be replanted as at 31 March 2006 is included as area at age 0; that is, area to be replanted in the 2006 planting season.

› SPECIES/REGIME

- › Area is replanted into the same species. Following harvest of old radiata pine croptypes, each area was assumed to be replanted into croptypes in proportion to the area in young radiata pine croptypes; that is, future silviculture was assumed to reflect what is currently being applied.

› OVERMATURE STANDS

- › Area of radiata pine in the small-scale owners' estate that was 40 years or older (134 hectares in total) was removed on the assumption that these trees would not be harvested.

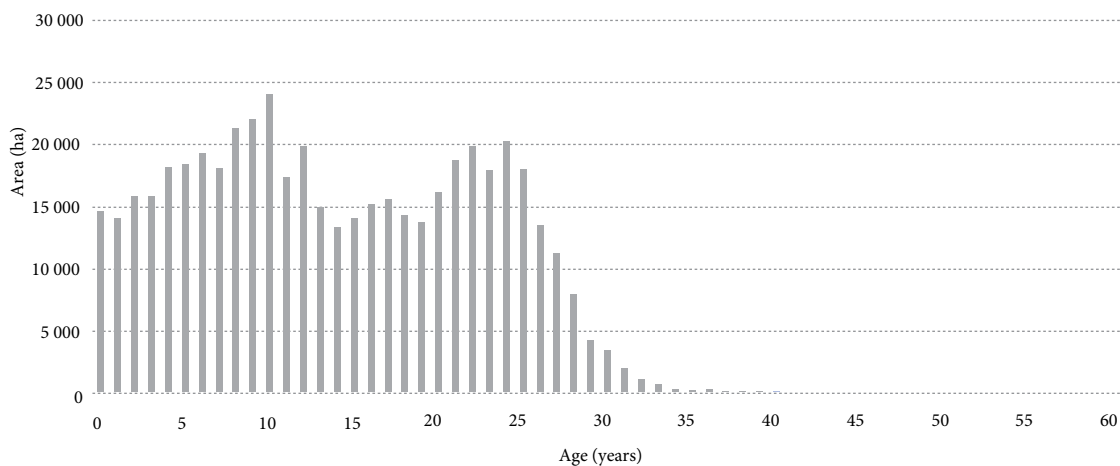
»» WOOD AVAILABILITY FORECASTS FOR THE CENTRAL NORTH ISLAND

» SCENARIO 1: HARVEST ALL FOREST AT AGE 28

This scenario has all forest harvested at age 28. It indicates the “pure” (that is, unconstrained) availability of wood from the CNI. 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 CNI, while Figure 4.3 shows the wood availability. The high point at 2024 in Figure 4.3 occurs because of the large area (24 187 hectares) at age 10 (planted in 1996) in Figure 4.2.

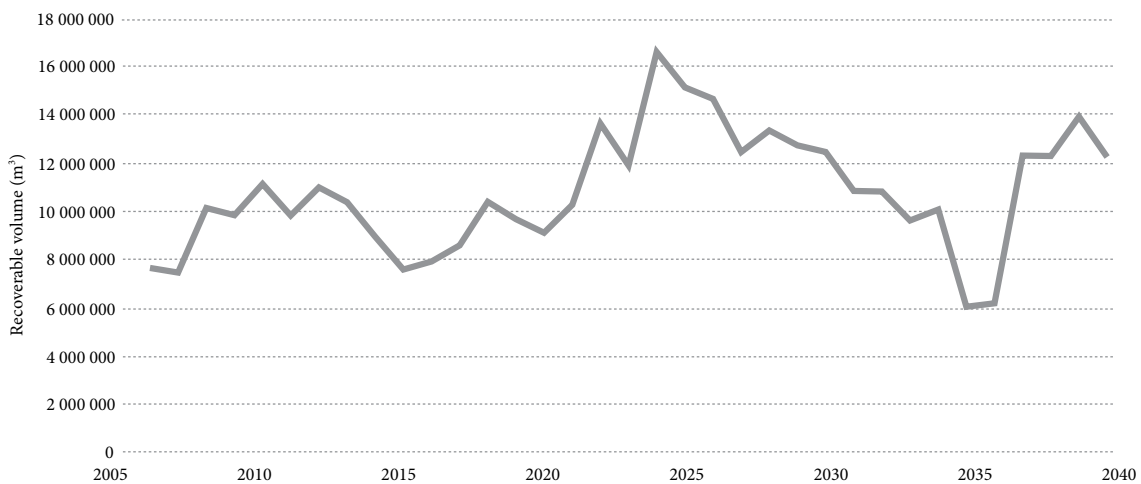
»» FIGURE 4.2: AGE-CLASS DISTRIBUTION OF CENTRAL NORTH ISLAND RADIATA PINE – COMBINED ESTATE



Source

NEFD as at 1 April 2006 (MAF 2007).

»» FIGURE 4.3: CENTRAL NORTH ISLAND RADIATA PINE AVAILABILITY UNDER SCENARIO 1



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

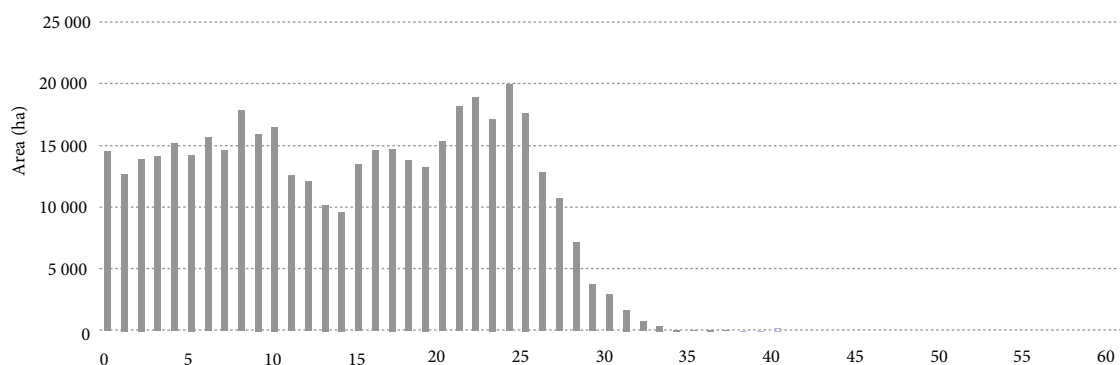
In this scenario, large-scale owners harvest in line with their stated intentions, and small-scale owners harvest forest aged 30.

LARGE-SCALE OWNERS

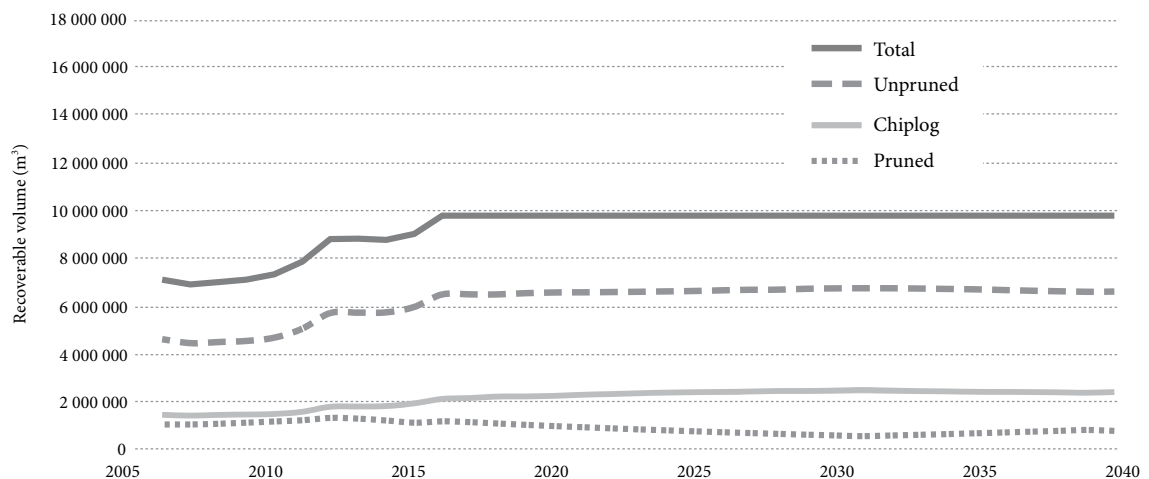
The age-class distribution of the large-scale owners' estate (Figure 4.4) is reasonably uniform, at least between ages 0 and 26. The area at age 0 is the area awaiting replanting as at 31 March 2006 (that is, the area to be replanted in the 2006 planting season).

For this scenario the availability of wood from large-scale owners is based on stated harvest intentions for 2006 to 2015. 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 until it reaches 9.8 million cubic metres per year from 2016. The increase between 2015 and 2016 reflects the higher yields (cubic metres per hectare) that owners expect to get from young stands when they mature.

►► **FIGURE 4.4: AGE-CLASS DISTRIBUTION OF THE CENTRAL NORTH ISLAND RADIATA PINE ESTATE – LARGE-SCALE OWNERS ONLY**



►► **FIGURE 4.5: CENTRAL NORTH ISLAND RADIATA PINE AVAILABILITY UNDER SCENARIO 2 – LARGE-SCALE OWNERS ONLY**



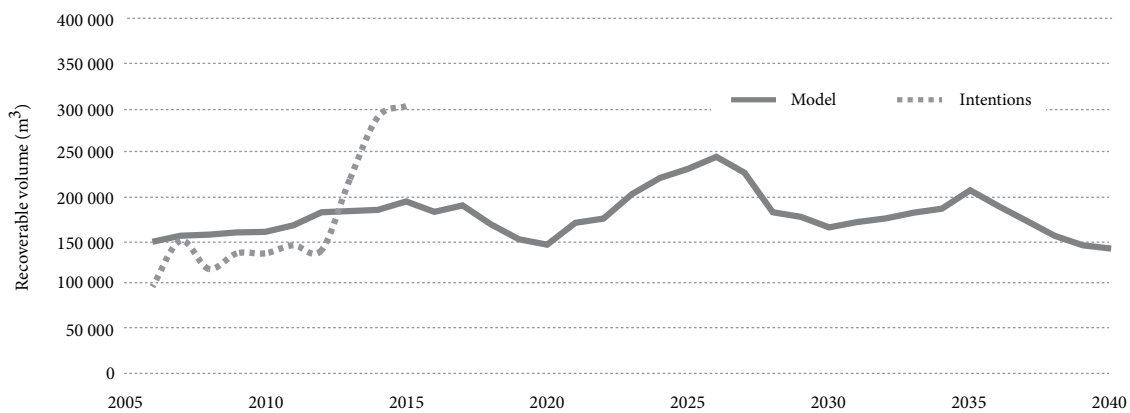
The volumes shown in Figure 4.5 are for clearfelling only. Production thinning volumes were also forecast, and Figure 4.6 compares such volumes forecast for large-scale owners in the wood availability model with stated intentions. Volumes of production thinning are low compared with those of clearfelling as the operation occurs at a comparatively young stand age (10–15 years). This operation is only viable when pulp mills require young wood.

SMALL-SCALE OWNERS

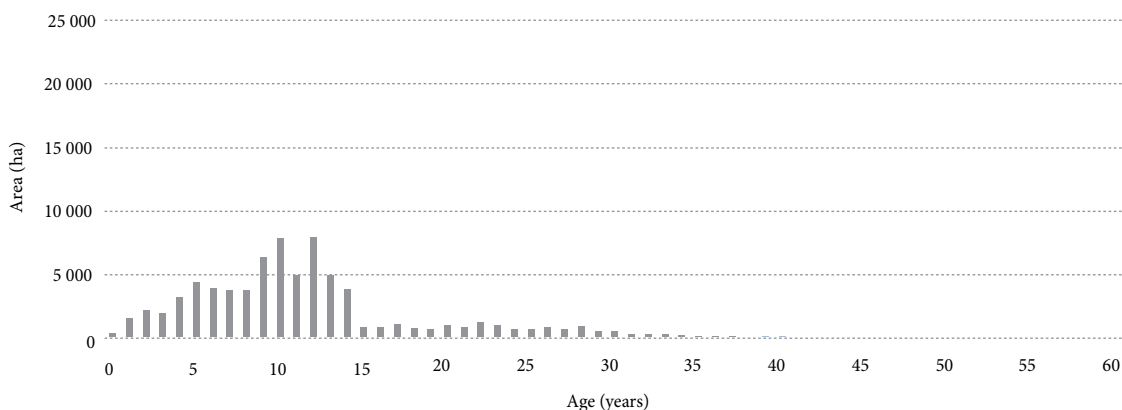
The age-class distribution of the small-scale owners' estate (Figure 4.7) is very irregular with greater areas between ages 4 to 14 years, particularly ages 9 to 12 years (planted in 1994 to 1997), and smaller areas in other age-classes. The key issue is how to forecast the availability from this estate. In particular, will the large area of younger stands 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: RADIATA PINE PRODUCTION THINNING VOLUMES AVAILABLE UNDER SCENARIO 2 – LARGE-SCALE OWNERS ONLY



»» FIGURE 4.7: AGE-CLASS DISTRIBUTION OF THE CENTRAL NORTH ISLAND RADIATA PINE ESTATE – SMALL-SCALE OWNERS ONLY



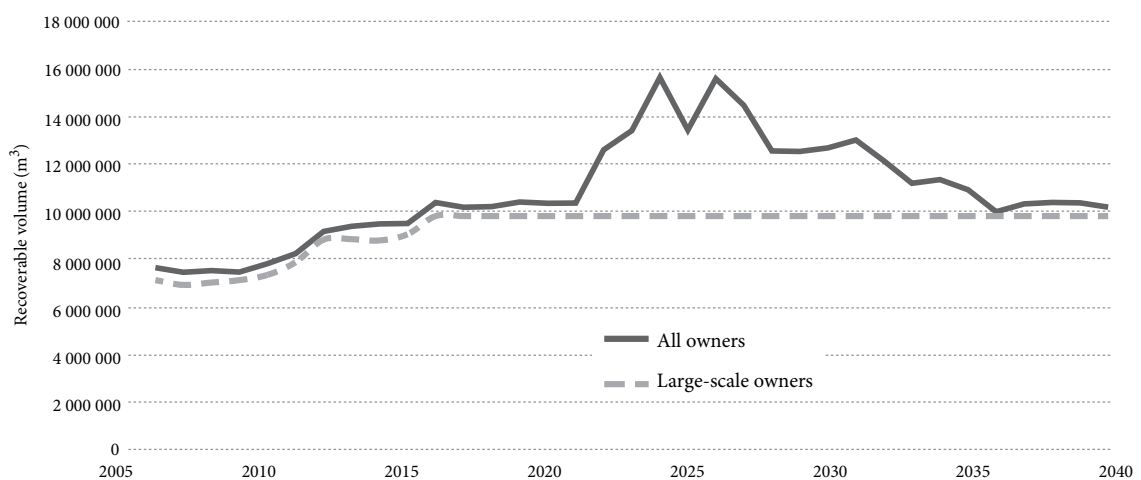
COMBINED ESTATE

The wood availability from all owners is presented in Figure 4.8. For large-scale owners this is the same as in Figure 4.5 (scenario 2, with all area in the small-scale owners' estate assumed to be harvested at age 30). 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 4.8) occurs when the large areas from the small-scale owners' estate in young age-classes is harvested. For example, the increase in 2022 is a consequence of the 3769 hectares planted by small-scale owners in 1992 (Figure 4.7: age 14) being harvested at age 30 years.

Fluctuations in harvest volumes of the magnitude shown in Figure 4.8 would be impractical because of marketing and logistical realities.

►►► FIGURE 4.8: CENTRAL NORTH ISLAND RADIATA PINE AVAILABILITY UNDER SCENARIO 2 – COMBINED ESTATE



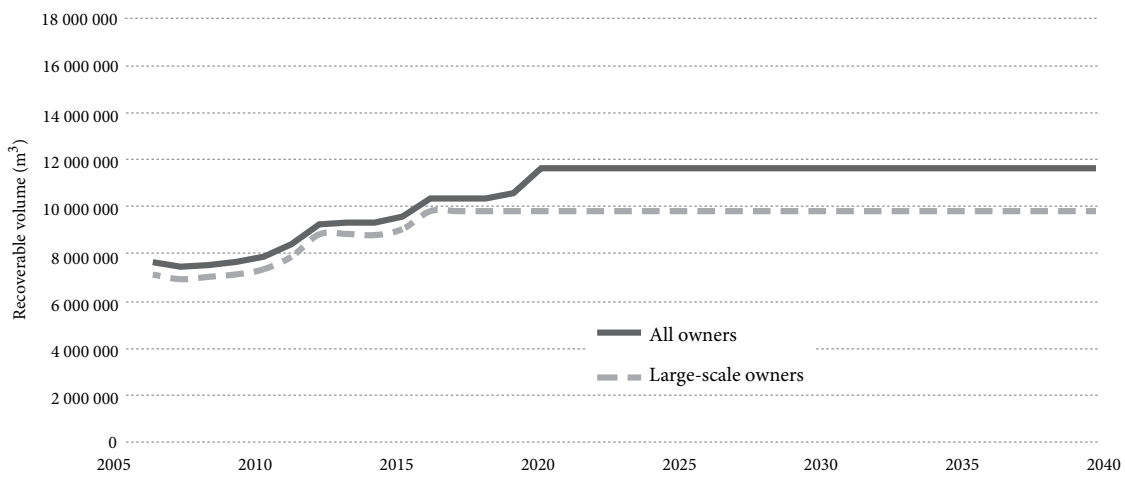
► SCENARIO 3: NON-DECLINING YIELD (TARGET ROTATION 30 YEARS)

The third scenario assumes a non-declining yield, with a target rotation age of 30 years. Figure 4.9 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 to 11.6 million cubic metres per year from 2020. The model

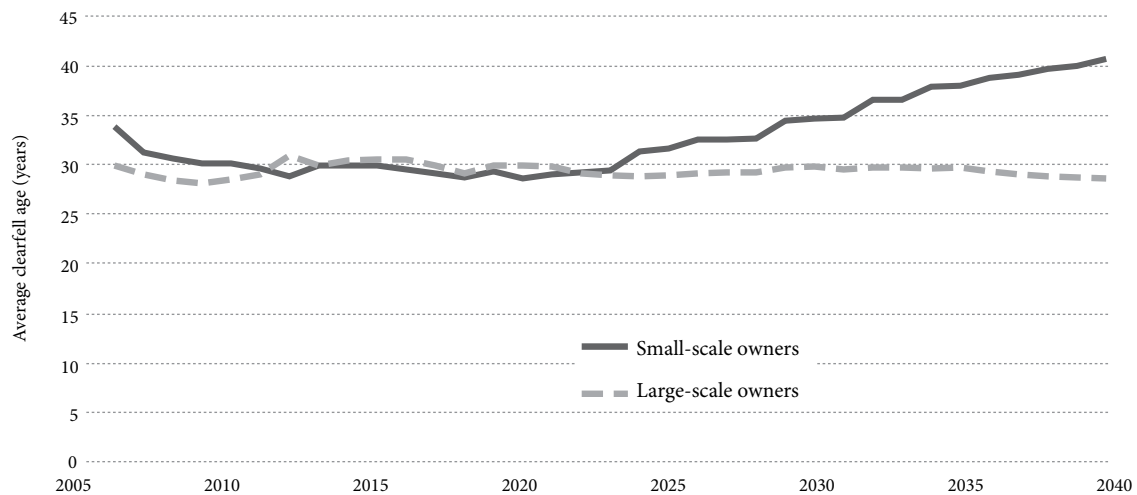
was constrained to ensure that the total volume harvested did not increase by more than 10 percent annually.

This scenario is similar to the base case scenario adopted in the 2000 NEFD wood supply forecasts (MAF, 2000). However, it results in the small-scale owners' estate being harvested at rotation ages that differ markedly from 30 years (Figure 4.10).

►► FIGURE 4.9: CENTRAL NORTH ISLAND RADIATA PINE AVAILABILITY UNDER SCENARIO 3



►► FIGURE 4.10: AVERAGE RADIATA PINE CLEARFELL AGE BY OWNERSHIP CATEGORY UNDER SCENARIO 3

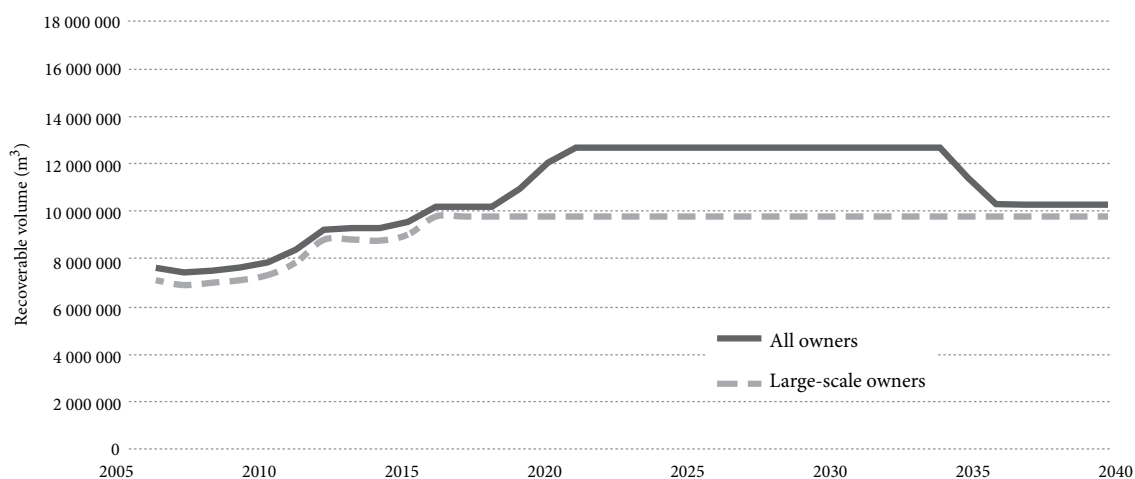


► SCENARIO 4: SPLIT NON-DECLINING YIELD (TARGET ROTATION 30 YEARS)

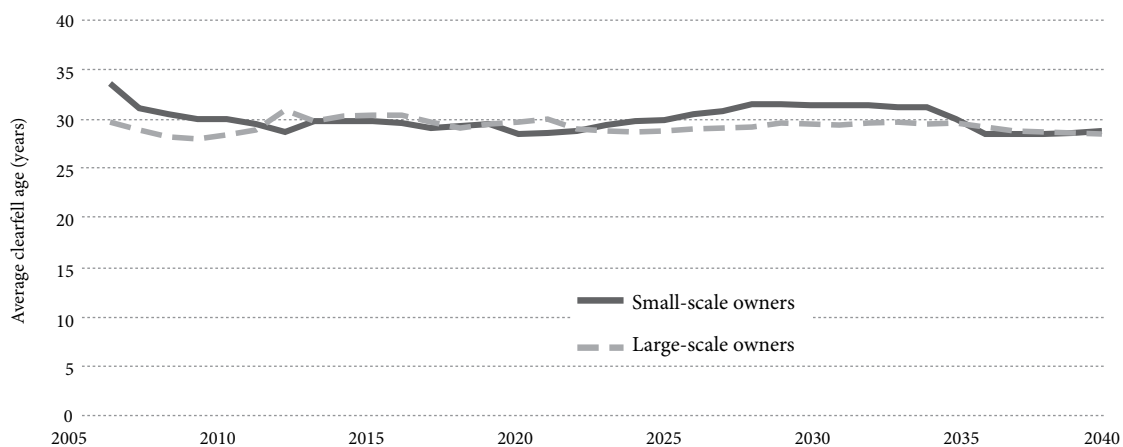
The fourth scenario is based on a split non-declining yield, with a rotation age of 30 years. This scenario gives a forecast wood availability that is similar to scenario 3 through to 2018 (Figure 4.11). Wood availability increases to 12.7 million cubic metres per year from 2021 before reducing to 10.3 million cubic metres per 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 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' forests stays closer to the target of 30 years than was the case in scenario 3 (Figure 4.12).

►►► FIGURE 4.11: CENTRAL NORTH ISLAND RADIATA PINE AVAILABILITY UNDER SCENARIO 4

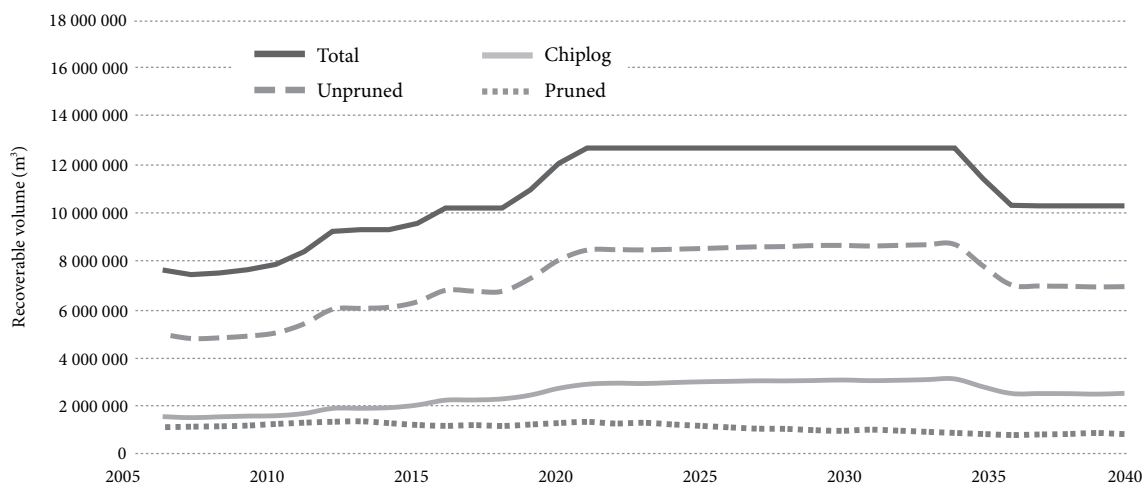


►►► FIGURE 4.12: AVERAGE RADIATA PINE CLEARFELL AGE BY OWNERSHIP CATEGORY UNDER SCENARIO 4

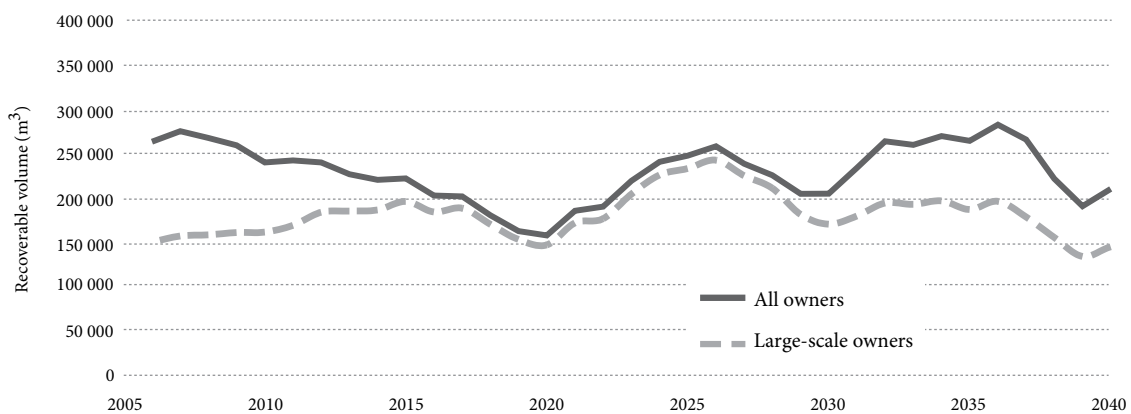


The total volume forecast for scenario 4 is broken down by log grade in Figure 4.13. Potential volumes from production thinning are shown in Figure 4.14.

»» FIGURE 4.13: CENTRAL NORTH ISLAND RADIATA PINE AVAILABILITY UNDER SCENARIO 4 – BY LOG PRODUCT



»» FIGURE 4.14: RADIATA PINE PRODUCTION THINNING VOLUMES AVAILABLE UNDER SCENARIO 4

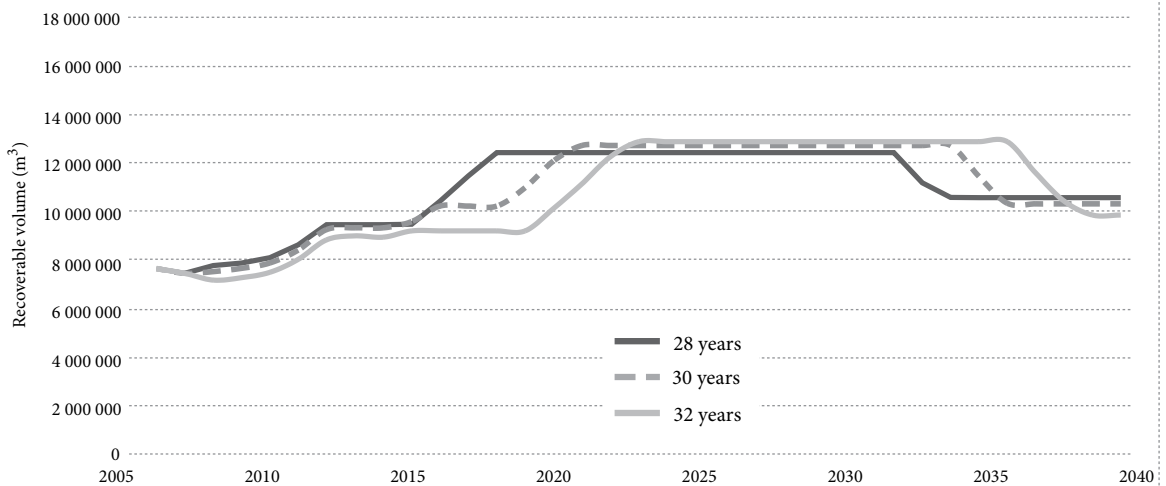


► SCENARIO 5: TARGET ROTATION AGE VARIATIONS

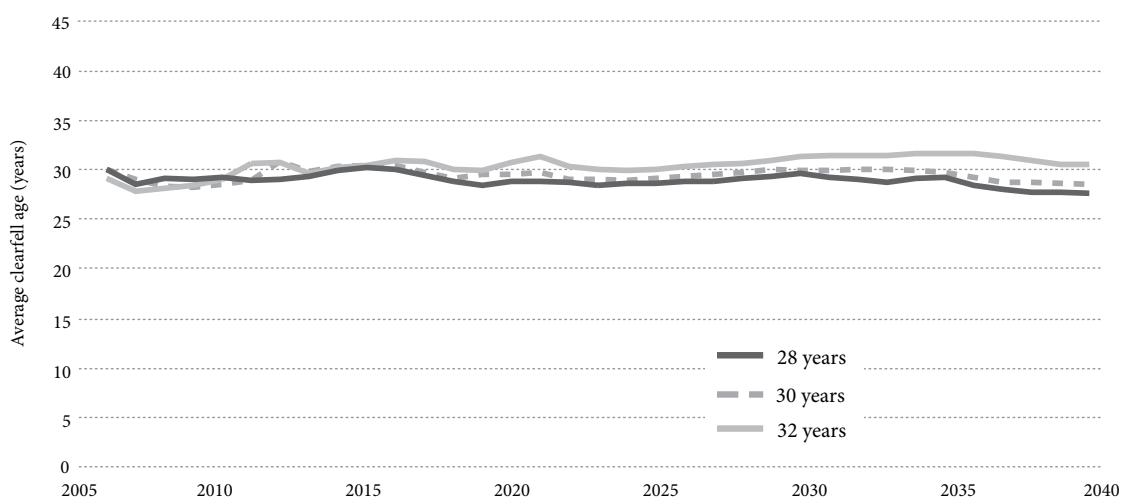
Different wood availability profiles are generated if target rotation age is changed from 30 years to either 28 or 32 years (Figure 4.15). Because of the limitations imposed by the current age-class distribution and large-scale owners' stated harvest intentions, it takes some time to achieve separation of average clearfell age (Figure 4.16).

Figure 4.15 shows the potential for a significant increase in the CNI harvest volumes. However, there is a range of possibilities for the timing of the increase and the level of the potential harvest volume.

»»» FIGURE 4.15: CENTRAL NORTH ISLAND RADIATA PINE AVAILABILITY UNDER SCENARIO 5



»»» FIGURE 4.16: AVERAGE RADIATA PINE CLEARFELL AGE FOR EACH TARGET ROTATION AGE UNDER SCENARIO 5



»»» DEFORESTATION SCENARIO

The scenarios presented assume that the recently announced liabilities for deforestation of pre-1990 forests will result in little deforestation from 2008 onwards. As a variation of this, an additional scenario was modelled in which:

- › 50 000 hectares of the large-scale owners' estate is not replanted after clearfelling from 2008 on;
- › 20 percent of the small-scale owners' estate is not replanted after clearfelling (compared with 10 percent in the previous scenarios).

Wood availability under the deforestation scenario is compared with that under scenario 4 in Figure 4.17. There is limited impact until 2037.

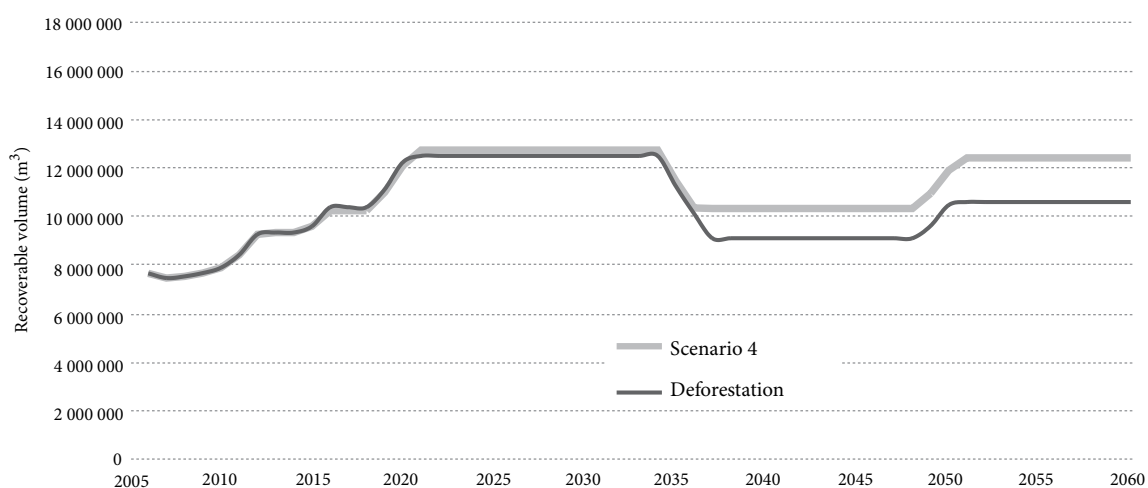
»»» OTHER SPECIES

› DOUGLAS- FIR

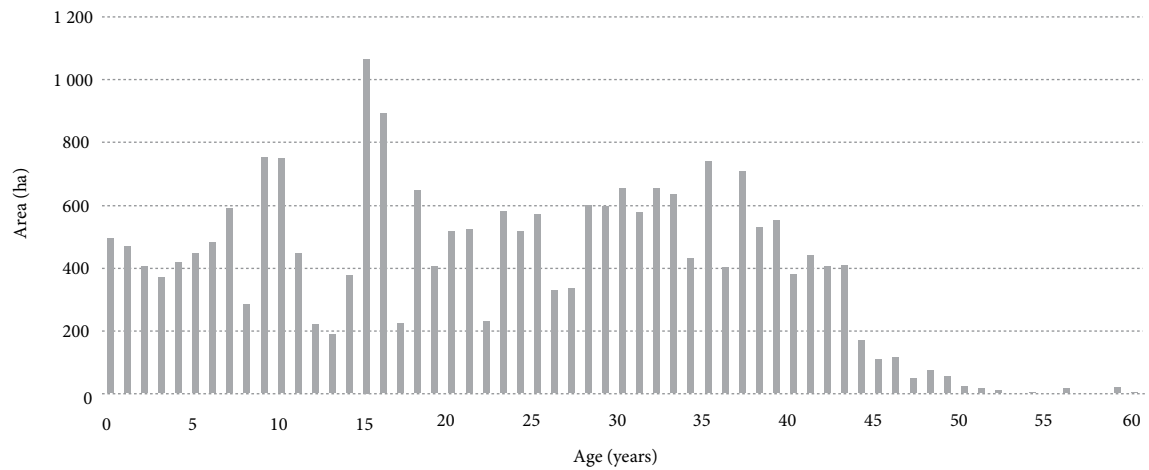
The area of Douglas-fir in the CNI is about 23 000 hectares, of which 20 000 hectares is in the large-scale owners' estate. The age-class distribution of Douglas-fir is reasonably uniform with an average of 500 hectares in age-classes 0 to 43 years (Figure 4.18).

The Douglas-fir harvest for the large-scale owners' estate is based on intentions for 2006 to 2015 and then required to be non-declining from 2016 on. The harvest from the small-scale owners' estate was required to be non-declining from 2007 on. Long-run volumes are 200 000 cubic metres per year from the large-scale owners' estate and 230 000 cubic metres per year from the combined estate (Figure 4.19).

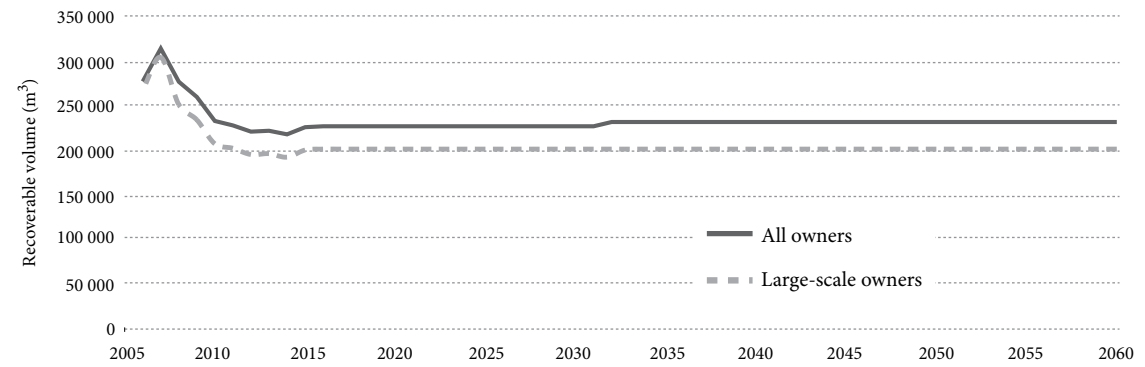
»»» FIGURE 4.17: CENTRAL NORTH ISLAND RADIATA PINE AVAILABILITY UNDER A DEFORESTATION SCENARIO AND SCENARIO 4



»» FIGURE 4.18: AGE-CLASS DISTRIBUTION OF CENTRAL NORTH ISLAND DOUGLAS-FIR – COMBINED ESTATE



»» FIGURE 4.19: CENTRAL NORTH ISLAND DOUGLAS-FIR AVAILABILITY – COMBINED ESTATE



THE INDIGENOUS FOREST INDUSTRY

5

About 25 percent of the CNI region is covered by natural vegetation. This is mainly high forest, with relatively small areas of scrubland. Most of the natural forest land is in reserves and stewardship areas administered by the Department of Conservation. The major reserves are Tongariro National Park, parts of Te Urewera and Whanganui National Parks, Pirongia, Kaimai-Mamaku, Whirinaki, Kaimanawa and Pureora Forest Parks, and a section of Raukumara Forest Park.

Natural forests range from small kauri stands in the north of the region to mountain beech tree-line forest at 1600 metres above sea level on Mount Ruapehu. Forest below 800 metres mainly occurs on hilly to very rugged land and is dominated by various hardwoods with occasional podocarps (principally rimu, totara, miro, matai and kahikatea). In the past, forests on easy terrain were logged for podocarp and tawa. The dense mixed podocarp forests of Whirinaki and Pureora forests were the major natural timber resources of the CNI region. Logging of these forests, followed by conversion to grass, or replanting with introduced species, occurred until the 1970s. This was followed by a system of sustained yield management of these forests until the 1980s. At this time the decision was taken to preserve all remaining Crown-owned natural forests in the North Island.

With no production of native timber from Crown forests in the North Island (apart from very small quantities for cultural use), and with controls on the extraction of timber from private natural forests, future production levels of native timber will be very low. Production is permitted under Part 111A of the Forests Act 1949, but must be carried out under an approved management plan or permit that ensures the sustainability of the forests.

Sustainable Forest Plans provide for an allowable annual harvest volume, whereas Sustainable Forest Permits are valid for a period of 10 years only. A permit states the total volume that may be removed from the area covered by the permit during the 10 years life of the consent.

Table 5.1 shows that permits rather than approved plans account for the bulk of CNI approval in both numbers and area covered. Most permits in the CNI region are associated with one of three Territorial Authorities: Opotiki (the eastern edge of the region); Ruapehu (the southern end) or Waitomo (the westernmost part of the region).

There are currently 121 registered indigenous sawmills in the North Island. Twenty-two of these operate from “permanent” locations, and the bulk (99) of the registered sawmills are portable. Within the CNI region, over 16 700 hectares of indigenous forest is covered by either sustainable management plans or permits. The total harvest/production volume covered by approved plans or permits in the CNI is about 5600 cubic metres per year. Actual indigenous production for the whole of the North Island, is currently in the range of 2000–3000 cubic metres per year, or less than the permitted production from the CNI region alone.

»» TABLE 5.1: APPROVED SUSTAINABLE FOREST MANAGEMENT PLANS AND PERMITS IN THE CENTRAL NORTH ISLAND REGION

TERRITORIAL AUTHORITY	SFM PLANS			SFM PERMITS			TOTAL AREA (HA)	TOTAL VOLUME (M ³)
	COUNT	AREA (HA)	VOLUME (M ³ PA)	COUNT	AREA (HA)	VOLUME (M ³ PA)		
Opotiki	0	0	0	15	2 848.3	4 667.0	2 848.3	4 667.0
Rotorua	0	0	0	3	307.0	1 000.0	307.0	1 000.0
Tauranga	0	0	0	3	184.0	0.0	184.0	0.0
Whakatane	0	0	0	3	445.0	750.0	445.0	750.0
Taupo	1	1 322.0	2 391.0	1	240.4	151.0	1 562.4	2 542.0
Ruapehu	1	470.1	602.0	39	6 091.9	7 745.0	6 562.0	8 347.0
Otorohanga	0	0	0	11	775.3	2 599.0	775.3	2 599.0
South Waikato	0	0	0	2	63.5	500.0	63.5	500.0
Waipa	1	60.0	37.0	1	16.4	125	76.4	162.0
Waitomo	0	0	0	30	3 894.6	8 901.7	3 894.6	8 901.7
Total	3	1 852.1	3 030.0	108	14 866.4	26 438.7	16 718.5	29 468.7

Source

MAF Sustainable Programmes – Indigenous Forestry Database.



Tachikawa Forest Products sawmill, Rotorua. Photo: John Vaney/MAF.

THE WOOD PROCESSING INDUSTRY

6

»»» OVERVIEW

The last five years have seen some significant changes in the wood processing sector. The most obvious change has been the demise of the large vertically integrated corporate operations. All large processing plants are now owned by organisations with no direct control over forest resources.

There has been considerable consolidation of capacity in the structural sawn timber area under Carter Holt Harvey after it acquired the structural sawmills owned by Fletcher Challenge. There were sawmill closures at Rainbow Mountain, Taupo, Tokoroa and Putaruru. The capacity of the Kawerau sawmill increased.

Further, the Laminex group decided to not rebuild its Taupo MDF plant that was damaged in a fire in 2006.

New owners, plants and processes have also come into the region over the five-year period. There are now wood pellet plants in Rotorua and Taupo.

The following is a description of the CNI processing industry as at September 2009. It is not a complete list of processing sites in the region but does represent capacity sufficient to process 6.5 to 7.0 million cubic metres of logs per year.

»»» SAWMILLING

» CHH WOODPRODUCTS NZ

CHH Woodproducts operates a large structural sawmill at Kawerau. Approximately 350 000 cubic metres of sawn product is produced per year from a log intake of 630 000 cubic metres. Product is sold to domestic markets (60 percent) and to export markets 40 percent, with the Middle East, Asia and South Africa being the main export markets.

Approximately 20 000 cubic metres of material is sent

from the site for remanufacturing in Rotorua and Kaingaroa.

Power supply to the mill is largely from geothermal steam, although some process steam is taken from the nearby pulp and paper-mill complex.

» RED STAG TIMBER

Red Stag Timber is an independent, privately owned company based in Rotorua. It was established in 2003 to own and operate the Waipa Sawmill, a mill originally set up as a demonstration mill by the government in 1939, and subsequently privatised in 1996. Red Stag Timber consists of a sawmill with associated plant, timber processing, and timber treatment operations. Current production is 260 000 cubic metres of sawn product per year. Log input is about 500 000 tonnes per year. Process heat and 25 gigawatt-hours (GWh) of electricity is provided by wood waste, bark and hog fuel using co-generation boilers.

While Red Stag is focused on production of structural lumber products, the company does have a commitment to developing its product range and market base. In addition to structural products it also produces outdoor, industrial, appearance and furniture-grade lumber. Recent investments in the business include a new stand-alone planer mill, processing plant, sonic testing of logs and sawn product, machine stress-grading, two high-speed drying kilns and a new pressure boron treatment plant.

About 65 percent of product is sold in the domestic market, the balance being exported.

» TACHIKAWA FOREST PRODUCTS

Rotorua-based Tachikawa Forest Products (NZ) Ltd is a joint venture between Japanese companies Tachikawa Forest Products Ltd and Sojitz Corporation (a diversified trading company). Both joint-venture partners have a long

history of trading links with New Zealand and set up their operation in 1989.

The group runs two sawmills and kiln-drying facilities with annual output of 220 000 cubic metres green and kiln-dried lumber from a log intake of 400 000 cubic metres.

The joint venture sells green and dried lumber to Japan

(36 percent) and the NZ domestic market (20 percent).

The balance of the company's output is sold in the Philippines, USA, China, Hong Kong, Taiwan, Indonesia, Thailand and – increasingly – the Middle East.

› TENON LTD

Tenon's Taupo sawmill was first commissioned in 1966 and is currently the largest pruned-log sawmill in New Zealand. The mill has a focus on value and grade recovery rather than throughput. The Taupo plant takes in about 300 000 tonnes of logs per year and is currently (September 2009) running on three shifts per day. Input is 100 percent radiata pine, predominantly pruned butt logs. Down-stream processing in the plant produces mouldings-and-better lumber for direct supply to the North American market as well as feedstock for Tenon's mouldings and clear-board plants. The mill operates 7 days a week.

In addition to the sawmill, the company also operates nine geothermal-powered kilns. Secondary operations include defecting, finger-jointing, surfacing and a paint line.

› WPI TIMBER

WPI Timber has been the processing arm of the Ernslaw One group since 2008. It was formerly owned by Winstone Pulp International, hence the name WPI, which Ernslaw One has retained. It owns three sawmills with one – the Tangiwai sawmill – in the CNI region. This sawmill is located at Tangiwai close to the company's Karioi pulp mill. It produces 100 000 cubic metres per year on a single-shift operation using 200 000 cubic metres of logs.

The Tangiwai site also has a planer, optimiser, dry-sheds, kilns and had a 5-megawatt (MW) wood waste (sawdust and dry shavings) heat plant installed in 2001.

Timber is produced for both domestic (35 percent) and export (65 percent) markets. Major export markets are

»»» TABLE 6.1: SAWMILLS OPERATING IN THE CENTRAL NORTH ISLAND REGION AS AT SEPTEMBER 2009

SAWMILL	LOCATION
A. PRODUCTION LEVEL: OVER 50 000 M³ SAWN TIMBER PER YEAR	
CHH Woodproducts	Kawerau
Red Stag	Rotorua
Tachikawa Forest Products	Rotorua
Tenon	Taupo
WPI Timber	Tangiwai
Sequal Lumber	Kawerau
Claymark Sawmills	Rotorua/Katikati
Pukepine	Te Puke
B. PRODUCTION LEVEL: 25 000-50 000 M³ SAWN TIMBER PER YEAR	
McAlpine	Rotorua
Mamaku Sawmilling	Mamaku
RH Tregoweth	Te Kuiti
Waitete Sawmills	Te Kuiti
Kiwi Lumber	Putaruru
Pacific Pine	Putaruru
Donelley Sawmillers	Reporoa
C. PRODUCTION LEVEL: 5000-24 999 M³ SAWN TIMBER PER YEAR	
None	
D. PRODUCTION LEVEL: 0-4999 M³ SAWN TIMBER PER YEAR	
Waiariki	Rotorua
Collectively 15 smaller mills	

China, Hong Kong, Vietnam, Korea, Philippines, Malaysia, Indonesia, Australia, the United States and the Pacific Islands. The company produces a range of grades and sizes for furniture, construction, landscaping, remanufacturing and mouldings markets. Various options for timber preservative treatment are available for in-ground, above-ground and internal applications.

› SEQUAL LUMBER

Sequal Lumber is a privately owned company involved in trading New Zealand pine timber products throughout New Zealand and to the Australian, Asian and Middle East markets. The company was established in Kawarau in 2008 with a new dimensional-lumber sawmill. Annual production is 75 000 cubic metres of lumber from a log input of 150 000 cubic metres.

› CLAYMARK

Claymark Industries has its head office and manufacturing facilities in Rotorua. The company also owns two sawmill and kiln-drying facilities located in Rotorua (Rotorua Sawmill Ltd) and Katikati (35 kilometres north of Tauranga). These sawmills have an annual lumber production capacity of 75 000 cubic metres per year from a log input of 135 000 cubic metres. The company operates a 7-megawatt high-pressure hot water waste wood boiler producing 56 gigawatt-hours of energy annually. All lumber is kiln-dried.

Sawn timber from the sawmills is re-manufactured into a variety of finished products at the Rotorua manufacturing plant. The company exports over two-thirds of total output, with its major markets being in the USA, Australia and Asia. Claymark's primary focus is on dressed (all four sides) radiata pine boards and on solid-timber mouldings markets.

› PUKEPINE SAWMILLS (1998) LTD

This company is a family-owned business involved in

sawmilling, timber processing, timber treatment, kiln-drying, wholesaling and export. Lumber production is 50 000 cubic metres per year from a log intake of 90 000 cubic metres. The company has nine kilns fired by wood waste. They utilise a mixture of accelerated conventional and conventional drying. The total drying capacity is approximately 5000 cubic metres per month. The company has stress-grading facilities along with finger-jointing and laminating capabilities.

› MCALPINES (ROTORUA) LTD

This is one of three sawmills that are part of a company with a capacity to process 260 000 cubic metres of sawlogs per year. The company's two other sites are in the South Island at Nelson and Rangiora. The Rotorua site has a lumber production capacity of 40 000 cubic metres per year from a log input of 70 000 cubic metres. In total, the McAlpines group has kiln-drying capacity for 130 000 cubic metres per year – about half the group's total production – and a treatment plant with a capacity of approximately 80 000 cubic metres per year. The Rotorua plant is fitted with a 2-megawatt hot water boiler running on green sawdust. This plant produces around 16 gigawatt-hours of heat per year. The McAlpines group produces timber for both local and export markets.

› MAMAKU SAWMILLING COMPANY

Part of the White Cliffs Timber group, Mamaku specialises in producing clear appearance-grade timber products milled from pruned logs. It produces for both domestic and export markets, cutting around 35 000 cubic metres of sawn timber annually from a log input of 60 000 cubic metres per year. While appearance grade from pruned material is a speciality, lower-grade logs are milled for use in pallet and box manufacture. Wood chips are sold to the pulp industry, with wood shavings and sawdust being used by the company as fuel for its kiln boilers. Bark is sold for use in landscaping and gardens. The company has a secondary processing unit based in

Ngongotaha. Both sawmill and processing sites have wood-fired boilers, a 2.75-megawatt hot water boiler at the mill and a 1.25-megawatt plant at the processing site.

› R H TREGOWETH LTD

This is a privately owned business at Te Kuiti which processes radiata pine for both domestic and export markets. Production is around 29 000 cubic metres of lumber per year from a log input of 53 000 cubic metres. The company has two 75 cubic metre kilns and one 50 cubic metre kiln to dry the product. RH Tregoweth Ltd produces a range of products from clears through to industrial grades in a variety of sizes. A 5-megawatt heat plant runs on wet and dry wood waste produced on site.

› WAITETE SAWMILLS LTD

This mill is located in Te Kuiti. It produces some 28 000 cubic metres per year of lumber from an annual log input of 51 000 cubic metres. The input is almost entirely pruned logs. Lumber is sold to the domestic market and to the US market. Heat for the four kilns is produced by a 3-megawatt waste burner utilising sawdust, shavings, bark, and off-cuts.

› KIWI LUMBER (PUTARURU) LTD

Kiwi Lumber is a privately-owned New Zealand company operating sawmills at three North Island sites (Putaruru, Dannevirke and Masterton). Together the three sites produce in excess of 100 000 cubic metres of sawn timber output per year for domestic and export markets. Of this, the Putaruru mill produces a sawn output of 27 000 cubic metres per year from a log intake of 47 000 cubic metres. The company has the capacity to kiln-dry and planer-finish its total sawn timber production and is currently some two-thirds through a five-year plan involving major upgrades at all sites. A 7-megawatt wood boiler using sawdust and dry shavings has been recently installed at Putaruru, eliminating the use of natural gas at this site. To improve recovery, this mill has also recently been

upgraded with new head-rig scanners.

› PACIFIC PINE INDUSTRIES LTD

This is an independently owned and operated mill (la Grouw Corporation) at Putaruru with an annual production of 30 000 cubic metres per year from a log intake of 50 000 cubic metres. The mill supplies clears and tight-knot grades to the local moulding, furniture and solid timber housing markets as well as to export markets. It also supplies structural, merchantable and industrial grades to the domestic market. The mill has four accelerated conventional medium-temperature kilns.

› DONELLEY SAWMILLERS LTD

This mill is located at Reporoa adjacent to Kaingaroa Forest. It saws predominantly radiata pine and some Douglas-fir from time to time. Annual lumber production is around 27 000 cubic metres per year from a log input of 52 000 cubic metres. The mill is able to receive off-highway rigs from Kaingaroa and more distant forests directly to the door. It produces structural products and appearance-grade material for the local and export markets. The four kilns are powered by heat from a wood-waste burner.

› WAIARIKI INSTITUTE OF TECHNOLOGY WAIPA CAMPUS SAWMILL

This mill (previously the Timber Industry Training Centre Sawmill) is still primarily a training mill, part of Waiariki Institute of Technology (see chapter 7). As part of educating students in the various aspects of sawmilling, it produces around 4000 cubic metres sawn annually from a log input of around 8500 to 9000 cubic metres.

› OTHER

Below this level of scale there are currently at least another 15 smaller mills operating in the CNI region. Collectively, these smaller mills have a wood input that is comparable to that of the Waiariki mill, around 9000 cubic metres per year.

»»» PANEL PRODUCTS

» CHH PLYWOOD

CHH Plywood began in Tokoroa in 1976. It produces approximately 80 000 cubic metres equivalent of plywood per year. Pruned logs make up 30 percent of the log input.

The plywood is used in residential, commercial and industrial construction, cladding, bracing, internal lining, farm and agricultural uses, furniture and joinery, packaging, materials handling, and transport.

Products are sold throughout Australasia.

» LAMINEX GROUP

The Laminex Group is part of Fletcher Building Products Ltd and was formed from the amalgamation of three companies: Scott Panel & Hardware, Fletcher Wood Panels, and Formica. Within Australasia the group holds a leading market position in decorative laminates (high-pressure laminates, MDF and decorated particleboard) and the number two position in commodity MDF and particleboard.

In the CNI region, the group's major manufacturing operation is a particleboard plant in Taupo. The plant's current production is 164 000 cubic metres per year. Of this production around 70 percent is exported, mainly to Asia, with the remainder consumed domestically.

A fire at the Group's MDF manufacturing plant in Taupo in 2006 destroyed the MDF press and in 2007 the company decided not to rebuild.

The closure of the MDF plant had a significant effect on local wood residue utilisation, as the plant consumed a significant quantity of sawdust from local mills. This material is now being utilised by the new wood pellet plant at Taupo.

»»» PULP AND PAPER

The New Zealand pulp and paper industry is located primarily in the CNI region with six pulp manufacturing plants and four papermaking facilities. The mills are located at Whakatane, Kawerau (3 mills), Kinleith, and Karioi.

The ownership of the mills has evolved considerably since 2000. The pulp and paper sector is now characterised by global corporate ownership, as distinct from the largely TIMO ownership structure prevalent in the forestry sector in the region. The corporate owners of the CNI pulp and paper facilities are international groups with marketing and manufacturing bases around the globe.

» CHH PULP AND PAPER KINLEITH

The Kinleith mill was built by NZ Forest Products (NZFP) in the 1950s to utilise the large plantation resource established by its forest division since the 1920s. The mill is one of the two Kraft chemical pulp mills in New Zealand. It was absorbed into the CHH business in the early 1990s and has been the flagship company pulp and paper plant since then. The mill has had numerous upgrades and modifications over the years, as technology has changed: the most recent modernisation programme was in 1998 to increase the Number 2 pulp mill and linerboard paper machine (PM6) production.

Since the acquisition of the Tasman mill in 2001 (see below), the Kinleith mill has concentrated on kraftliner and softwood kraft pulp. The mill has 327 000 tonnes per year of kraftliner capacity on a single 6.3-metre-wide paper machine, plus 270 000 tonnes per year of softwood kraft pulp. The mill exports 70 percent of its kraftliner and the majority of its softwood kraft pulp output.

The mill operates a continuous digester linked to the Number 2 pulp dryer. PM6 softwood feed stock is cooked

via a series of batch digesters, with a dedicated semi-chemical hardwood digester.

Annual fibre use is approximately 2.2 million tonnes per year, of which 100 000 tonnes is hardwood logs, 200 000 tonnes is sawmill residue, and the balance is softwood (mainly radiata pine) logs.

› SCA HYGIENE AUSTRALASIA – KAWERAU

This plant began as the Caxton Tissue pulp and paper facility, and became part of the CHH group in the late 1980s. It is based in Kawerau. It was run as CHH Tissue until the plant was sold to Svenska Cellulosa Aktiebolaget, a Swedish-based forest products company that set up SCA Hygiene Australasia (SCA HA) to manage its Australasian assets. SCA HA is a US\$12 billion international paper company producing absorbent hygiene products, packaging solutions and publication papers.

At the Kawerau site, SCA HA manufactures base paper for Purex and Economy Toilet Tissues, Handee kitchen towels, Deeko napkins and for the Tork brand of commercial washroom and cleaning products. SCA HA also converts jumbo reels of base paper into the Tork range of roll and interfold products for Australasian markets.

In 2007 SCA HA closed its pulp mill. It now sources base pulp for tissue manufacture from domestic and international markets. Annual paper production is of the order of 60 000 tonnes per year.

In May 2009, the company entered into an agreement with Ngati Tuwharetoa Geothermal Assets (NTGA) for a new geothermal steam line to supply the company's tissue manufacturing plant. The pipeline and steam processing equipment will be constructed by 2010 and will eliminate the need for gas-fired boilers on the site.

› NORSKE SKOG TASMAN LIMITED

Founded in 1952, the Tasman Pulp and Paper Company commenced production of newsprint and kraft pulp at its Bay of Plenty mills in Kawerau in 1955. The New Zealand Government underwrote the supply of pulp logs with a guaranteed supply from Kaingaroa Forest under two long-term wood sales.

Tasman became part of the Fletcher Challenge group in 1980, and subsequently became part of Fletcher Paper which had world-wide interests in pulp and paper. Fletcher Paper sold the Tasman operation (which included a kraft mill and a mechanical pulping plant which produced pulp for the newsprint machines) to Norske Skog in 2000. The NZ\$2.4 billion deal gave the global newsprint company 900 000 tonnes per year of newsprint capacity at three mills: the Tasman mill in New Zealand, plus the Boyer and Albury mills in Australia.

Norwegian-based Norske Skog is the world's second largest producer of publication paper, with 15 wholly and partly owned mills in 11 countries. Norske Skog has a 13 percent share of the global market for newsprint and magazine paper.

In 2001 Norske sold the Tasman kraft mill to CHH Pulp and Paper, leaving Norske with stone groundwood (SGW), refiner mechanical pulp (RMP) and thermo-mechanical pulp (TMP) production plants to produce mechanical pulp for the three paper machines.

In 2005 Norske Skog embarked on an Australasian rationalisation and upgrade that saw the Tasman Paper Machine 1 (PM1) and the SGW plant shut down, and the production of PM2 and PM3 boosted to 315 000 tonnes per year. The net loss in production from the Tasman mill was compensated for with the upgrade of the Norske Skog Albury Mill in Australia.

Norske Skog Tasman takes in 0.75 million tonnes of softwood fibre annually, comprising 0.5 million tonnes of sawmill chips and 0.25 million tonnes of pulplogs.

The Tasman mill supplies all of New Zealand's standard newsprint, improved newsprint and directory paper, and a large portion of Australia's newsprint requirements. Recently the mill has started producing book paper as it increases its product range.

› CHH TASMAN KAWERAU

As noted above, the CHH Tasman kraft mill was purchased by Carter Holt Harvey from Norske Skog in 2001.

The CHH Tasman mill produces 285 000 tonnes per year of both softwood (radiata pine) and hardwood (eucalypt) bleached and unbleached kraft pulp through targeted wood segregation, and the utilisation of two digester fibre lines. The facility manufactures bleached softwood, low-coarseness, fibre-cement and bleached hardwood pulp used by manufacturers of high-quality paper, tissue and building products. CHH Tasman's target markets are primarily New Zealand and Australia for bleached pulps, with fibre cement pulp being sold on a global basis.

Annual fibre use is approximately 1.3 million tonnes per year, of which 450 000 tonnes is radiata pine logs, 300 000 tonnes is eucalypt logs, and 550 000 tonnes is sawmill chips.

› CHH PAPERBOARD WHAKATANE

The board mill at Whakatane was one of the earliest pulp and paper mills built in New Zealand, starting operations in 1939. The mill was part of the NZFP group for many years and became part of the CHH group when CHH acquired NZFP in the early 1990s.

The mill manufactures mechanical pulp for paperboard,

primarily for food and beverage packaging in Australasia. Production is about 130 000 tonnes per year of carton board.

Fibre demand is approximately 155 000 tonnes per year of radiata pine logs, plus a volume of bleached pulp from CHH mills.

› WPI INTERNATIONAL

WPI International has been part of the Ernslaw One group since 2008, with a pulpmill at Karioi in the southern part of the CNI wood supply region. It is an important pulpwood market for forests in this part of the region. The pulpmill processes 389 000 tonnes of raw material per year, 37 percent of which is sourced as sawmill chips. Pulp logs come mainly from Ernslaw One's Karioi and Waimarino forests, and other forests in the southern part of the region and the southern North Island. The mill produces 160 000 tonnes of chemi-thermo-mechanical pulp (CTMP), some of which is bleached, and all of which is exported to Asian markets.

››› CHIP EXPORT

Since 2005 there has been little in the way of chip export from the CNI region. The residue industries in the region are currently using all available material. Chip exports through the Port of Tauranga are approximately 350 Bone Dry Units (BDU) per year, down from 17 290 BDU in 2005.

››› OTHER PROCESSORS

› WOOD PELLETS

The CNI region now has two wood pellet plants. Both have been developed by Nature's Flame which is a subsidiary of the state-owned enterprise Solid Energy New Zealand Ltd.

These plants use sawdust from local sawmills to make compressed wood pellets which are burnt in specially

designed pellet fires. The target market is heating in commercial and private premises. Wood pellet fires have low emissions and are suited to urban use. Use of these fires will be encouraged by the National Environmental Standards for air quality which will apply from 2013.

The Rotorua plant opened in 2005. It has an annual production capacity of 50 000 tonnes, equivalent to 100 000 cubic metres of logs.

The Taupo plant opened in 2009 and utilises the wood residues which became available when the Laminex MDF plant closed. Initial production is planned to be 60 000 tonnes per year, eventually rising to 150 000 tonnes, equivalent to 300 000 cubic metres of logs.

› TRADING COMPANY (TAURANGA)

Arbor Resources Ltd is a trading company with direct ownership interests in sawmills and kiln drying facilities. It is a manufacturer, processor and exporter of radiata pine timber. The company is based in Welcome Bay, Tauranga and associated companies include Hunters Creek Sawmill, Port Kilns Ltd (which operates wood kilns) and Finsaw BOP Ltd (sawmill).

The company has export marketing agreements with independent sawmills. Arbor-associated sawmills have a combined productive capacity of over 20 000 cubic metres per month.

In the last two years, the company has constructed four additional timber-drying kilns at the Port of Tauranga, increasing its capacity to export kiln-dried timber by some 5000 cubic metres per month.

Several other processors in the CNI region are involved with re-manufacturing and roundwood products. They include:

- › Hume Pine (NZ) Limited;
- › Intalok Tauranga;
- › Jointwood Products (Moore Levesque & Morriss Ltd) Cambridge;
- › KLC Limited Kaingaroa;
- › Laminated Beams Ltd Tauranga;
- › Les O'Leary Limited Tokoroa (part of the CHH group);
- › Lockwood Group Ltd Rotorua;
- › OTC Timber Co Ltd Otorohanga;
- › Permapine Limited Reporoa;
- › PurePine Mouldings Te Puke;
- › TimFin Limited Mt Maunganui;
- › Total Fascia Limited Tauranga;
- › Verda New Zealand Limited Rotorua.



Cable harvesting at Te Whaiti-Nui-a-Toi Forest. Photo: Michael Power/Crown Forestry.

»»» TABLE 6.2: SAWN TIMBER PRODUCTION IN THE CENTRAL NORTH ISLAND

YEAR ENDED 31 MARCH	INDIGENOUS FORESTS (M ³)	PLANTATION FORESTS (M ³)	TOTAL (M ³)
2000	1 730	1 840 718	1 842 448
2001	971	1 798 852	1 799 823
2002	1 673	1 778 866	1 780 539
2003	1 516	2 073 992	2 075 508
2004	672	1 926 171	1 926 843
2005	717	1 942 501	1 943 218
2006	861	1 883 778	1 884 639
2007	218	1 871 698	1 871 916
2008	222	1 816 005	1 816 227

»»» PRODUCTION AND EXPORT DATA

» SAWN TIMBER PRODUCTION

Indigenous production is now close to zero while production from plantation forests has remained in a narrow band around 1.85 million cubic metres per year, down from a 2003 high of 2 million cubic metres. The loss of production from the closure of some large mills, such as Rainbow Mountain and CHH Putaruru, has largely been made up by increased production from other mills in the region.

» SAWN TIMBER EXPORTS

Sawn timber exports have been around 690 000 cubic metres per year during the nine years shown, apart from the 2003 high. They average around 37 percent of total sawn lumber production in the region.

» LOG EXPORTS

During 2000 to 2004 log exports averaged 3.45 million cubic metres per year, dropping to an average of 2.33 million during 2005 to 2008, a fall of 32 percent. This fall in export log volume reflects the decisions of some forest owners to increase harvest age, as well as being a response to a range of adverse export factors.

»»» TABLE 6.3: SAWN TIMBER EXPORTS FROM THE PORT OF TAURANGA

YEAR ENDED 31 MARCH	TOTAL (M ³)
2000	648 302
2001	639 776
2002	708 025
2003	793 663
2004	603 075
2005	721 944
2006	616 330
2007	679 290
2008	788 926

»»» TABLE 6.4: LOG EXPORTS FROM THE PORT OF TAURANGA

YEAR ENDED 31 MARCH	TOTAL (M ³)
2000	3 324 199
2001	2 862 844
2002	3 513 889
2003	3 946 172
2004	3 624 822
2005	2 297 310
2006	2 283 265
2007	2 299 104
2008	2 458 667

RESEARCH, EDUCATION AND TRAINING

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A number of research, education and training providers operating in the CNI have knowledge and skills that are relevant to the forest sector. The region has one university (the University of Waikato), and a number of other tertiary education institutions including the Bay of Plenty Polytechnic, Wintec (Waikato Institute of Technology), Te Wananga o Aotearoa, and the Waiariki Institute of Technology. Crown Research Institutes (CRIs) in the region include Scion (trading name for New Zealand Forest Research Ltd), AgResearch, the Institute of Geological & Nuclear Sciences (GNS), HortResearch, LandCare Research, and the National Institute of Water & Atmospheric Research (NIWA).

Scion and the Waiariki Institute of Technology are two organisations important to the forestry sector nationally as major research, education and training providers.

»» SCION

Scion focuses on four strategic goals:

- › increasing the profitability of New Zealand's forest industries;
- › optimising the value of marginal land;
- › accelerating the growth of the bio-economy;
- › maximising the quality and impact of Scion's science.

In addition to pure and applied research, Scion also operates a number of facilities of national importance to the New Zealand forest industry. They include:

- › the National Forestry Library: it contains the largest collection of forestry, forest products and pulp and paper literature in the Southern Hemisphere;
- › the New Zealand National Forestry Herbarium: a large reference collection containing over 25 000 catalogued plant specimens;
- › a Quarantine Containment Facility fully registered under the MAF Biosecurity Standards for Invertebrates and Microorganisms.

Scion also hosts the Bioenergy Knowledge Centre: a website designed to help forest growers, wood processors and bioenergy consumers assess the potential value of wood waste and harvesting residues.

Scion has smaller offices in Christchurch, Wellington and Auckland. The Christchurch office is next to the School of Forestry on the grounds of the University of Canterbury.

»» WAIARIKI INSTITUTE OF TECHNOLOGY

The NZ Forest Service (NZFS) set up the Forestry Training Centre (FTC) on some of its nursery land near Whakarewarewa village in Rotorua in the mid-1940s. The purpose of this centre was to train NZFS rangers for the industry, as well as science technicians for the newly created Forest Research Institute (FRI). It also provided a variety of in-service training courses for NZFS and industry personnel.

In 1970 the NZFS established another vocational training facility, the Timber Industry Training Centre (TITC), adjacent to the state-owned Waipa sawmill. This facility included a small sawmill and drying, moulding, and saw-doctor training facilities.

In the late 1980s, FTC and TITC were transferred to the local Waiariki Community College, now Institute of Technology.

The Waiariki Institute of Technology houses the largest vocational forestry training school in New Zealand. The forest management department provides the Level 5 Diploma in Forestry (Operations Management) and the Level 6 Diploma in Forestry. The Forest Operations Department offers vocational training in fundamental forestry skills to Levels 2 and 3.

The School employs 33 full-time staff and trains over 750 students per year.

»» WAIARIKI NATIONAL CENTRE OF EXCELLENCE FOR THE FOREST AND WOOD INDUSTRY

In addition, there is a partnership between Waiariki Institute of Technology, FITEC, and Auckland University. This partnership received funds in 2006 from the Tertiary Education Commission and the Forest Industry Development Agenda to build an industry training centre, develop qualifications, and invest in technology. The latter would help the industry move away from a commodity focus and towards high value-added, export-orientated products. This centre opened in 2008.



Tachikawa Forest Products sawmill, Rotorua. Photo: John Vane/MAF.

8

INFRASTRUCTURE

»» PORTS

The CNI region contains one major export port, the Port of Tauranga. Land-based commodities helped the rapid growth of this port from the 1950s to what it is today, the country's largest export port. Forestry, kiwifruit and dairy exports account for around 80 percent of the annual export cargo at the port. The bulk of this cargo is destined for customers in North and South East Asia, Australia, and the Pacific Islands. Currently exports through the port exceed 7.5 million tonnes annually. Log exports account for 30 percent of this tonnage while other forest products (sawn timber, pulp, paper and board products) account for another 26 percent.

The Port of Tauranga is a publicly listed company and it established New Zealand's first integrated inland port operation, MetroPort, in South Auckland. It is also in a joint venture ("Northport Ltd") with the Northland Port Corporation which operates the deepwater port at Marsden Point.

»» ROAD TRANSPORT

The CNI region is generally well served for road transport, with an extensive network of state and provincial highways. In the past 10 years, considerable expenditure has gone into improving state highways.

Forestry traffic transports logs, sawn timber, chips, pulp and paper products and forest residues for fuel. The NZ Transport Agency recognises that forestry traffic is a significant user of the highway network, and is working on a number of projects to ensure that the strategic corridors are capable of handling the freight loadings safely. Significant routes for forestry currently include those linking the Port of Tauranga with the main forestry centres of Tokoroa, Whakatane, Kawerau, and Murupara as well as Ohakune and Taupo.

As the estate matures and the woodlot areas established in

the 1990s come on stream, the arterial and secondary roads in the western part of the region will see increased logging traffic. These roads are not as well designed and constructed for high volumes of heavy traffic as those in the east of the region. Issues are likely to arise as a result of additional heavy traffic interacting with existing traffic including tourist vehicles. Similarly, as forest operations extend to the far east of the Bay of Plenty, heavy traffic will increase on this difficult stretch of coastal road.

The region has an extensive private "off-highway" road network that has been established since the 1950s, largely in Kaingaroa, Kinleith, Tarawera, Matahina, Tahorakuri, and Tauhara forests. The major off-highway routes include a sealed surface and feed large volumes of logs directly to railheads, log yards and processing facilities. These private roads are typically built and maintained to a higher load specification and regularly carry loads well in excess of on-highway weight and length limits. They play an important role in taking heavy-vehicle movements off the public highways in the region.

»» RAIL TRANSPORT

Rail has historically played an important role in transporting forest produce from the region's major forests to processing plants and to the Port of Tauranga. It has also played an important role in transporting forest products from the major processing plants to the Port of Tauranga. To a lesser extent, rail has also been used to carry pulp log material from the Northland region to the mills in the CNI region.

The major rail links used by the forest industry include:

- › the line from Kinleith (pulp and paper mill; log yard) to the Port of Tauranga;
- › the line from Murupara (log yard) to Kawerau;
- › the line from Kawerau (pulp and paper mills; sawmills, log yard) to the Port of Tauranga;

- › the main trunk line which traverses the western side of the CNI region and eventually links population centres and ports.

»» ENERGY

The region is a significant contributor to New Zealand's electricity supply and is a critical component in the national (Transpower) electricity grid. Three of the country's largest electricity generating companies (Contact, Mighty River Power, and Genesis) have plants in the region. In addition there are a number of smaller local hydro schemes, and several new geothermal generation plants are under construction.

In all there are 20 hydro-electric stations within the CNI region with a total generating capacity of around 1540 megawatts. These plants account for some 90 percent of the North Island's total hydro capacity.

Geothermal stations at Ohaaki and Wairakei add a further 280 megawatt to the region's generating capacity while the country's newest generation plant, a 100 megawatt geothermal station, is at Kawerau. Planning and construction have commenced for significant extra geothermal generation capacity in the region around Taupo: the 220-megawatt Te Mihi station (planned to commence generation in 2011), the 132-megawatt Nga Awa Purua station (commences generation in 2010), the 20-megawatt binary plant at Taupo, and the 113-megawatt Mokai station.

Natural gas is available throughout the region and is a significant energy source for the wood processing industry, especially for timber drying, and pulp and paper.

Wood residues are becoming a major energy source in the larger wood processing plants.



Forwarder loading eucalypt pulpwood at Wairakei Forest. Photo: David Little/Crown Forestry.

OPPORTUNITIES AND CONSTRAINTS

9

»» OPPORTUNITIES

A recent MAF report (MAF, 2008a) identified five key drivers that will influence New Zealand forestry over the next 20 years. These factors are:

- › a growing awareness and demand for services other than wood production that forests provide;
- › lifestyle changes leading to greater focus on renewable resources and sustainable environments;
- › future energy supply and cost;
- › the markets for additional forest production lie overseas;
- › the existing forest resource predetermines the wood availability and quality for the next 20–30 years.

All these influences are relevant to the opportunities for forestry in the CNI region.

The region, with 13 percent of the country's population, contains 30 percent of the total national planted forest estate. The forest industry in the region is relatively mature and it currently produces 45 percent of the total national harvest.

A number of nationally significant research, education and training institutions are based in the CNI, and these institutions themselves offer the region unique opportunities.

› WOOD AVAILABILITY

The forecasts indicate that the availability of radiata pine from the region's existing forests will increase, from the current harvest level of about 9 million cubic metres per year to about 10 million by 2015; there is potential for further increases to about 12 million by 2020. This forecast increase in wood availability of around 2.5-3 million cubic metres over the next 10 years is the largest increase in wood availability out of the 10 wood supply regions in New Zealand.

The characteristics of the region's wood availability will also change. There is a gradual decrease in pruned volume availability from around 16 percent of harvest to around 11 percent by 2020, then to less than 8 percent by 2030. The volume of pruned logs available is expected to remain constant at current levels of around 1.2 million cubic metres per year (most of which is processed within the CNI) until about 2020, then progressively decline to about 900 000 cubic metres by 2030. The regional harvest of Douglas-fir is also expected to decline from about 400 000 cubic metres per year to 200 000 cubic metres, if owners do not liquidate this resource earlier.

› NEW PROCESSING

The forecast increase in wood availability provides opportunities to expand processing by up to 3 million cubic metres per year from 2020. In the intervening years there is a steady increase in wood availability. An increase of this magnitude is sufficient for a new world-scale processing plant, although existing plants could also expand.

There is also potential for growth of wood availability from some areas within the neighbouring wood supply regions: Auckland, East Coast, Hawkes Bay and the southern North Island.

Within the CNI region, the existing processing capability will need to adapt over time to a reduced percentage and volume of pruned logs, with a corresponding increase in the volume of unpruned sawlogs and pulplogs. The existing sawmilling industry is aware of the trend as the prices paid for pruned logs currently mean that pruning is no longer economic for most forest owners.

› INFRASTRUCTURE

The existing roads and rail systems handle the current level of production very well from currently producing forests. However, if by 2020 the projected volume

increases eventuate, there is potential for another 120 000 extra truck movements per year (545 per working day) at the current weight restrictions and truck configurations. Many of these truck movements will be outside the existing infrastructure network in the most distant eastern and western parts of the region as those forests mature.

The NZFOA is working with the NZ Transport Agency to define roads on which to trial an increase in the weight and length limits of logging trucks to minimise the number of extra trucks and truck movements around New Zealand. This work has major significance in the CNI as an opportunity for reducing the social impact of additional trucks on the roads.

› BIOENERGY POTENTIAL

At a national level, wood currently supplies about 7 percent of total consumer energy. There are opportunities to grow both the industrial and the residential use of wood fuel, particularly if the cost of alternate fuels keeps increasing. The CNI region already has two wood pellet plants and the wood pellet industry has experienced rapid growth over the last few years in New Zealand as well as Australia, Europe and North America.

Recent studies by Scion have reconfirmed there are a number of options (including residue biomass) to increase the supply of renewable electricity and heat. They also reconfirmed past conclusions that meeting New Zealand's liquid transport fuels needs is likely to pose the greatest challenge. There is an opportunity for forestry businesses in the CNI to further contribute to the energy sector.

The large processing plants in the CNI use a mix of energy sources. A large amount of wood energy is already used for generation of steam and heat for wood processing, and there is an opportunity to use increasing amounts of wood energy to complement the increase in geothermal energy

that is replacing natural gas and electricity as energy sources for the wood processing sector. Geothermal energy use by wood processing plants has increased in part in response to electricity price increases and to ensure continuity of supply.

› ENVIRONMENTAL SERVICES

A number of forests in the CNI are heavily used recreational forests with international recreational events held in them. These produce significant economic spin-off benefits to the local district. There is an opportunity for other parts of the CNI forest estate to be developed along these lines, subject to resolving the issues surrounding who should pay for each development and how the forest owner could be rewarded.

Companies in the CNI are leading the way in developing and improving the sustainability credentials of New Zealand's housing stocks. There is a further opportunity for wood-based products to gain market share by providing evidence that they can ease concerns about climate change, energy usage and greenhouse gas emissions in a cost-effective manner.

Forestry companies in the CNI have been participating in, and often leading, research efforts into understanding then maintaining and enhancing the indigenous biodiversity in plantation forests. This can generate additional marketing opportunities, and it also illustrates the additional environmental services that CNI forests supply, albeit currently without tangible economic benefit.

Forests also have a role in maintaining and improving water quality, and in the CNI the forests around Lake Taupo and Lake Rotoaira have played an important role in the maintenance of water quality in those lakes.

»» CONSTRAINTS

» CO-ORDINATION OF WOOD SUPPLY

The scenarios for the CNI resource show that most of the increase in wood availability beyond 2018 is from small-scale growers who planted forests in the late 1980s and 1990s. At present there is no co-ordination of these growers. There are three Farm Forestry Association branches in the CNI region, but these do not have a marketing or co-ordinating function at present. There are a number of log traders and marketing consultants, but again these groups are competitive and there is no obvious co-ordinated approach. There are likely to be significant benefits from a more co-ordinated approach to the future harvesting of the smaller-scale forest resource. Wood processors would benefit from better knowledge of future wood supply and from security of supply. Co-ordination is likely to lead to lower harvesting costs for growers and more orderly use of labour, harvesting equipment and infrastructure.

» AGE AND SCALE OF EXISTING INDUSTRY

Although there have been a number of upgrades and new equipment installations as described in chapter 5, most of the wood processing plants in the CNI can be regarded as small and relatively old by world standards. The global corporate owners of the large processors make investment decisions based on a number of factors, not just wood availability, so the CNI mills must compete for global capital investment.

» INFRASTRUCTURE FOR NEW FOREST AREAS

The young forests to the west of Lake Taupo (in the King Country) and the ex-Caxton forests in the Eastern Bay of Plenty have poorer infrastructure support, in terms of good district roads and improved state highway or rail networks to service the increased wood volumes that could come from these areas. Unless the road links and

related infrastructure are improved, this will result in higher transport costs from these forests and may restrict access to them.

» LEASE UNCERTAINTIES

Forest ownership in the CNI region has always been relatively concentrated, with the four largest forest owners controlling at least three-quarters of the total estate. However, since 1987 a significant proportion of CNI forest ownership has been in the form of Crown Forest Licences (CFLs). Under CFLs the forest company owns the trees and the right to rent the land from the Crown for a period of 35 years. The Crown Forest Assets Act 1989 sets out a process for terminating this rental right in the event that land ownership changes from the Crown to Māori. Basically, upon “termination” the occupier is still able to continue occupation of the forest land until he has completed harvesting all of his standing crop (all trees that were in the ground at time of “termination”). The new Māori owners are obliged to continue to rent the land to the forest owner on similar conditions to those agreed with the Crown for a period of up to 35 years.

The Treelords deal offers a number of opportunities and some challenges for the industry in the CNI. Although the iwi are obliged to rent the land to the existing holders of CFLs, it is on a similar rather than identical basis to that applying when the Crown was the landowner. The vision that each individual iwi group has for its land in the longer term could impact on future rental conditions, which are yet to be tested.

The termination provisions of the CFLs were developed to allow an existing licence holder to grow its trees to maturity and harvest them. However, unless there is a mutually acceptable agreement between the landowner and the licensee on future lease terms and conditions,

licensees may choose not to renew the lease on land after harvesting. In these cases landowners could: seek a new lessee, replant the land themselves, go into a joint venture with another forest owner, and/or potentially change land use.

The Treelords deal has the potential to dramatically increase local interest and involvement in commercial plantation forests. This major change in land ownership will bring changes and new challenges to both the new landowners and the current forest owners.

»» CONCLUDING COMMENTS

The CNI region is, and will remain, New Zealand's largest commercial forestry region. The forest industries in the region have a history, depth and scale not present in other parts of the country. The CNI region remains an attractive area to grow production forests.

Forecasts indicate that the availability of radiata pine from the CNI forest estate will increase steadily from the current level of about 9 million cubic metres per year to around 10 million by 2015. By about 2020, wood availability is expected to increase to around 12 million cubic metres per year.

Most of the potential increase in wood availability from

2008 to 2015 will come from the region's large-scale forest growers. Thereafter, from 2018 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) may limit how quickly the additional wood from the region's forests can be harvested.

The degree to which the CNI 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 markets for their products; and the potential for the region to attract additional processing capacity.

The region is surrounded by other wood supply regions with increasing wood flows. In addition, it has good infrastructure, developed forestry training and processing sectors and the country's main forest export port. It is therefore potentially well placed to capitalise on not only its own increasing wood flows, but on those expected from the other adjacent North Island wood supply regions as well.



Port of Tauranga. Photo: Port of Tauranga Ltd.

WEBSITES

FOR MORE INFORMATION

10

FOREST OWNERS AND MANAGERS

www.kaingaroatimberlands.co.nz
www.rayonier.com
www.pfolsen.com
www.nzfm.co.nz
www.hnrg.com
www.gfplp.com
www.maf.govt.nz/forestry/crown-forestry
www.whitecliffs.co.nz/forestry; www.whitecliffs.co.nz/mamaku
www.gmo.com/America/About/People/_Departments/Forestry
www.arborgen.co.nz
www.ernslaw.co.nz
www.blakely-pacific.co.nz

WOOD PROCESSORS

www.chh.com
www.redstag.co.nz
www.fletcherbuilding.co.nz
www.tachikawa.co.nz/slide.html

INFRASTRUCTURE

www.gridnewzealand.co.nz/gnz-projects
www.bioenergy-gateway.org.nz
www.tranzrail.co.nz
www.ontrack.govt.nz
www.port-tauranga.co.nz

INDUSTRY TRAINING

www.fitec.co.nz
www.fore.canterbury.ac.nz
www.forestryschool.ac.nz

FORESTRY ADVICE AND CO-ORDINATION

www.nzif.org.nz
www.nzffa.org.nz
www.nzfoa.org.nz

GOVERNMENT DEPARTMENTS

www.maf.govt.nz
www.doc.govt.nz
www.eeca.govt.nz
www.statistics.govt.nz
www.transit.govt.nz

LOCAL AND REGIONAL AUTHORITIES

www.ebop.govt.nz
www.ew.govt.nz
www.hamiltoncity.co.nz
www.waipadc.govt.nz
www.otorohangadc.govt.nz
www.waitomo.govt.nz
www.ruapehudc.govt.nz
www.swktohc.govt.nz
www.taupodc.govt.nz
www.tauranga.govt.nz
www.wbop.govt.nz
www.rdc.govt.nz
www.kaweraudc.govt.nz
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RESEARCH

www.scionresearch.com
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Mechanical harvesting near Mamaku. Photo: John Stulen/FICA.

APPENDIX

12

SUPPORTING TABLES FOR THE WOOD AVAILABILITY FORECASTS

»» TABLE 12.1: CENTRAL NORTH ISLAND HARVEST INTENTION SURVEY RESULTS – LARGE-SCALE OWNERS

	HARVEST INTENTIONS FOR SUBSEQUENT 10 YEARS									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
RADIATA PINE										
Pruned (m ³)	1 124 248	1 174 780	1 175 451	1 228 599	1 288 416	1 296 059	1 400 410	1 397 674	1 379 866	1 281 949
Unpruned (m ³)	4 675 955	4 582 420	4 645 099	4 577 529	4 761 198	5 136 755	5 702 717	5 843 331	5 914 507	6 084 931
Pulp (m ³)	1 436 151	1 339 111	1 359 101	1 489 253	1 461 216	1 598 772	1 877 416	1 847 927	1 812 987	1 992 165
Total (m³)	7 236 353	7 096 311	7 179 651	7 295 381	7 510 830	8 031 586	8 980 544	9 088 931	9 107 360	9 359 044
Area radiata (ha)	15 285	14 889	15 142	15 811	15 494	15 852	17 525	18 585	19 481	19 839
DOUGLAS-FIR										
Unpruned (m ³)	205 784	227 997	194 691	180 891	143 268	164 487	134 511	155 131	149 244	152 195
Pulp (m ³)	60 707	75 252	55 008	52 168	36 116	63 043	49 140	50 243	41 723	47 018
Total (m³)	266 492	303 250	249 699	233 059	179 383	227 530	183 650	205 374	190 967	199 213
OTHER SPECIES										
Unpruned (m ³)	32 522	31 995	31 995	30 478	11 315	275	270	2 640	1 980	300
Pulp (m ³)	186 268	174 253	186 492	173 089	161 880	75 554	68 376	68 023	56 230	52 830
Total (m³)	218 790	206 248	218 487	203 567	173 195	75 828	68 646	70 663	58 210	53 130
TOTAL ALL SPECIES (M³)										
	7 721 635	7 605 809	7 647 838	7 732 007	7 863 409	8 334 944	9 232 840	9 364 968	9 356 537	9 611 387

»» TABLE 12.2: CENTRAL NORTH ISLAND RADIATA PINE AVAILABILITY UNDER SCENARIO 1 (UNCONSTRAINED CUT), FOR ALL OWNERS

YEAR ENDING DECEMBER	RECOVERABLE VOLUME (000 M ³ IB)
2006	7 644
2007	7 451
2008	10 127
2009	9 829
2010	11 125
2011	9 816
2012	10 979
2013	10 368
2014	8 938
2015	7 577
2016	7 910
2017	8 579
2018	10 383
2019	9 666
2020	9 101
2021	10 261
2022	13 625
2023	11 893
2024	16 592
2025	15 126
2026	14 650
2027	12 444
2028	13 341
2029	12 725
2030	12 447
2031	10 835
2032	10 811
2033	9 610
2034	10 062
2035	6 034
2036	6 176
2037	12 300
2038	12 282
2039	13 912
2040	12 241

Note

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

»» TABLE 12.3: CENTRAL NORTH ISLAND 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.

YEAR ENDING DECEMBER	RECOVERABLE VOLUME		
	LARGE-SCALE OWNERS (000 M ³ IB)	SMALL-SCALE OWNERS (000 M ³ IB)	ALL OWNERS (000 M ³ IB)
2006	7 120	524	7 644
2007	6 918	533	7 451
2008	7 019	500	7 519
2009	7 122	338	7 460
2010	7 342	470	7 812
2011	7 872	359	8 231
2012	8 822	341	9 163
2013	8 838	538	9 376
2014	8 786	693	9 479
2015	9 042	454	9 496
2016	9 806	567	10 373
2017	9 806	371	10 177
2018	9 806	398	10 204
2019	9 806	590	10 396
2020	9 806	538	10 344
2021	9 806	548	10 354
2022	9 806	2 779	12 585
2023	9 806	3 583	13 390
2024	9 806	5 816	15 622
2025	9 806	3 612	13 418
2026	9 806	5 763	15 569
2027	9 806	4 642	14 449
2028	9 806	2 730	12 537
2029	9 806	2 711	12 517
2030	9 806	2 861	12 668
2031	9 806	3 191	12 997
2032	9 806	2 314	12 121
2033	9 806	1 373	11 180
2034	9 806	1 528	11 334
2035	9 806	1 101	10 908
2036	9 806	181	9 988
2037	9 806	511	10 318
2038	9 806	570	10 377
2039	9 806	552	10 359
2040	9 806	374	10 180

Note

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

»» TABLE 12.4: CENTRAL NORTH ISLAND RADIATA PINE AVAILABILITY UNDER SCENARIO 3

Scenario 3 assumes a non-declining yield with target rotation of 30 years.

YEAR ENDING DECEMBER	RECOVERABLE VOLUME		
	LARGE-SCALE OWNERS (000 M ³ IB)	SMALL-SCALE OWNERS (000 M ³ IB)	ALL OWNERS (000 M ³ IB)
2006	7 120	524	7 644
2007	6 918	533	7 451
2008	7 019	500	7 519
2009	7 122	533	7 655
2010	7 342	533	7 875
2011	7 872	533	8 405
2012	8 822	424	9 246
2013	8 838	481	9 319
2014	8 786	533	9 319
2015	9 042	533	9 575
2016	9 806	532	10 338
2017	9 806	532	10 338
2018	9 806	532	10 338
2019	9 806	758	10 564
2020	9 806	1 814	11 620
2021	9 806	1 814	11 620
2022	9 806	1 814	11 620
2023	9 806	1 814	11 620
2024	9 806	1 814	11 620
2025	9 806	1 814	11 620
2026	9 806	1 814	11 620
2027	9 806	1 814	11 620
2028	9 806	1 814	11 620
2029	9 806	1 814	11 620
2030	9 806	1 814	11 620
2031	9 806	1 814	11 620
2032	9 806	1 814	11 620
2033	9 806	1 814	11 620
2034	9 806	1 814	11 620
2035	9 806	1 814	11 620
2036	9 806	1 814	11 620
2037	9 806	1 814	11 620
2038	9 806	1 814	11 620
2039	9 806	1 814	11 620
2040	9 806	1 814	11 620

Note

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

»» TABLE 12.5: CENTRAL NORTH ISLAND 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 M ³ IB)	RECOVERABLE VOLUME BY LOG GRADE		
		PRUNED LOGS (000 M ³ IB)	UNPRUNED LOGS (000 M ³ IB)	CHIP LOGS (000 M ³ IB)
2006	7 644	1 114	4 974	1 555
2007	7 451	1 138	4 799	1 514
2008	7 519	1 155	4 826	1 547
2009	7 655	1 183	4 898	1 578
2010	7 875	1 252	5 031	1 591
2011	8 405	1 302	5 407	1 686
2012	9 246	1 340	6 010	1 898
2013	9 319	1 361	6 051	1 900
2014	9 319	1 285	6 096	1 928
2015	9 575	1 208	6 322	2 036
2016	10 215	1 171	6 798	2 239
2017	10 215	1 201	6 762	2 245
2018	10 215	1 169	6 756	2 292
2019	10 971	1 227	7 294	2 450
2020	12 068	1 288	8 050	2 730
2021	12 703	1 337	8 467	2 898
2022	12 703	1 271	8 487	2 946
2023	12 703	1 298	8 475	2 931
2024	12 703	1 233	8 503	2 968
2025	12 703	1 171	8 532	3 000
2026	12 703	1 113	8 570	3 020
2027	12 703	1 057	8 602	3 044
2028	12 703	1 048	8 615	3 040
2029	12 703	996	8 656	3 052
2030	12 703	967	8 663	3 074
2031	12 703	1 015	8 637	3 051
2032	12 703	972	8 666	3 065
2033	12 703	924	8 689	3 091
2034	12 703	877	8 706	3 119
2035	11 433	833	7 810	2 789
2036	10 329	792	7 022	2 515
2037	10 305	814	6 979	2 512
2038	10 305	832	6 965	2 507
2039	10 305	874	6 941	2 490
2040	10 305	830	6 953	2 522

Note

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

»» TABLE 12.6: CENTRAL NORTH ISLAND 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 ³ IB)	AVERAGE AGE (YEARS)	RECOVERABLE VOLUME (000 M ³ IB)	AVERAGE AGE (YEARS)	RECOVERABLE VOLUME (000 M ³ IB)	AVERAGE AGE (YEARS)
2006	7 644	30	7 644	30	7 644	29
2007	7 451	29	7 451	29	7 451	28
2008	7 769	29	7 519	28	7 169	28
2009	7 872	29	7 655	28	7 272	28
2010	8 092	29	7 875	29	7 492	29
2011	8 622	29	8 405	29	8 022	31
2012	9 447	29	9 246	31	8 824	31
2013	9 447	29	9 319	30	8 988	30
2014	9 447	30	9 319	30	8 936	30
2015	9 467	30	9 575	30	9 192	30
2016	10 413	30	10 215	30	9 192	31
2017	11 455	29	10 215	30	9 192	31
2018	12 411	29	10 215	29	9 192	30
2019	12 411	28	10 971	30	9 192	30
2020	12 411	29	12 068	30	10 111	31
2021	12 411	29	12 703	30	11 122	31
2022	12 411	29	12 703	29	12 235	30
2023	12 411	28	12 703	29	12 861	30
2024	12 411	29	12 703	29	12 861	30
2025	12 411	29	12 703	29	12 861	30
2026	12 411	29	12 703	29	12 861	30
2027	12 411	29	12 703	30	12 861	31
2028	12 411	29	12 703	30	12 861	31
2029	12 411	29	12 703	30	12 861	31
2030	12 411	30	12 703	30	12 861	31
2031	12 411	29	12 703	30	12 861	31
2032	12 411	29	12 703	30	12 861	31
2033	11 170	29	12 703	30	12 861	31
2034	10 570	29	12 703	30	12 861	32
2035	10 558	29	11 433	30	12 861	32
2036	10 558	28	10 329	29	12 861	32
2037	10 558	28	10 305	29	11 575	31
2038	10 558	28	10 305	29	10 417	31
2039	10 558	28	10 305	29	9 847	31
2040	10 558	28	10 305	29	9 847	31

Note

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

»» TABLE 12.7: WOOD AVAILABILITY AND AVERAGE CLEARFELL AGE FOR OTHER SPECIES IN CENTRAL NORTH ISLAND

YEAR ENDING DECEMBER	RECOVERABLE VOLUME (000 M ³ IB)	AVERAGE AGE (YEARS)
2006	276	47
2007	313	44
2008	276	44
2009	259	44
2010	232	43
2011	227	43
2012	220	44
2013	221	44
2014	217	44
2015	225	44
2016	226	44
2017	226	45
2018	226	45
2019	226	45
2020	226	45
2021	226	46
2022	226	46
2023	226	46
2024	226	45
2025	226	45
2026	226	45
2027	226	45
2028	226	46
2029	226	45
2030	226	45
2031	226	45
2032	230	44
2033	230	45
2034	230	44
2035	230	45
2036	230	45
2037	230	46
2038	230	47
2039	230	45
2040	230	45

Note

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