

Facts & Figures

2019/20

NEW ZEALAND PLANTATION
FOREST INDUSTRY



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Minister's Foreword

Forestry facts and figures more important than ever

I am extremely pleased to endorse the Forest Owners Association latest facts and figures document. The information in this document enables us to track how well and how quickly the sector recovers from the impacts of COVID-19.

Last year, the forestry and wood processing sector earned around \$6.9 billion in export revenue and employed more than 35,000 people – making the sector a key player in the New Zealand economy.

Forestry, along with the wider primary sector, will be a driving force in the economy as New Zealand begins to recover from COVID-19. As we recover, the sector will need to seize opportunities to develop new domestic and export markets for additional and more sustainable products.

The need to develop new markets was highlighted in the Economic Update for the Primary Industries published in June 2020, which confirmed that the forestry sector is in for a bumpy ride as export markets, particularly those in China, begin to recover.

The Economic Update for the Primary Industries shows forestry has been significantly impacted by the COVID-19 outbreak and responses, first by China's lockdown, then by New Zealand's, with \$434 million less revenue (down 39 per cent) compared with the same period last year and 42 per cent down to China. Since moving to Level 3 in late April, forestry export revenue has been able to ramp up, with higher export revenue in the second half of May than the same period in 2019.

The forestry and wood processing sector and the Government will need reliable facts and figures to inform and improve policy making decisions, and also to track how the sector is fairing, making this document more important than ever as we recover from COVID-19.

This document is and will continue to be an invaluable source of information for the Government, the sector, investors and others who have an interest in New Zealand forestry and wood processing.

Hon Shane Jones
Forestry Minister



SECTION 1

New Zealand Planted Forestry Highlights



New Zealand Planted Forestry Highlights

1.697 m ha is the estimated net stocked plantation forest area at 1 April 2019. This is a reduction of 9,918 ha from the net stocked area at 1 April 2018.

1

IN 2019, A RECORD

35.9 million m³
 WAS HARVESTED FROM NEW ZEALAND FORESTS, UP 1% FROM THE 2018 CALENDAR YEAR (35.7 MILLION M³).

2

The value of all forestry exports to December 2019 was

\$6.32 billion. Of this, \$3.45 billion of export revenue for the year was from logs.

3

MPI predicts the **value of forest product exports will fall** in 2020 behind that of horticulture for the first time

4

Source Box 1 NEFD 2019
 Source Box 2 SOPI June 2019
 Source Box 3 SOPI September 2019
 Source Box 4 SOPI March 2020

New Zealand Planted Forestry in Summary

Area and standing volume statistics	As at 1 April 2017	As at 1 April 2018	As at 1 April 2019
Forest area			
Net stocked area (ha)	1,706,429	1,704,494 ¹	1,696,584
Growth characteristics			
Standing volume (000 m ³)	472,715	482,511	494,618
Average standing volume (m ³ /ha)	277	283	292
Area-weighted average age (years)	17.39	17.63	17.91
Area by species²			
Radiata pine (ha)	1,535,510	1,532,444	1,525,711
Douglas-fir (ha)	103,726	104,258	103,410
Cypress species (ha)	9,855	9,928	9,825
Other softwoods (ha)	22,539	23,378	23,381
Eucalypts (ha)	22,307	22,148	21,777
Other hardwoods (ha)	12,492	12,339	12,481
Planting statistics			
	Year ended 31 Dec 2016	Year ended 31 Dec 2017	Year ended 31 Dec 2018
New planting⁴			
Total estimated new planting (ha)	2,500	6,000	7,000
Restocking	40,610	36,616	41,073
Harvested area awaiting restocking	48,470	50,072	51,609
Harvesting statistics			
	Year ended 31 Mar 2017	Year ended 31 Mar 2018	Year ended 31 Mar 2019
Harvesting⁵			
Area-weighted average clear fell age for radiata pine (years)	28.4	28.7	29.1
Estimated planted forest roundwood removal (000m ³) ⁶	30,650	34,442	36,404

THERE ARE
74,000
 FEWER HECTARES OF PLANTATION FORESTS NOW THAN IN 2003

1

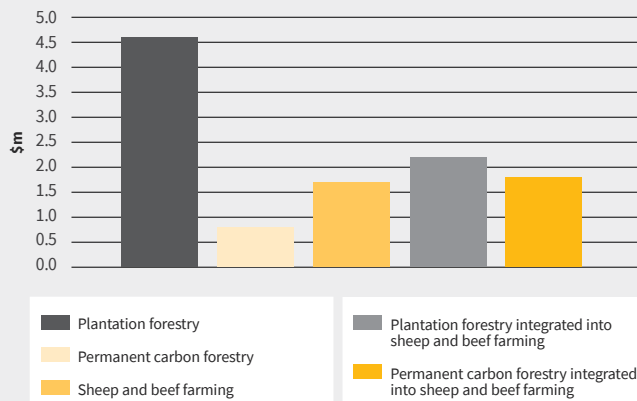
Notes

- ¹ The net stocked area for 2018 has been revised.
- ² The 2019 survey sought data from owners with 40 hectares of forest or more.
- ³ All volumes are reported as recovered volumes.
- ⁴ These estimates are based on data collected in the 2018 NEFD survey and may differ from the roundwood removals estimate as published in the Annual log and roundwood removal statistics, Ministry for Primary Industries.
- ⁵ Estimate from the Annual log and roundwood removal statistics.

Source National Exotic Forest Description NEFD 2019
 Source Box 1 NEFD

Land Use and Returns

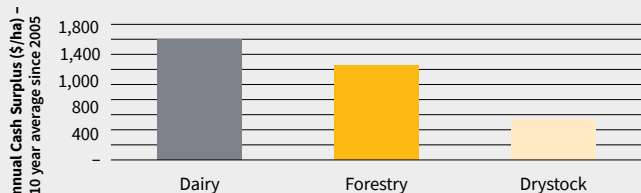
Annual Total Value Chain Impact per 1,000 hectares - Value-Add by Land-Use



Export Value Comparisons^{1,2,3}

Export product category	million ha 2016 ¹	Year to June 2019 exports billion \$*	Per ha/yr \$
Horticulture	0.19	6.1	32,158
Dairy	2.6	18.1	6,969
Forestry	1.7	6.9	4,077
Meat & wool	8.5	10.2	1,200
All pastoral farms	11.1	28.3	2,550

Annual Cash Surplus⁴



Notes

¹ These export return figures do not take into account the different land class ratios used for the four listed industry categories, nor the shift of product across categories, such as beef from dairy cows.

² Neither charges nor payments under the Emissions Trading Scheme are calculated into these figures.

³ These are export figures alone and do not reflect the different domestic consumption levels across the primary sector. Nor do they reflect different ROI levels.

⁴ Dairy and Forestry is 10 year averages since 2005. Drystock is for East Coast hill country. Beef & Lamb NZ data.

Source Annual total value chain impact per 1,000 hectares - value-add by land-use Economic Impacts of Forestry In New Zealand, PwC 2020

Source Export Value Comparisons ¹MfE/Stats 'Our Land 2018', ²SOPI September 2019

Source Annual Cash Surplus Scion November 2015

Comparative Export Earnings and China Market

MPI anticipates that the value of forest product exports will have fallen to

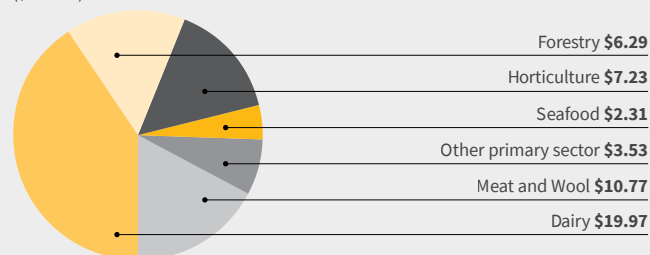
\$6.3 billion

in 2024, from a high of \$6.96 billion to June 2019.

1

MPI Predictions for Primary Industry Sector Export Values 2024

(\$ billions)



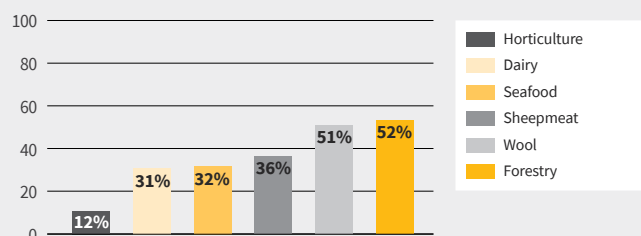
MPI Predictions for Primary Industry In-sector Export Values 2024

(\$ billions)

Export	Billions \$
Whole Milk Powder	\$6.65
Logs	\$3.46
Butter, Anhydrous Milk Fat & Cream	\$3.56
Sheepmeat	\$4.04
Beef	\$3.54
Processed Forest Products	\$2.55
Kiwifruit	\$3.42
Cheese	\$2.13
Wine	\$1.96

Proportion of exports to China by primary sector

(% percentage)



Source Box 1 SOPI March 2020

Source SOPI March 2020

Source MPI Predictions for Primary Industry In-sector Export Values 2024

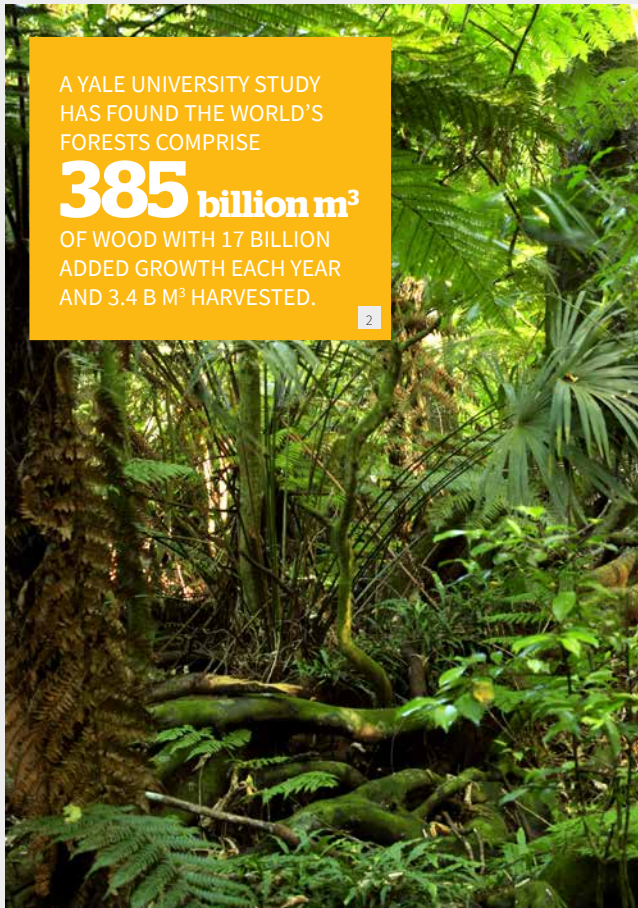
SOPI March 2020

Source Proportion of exports to China by primary sector SOPI September 2019

Global Forests

Some **560 billion** trees comprise a world forest area of 4.06 billion hectares, which is 31 percent of the total land area, and 290m ha of this is planted forest including 131m ha of managed plantation forest

1



A YALE UNIVERSITY STUDY HAS FOUND THE WORLD'S FORESTS COMPRISE

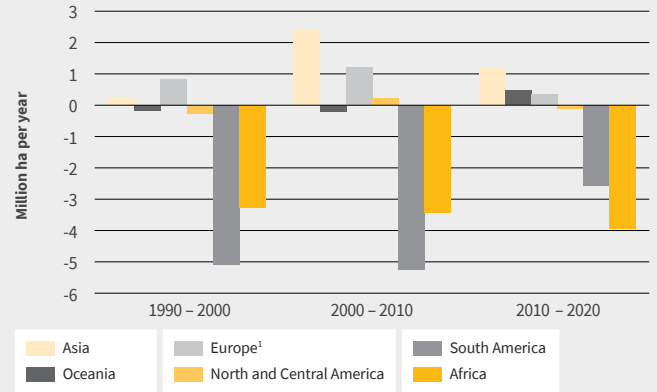
385 billion m³

OF WOOD WITH 17 BILLION ADDED GROWTH EACH YEAR AND 3.4 B M³ HARVESTED.

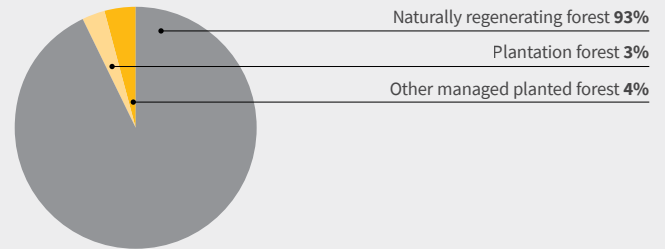
2

Source **Box 1** FAO Global Forest Resources Assessment 2020
Source **Box 2** Journal of Sustainable Forestry, 28 March 2014

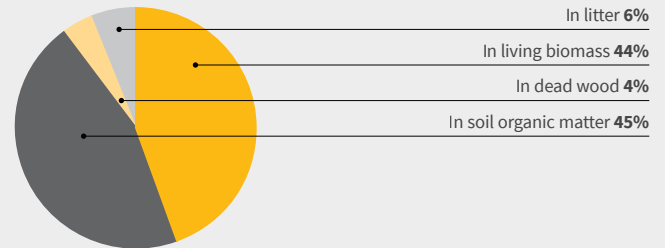
Annual Forest Area Net Change, by Decade and Region, 1990-2020



Naturally Regenerating versus Managed Planted Forests, (% of global forest area)



World Proportion of Carbon Stock in Forest Carbon Pools



Notes

¹ According to the regional breakdown used in FRA 2020, Europe includes the Russian Federation.

Source **Annual Forest Area Net Change, by Decade and Region** FAO Global Forest Resources Assessment 2020

Source **Naturally Regenerating versus Planted Forests** FAO Global Forest Resources Assessment 2020

Source **Proportion of Carbon Stock in Forest Carbon Pools** FAO Global Forest Resources Assessment 2020

SECTION 2

New Zealand Planted Forestry

THE WORLD HAS LOST

178 million

HECTARES OF FOREST SINCE 1990, WHICH IS 6.5 TIMES THE AREA OF NEW ZEALAND, THOUGH THE RATE OF LOSS HAS FALLEN FROM 7.8M HA TO 4.7M HA PER YEAR, MOST OF WHICH OCCURS IN AFRICA

1

World forests' carbon fell from 668 gigatonnes in 1990 to

662 gigatonnes in 2020

2

The forest area designated for soil and water protection has increased from 200m ha in 1990 to

399m ha in 2020

3



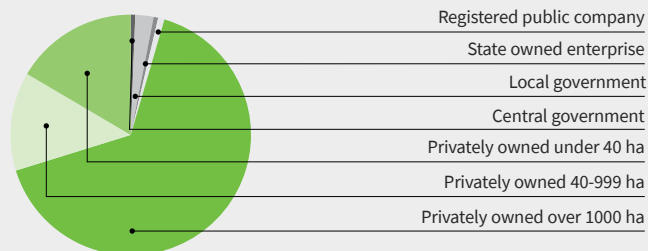
Planted Forest Mix and Ownership

The trees in **90%** of all New Zealand planted forests are *Pinus radiata*, with most of the other species growing in the South Island.

1

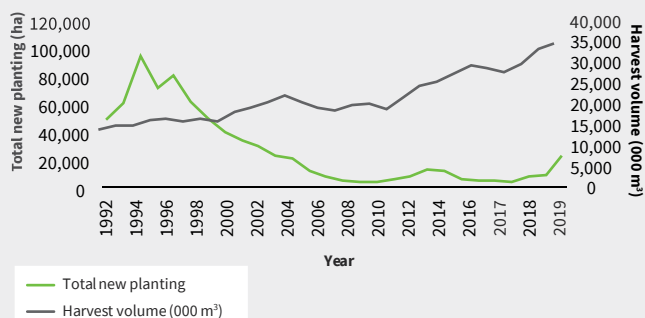
Planted Forest Ownership^{1,2,3,4,5}

As at 1 April 2019



Forestry Plantings and Harvest Volumes

Year ended December 1992–2019



Notes

- Ownership is based solely on the ownership of the forest irrespective of the ownership of the land.
- Net stocked planted production forest area.
- Significant changes in forest ownership occurred in 2003, resulting in large areas of forest previously owned by public companies now being privately owned.
- "Privately owned" includes all privately owned forests. The legal entities included in this category are private companies, partnerships, individuals and trusts, which include Maori trusts and incorporations.
- "Central government" forests are predominantly Crown-owned forests on Maori lease hold land. These forests are managed by the Ministry for Primary Industries.

Source **Box 1 & Planted Forest Ownership** NEFD 2019

Source **Forestry Plantings and Harvest Volumes** Statistics NZ & MPI

NZ Plantation Forest Ownership – Underlying Land Status

As at 31 December 2019

Firm/Entity	Underlying Land Status (Productive area (ha))				
	Freehold	Leasehold		Total	
		Crown	Māori Inc.	Other	
Kaingaroa Timberlands Limited	1,396		184,100		185,496
Hancock Natural Resource Group	84,546	8,792	62,007	24,392	179,737
Rayonier Matariki Forests	56,740	27,081	17,778	17,642	119,241
Ernslaw One	59,889	43,690	4,647	1,989	110,215
NZ Carbon Farming Group Ltd	36,869			43,888	80,757
OneFortyOne	22,731		39,691	523	62,945
Summit Forests NZ Limited	4,030	3,333	23,023	6,557	36,943
Tasman Pine Forests Ltd	25,306		9,044	2,010	36,360
Pan Pac Forest Products	5,108	817	28,605	430	34,960
Global Forest Partners LP	33,688			97	33,785
Juken New Zealand	9,907	14,593	6,675	1,124	32,299
Crown Forestry (MPI)	1,523		19,478	9,809	30,810
Forest Enterprises	27,647	2,003		589	30,239
Ngāi Tahu Forestry	29,912				29,912
Wenita	5,815			23,369	29,184
Port Blakely Ltd	26,830			1,829	28,659
Aratu Forests Ltd	25,570		2,218	296	28,084
Roger Dickie NZ	27,847				27,847
Lake Taupo Forest Trust	22,893		2,230	1,443	26,566
China Forestry Group Corporation	13,893	6,019	1,150	1,375	22,437
City Forests	17,162			981	18,143
The Rohatyn Group	2,209				2,209
Totals	541,511	106,328	400,646	138,343	1,186,828

Notes

Total Prod area is as at 31 December 2019

Source **FOA**

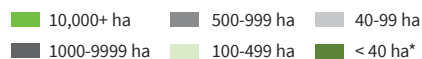
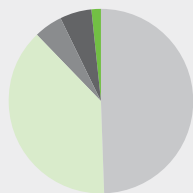
Commercial Planted Forest Ownership and Management

As at 31 December 2019

Firm/Entity	Forest Management Productive Area (ha)	
	(TIMO)	Property Management
Kaingaroa Timberlands Limited		185,496
Hancock Forest Management (NZ) Ltd		179,737
Hancock Natural Resource Group	179,737	
PF Olsen Ltd		137,060
Rayonier New Zealand Ltd		119,241
Ernslaw One	95,664	14,550
OneFortyOne		62,944
Summit Forests NZ Limited		36,943
Tasman Pine Forests Ltd		36,360
Pan Pac Forest Products		34,960
Juken New Zealand		32,299
Forest Enterprises	19,881	10,358
Port Blakely Ltd		28,660
Aratu Forests Ltd		28,084
Roger Dickie NZ	27,847	
Forest Management NZ Ltd		27,847
Ngāi Tahu Forestry		26,126
Wenita		25,015
M&R Forestland Management Ltd	8,014	10,152
City Forests		18,143
Global Forest Partners LP	12,342	
The Rohatyn Group	2,209	
Totals	345,694	1,013,975

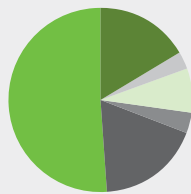
Number of Forest Owners by National Size Class

As at 1 April 2019¹



Forest Area by Forest Owner National Size Class

As at 1 April 2019



Notes see page 14

Environmental Certification

As at 31 December 2019

Company	Environmental Certification Body	
	FSC (ha)	PEFC (ha)
Rayonier New Zealand Ltd	156,788	157,311
PanPac Forest Products Ltd	46,311	
NZ Forest Managers Ltd ¹	59,122	
Wenita Forest Products Ltd	29,182	-
Aratu Forests Ltd	28,636	29,005
Juken New Zealand Ltd	32,299	
PF Olsen Ltd	9,054	5,162
Summit Forests NZ Limited	36,943	
The Rohatyn Group	1,185	
Kaingaroa Timberlands Limited	185,496	185,496
Port Blakely Ltd	33,880	
Southland Plantation Forest Company of New Zealand	13,907	
M&R Forestland Management Ltd	12,061	
China Forestry Group Corporation	20,591	
Tasman Pine Forests Ltd	36,360	
Ngāi Tahu Forestry	45,847	
Forest Enterprises	10,634	
City Forests Ltd	22,544	
Ernslaw One Ltd (North Island)	80,607	
Ernslaw One Ltd South Island)	29,676	
Hancock Forest Management (NZ) Ltd	179,737	179,737
Craigpine Timber Ltd	2,266	
OneFortyOne	79,924	
Total	1,153,050	556,711

P13 Notes:

This table is designed to identify who manages NZ forests.

Within "management" there are 2 main categories:

Timberland Investment Management (commonly referred to as a TIMO).

These organisations do not own any forest. The forests are owned by retail investors or institutional funds.

Property Management

Planning and managing field operations, mapping and maintaining records.

Some entities carry out both functions within the same organisation, others carry out both for some parts of a forest estate and not others.

Source Commercial Planted Forest Ownership and Management FOA

Source Number of Forest Owners by National Size Class NEFD 2019

¹ Crown Forestry forests are managed under an FSC licence held by NZ Forest Managers.

n.b. Productive Area = Net Stocked Area + Area Awaiting Restocking

Total Certified Area = Total Forest Area as recorded on FSC certificate

Source Forest Area by Forest Owner National Size Class NEFD 2019

*The number of forest owners for areas less than 40ha is not shown

P14 Notes:

Source Environmental Certification FOA

¹ Crown Forestry forests are managed under an FSC licence held by NZ Forest Managers

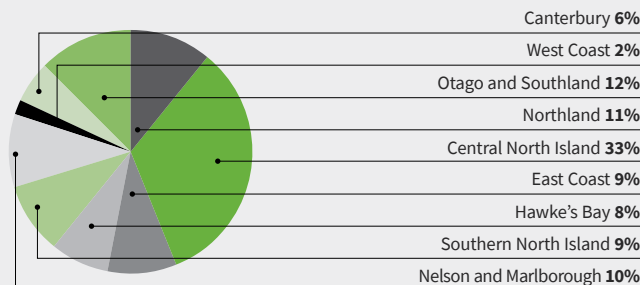
Planted Forests by Location

Area Planted in all Species by Territorial Authority,^{1,2}

Region	Estimated Total Forest Area (HA)		
	2017	2018	2019
Northland	186,868	187,489	185,943
Central North Island	567,478	584,241	562,792
East Coast	154,149	156,556	155,617
Hawke's Bay	134,391	133,710	131,733
Southern North Island	161,432	161,623	159,690
Nelson/Marlborough	166,230	166,981	165,077
West Coast	31,375	29,840	30,401
Canterbury	95,763	95,735	94,782
Otago/Southland	208,744	209,302	210,549
Total	1,706,429	1,725,476	1,696,584

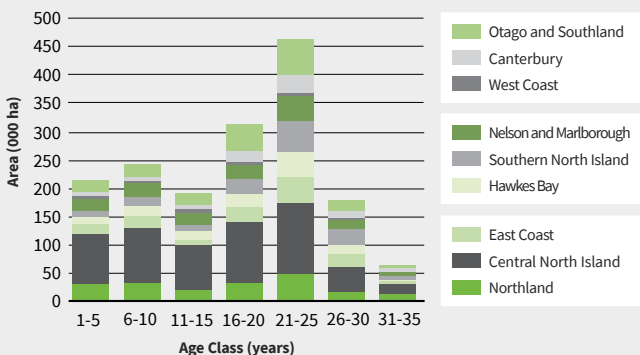
Plantation Forests

As at 1 April 2019



Forest Area by Age Class and Wood Supply Region

As at 1 April 2019



Notes

¹ Net stocked planted production forest area.

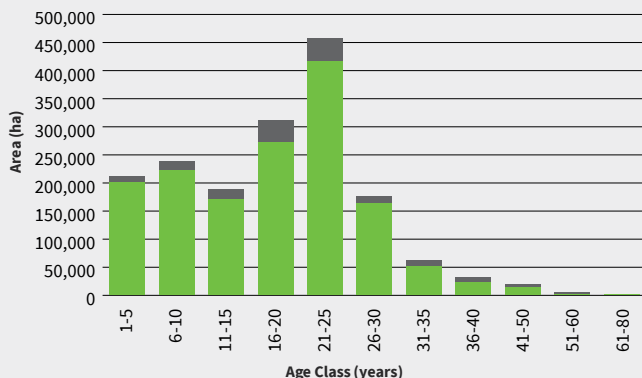
² Individual entries may not add to totals due to rounding.

Source: Area Planted in all Species by Territorial Authority, Plantation Forests & Forest Area by Age Class and Wood Supply Region NEFD 2019

Net Stocked Area of *Pinus radiata*

Forest Area 2019 by 5 Yearly Age Class

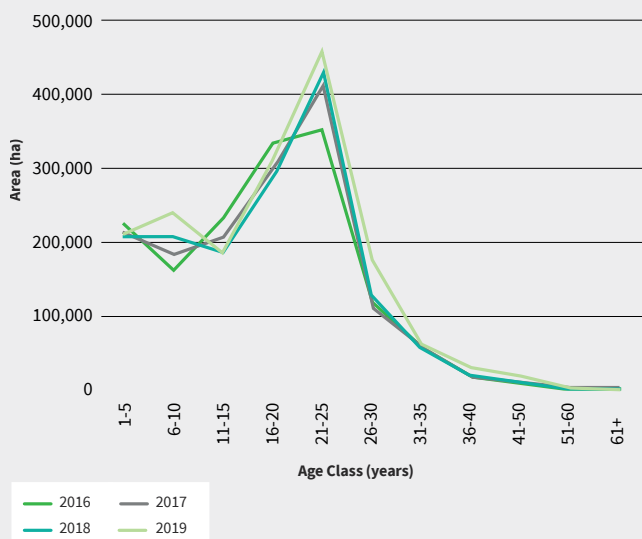
By Age Class as at 1 April 2019



Forest area *Pinus radiata*
Other species

Age Class 2019 Over Time

By Age Class as at 1 April 2019



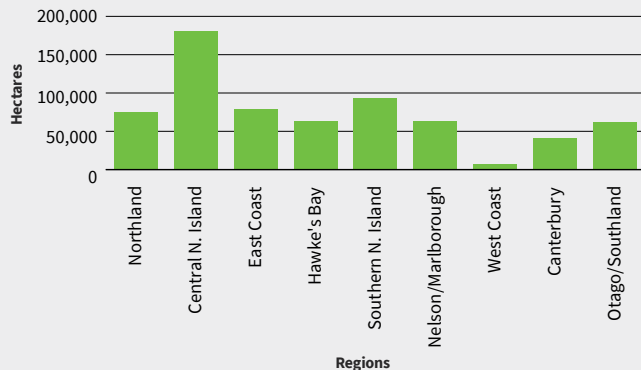
2016 2017
2018 2019

Source: Forest Area by Annual Age Class & Age Class Over Time NEFD 2019

Harvestable *Pinus radiata*

Forest Area Planted in *Pinus Radiata* by Territorial Authority

Of Harvestable Age (21+) Per Region (ha), as at 1 April 2019



The total planted forest standing volume in April 2019 was

495 million m³,

an increase of 12 million m³ from the 2018 revised figure.

The average age of plantation trees was

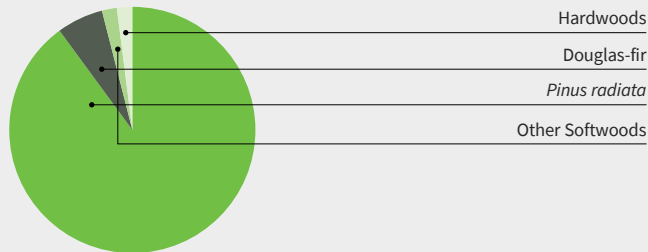
17.9 years in April 2019, a marginal increase (99 days) from 17.63 years in 2017, indicating the 1990s peak planting is still more than offsetting the increased harvesting and new planting rates.

Source NEFD 2019

Plantation Species (ha)

Species Distribution

As at 1 April 2019



Minor Plantation Species

Other pines; *P. nigra*, *P. muricata*, *P. ponderosa*

Other softwoods; *Redwoods*, *Larch*, *Cryptomeria*, *Cypress*

Indigenous species¹; *Kauri*, *Tōtara*, *Beech*

Other hardwoods; *Poplars*, *Acacia*, *Willows*, *Black Walnut*, *Paulownia*, *Oaks*

Non-durable eucalypts; *E. obliqua*, *E. fastigata*, *E. regnans*, *E. nitens*, *E. saligna*, *E. botryoides*, *E. pilularis*, *E. muelleriana*

Durable eucalypts; *E. globoidea*, *E. bosistoana*, *E. quadrangulata*.

Approximate Harvest Age Over the Past Five Years

Species	Harvest Age
<i>Pinus radiata</i>	29.1 years
Douglas-fir	40 years
Cypress	34 years
Eucalypts	21 years



Notes

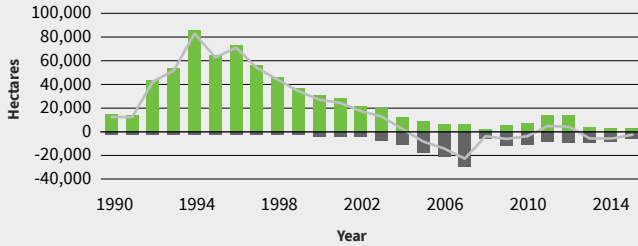
¹ Not listed by NEFD

Source Species Distribution NEFD 2019

Source Approximate Harvest Age Over the Past Five Years SOPI June 2019

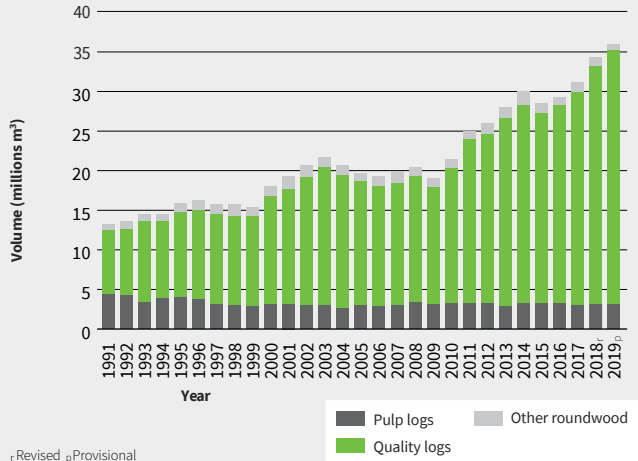
New Forest Planting and Deforestation

Afforestation and Deforestation in New Zealand, 1990-2015



Plantation Forest Harvest

for Year Ended 31 Dec



r Revised p Provisional

Source Afforestation and Deforestation in New Zealand, 1990-2015 Productivity Commission 2017
 Source Plantation Forest Harvest MPI

Forest Planting

Tree Stock Sales from 2012 to 2019¹

Tree Stock Sales in Millions								
	2012	2013	2014	2015	2016	2017	2018	2019 ^p
<i>Pinus radiata</i>	64.6	48.5	47.2	45.8	49.3	48.0	56.6	84.0
Other	7.9	5.7	3.6	3.8	3.4	3.4	3.3	4.8
Total	72.5	54.1²	50.8	49.5²	52.7	51.3	59.9	88.8

p Provisional

Estimated Percentages of Total Radiata Pine Planting by Categories

Percentages of Total Radiata Pine Planting by Categories								
	2012	2013	2014	2015	2016	2017	2018	2019 ^p
Open pollinated seedlings	48	38	36	31	28	25	30	49
Control pollinated seedlings, cuttings/ clones	52	62	64	69	72	75	70	51

p Provisional

85,000 HECTARES OF PLANTATION FOREST WERE PLANTED IN 2019, COMPRISING 63,000 HA OF REPLANTING AND

22,000 ha OF NEW PLANTING

1



MPI EXPECTS UP TO

100 million

PLANTATION SEEDLINGS WILL BE PLANTED IN 2020

2

Notes

¹ MPI expect 2020 seedling planting to be nearly 100,000 seedlings

² Individual entries do not add up to totals due to rounding to the nearest 100,000

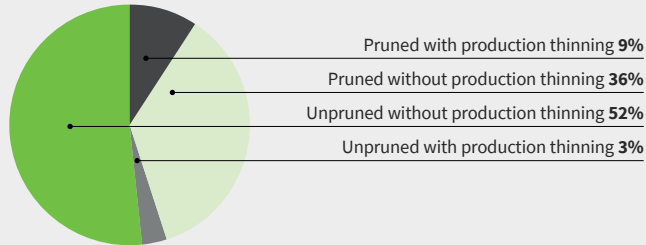
Source **Tree Stock Sales from 2011 - 2019** Provisional estimates of tree stock sales and forest planting in 2019, MPI

Source **Box 1 & 2** Tree Stock Sales from 2011 - 2019 Provisional estimates of tree stock sales and forest planting in 2019, MPI

Forest Management Trends

Radiata Pine by Tending Regime

As at 1 April 2019



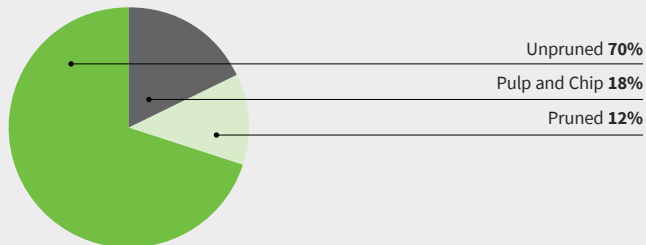
	2017 Hectares ¹	2018 Hectares ¹	2019 Hectares ¹
Pruned with production thinning	154,427	148,191	140,318
Pruned without production thinning	595,958	576,195	547,042
Unpruned with production thinning	53,844	51,716	50,733
Unpruned without production thinning	731,282	775,884	787,617

The area under an unpruned management regime continues to grow, to now about **55%** of the *Pinus radiata* forest estate. The area of production thinned radiata forest is also decreasing, now to about 12%.

1

Pinus Radiata Harvest Volume by Log Type

For year end 31 March 2019

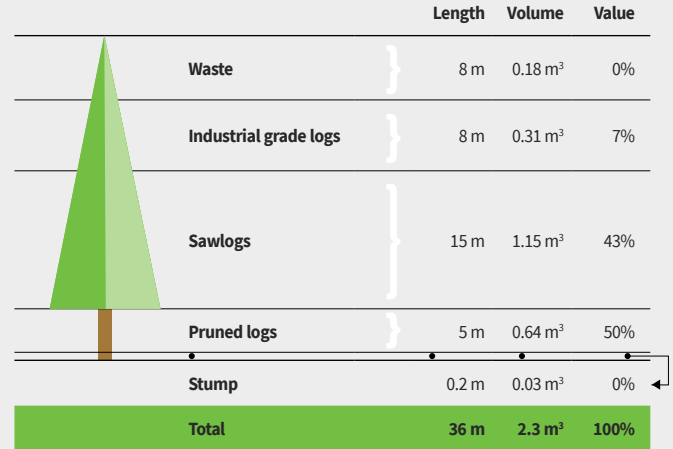


Source *Pinus Radiata* by Tending Regime & Radiata Pine Harvest Volume by Log Type NEFD 2019
 Source Box 1 MPI
 Source *Pinus Radiata* Harvest Volume by Log Type NEFD 2019

Typical Log Out-turn

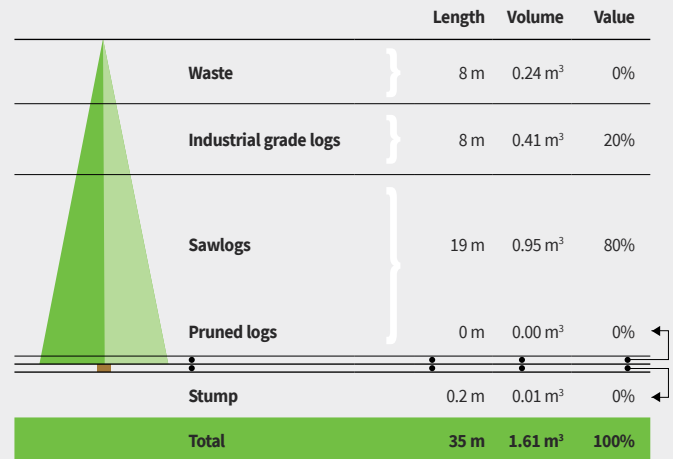
Direct Sawlog Regime

Pruned and thinned. Final Crop Stocking 228 stems per hectare.



Structural Regime

Thinned. Final Crop Stocking 487 stems per hectare.



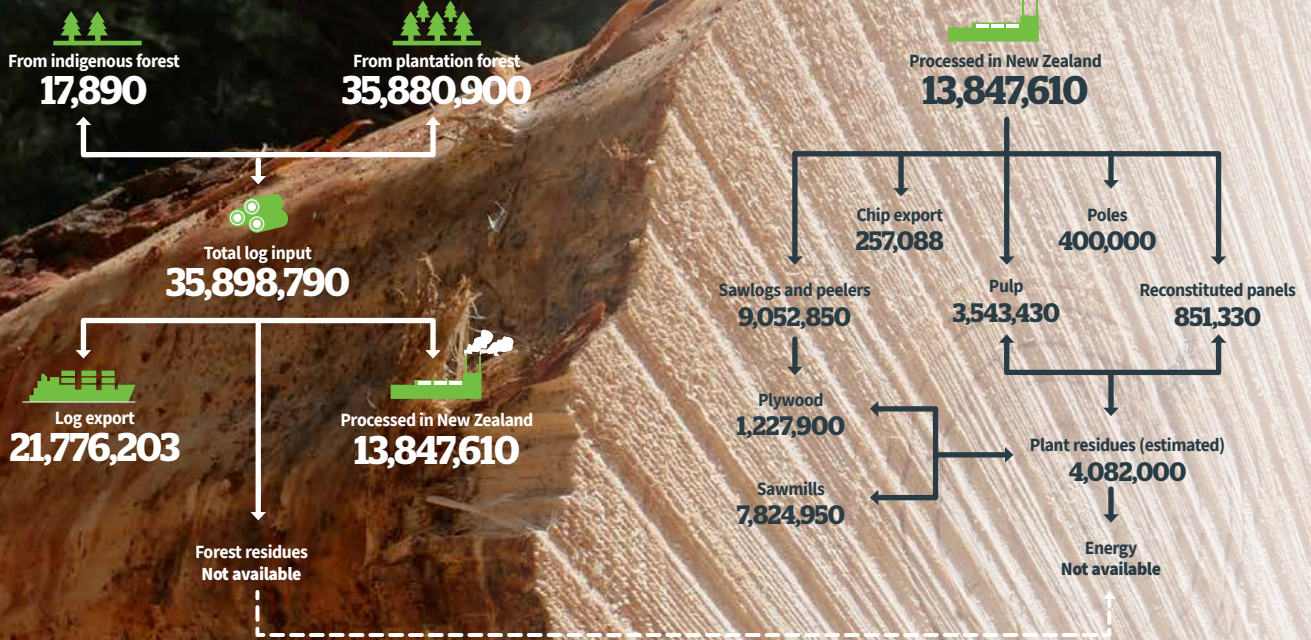
Notes

Average site (Site Index 29 m, 300 Index 23 m³/ha/yr). Clearfelled at 28 years.

Source **Direct Sawlog Regime & Structural Regime** Scion

Log Flow in the New Zealand Forestry Industry

Year Ended December 2019, in tonnes



THE INDIGENOUS TREE HARVEST NOW REPRESENTS LESS THAN **0.05%** OF THE TOTAL

Reporting a Suspected Pest/Disease

Sirex Woodwasp



Don't go down in history as the person who noticed something but didn't tell. Keep our forests free of new pests and diseases.

Infestations of the sirex woodwasp, accidentally imported into New Zealand more than a 100 years ago, causes pine trees to rot and India assesses it as a phytosanitary concern.

If you believe you've found something that shouldn't be here, phone MPI's hotline on **0800 80 99 66**. They will arrange for whatever photos, samples and site visits are necessary. Or, email to; **Info@mpi.govt.nz**, with 'Reporting a suspected pest/disease' in the subject line, and make sure to include contact name, phone number and location of the discovery. Photos of the pest and plant damage would also be useful.

SECTION 3

Export and Production



Top Export Destinations*

For Year Ended March 2019

- 1 Most exports for category
- 2 Second most exports for category
- 3 Third most exports for category



1. China (People's Republic of) \$NZ 3,272,196,860

All other	8,194,849
1 Logs	2,755,903,685
Panels	17,296,542
3 Paper & Paperboard	44,571,232
2 Sawn Timber & Sleepers	146,445,232
1 Pulp	299,785,320

2. Australia \$NZ 575,135,608

All other	136,5967,30
Logs	2,218,336
2 Panels	95,181,600
1 Paper & Paperboard	171,384,565
3 Sawn Timber & Sleepers	107,638,283
3 Pulp	62,116,094

7. Indonesia \$NZ 145,667,501

All other	16,278,749
Panels	15,700,817
Paper & Paperboard	8,993,881
Sawn Timber & Sleepers	33,819,319
Pulp	70,874,735

8. Thailand \$NZ 136,462,037

All other	2,582,462
Panels	904,629
2 Paper & Paperboard	66,289,080
Sawn Timber & Sleepers	28,513,593
Pulp	37,244,395

3. Japan \$NZ 408,747,127

All other	79,462,706
Logs	54,473,892
1 Panels	203,700,267
Paper & Paperboard	202,993
Sawn Timber & Sleepers	30,878,707
Pulp	40,028,562

4. South Korea \$NZ 393,451,527

All other	1,098,784
2 Logs	285,850,160
Panels	1,792,987
Paper & Paperboard	25,010,471
Sawn Timber & Sleepers	24,087,182
Pulp	55,611,943

9. Viet Nam \$NZ 102,149,621

All other	2,483,889
Logs	2,132,231
3 Panels	29,370,294
Paper & Paperboard	11,152,872
Sawn Timber & Sleepers	55,294,458
Pulp	171,5877

10. Taiwan \$NZ 86,952,920

All other	353,251
Logs	26,130,286
Panels	7,277,459
Paper & Paperboard	6,349,664
Sawn Timber & Sleepers	27,260,214

5. India \$NZ 326,496,242

All other	3,236,137
3 Logs	244,725,519
Panels	4,451,336
Paper & Paperboard	10,463,649
Sawn Timber & Sleepers	5,499,419
2 Pulp	58,120,182

6. United States \$NZ 251,542,925

All other	14,108,612
Logs	54,000
Panels	29,250,928
Paper & Paperboard	3,716,151
1 Sawn Timber & Sleepers	202,024,319
Pulp	2,388,915

11. Hong Kong \$NZ 76,584,662

All other	724,157
Logs	64,711,800
Panels	395,741
Paper & Paperboard	10,071,925
Sawn Timber & Sleepers	681,039

12. Other \$NZ 630,897,058

All other	51,863,541
Logs	5,128,437
Panels	107,081,846
Paper & Paperboard	139,057,044
Sawn Timber & Sleepers	258,980,577
Pulp	68785613

Source Top Export Destinations Stats NZ YE December 2019

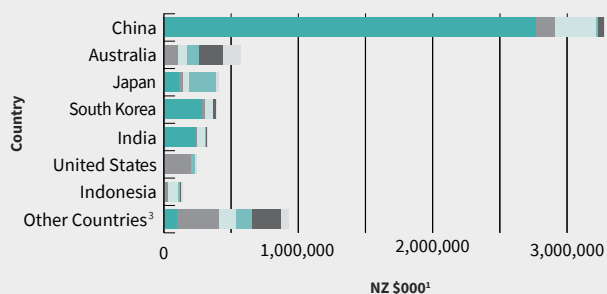
Export Value by Destination and Product¹

for Year Ended 31 December 2019

Total Export Value by Main Countries of Destination

Country of Destination	Total Export Value (NZD\$)		
	2017	2018	2019
China	2,276,834,724	2,904,761,827	3,445,393,297
Australia	723,624,489	743,463,783	673,908,968
Republic of Korea	483,178,648	512,342,963	460,256,414
Japan	426,053,047	435,952,082	415,389,411
India	302,734,068	305,572,552	316,692,063
United States	250,531,140	247,517,855	253,932,511
Indonesia	158,708,145	194,227,433	179,041,650
Thailand	82,056,261	119,496,436	153,431,540
Taiwan	87,214,989	91,846,072	118,102,023
Viet Nam	86,920,838	89,565,874	109,656,637
Philippines	91,350,975	82,132,685	101,581,149
Malaysia	55,107,264	85,841,045	108,219,728
Hong Kong	26,119,730	47,062,150	117,728,040
Singapore	43,387,213	56,525,465	34,892,722
Netherlands	36,835,695	34,370,258	40,471,192
All other destinations	254,023,332	268,962,253	303,154,486
Total	5,384,680,558	6,219,640,733	6,831,851,831

Exports of Forestry Products by Main Countries of Destination



Notes

¹ Values are NZ\$ f.o.b. and may include items, e.g. some plywood items, for which no quantities are given.

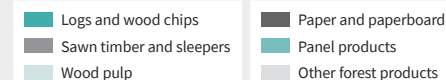
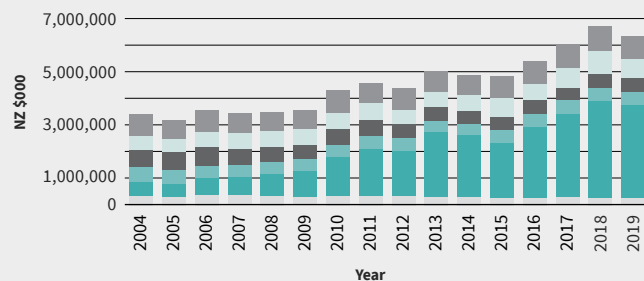
² All other forestry products include chips, mouldings, manufactures of paper and paperboard, furniture and miscellaneous forestry products.

³ Other countries are all other countries to which New Zealand has exported forest products during the year.

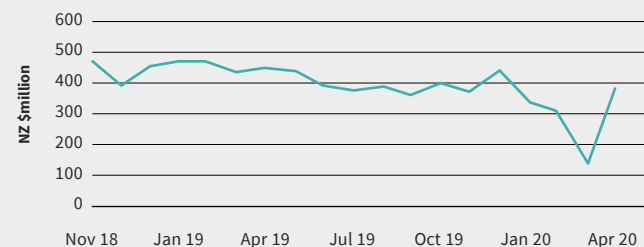
Source MPI

Major Forest Product Export Earners¹

for Year Ended March



Log and Wood Export Values



Notes

¹ Paper and paperboard includes Newsprint data, therefore differs from Statistics NZ data

Source Major Export Earners Stats NZ and FOA

Source Log and Wood Export Values Westpac Economic Bulletin 2020

Source Box 1 SOPI September 2019

Production and Exports of Selected Forestry Products

for Year Ended 31 December 2019

123,445	473,614	Veneer (m ³)
24,370	356,271	Plywood ¹ (m ³)
562,520	741,631	Fibreboard (m ³)
442,042	574,215	Other paper & paperboard (tonnes)
954,383	1,440,879	Wood pulp (tonnes)
1,821	4,332	Sawn timber (000m ³)
21,721	35,899	Logs (000m ³)
267,852	Data not available	Wood chips (BDU)

Quantity exported²
Total production



Log export shipments in the year to July 2020 were

3 million m³,

less than the 12.5 million m³ for the same period in 2019

Notes

¹ Plywood includes laminated veneer lumber.

² Exports excluded re-exports.

Source Production and Exports of Selected Forestry Products MPI, Statistics NZ and FOA

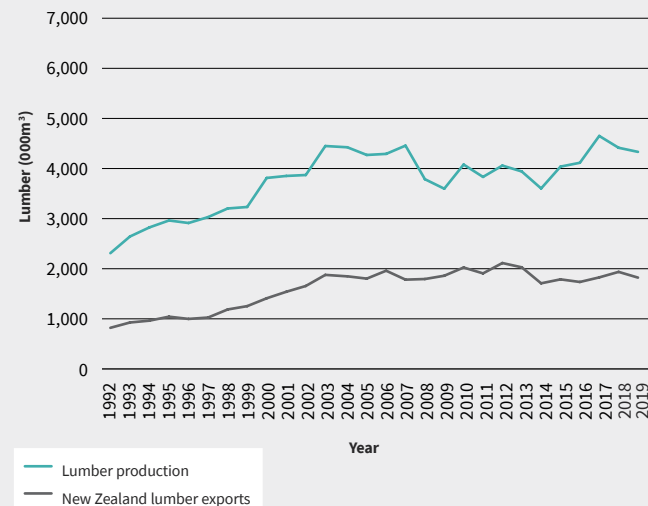
Source Box 1 MPI

Source Box 2 MPI

Lumber and Log Production and Exports

Lumber Production and New Zealand Lumber Exports

for Year Ended March



Forestry Export Revenue, 2017-21 (\$NZ million)

for Year Ended June

Year to 30 June	Actual			Forecast	
	2017	2018	2019	2020	2021
Logs	2,687	3,337	3,806	2,890	3,230
Sawn timber & sleepers	830	890	936	850	860
Pulp	651	828	812	630	650
Paper & paperboard	488	491	491	470	420
Panels	476	501	514	480	490
Chips	59	56	67	60	80
Other forest products ¹	290	281	257	270	290
Total	5,482	6,384	6,883	5,650	6,010
Y/Y % change	+6.7%	+16.4%	+7.9%	-17.9%	+6.4%

About 16% of New Zealand's timber production is consumed in New Zealand, compared with 15% for meat and 5% for dairy production

Notes

¹ Other forest products include: structural or moulded wood, furniture and prefabricated buildings

Source Sawn Timber Export Value 2015-20 Stats NZ and MPI

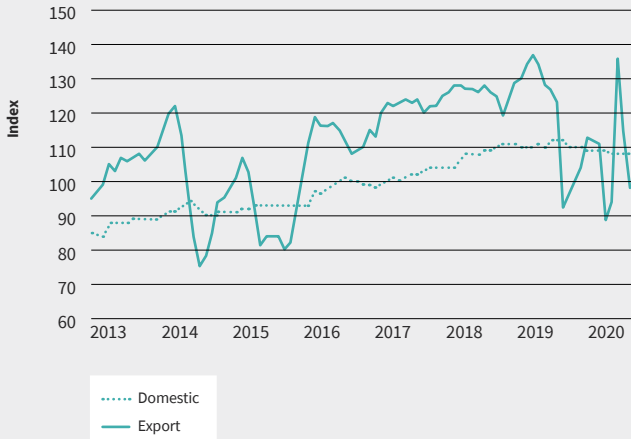
Source Forestry Export Revenue, 2015-21 SOPI March 2020

Source Box 1 MPI, Meat Industry Association and Dairy Companies Association

NZ Logs

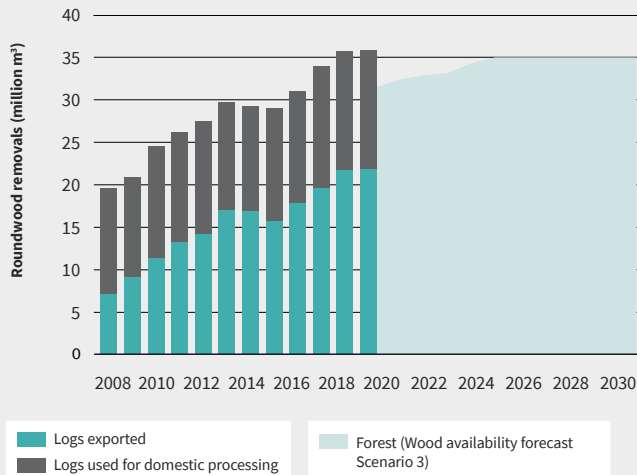
Export and Domestic Log Prices

for Year Ended June



Volume of Logs used in Domestic Processing versus Exported

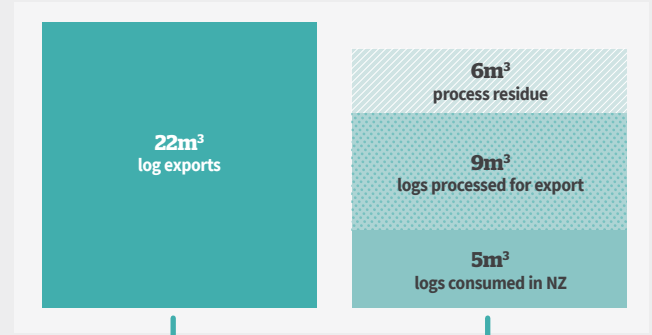
for Year Ended December 2018



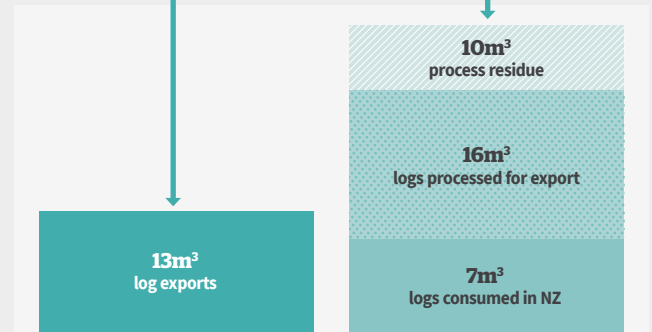
Source **Export and Domestic Log Prices** Westpac Economic Bulletin 2020
Volume of Logs used in Domestic Processing versus Exported 2008-2030 Wood Availability Forecast, MPI

A Transformation Scenario for New Zealand

2020



2030



In 2030

We will need 15 more primary sawmills



Notes

Both 2020 and 2030 harvests are assumed at 36mm³ of logs

Source **A Transformation Scenario for New Zealand Today** MPI, FOA

Log Exports by Port

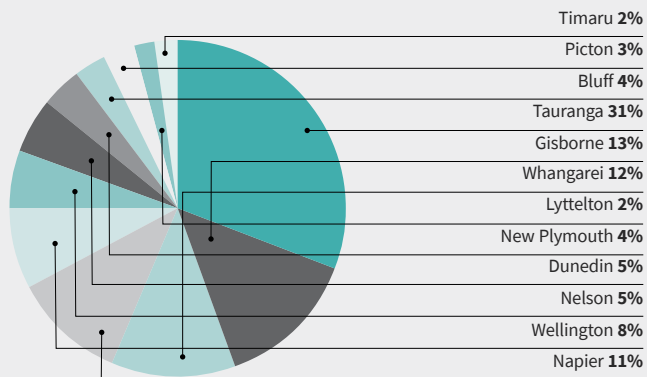
Log Export Quantity and Export Value by Port¹

For Year Ended March 2019

Port of Loading	Export Quantity (m ³)	Export value (\$NZ)
Auckland	42,856	8,380,248
Christchurch	478,160	90,723,458
Dunedin	1,098,413	178,760,646
Gisborne	2,899,305	489,849,993
Invercargill	718,731	131,601,481
Napier	2,226,602	387,226,415
New Plymouth	869,063	153,957,151
Nelson	1,376,655	212,133,872
Picton	658,660	101,369,144
Timaru	548,662	91,598,876
Tauranga	6,791,188	1,143,675,802
Wellington	1,679,533	280,127,578
Whangarei	2,676,490	461,425,208
Total	22,064,319	3,730,829,872

Logs Percentage Export Quantity by Port

Forest exports to China



Notes

¹ Ports with <1% not included.

Source Log Exports by Port MPI

Source Logs Percentage Export Quantity by Port MPI

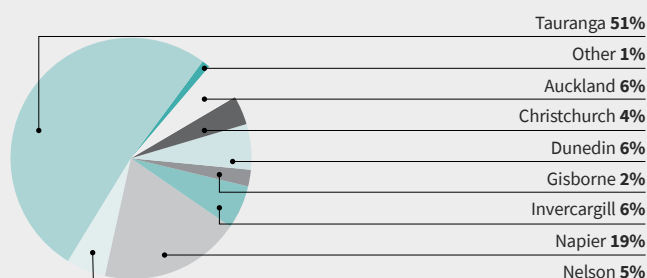
Sawn Timber Exports by Port

For Year Ended March 2019

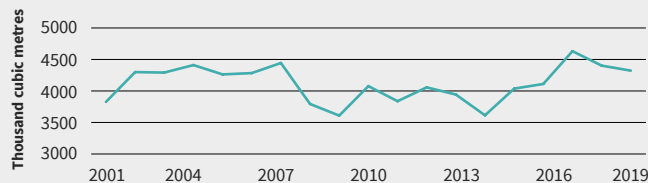
Sawn Timber Export Quantity and Export Value by Port

Port of Loading	Export Quantity (m ³)	Export value (\$NZ)
Auckland	162,025	90,856,571
Christchurch	83,521	37,373,756
Dunedin	133,212	48,514,242
Gisborne	48,350	11,461,840
Invercargill	92,937	35,508,300
Napier	357,119	147,702,730
Nelson	93,393	41,870,986
Picton	863	214,628
Timaru	62	20,614
Tauranga	936,883	517,438,248
Wellington	3,959	5,107,975
Whangarei	10,618	3,603,804
Total	1,922,941	939,673,694

Sawn Timber Percentage Export Quantity by Port



Sawn Timber Production to December 2019

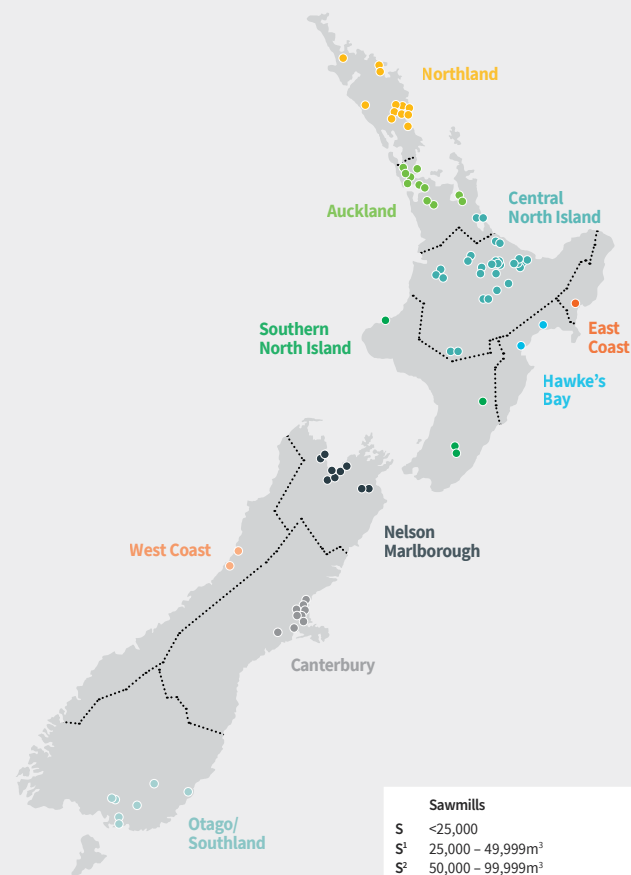


Source Sawn Timber Production to March 2000-18 MPI

Source Sawn Timber Percentage Export Quantity by Port MPI

Source Sawn Timber Production to December 2019 MPI

Forest Products Industry 2020



Sawmills	
S	<25,000
S ¹	25,000 – 49,999m ³
S ²	50,000 – 99,999m ³
S ³	100,000 – 249,999m ³
S ⁴	250,000 – 499,999m ³
S ⁵	>500,000m ³
Processing Plants	
F	Fibreboard (MDF & Hardboard)
P	Particleboard (Incl Strandboard)
PL	Plywood
PP	Pulp and Paper
V	Veneer/LVL/CLT
PTP	Paper/Tissue/Paperboard
CEF	Chip Export Facilities ¹
MW	Manufactured Wood Products ²

Notes
¹ >50,000 BDU per annum.
² >20,000m³ production per annum.

Source Forest Products Industry Map Australia & New Zealand Forest Products Industry Map 2020

Northland

Juken New Zealand Ltd Triboard Mill, Kaitaia	F
Juken New Zealand Ltd Northland Mill, Kaitaia	V
Waipapa Pine Limited, Kerikeri	S ²
Mount Pokaka Timber Products Ltd, Kerikeri	S ²
Rosvall Sawmill Ltd, Whangarei	S ²
CHH Woodproducts NZ LVL, Marsden Point	V
North Sawn Lumber Ltd, Ruakaka	MW
Marusumi Whangarei Co Ltd, Marsden Point	CEF
BBS Timbers Ltd, Whangarei	MW
Kiwi Timber Protection Ltd, Whangarei	MW
North Pine Ltd, Waipu	S ¹
Kaihu Valley Sawmill	S ¹
Croft Poles, Whangarei	S ²

Auckland

Herman Pacific Ltd, Silverdale	MW
JSC Timber, Kumeu	MW
Anderson & O'Leary Ltd, Whenuapai	S ²
Claymark Ltd, Henderson	MW
Timberlab Solutions Ltd, Auckland	MW
Oji Fibre Solutions, Penrose	PTP
Max Birt Sawmills Ltd, Pokeno	S ²
Claymark Ltd, Thames	S ²
Kopine, Kopu	P
Anderson & O'Leary, Kumeu	S ¹
TTT Products, Tuakau	S ²

Central North Island

Claymark Ltd, Katikati	S ² , MW
Pure Pine Mouldings, Te Puke	MW
Pukepine Sawmills (1998) Ltd, Te Puke	S ²
Kiwi Lumber (Putaruru) Ltd, Putaruru	S ¹
CHH Woodproducts NZ Plywood, Kinleith	PL
Alkieman Custom Jointing Ltd, Tokoroa	MW
Oji Fibre Solutions, Kinleith	PP
Claymark Ltd, Rotorua	S ² , MW
Claymark Profiles, Rotorua	MW
McAlpines Rotorua Ltd, Rotorua	S ²
Hume Pine NZ Ltd, Rotorua	MW
Red Stag Timber, Waipa	S ² , MW
CHH Woodproducts NZ Sawmill, Kawerau	S ⁴
Sequal Lumber, Kawerau	S ²
Asaleo Care, Kawerau	PTP
Oji Fibre Solutions, Kawerau	PP
Norske Skog Tasman Ltd, Kawerau	PP
Whakatane Mill Ltd, Whakatane	PTP
KLC Ltd, Kaingaroa	MW
Donelley Sawmills Ltd, Reporoa	S ²
Laminex NZ, Taupō	P
Tenon Clearwood, Taupō	S ² , MW
OTC Timber Co Ltd, Otorohanga	MW
Waitete Sawmills Ltd, Te Kuiti	S ¹
R.H. Tregoweth Ltd, Te Kuiti	S ¹
WPI Tangiwai Sawmill, Ohakune	S ²
WPI Karioi Pulpmill, Ohakune	PP

East Coast

Juken New Zealand Ltd Gisborne Mill, Gisborne	S ² , V
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Hawke's Bay

Pan Pac Forest Products Ltd, Napier	S ¹ , PP
East Coast Lumber, Hawke's Bay	S

Southern North Island

Taranakipine, New Plymouth	S ² , MW
Kiwi Lumber (Dannevirke) Ltd, Dannevirke	S ²
Juken New Zealand Ltd, Wairarapa Mill	S ¹ , V, MW
Kiwi Lumber (Masterton) Ltd, Masterton	S ²

Nelson Marlborough

Timberlink New Zealand Ltd, Blenheim	S ² , MW
Nelson Forests Ltd, Kaituna Sawmill, Renwick	S ²
XLam NZ Ltd, Nelson	V
Eurocell Woodproducts, Nelson	S ² , MW
Nelson Pine Industries Ltd, Richmond	V, F
Southpine (Nelson) Ltd, Nelson	S ²
CHH Woodproducts NZ Sawmill, Nelson	S ²
MLC Group, Motueka	MW
Prowood Ltd, Motueka	MW

West Coast

International Panel & Lumber (West Coast) Ltd, Greymouth	PL
Westco Lumber Ltd, Hokitika	S ¹

Canterbury

Daiken NZ Ltd, Rangiora	F
McAlpines Timber Ltd, Rangiora	S ¹
Stoneyhurst Timbers Ltd, Belfast	S ¹
Belfast Timber Processing Ltd, Belfast	MW
McVicar Timber Group Ltd, Christchurch	S ¹
Southern Pine Products Ltd, Christchurch	MW
SRS New Zealand Ltd, Rolleston	S ²
Niagara Sawmilling Ashburton	MW
Jonnie Sutherland, Kaiapoi	S

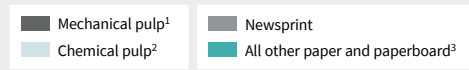
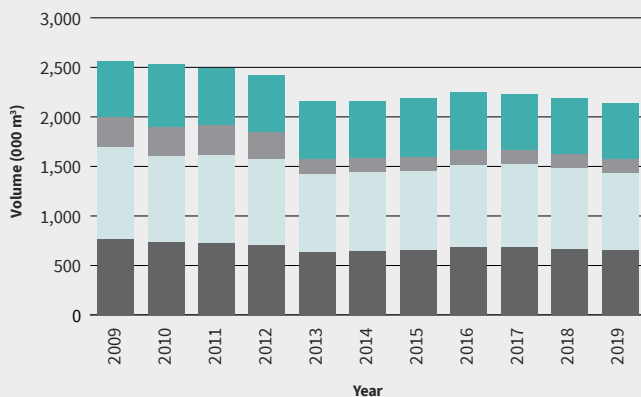
Otago/Southland

Pan Pac Forest Products (Otago) Ltd, Milburn	S ²
Daiken Southland, Mataura	F
Niagara Sawmilling Co. Ltd, Invercargill	S ² , MW
Southwood Export Ltd, Awarua	CEF
Craigpine Timber Ltd, Winton	S ²
Roger Stuart, Tapanui	S
Wayne Findlater, Winton	S

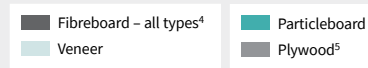
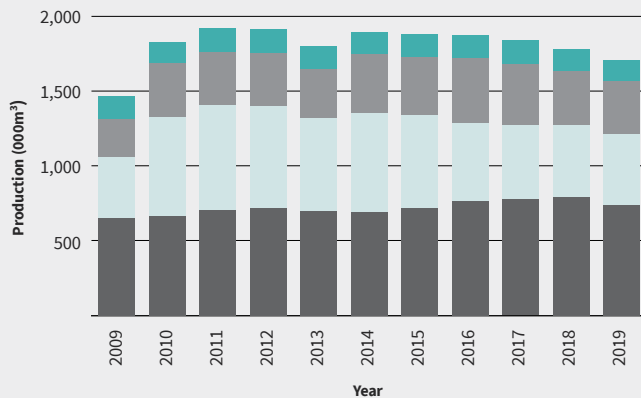
Paper, Pulp and Panel Products Production

for Year Ended March

Paper and Pulp Production



Panel Products Production



Notes

¹ Mechanical Pulp is those export items in HS item grouping 4701.

² Chemical Pulp is those export items in HS groupings 4702, 4703, 4704 and 4705.

³ All other paper and paperboard includes printing and writing paper, other paper and paperboard.

⁴ Fibreboard includes MDF, hardboard & softboard.

⁵ Plywood includes laminated veneer lumber.

Source Paper, Pulp and Panel Products Production MPI

SECTION 4

Health, Safety and Training



TOGETHER TOWARDS ZERO



The Forest Industry Safety Council is a pan-industry initiative to reduce and ultimately eliminate deaths and serious injuries in New Zealand plantation forestry, by;

- Improving leadership of safety
- Providing easy-to-use forest safety resources through www.safetree.nz website
- Sharing better information on what's causing injuries
- Getting companies and workers more competent
- Helping the sector adapt to the Health and Safety at Work Act 2015.

**FOREST
INDUSTRY
SAFETY
COUNCIL**

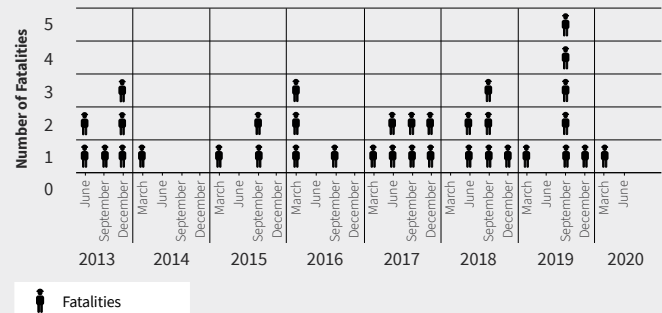
www.fisc.org.nz



safetree[™]
You are the key

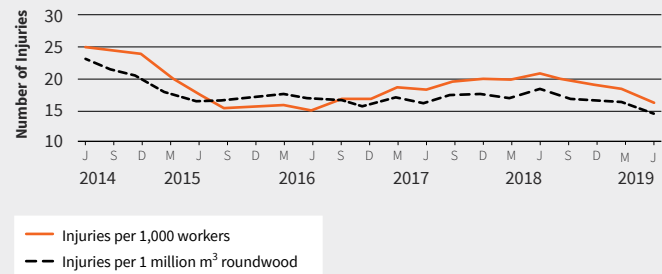
Health and Safety in the Forest Industry

Fatalities



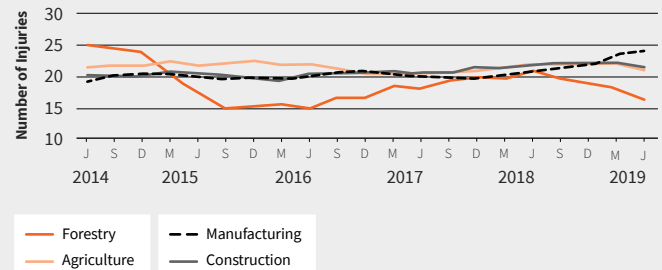
Severe Injuries¹

Rate of injuries to workers resulting in more than a week off work



How Do We Compare?²

Rate of injuries to workers resulting in more than a week off work



Notes

¹ Rolling average last four quarters.

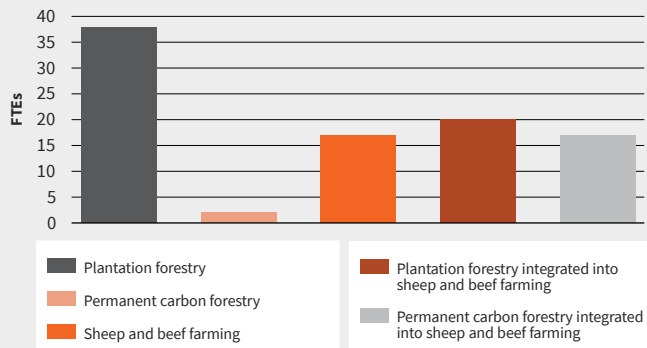
² Rolling average last four quarters per 1,000 workers.

Source WorkSafe/MPI/FISC.

Injury data in this dashboard is based on ACC claims where someone receives a period of weekly compensation within a quarter. This data lags by 6 months due to claim processing time.

Forestry Workforce

Annual total value chain impact per 1,000 hectares - FTEs by land-use



Employees per 100ha

Forestry / Dairy / Sheep & Beef



Forest and Meat/Wool Workforces

	2003	2012	2016
Forestry area	1.83m ha	1.72m ha	1.70m ha
Workers in-forest	11,100	8,300	7,500
Workers per 1000 ha	6.1	4.8	4.4
Meat and Wool area	10.6m ha	9.1m ha	8.5m ha
Workers on-land	42,390	33,350	30,890
Workers per 1000 ha	4.0	3.5	3.6

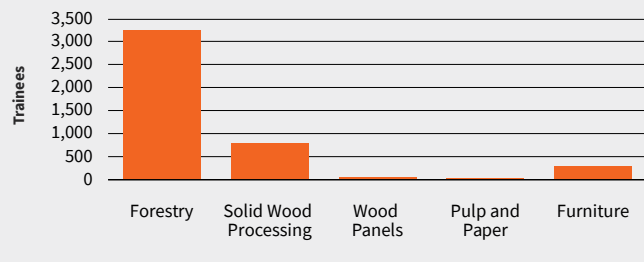
Source Annual total value chain impact per 1,000 hectares - FTEs by land-use Economic Impacts of Forestry In New Zealand, PwC 2020

Source Employees per 100ha Economic Impacts of Forestry In New Zealand, PwC 2020

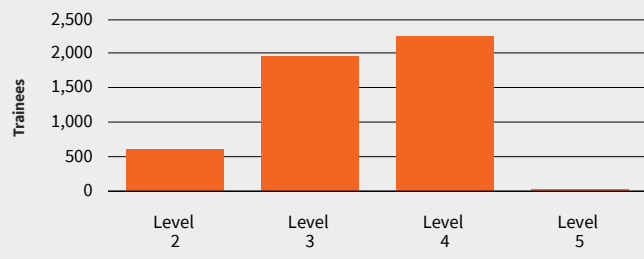
Source Forest and Meat/Wool Workforces Stats NZ

Industry Training 2018

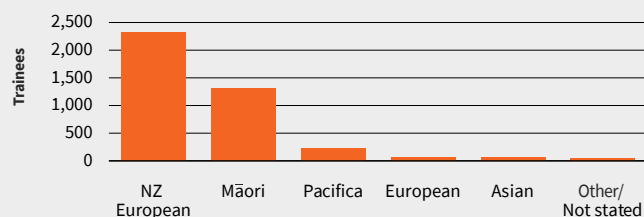
Trainee Count



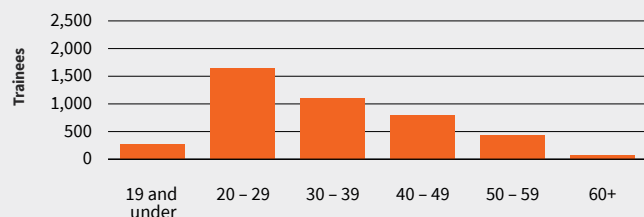
Trainee by Qualification Level



Trainees by Ethnicity



Trainees by Age



Source Industry Training 2018 MPI

Free forestry training*

Includes forestry apprenticeships,
traineeships and micro-credentials

Employers of first or second-year
apprentices may be eligible for wage
subsidies

Micro-credentials are available
in tree planting and the forestry
environment

Flexible programmes to suit your
business.

*Forestry qualifications are free from 01 July 2020 to 31 Dec 2022

Contact your account manager
to talk about free training today

0800 526 1800
freetraining@competenz.org.nz
competenz.org.nz

SECTION 5

Supplementary Information



A Forestry Roadmap for Aotearoa New Zealand

Vision for 2050: Forestry will be New Zealand's number 1 primary sector and exemplify the best plantation forest management in the world.

01

Tree growth and forest production efficiency will have both doubled.

02

Our increasingly diverse forests will provide valuable products tailored to our customers' needs.

03

People will be attracted to work in forestry because they will be safe, valued and well trained.

04

Expanding commercial plantation forestry will have been the prime means of achieving New Zealand's net zero carbon goal by 2050, while providing other substantial environmental and social benefits.

05

Our licence to operate will have widespread support.



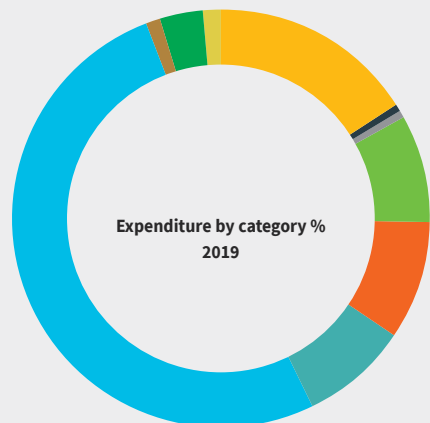
Forest Growers Levy Trust



The 2014 to 2019 Harvested Wood Material Levy Order has expired and has been replaced by a new levy order which will run to 2025, based on a 89.1% affirmative vote of levy payers. The rate for the first year of the new levy has continued at 27 cents per tonne of harvested log. The levy generated in the year to the end of 2019 was \$9,710,252. The levy income is invested in industry good projects by the Forest Growers Levy Trust, which has contracted the Forest Owners and Farm Forestry Associations to manage the annual work programme. The annual work programme consists of research and work which will benefit the industry as a whole. More information, including the 2019 Annual Report, can be found at www.fgt.org.nz.



How the FGL is Invested



51.3% Research, Science and Technology

The large research programme is focussed on improving the profitability and sustainability of forest growers large and small and extends across the value chain from genetics to the harvesting supply chain. It covers research on raising the productivity of radiata pine through better site and stand management, understanding and responding to needle diseases such as red needle cast, finding longer term solutions to the wilding conifer problem in parts of New Zealand and better understanding of forest fire behaviour.

Two new programmes commenced during the year, one on improving the efficiency and cost effectiveness of vegetative plant propagation systems and the other on introducing new automation and robotics technology into the post-harvest supply chain with the aim of enhancing safety and attractiveness of forestry work.

Licence to operate issues were addressed with projects to reduce the incidence of tree breakage on steep land, the development of harvesting equipment to remove harvesting slash from waterways on steep land. The programme also has a focus on other commercial tree species and overcoming some of the processing challenges to give land owners greater confidence to grow these species. A joint project with the Radiata Pine Breeding Company to assess growth performance of the latest improved genetics was also started during the year.

15.9% Operational Costs (incl. Administration)

Represent Levy collection and database maintenance costs, business compliance costs and all direct costs associated with supporting FGL secretariat and the planning, management and delivery of the annual Work Programme. In 2019 the conduct of the Harvested Wood Materials Levy Referendum of forest owners, including meetings, advertising, surveying and commissioning the voting process.

8.3% Forest Biosecurity

Forest biosecurity surveillance of high-risk sites including field activities and diagnostic identification of samples. Work has continued on the development and field trialling of a general surveillance app – Find-A-Pest – with co-investment by MPI and other stakeholders, and work continued alongside other sectors on the development of a Plant Production Biosecurity Scheme.

0.5% Fire

The Levy helps fund the fire season awareness campaign conducted by Fire and Emergency New Zealand, along with promoting fire awareness through the established Love our Forests campaign. The committee also partners with FENZ throughout the year to support rural fire prevention and management.

3.3% Training and Careers

The Training and Careers Committee has been set up to serve the needs of small, medium and large plantation forest owners, by bringing together in one forum all the disparate organisations that deliver, manage, promote or fund plantation forest industry training and careers initiatives.

The purpose is to consult on and develop a co-ordinated view on plantation forestry standards, qualifications and training needs and work with the Forest Industry Safety Council (FISC), Forest Industry Contractors Association (FICA) and Competenz, as well as government, funders and training providers to ensure standards and training solutions are delivering on those needs and to promote forestry careers, both directly and by working with and through other agencies. The Training and Careers committee composition includes forest owners (FOA and FFA), contractors, Competenz, government and training providers with an interest in forestry.

The Committee is responsible for the Forestry Careers website, overseeing the site development and maintenance: <https://www.forestrycareers.nz/about-us/>

In addition the committee promotes forestry careers, both directly and by working with and through other agencies and develops and distributes resources to assist training and career providers.

A small number of training providers are also assisted directly, with the provision of FGLT funding and targeted resources. Annual support for the University of Canterbury School of Forestry forest engineering department, the Grow Me and Generation programmes and Tokomariro School forestry training are examples of direct support for the forest training sector. Future Foresters are supported in providing professional development courses for their members and to represent the industry at career functions nationally.

The committee has been instrumental in providing industry representation in the government Reform of Vocational Education (RoVE) review. This is a major reset of vocational training in NZ with a heavy requirement for industry representation.

The industry has put together the Forestry Workforce Action Plan. This plan will be overseen by a Forestry Council. The Training and Careers committee is the conduit to ensure forest owner input.

0.7% Forest Resources and Environment

Developing policies on forest growing and environment issues, including collective data on FSC certified forest companies' biodiversity management, climate change, freshwater management and carbon sequestration. The committee provides advice to government on environmental issues. It supports work to provide guidance to kea protection in plantation forests and management of other rare species.

0.2% Health and Safety

This is the joint industry contribution to support the work of the Forest Industry Safety Council (FISC). Major 2019 initiatives supported include: Certification, Growing our Safety Culture initiative (which was nominated as a finalist in the 2019 NZ Workplace H&S Awards) a mobile phone app, which gives forestry workers more control over improving their own health, the Safetree website and Facebook page, which are used to share resources, information and safety alerts across the industry.

0.4% Promotions

NZ Wood/Love our Forests campaign in print, television, social media and highway billboards.

Publications, including Facts and Figures, external memberships, sponsorships. Close coordination with the Training and Careers committee for the launch and maintenance of Careers and Training website and collateral material for Regional Wood Councils. Regional support of careers promotion. Public opinion surveys.

1.2% Small and Medium Forest Enterprises

This is a forum for owners and managers of small to medium sized forests. It includes communication activities such as field days, publications, website, workshops and newsletters. Two projects were completed in 2019, one to pilot the feasibility of amalgamating small woodlots, and the other to establish the particular research needs of small growers (for example, harvesting techniques that may be better suited for smaller woodlots).

1.3% Transport

The committee works with the Log Transport Safety Council. The committee has also developed in conjunction with SCION a Log Transport Calculator to analyse the transport volumes at a regional or even individual road level. The committee represents forest grower interests at local and central government levels.

Sector Agreements

Plantation Forestry Rural Fire Control Charter 2017

FOA and FFA signed a charter with Fire and Emergency New Zealand for the integration period as Fire and Emergency moves to become a fully unified, national organisation.

Forest Government Industry Agreement for Biosecurity 2015

The FOA has signed a Government Industry Agreement to protect New Zealand forests from introduced pests, weeds and diseases through sharing of costs and decision making. The Forest Biosecurity Surveillance programme began on 1 July 2016, covering all commercial plantations. PineNet is a forest industry network to respond to a major incursion.

Forest Industry Safety Council 2015

The FOA is participating in FISC as the pan-industry Health and Safety initiative. FISC has an independent cross sector board. FISC's mission is to reduce the rate of serious injury and fatalities in plantation forests, with an ultimate goal of eliminating them.

Cooperation with Farmers 2013

The MOU with Federated Farmers, FOA and FFA is to manage relationships between forest owners/managers and their farming neighbours to promote co-operation and constructive neighbourly relations. A guiding principle is timely communication is the key to good neighbourly relations.

Log Transport Safety Accord 2008

An agreement between FOA/FFA, the Road Transport Forum New Zealand and the Log Transport Safety Council to reduce the incidence of log truck accidents on roads.

Eliminating Illegal Forest Products 2008

The FOA, WPMA and Pine Manufacturers Association joined NGOs in calling on the New Zealand government, importers, processors, retailers, New Zealand forest and plantation managers and processors of forest and plantation products, to strongly oppose the importation and use of illegally harvested and traded forest products in New Zealand.

New Zealand Climate Change Accord 2007

An agreement between FOA/FFA, the Timber Design Society and eight NGOs acknowledging the contribution of indigenous and plantation forests to mitigate climate change, which also provides a renewable, reusable and recyclable resource.

The Accord endorses the principle of polluter pays to cover all greenhouse gases with all sectors taking responsibility and with time bound targets.

New Zealand Forest Accord 1991 and 2007

The Forest Accord is between forest and timber groups and 10 NGOs to agree on; defining areas unsuitable for forestry, maintaining existing natural forest, recognition of commercial forestry as essential, indigenous forest extraction only on a sustainable basis and new forests not disturbing natural indigenous vegetation.

Wood

Wood is the world's most renewable raw material. For this reason forests and the wood they provide are vital in the fight against climate change. As the effects of global warming impact on our environment, the use of renewable and sustainable building materials has never been so important.

The stages of the wood story – planting and renewal, growth, harvesting and use – are part of a renewable cycle that takes and stores carbon dioxide from the atmosphere, making wood a better-than-carbon-neutral building material.

Wood is the only construction material which has absorbed CO₂ from the atmosphere when produced, not emitted more

During its production, one tonne of:

- Cement – has released one tonne of CO₂ into the atmosphere
- Steel – has released 1.24 tonnes of CO₂ into the atmosphere
- Aluminium – has released 9.3 tonnes of CO₂ into the atmosphere

Wood, however, has absorbed a net 1.7 tonnes of CO₂ from the atmosphere, over and above the energy expended in growing, harvesting and processing.

The more timber you use in a house, the more CO₂ you remove from the atmosphere

- It takes around 20 trees to build an average house frame
- A steel house frame has added 4.5 tonnes of CO₂ to the atmosphere
- A wooden house frame has absorbed 9.5 tonnes of CO₂ from the atmosphere
- Choosing timber options for an average house can take around 20 tonnes net of CO₂ out of the atmosphere (saving the equivalent of 150 trips Auckland to Wellington, or 7.1 years of car use)
- Using alternative materials (concrete, steel, brick and aluminium) can add 24 tonnes net CO₂ to the atmosphere (costing the equivalent of 180 trips Auckland to Wellington, or 8.6 years of car use).

Using wood is something we can all do to help the environment. By demanding and using more sustainably produced wood, we can ensure that more trees will be planted and more carbon dioxide will be absorbed from the atmosphere.

The result is a better world for ourselves, our families and future generations. It's simple.

New Zealand's Greenhouse Gas Inventory

The Carbon Cycle

Planting trees begins a cycle that continuously removes, releases and re-absorbs greenhouse gases such as carbon dioxide. As trees grow, they absorb carbon dioxide through the process of photosynthesis.

The carbon dioxide absorbed by the growing forest remains stored within the wood products used throughout the lifetime of the building structure or product.

When a structure or product reaches the end of its lifetime, the carbon dioxide is released back into the atmosphere as the wood decays or is burnt as fuel.

Wood can be recycled to extend its lifetime and slow down the natural release of carbon dioxide back into the atmosphere. Once the carbon dioxide is released, it is available to be re-absorbed by growing trees.

New Zealand's Greenhouse Gas Inventory

In 2018, New Zealand's total gross emissions were 78.9 million tonnes of carbon dioxide (Mt CO₂-e). In 1990, gross emissions were 65.8 Mt CO₂-e.

In 2018, 23.4 Mt CO₂-e was removed from the atmosphere by the forestry sector, compared with 31.5 Mt CO₂-e in 1990. Forestry sector removals in 2018 reduced total emissions to 55.5 Mt CO₂-e net or a 30% offset.

Agriculture continued to be the largest contributor to New Zealand's Greenhouse Gas Emissions, with 48% of the total at 37.7 Mt CO₂-e, compared with energy at 41%.

Total CH₄ and N₂O emissions in 2017 attributable to dairy cattle, beef cattle, sheep and deer¹

	Total emissions (million tonnes CO ₂ -e)	2018-20 Population (millions)	Emissions per each (tonnes CO ₂ -e)
Sheep	10.24	27.4	0.37
Deer	0.65	0.9	0.72
Beef	6.99	3.8	1.84
Dairy	13.66	4.9	2.79
Petrol vehicles	7.22	3.6*	2.0*



Notes

¹ Based on figures from the Agricultural Inventory Model, used in New Zealand's Greenhouse Gas Inventory 1990-2017 report published by MfE

*Automobile Association

+Motor Industry Association

Source MfE, FOA

Source PCF, Primary sector bodies

Forests Removing Carbon

How is carbon removed from the atmosphere by New Zealand's forests?

Forests act as carbon sinks – a reservoir which removes and stores more carbon from the atmosphere than it releases. Trees use carbon dioxide (CO₂) as part of their 'breathing' cycle – taking in CO₂ and storing it within roots, trunks and branches – and releasing oxygen.

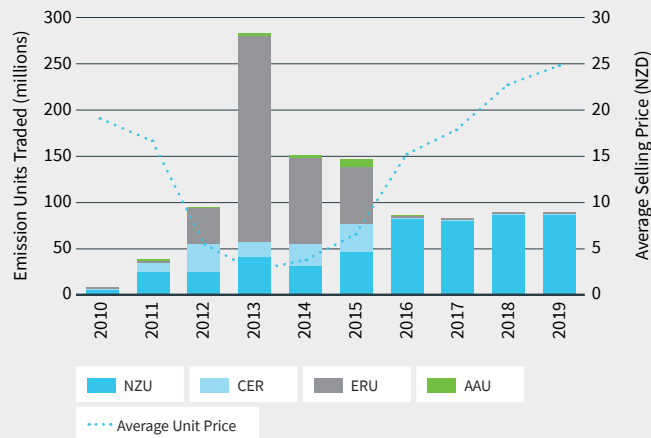
A young forest will remove small amounts of CO₂ until the trees establish and when forests will remove the most carbon. As a forest ages and its growing process slows, it will revert to absorbing less carbon again.

At harvesting, the forest ceases to be a carbon sink. But instead of releasing all the carbon it has stored, the harvested wood retains some of it. All wood products store carbon that will eventually be released, however the rate at which that carbon is released depends on the type of product and the type of treatment the wood has undergone.

The amount of carbon removed by New Zealand's forests is therefore dependent on the coverage of forestland, the age and species of the trees and the rate of harvest.

New Zealand has committed to reduce net greenhouse gas emissions to 30% below 2005 levels by 2030 and to zero by 2050.

Emissions Units Traded Volume and Price Changes



Source 1990 to 2015 National Greenhouse Gas Inventory

Source Emissions Units Traded Volume and Price Changes MPI, Margules Groomer

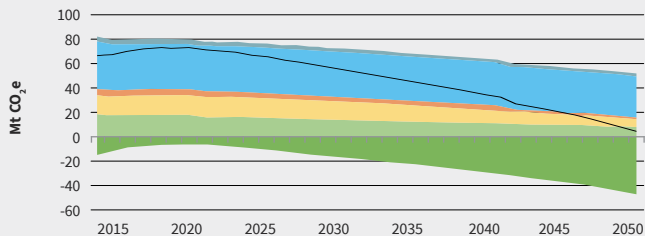
Forestry the solution in Carbon Zero pathways

The Productivity Commission has presented three pathways to achieve a carbon neutral economy by 2050. All pathways rely on new forest planting.

The pathways are; Policy Driven, Disruptive Decarbonisation (e.g. artificial meat widespread in the market) and Stabilising Decarbonisation (e.g. methane vaccine for cows becomes available).

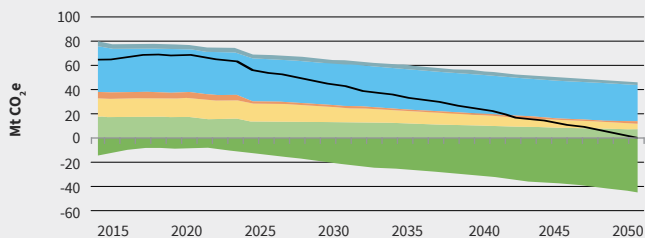
Policy Driven

2.8 m ha new forest (1.9 m ha exotic, 0.9 m ha indigenous)
45 MtCO₂e forest carbon sequestration



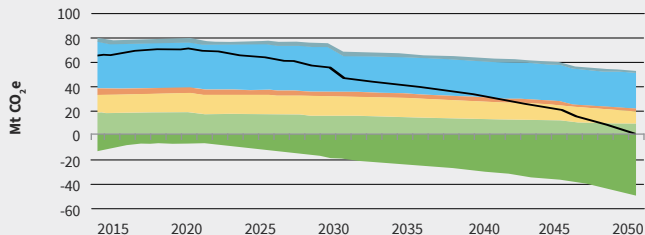
Disruptive Decarbonisation

2.1 m ha of new exotic forest
45 MtCO₂e forest carbon sequestration



Stabilising Decarbonisation

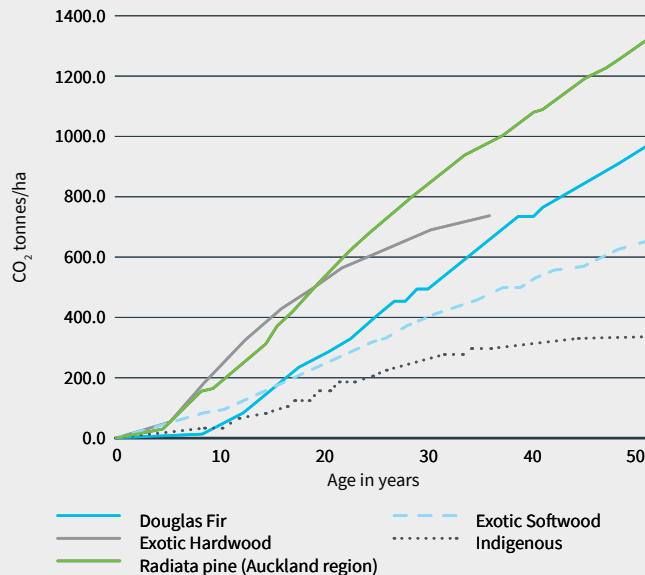
2.3 m ha new exotic forest
50 MtCO₂e forest carbon sequestration



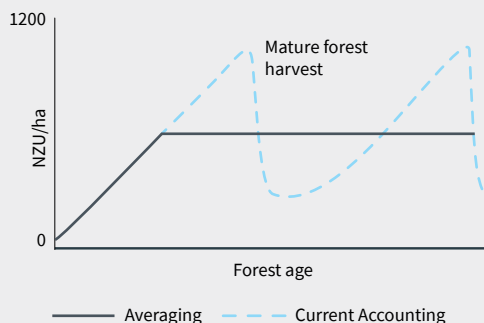
Source Productivity Commission Low-emissions economy, Final report, August 2018

Carbon Sequestration

Default Yield Tables of CO₂ Storage for Radiata and Other Tree Species



Carbon accounting practices

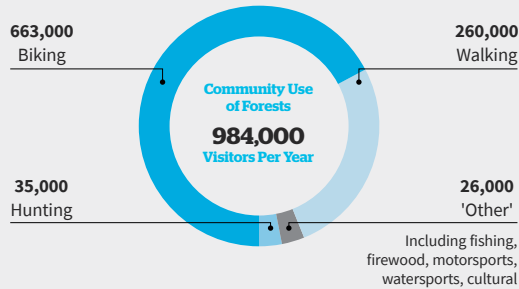


Forests first registered in the ETS between 1 January 2019 and 31 December 2022 will have the option to move to averaging in 2023. Forests registered before 1 January 2019 will remain on the stock change (current) approach.

Source Default Yield Tables of CO₂ Storage for Radiata and Other Tree Species MPI
Source Carbon accounting practices SOPI June 2019

FSC certified plantation forests contribution to social, economic and environmental wellbeing

Visitors



Area Certification Statistics



Area under certification
1,167,885 ha



920,589 ha
Area planted in forest



23,069 ha
Area harvested in year to June 2019



19%
Indigenous areas as part of working forest (weighted average)



14,982,455
Tonnes of logs harvested in year to 2019



9,315 ha
High conservation value areas protected



\$1,368,000
Spent on enviro-management in year to July 2019

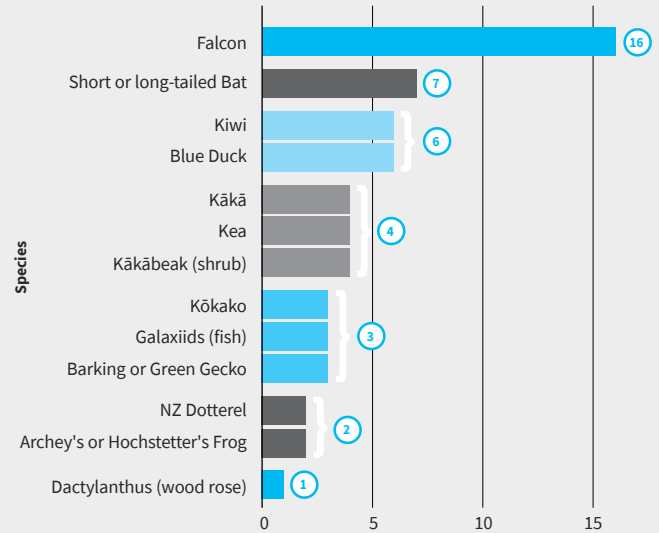


86 Special Areas
managed by forest companies



Species Biodiversity

Species Found in FSC Forests



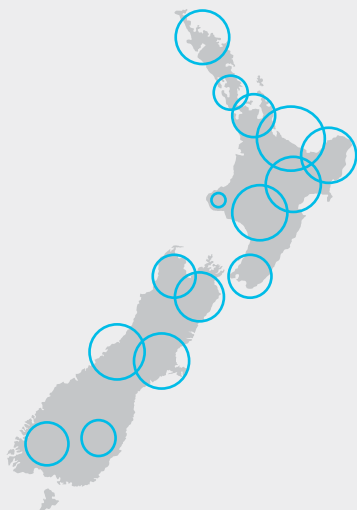
Number of FSC certified companies reported (out of a total of 19). Threatened and at risk species can be found in multiple forests owned by a single forest company.



Regional Biodiversity

Area of Native Vegetation Within FSC Certified Plantation Forests

Region	Hectares
Bay of Plenty	28,908
Northland	21,252
Waikato	18,654
Gisborne	13,717
Westcoast	13,399
Horizons	11,732
Hawkes Bay	10,383
Southland	8,531
Tasman	8,006
Otago	6,318
Canterbury	6,076
Marlborough	4,718
Greater Wellington	2,743
Auckland	2,668
Taranaki	1,025
Nelson	829



Multiple-use

Plantation forests have multiple uses and functions and produce mainly wood fibre and logs for construction or other purposes. They also provide and support other goods.



Honey



Livestock grazing



Koura



Under canopy crops and food harvest



Rongoa/Māori medicine



Game

Terms, Names and Sites

Area and volume

- An average *Pinus radiata* tree yields 2.4 m³ of wood at harvest.
- 1 hectare of 28 year-old *Pinus radiata* contains between 650 and 800 m³ of wood.
- 1 hectare grows up to 28 m³ of wood each year.
- A log truck and trailer carries approximately 30 tonnes of logs.
- A log ship contains approximately 30-35,000 tonnes of logs.
- By weight, the ratio of carbon to oxygen in carbon dioxide is 1-2.66.

Abbreviations

AAU	Assigned Amount Unit
CER	Certified Emissions Reduction
ERU	Emissions Reduction Unit
FAO	Food & Agriculture Organization of the United Nations
FFA	New Zealand Farm Forestry Association
FGLT	Forest Growers Levy Trust
FICA	Forest Industry Contractors Association
FIEA	Forest Industry Engineering Association
FISC	Forest Industry Safety Council
FOA	New Zealand Forest Owners Association
FSC	Forest Stewardship Council
MfE	Ministry for the Environment
MPI	Ministry for Primary Industries
NEFD	National Exotic Forest Description
NZIER	New Zealand Institute of Economic Research
NZU	NZ Units
PEFC	Programme for the Endorsement of Forest Certification
SOPI	Situation and Outlook for Primary Industries
Stats NZ	Statistics New Zealand
WPMA	Wood Processors and Manufacturers Association

Facts & Figures organisation sites

Competenz	www.competenz.org.nz
FAO	www.fao.org/forestry
FFA	www.nzffa.org.nz
FGLT	www.fglt.org.nz
FIEA	www.fiea.org.nz
FISC	www.safetree.nz
FOA	www.nzfoa.org.nz
FSC	www.nz.fsc.org/en-nz
MfE	www.mfe.govt.nz
MPI	www.mpi.govt.nz
NZIER	www.nzier.org.nz
NZFOA	www.nzfoa.org.nz
PEFC	www.pefc.org
Rare Species	www.rarespecies.nzfoa.org.nz
Scion	www.scionresearch.com
Statistics NZ	www.stats.govt.nz
WPMA	www.wpma.org.nz
WorkSafe NZ	www.business.govt.nz/worksafe

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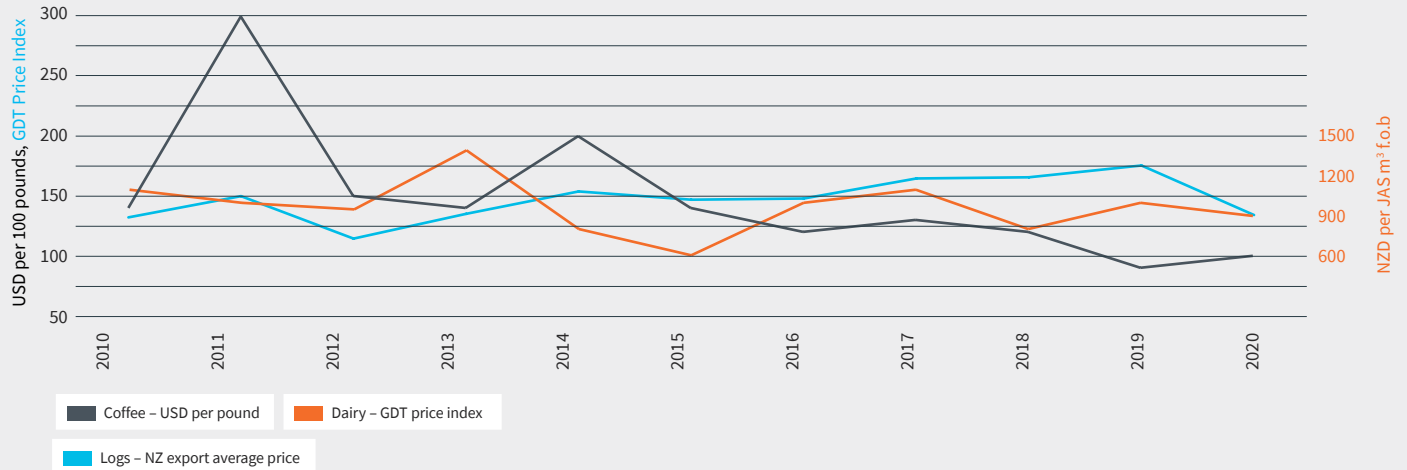
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Log Pricing Data

Log Type, Pricing Point, and Market	Mar-13 Quarter	Jun-13 Quarter	Sep-13 Quarter	Dec-13 Quarter	Mar-14 Quarter	Jun-14 Quarter	Sep-14 Quarter	Dec-14 Quarter	Mar-15 Quarter	Jun-15 Quarter	Sep-15 Quarter	Dec-15 Quarter	Mar-16 Quarter	Jun-16 Quarter	Sep-16 Quarter	Dec-16 Quarter	Mar-17 Quarter	Jun-17 ¹ Quarter	Sep-17 Quarter	Dec-17 Quarter	Mar-18 Quarter	Jun-18 Quarter	Sep-18 Quarter	Dec-18 Quarter	Mar-19 Quarter	Jun-19 Quarter	Sep-19 Quarter	Dec-19 Quarter	Mar-20 ¹ Quarter	
EXPORT (NZ\$ per JAS m ³ f.o.b)																														
Pruned	168 - 192	169 - 209	177 - 201	181 - 206	171 - 198	158 - 190	146 - 187	165 - 236	186 - 199	121 - 199	189 - 211	121 - 228	220 - 230	204 - 236	184 - 207	180 - 225	185 - 214	152 - 213	177 - 217	184 - 222	176 - 222	175 - 234	153 - 236	166 - 228	169 - 237	182 - 221	133-195	164-211	138 - 187	
A Grade	128 - 138	136 - 153	143 - 162	137 - 169	142 - 165	104 - 142	110 - 140	127 - 169	134 - 150	81 - 133	90 - 133	81 - 141	119 - 166	146 - 169	138 - 162	141 - 173	150 - 180	145 - 182	151 - 180	144 - 168	147 - 172	154 - 175	145 - 172	150 - 172	158 - 183	151 - 172	121-141	144-156	120 - 146	
J Grade	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
K Grade	112 - 131	114 - 147	132 - 156	127 - 159	133 - 159	96 - 137	101 - 134	117 - 163	124 - 143	99 - 126	91 - 125	91 - 135	99 - 158	136 - 162	124 - 157	135 - 167	142 - 174	134 - 177	142 - 174	137 - 158	132 - 165	141 - 168	133 - 158	138 - 162	146 - 176	143 - 160	109-137	132-149	112 - 138	
Pulp	106 - 108	108 - 123	128 - 131	119 - 154	125 - 140	110 - 122	92 - 108	112 - 135	117 - 121	65 - 107	73 - 110	65 - 118	55 - 138	120 - 143	111 - 134	125 - 140	126 - 149	125 - 153	123 - 166	117 - 148	122 - 150	130 - 151	119 - 152	127 - 154	135 - 159	129 - 144	98-117	116-130	74 - 122	
Average	135	145	154	157	154	132	127	153	147	116	128	123	148	165	152	161	165	166	169	159	166	166	164	167	176	166	136	150	134	
DOMESTIC (NZ\$ per tonne delivered at mill)																														
P1	135 - 150	142 - 158	126 - 157	132 - 156	129 - 155	131 - 155	132 - 154	134 - 154	139 - 164	135 - 170	135 - 174	135 - 174	140 - 187	142 - 195	140 - 193	142 - 186	151 - 189	155 - 191	157 - 193	157 - 195	149 - 199	150 - 197	160 - 195	164 - 200	168 - 196	166 - 196	163-197	158-198	160 - 194	
P2	120 - 121	121 - 133	114 - 125	121 - 127	126 - 126	119 - 130	125 - 126	121 - 130	116 - 136	116 - 133	116 - 133	105 - 170	129 - 182	134 - 188	130 - 192	102 - 189	125 - 142	115 - 189	120 - 190	120 - 190	97 - 191	126 - 194	143 - 195	128 - 195	132 - 194	125 - 195	114-191	128-191	129 - 192	
S1	97 - 102	103 - 110	102 - 120	102 - 123	98 - 112	101 - 111	103 - 109	98 - 108	108 - 112	100 - 109	100 - 108	96 - 109	102 - 118	104 - 123	105 - 123	105 - 126	114 - 127	115 - 136	116 - 143	116 - 152	124 - 159	122 - 151	122 - 148	122 - 148	122 - 148	122 - 152	122-143	122-137	118 - 147	
S2	95 - 98	101 - 105	90 - 110	90 - 113	92 - 118	91 - 123	101 - 110	98 - 109	96 - 109	85 - 109	85 - 105	85 - 109	90 - 115	90 - 118	80 - 116	93 - 120	83 - 124	117 - 130	116 - 135	120 - 144	115 - 141	120 - 141	123 - 143	120 - 143	122 - 144	110 - 147	115-142	120-132	117 - 132	
L1 and L2	84 - 100	88 - 105	78 - 111	80 - 113	77 - 123	78 - 78	81 - 87	85 - 103	97 - 139	78 - 95	78 - 94	78 - 109	79 - 130	71 - 132	74 - 130	82 - 138	81 - 126	83 - 145	80 - 130	71 - 143	89 - 137	82 - 137	84 - 141	90 - 141	84 - 141	71 - 144	63-118	91-118	71 - 121	
S3 and L3	72 - 90	83 - 100	75 - 106	75 - 102	86 - 108	90 - 115	81 - 100	86 - 100	88 - 100	69 - 96	76 - 90	69 - 96	68 - 106	82 - 119	69 - 107	71 - 112	71 - 116	71 - 120	94 - 138	83 - 134	109 - 136	109 - 129	88 - 130	111 - 133	104 - 132	96 - 135	84-124	88-113	82 - 117	
Run of bush
Pulp	46 - 50	46 - 51	47 - 54	46 - 54	44 - 55	46 - 55	45 - 55	49 - 54	50 - 55	31 - 54	31 - 55	31 - 55	31 - 59	44 - 59	31 - 61	40 - 52	40 - 61	31 - 56	31 - 59	30 - 59	31 - 60	31 - 66	31 - 77	32 - 68	50 - 79	32 - 64	31-61	30-60	31 - 75	
Average	97	103	101	102	104	102	101	102	108	99	99	102	110	114	111	111	111	126	136	134	134	135	133	135	136	136	127	125	126	

Forest, Dairy and Coffee Prices



The photo on page 46 came from Phil Taylor, Port Blakely NZ Ltd.

Notes

- ¹ Weighted averages have been used from June 2017. Please take care when comparing with previous quarters.
- * Limited response – very small volume traded.
- ** Data not available.

Source Log Pricing Data MPI

Source Forest, Dairy and Coffee Prices Global Dairy Trade: Price Index over 10 years, Macrotrends: Coffee Prices – 45 Year Historical Chart, MPI: Log Pricing Data



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