

GLOBAL FOREST RESOURCES ASSESSMENT 2015

COUNTRY REPORT

New Zealand

Rome, 2014

FAO, at the request of its member countries, regularly monitors the world's forests and their management and uses through the Global Forest Resources Assessment (FRA). This country report is prepared as a contribution to the FAO publication, the Global Forest Resources Assessment 2015 (FRA 2015).

The content and the structure are in accordance with the recommendations and guidelines given by FAO in the document Guide for country reporting for FRA 2015 (<http://www.fao.org/3/a-au190e.pdf>). These reports were submitted to FAO as official government documents.

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Introductory Text

Place an introductory text on the content of this report

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Desk Study?

Check "yes" if this survey is a Desk Study, "no" otherwise	
Desk Study?	no

1. What is the area of forest and other wooded land and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

1.1 Categories and definitions

Category	Definition
Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.
Other wooded land	Land not classified as "Forest" spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of 5-10 percent or trees able to reach these thresholds ; or with a combined cover of shrubs bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
Other land	All land that is not classified as "Forest" or "Other wooded land".
...of which with tree cover (<i>sub-category</i>)	Land considered as "Other land", that is predominantly agricultural or urban lands use and has patches of tree cover that span more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 meters at maturity. It includes bothe forest and non-forest tree species.
Inland water bodies	Inland water bodies generally include major rivers, lakes and water reservoirs.
Forest expansion	Expansion of forest on land that, until then, was not defined as forest.
...of which afforestation (<i>sub-category</i>)	Establishment of forest through planting and/or deliberate seeding on land that, until then, was not defined as forest.
...of which natural expansion of forest (<i>sub- category</i>)	Expansion of forests through natural succession on land that, until then, was under another land use (e.g. forest succession on land previously used for agriculture).
Deforestation	The conversion of forest to other land use or the longterm reduction of the tree canopy cover below the minimum 10 percent threshold.
...of which human induced (<i>sub-category</i>)	Human induced conversion of forest to other land use or the permanent reduction of the tree canopy cover below the minimum 10 percent threshold.
Reforestation	Natural regeneration or re-establishment of forest through planting and/or deliberate seeding on land already in forest land use.
...of which artificial reforestation (<i>sub- category</i>)	Re-establishment of forest through planting and/or deliberate seeding on land already in forest land use.

1.2 National data

1.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments

1	Statistics New Zealand (2012). New Zealand Official Yearbook 2012.	Country land area estimate.	1990 2000 2005 2010	Official area of New Zealand. • Includes all internal waterways (lakes and rivers). • Includes all offshore islands 20 square kilometres or larger.
2	Ministry for the Environment (2012) LUCAS New Zealand Land Use Map 1990-2008. Version 11	Planted forest, tall indigenous forest, regenerating forest and shrubland – area estimates.	1990 2000 2005 2010	Available from: http://koordinates.com/layer/4316-lucas-new-zealand-land-use-map-1990-2008-v011/#
3	Newsome P, Shepherd JD. 2009. Establishing New Zealand's Kyoto Land Use and Land-Use Change and Forestry 1990 Baseline Map, Landcare Research Contract Report LC0809/103, 27p	Planted forest, tall indigenous forest, regenerating forest and shrubland – area estimates.	1990 2000 2005 2010	N/A
4	Shepherd JD, Newsome P. 2009. Establishing New Zealand's Kyoto Land Use and Land-use Change and Forestry 2008 Map. Landcare Research Contract Report LC0809/133, 34 p.	Planted forest, tall indigenous forest, regenerating forest and shrubland – area estimates.	1990 2000 2005 2010	N/A
5	Ministry of Agriculture and Forestry (2000). New Zealand Land Cover Database. Version 1.	Tall indigenous forest, regenerating forest and shrubland – area estimates. Inland water.	1990	Available from: http://www.lcdb.scinfo.org.nz/
6	Ministry for the Environment (2004). New Zealand Land Cover Database. Version 2.	Tall indigenous forest, regenerating forest and shrubland – area estimates. Inland water.	1990 2000	Available from: http://koordinates.com/login/?next=/layer/1072-land-cover-database-version-2-lcdb2/
7	Landcare Research NZ Ltd (2012) New Zealand Land Cover Database. Version 3.	Tall indigenous forest, regenerating forest and shrubland – area estimates. Inland water.	1990 2000 2005 2010	Available from: http://iris.scinfo.org.nz/layer/304-lcdb-v30-land-cover-database-version-3/#
8	Ministry for the Environment (2013) New Zealand's Greenhouse Gas Inventory 1990 – 2011.	Planted forest, indigenous and regenerating forest – deforestation estimates	1990 2000 2005 2010	Available from: http://www.mfe.govt.nz/publications/climate/greenhouse-gas-inventory-2013/index.html
9	National Exotic Forest Description (NEFD) – annual publication now produced by the Ministry for Primary Industries.	Planted forest – new planting and restocking estimates	1990 2000 2005 2010	Available from: http://www.mpi.govt.nz/
10	Manley B. (2013) Deforestation Survey 2012. Ministry for Primary Industries Technical Paper No: 2013/02. 16 p.	Planted forest – forecast forest area	2015	N/A

1.2.2 Classification and definitions

National class	Definition
Planted forest	Forests planted in exotic tree species predominately grown for wood or wood fibre and at least 1 ha in extent. In New Zealand approximately 90 percent of the area is planted in <i>Pinus radiata</i> . The area reported is the gross stocked forest area which generally includes mappable gaps such as roads, landings, and areas within forest boundaries that are not planted in exotic forest. Harvested areas awaiting replanting are included in the area. All forests in this class will meet or exceed 30% canopy cover and 5 metres in height at maturity.
Tall indigenous forest	Areas of naturally regenerating forest at least 1 ha in extent that are dominated by tall indigenous forest canopy species. All forests in this class exceed 30% canopy cover and 5 metres in height.
Regenerating forest	Areas of naturally regenerating woody vegetation at least 1ha in extent that will meet or exceed the indigenous forest thresholds (trees at least 5 meters in height and a canopy cover of at least 30 percent) at maturity.
Shrubland	Areas of naturally regenerating woody vegetation at least 1ha in extent that are not expected to meet or exceed the forest thresholds at maturity. Woody vegetation in this class meets or exceeds 'Other Wooded Land' thresholds, and will generally exceed 30% canopy cover and 1 metre in height.
Inland water	Lakes, water reservoirs and rivers. Does not include estuarine areas.
Afforestation (new plantings)	Planting of trees for the primary purpose of producing wood or wood fibre, on land that has not previously been used for growing planted production forests. Based on data collected from forest owners.
Deforestation	The conversion of forest land to a non-forest (usually agricultural) land use.
Reforestation (restocking)	Replanting of a planted production forest area that has been clear felled. Based on data collected from forest owners.

1.2.3 Original data

<p>Forest area</p> <p>Forest area estimates in the FRA 2015 report were obtained from the New Zealand Land Use Map 1990-2008 used to calculate carbon estimates for the national greenhouse gas inventory. This partitions forest land into planted forest and natural forest. The latter includes all naturally regenerating woody communities that meet the forest land criteria. While most natural forests are indigenous, a small proportion is dominated by self seeding exotic conifer (e.g. pine, fir) and/or broadleaved (e.g. poplar, willow) tree species. Subdivision of the natural forest area into tall indigenous and regenerating forest was achieved using the Land Cover Data Base (LCDB) classes. Woody communities that do not meet the forest land criteria are mapped as shrubland. Data on post 2008 forest area changes were provided by the Land Use and Carbon Analysis System (LUCAS) team at the Ministry for the Environment.</p>
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1. *Planted forest*

The estimates include areas with the presence of trees, and areas temporarily unstocked due to harvesting. In this report we use gross stocked plantation areas obtained using satellite imagery. Previous reports have used net stocked areas obtained from forest owner surveys.

National Class	Forest area (1000 ha)				
	1990	2000	2005	2010	2011
Stocked plantation forest area	1525	2009	2071	2026	2031
Harvested area awaiting restocking	20	42	34	55	59
Total planted forest area	1545	2051	2105	2081	2090

2. *Tall indigenous forest, regenerating forest, and shrubland*

These figures differ from previous reports. FRA 2010 shrubland estimates included woody vegetation classes that would be expected to meet or exceed the forest land threshold at maturity. These are now classed as regenerating forest. Naturally regenerating woody vegetation not expected meet the forest thresholds (i.e. Other Wooded Land) is reported here as shrubland.

National Class	Forest area (1000 ha)				
	1990	2000	2005	2010	2011
Tall indigenous forest	6866	6846	6835	6830	6829
Regenerating forest	1240	1237	1235	1234	1234
Total forest area	8107	8082	8070	8063	8063
Shrubland	1258	1147	1128	1122	111

Forest expansion, deforestation, reforestation

New planting and restocking

Afforestation and reforestation figures for planted forests are based on data obtained from National Exotic Forest Description (NEFD) reports. Deforestation estimates, which are taken from the New Zealand Greenhouse Gas Inventory 1990-2011, include both planted and indigenous forest. There are no data for afforestation or reforestation in indigenous forests. These estimates are reported for reference.

Reporting year: 1990

National class	Years					Average (5-years)
	1988	1989	1990	1991	1992	
Afforestation - new plantings (000 ha)	20	21	16	15	50	25
Deforestation (000 ha)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Reforestation - restocking (000 ha)	22	23	22	22	21	22

Reporting year: 1995

National class	Years					Average (5-years)
	1993	1994	1995	1996	1997	
Afforestation - new plantings (000 ha)	62	98	74	84	64	76
Deforestation (000 ha)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Reforestation - restocking (000 ha)	25	25	25	28	30	27

Reporting year: 2000

National class	Years					Average (5-years)
	1998	1999	2000	2001	2002	
Afforestation - new plantings (000 ha)	51	40	34	30	22	35
Deforestation (000 ha)	n.a.	n.a.	1	1	2	1

Reforestation - restocking (000 ha)	30	30	36	36	40	34
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Reporting year: 2005

National class	Years					Average (5-years)
	2003	2004	2005	2006	2007	
Afforestation - new plantings (000 ha)	20	11	6	3	2	8
Deforestation (000 ha)	4	7	12	14	21	12
Reforestation - restocking (000 ha)	38	40	32	34	35	36

Reporting year: 2010

National class	Years					Average (5-years)
	2008	2009	2010	2011	2012	
Afforestation - new plantings (000 ha)	2	4	6	12	12	7
Deforestation (000 ha)	3	3	2	3	8	4
Reforestation - restocking (000 ha)	31	33	35	39	n.a.	35

1.3 Analysis and processing of national data

1.3.1 Adjustment

Forest area

Forest area estimates were adjusted to accommodate the difference in total land area between the land use maps (LUM) (26 753 “000” ha) and the official land area for New Zealand, as reported by Land Information New Zealand (LINZ) in the New Zealand Official Yearbook 2012 (Statistics New Zealand, 2012). LINZ is the government agency responsible for measuring and providing official land area information in New Zealand. This coincides with the New Zealand data reported in FAOSTAT (26 771 “000” ha).

1. *Planted forest*

National Class	Forest area (1000 ha)				
	1990	2000	2005	2010	2011
Stocked plantation forest area	1526	2010	2072	2027	2032
Harvested area awaiting restocking	20	42	34	55	59
Total planted forest area	1546	2052	2107	2082	2091

2. *Tall indigenous forest, regenerating forest and shrubland*

National Class	Forest area (1000 ha)				
	1990	2000	2005	2010	2011
Tall indigenous forest	6871	6850	6840	6834	6834
Regenerating forest	1241	1237	1236	1235	1234
Total forest area	8112	8088	8075	8069	8068
Shrubland	1259	1148	1129	1122	1119

Forest expansion, deforestation, reforestation

Net stocked estimates of forest expansion and reforestation obtained from the NEFD were scaled by 12.7% to enable them to be reported on a gross stocked basis. The scaling factor was provided by the Land Use and Carbon Analysis System (LUCAS) team at the New Zealand Ministry for the Environment. Deforestation estimates were adjusted to accommodate the difference in total land area between the LUM (26 753 “000” ha) and the official land area for New Zealand (26 771 “000” ha).

Reporting year: 1990

National class	Years					Average (5-years)
	1988	1989	1990	1991	1992	
Afforestation - new plantings (000 ha)	23	24	18	17	56	28
Deforestation (000 ha)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Reforestation - restocking (000 ha)	26	25	26	25	24	25

Reporting year: 1995

National class	Years					Average (5-years)
	1993	1994	1995	1996	1997	
Afforestation - new plantings (000 ha)	70	110	83	95	72	86
Deforestation (000 ha)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Reforestation - restocking (000 ha)	28	28	28	32	34	30

Reporting year: 2000

National class	Years					Average (5-years)
	1998	1999	2000	2001	2002	
Afforestation - new plantings (000 ha)	57	45	38	34	25	40
Deforestation (000 ha)	n.a.	n.a.	1	1	2	1

Reforestation - restocking (000 ha)	34	34	41	41	45	39
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Reporting year: 2005

National class	Years					Average (5-years)
	2003	2004	2005	2006	2007	
Afforestation - new plantings (000 ha)	23	12	7	3	2	9
Deforestation (000 ha)	4	7	12	14	21	12
Reforestation - restocking (000 ha)	43	45	36	38	39	40

Reporting year: 2010

National class	Years					Average (5-years)
	2008	2009	2010	2011	2012	
Afforestation - new plantings (000 ha)	2	5	7	14	21	10
Deforestation (000 ha)	3	3	2	3	6	3
Reforestation - restocking (000 ha)	35	37	39	44	n.a.	39

1.3.2 Estimation and forecasting

Forest area

1. Planted forest

Planted forest area is expected to increase by 9,100 ha between 2012 and 2015, based on the following information,

- a. Total planted forest area 2011: as sourced from the New Zealand Greenhouse Gas Inventory 1990-2011 is 2 091 000 ha: 2 032 000 ha of stocked plantation area, and 59 000 ha of harvested area awaiting restocking.
- b. New planting: projected to be 10 500 between 2013 and 2015. Estimate based on the medium projection developed for New Zealand's sixth national communication under the United Nations Framework Convention on Climate Change.
- c. Deforestation intention: projected to be 28 600 ha between 2012 and 2015. Estimate based on the high projection developed for New Zealand's sixth national communication under the United Nations Framework Convention on Climate Change.

2. Tall indigenous forest, regenerating forest, and shrubland

Tall indigenous forest /regenerating forest area is expected to decrease by 2 800 ha between 2012 and 2015, based on the following information:

- a. Total tall indigenous forest /regenerating forest area 2011: as sourced from the New Zealand Greenhouse Gas Inventory 1990-2011 is 8 068 000 ha.
- b. Natural expansion: not generally observed. No data available.
- c. Deforestation intention: projected to be 2 800 ha between 2012 and 2015. Estimate based on the medium projection developed for New Zealand's sixth national communication under the United Nations Framework Convention on Climate Change.

Shrubland area is expected to decrease by 59 000 ha between 2012 and 2015, based on the following information:

- a. Total shrubland area 2011: as sourced from the New Zealand Greenhouse Gas Inventory 1990-2011 is 1 119 000 ha.
- b. Projection of the 1990-2011 trend to 2015.

Inland water

This includes lakes, water reservoirs and rivers, but not estuarine areas.

Other land

Other land area was calculated as difference between Total Land Area and Total Wooded Land plus Inland water.

The estimates for the categories explained in the items above are presented in the following table.

National Class	Area (1000 hectares)				
	1990	2000	2005	2010	2015

Planted forest	1546	2052	2107	2082	2087
Tall indigenous forest	6871	6850	6840	6834	6831
Regenerating forest	1241	1237	1236	1235	1234
Total Forest	9658	10139	10183	10151	10152
Shrubland	1259	1148	1129	1122	1060
Total Wooded Land	10917	11287	11312	11273	11212
Inland water	440	440	440	440	440
Other land	15414	15044	15019	15058	15119
Total Land Area	26 771				

Forest expansion, deforestation, reforestation

The values reported for forest expansion and reforestation are five year average estimates based on NEFD reports (exotic species). Deforestation values are five year average estimates based on figures reported in the New Zealand Greenhouse Gas Inventory 1990-2011 (exotic and indigenous species)

1.3.3 Reclassification

Forest area

The forest areas were reclassified (percentage allocation) according to FRA 2015 categories as follows,

National Class	FRA 2015 Categories				
	Forest	Other wooded land	Other land with tree cover	Other land	Inland water
Planted forest	100 %				
Tall indigenous forest	100 %				

Regenerating forest	100 %				
Shrubland		100 %			
Other land				100 %	
Inland water					100 %

Forest expansion, deforestation, reforestation

New planting estimates are reported as Afforestation, and Restocking estimates are reported as Reforestation.

1.4 Data

Table 1a

Categories		Area (000 hectares)				
		1990	2000	2005	2010	2015
	Forest	9658	10139	10183	10151	10152
	Other wooded land	1259	1148	1129	1122	1060
	Other land	15414	15044	15019	15058	15119
	... of which with tree cover	N/A	N/A	N/A	N/A	N/A
	Inland water bodies	440	440	440	440	440
	TOTAL	26771.00	26771.00	26771.00	26771.00	26771.00

Table 1b

Categories		Annual forest establishment / loss (000 hectares per year)				...of which of introduced species (000 hectares per year)			
		1990	2000	2005	2010	1990	2000	2005	2010
	Forest expansion	28	40	9	10	28	40	9	10
	... of which afforestation	28	40	9	10	28	40	9	10
	... of which natural expansion of forest	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deforestation	N/A	N/A	12	3	N/A	N/A	12	3
	... of which human induced	N/A	N/A	12	3	N/A	N/A	12	3
	Reforestation	25	39	40	39	25	39	40	39

	... of which artificial	25	39	40	39	25	39	40	39
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Tiers

Category	Tier for status	Tier for reported trend
Forest	Tier 3	Tier 3
Other wooded land	Tier 3	Tier 3
Forest expansion	Tier 3	Tier 3
Deforestation	Tier 3	Tier 3
Reforestation	Tier 3	Tier 3

Tier criteria

Category	Tier for status	Tier for reported trend
<ul style="list-style-type: none"> • Forest • Other wooded land • Afforestation • Reforestation • Natural expansion of forest • Deforestation 	<p>Tier 3 : Data sources: Either recent (less than 10 years ago) National Forest Inventory or remote sensing, with ground truthing, or programme for repeated compatible NFIs</p> <p>Tier 2 : Data sources: Full cover mapping / remote sensing or old NFI (more than 10 years ago)</p> <p>Tier 1 : Other</p>	<p>Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status)</p> <p>Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status)</p> <p>Tier 1 : Other</p>

1.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trends
Forest	Since FRA 2010 New Zealand has produced new land use (LUM 1990-2008) and land cover (LCDB3) maps based on satellite imagery. These have been used to report forest area, and to partition naturally regenerating (i.e. non-planted) forest into tall indigenous and regenerating forests.	Comments related to data apply also to trend. See comments on forest expansion and deforestation for estimates to 2015.
Other wooded land	The LUM (1990-2008) Grassland with Woody Biomass (GWB) class has been used to report Other Wooded Land (OWL).	Comments related to data apply also to trend. Estimates to 2015 were obtained by projecting the 1990-2011 trend.
Other land	N/A	N/A
Other land with tree cover	N/A	N/A
Inland water bodies	N/A	N/A

Forest expansion	Data on forest expansion in planted forests are sourced from the National Exotic forest Description, an annual publication based on statistical returns provided by forest owners.	Comments related to data apply also to trend. Estimates to 2015 are based on the medium projection developed for New Zealand's sixth national communication under the United Nations Framework Convention on Climate Change.
Deforestation	Deforestation estimates are taken from the New Zealand Greenhouse Gas inventory (1990-2011).	Comments related to data apply also to trend. Estimates to 2015 are based on the high projection developed for New Zealand's sixth national communication under the United Nations Framework Convention on Climate Change.
Reforestation	Data on reforestation in planted forests are sourced from the National Exotic Forest Description, an annual publication based on statistical returns provided by forest owners.	Comments related to data apply also to trend. Estimates to 2015 are based on the medium projection developed for New Zealand's sixth national communication under the United Nations Framework Convention on Climate Change.

Other general comments to the table

Land Use Maps (LUM) The 1990 land-use map was derived from 30-metre spatial resolution Landsat-4 and Landsat-5 satellite imagery taken in, or close to, 1990. The first of the images used were taken in November 1988 and the last in February 1993. The 1990 mapping was assisted by manual comparison with a c. 2001 reference dataset. This reference dataset was derived from Landsat 7 imagery which had been sharpened to a 15 m spatial resolution (Newsome & Shepherd, 2009), as well as other available imagery, such as SPOT-2 and 3 data acquired 1996–1997. The use of this higher resolution imagery, coupled with concurrent reference to aerial photography, increased the certainty of land-use decisions in the 1990 map. The 2008 land-use map was compiled by mapping and verifying change with respect to the 1990 land-use map and the 2001 reference dataset (Shepherd & Newsome 2009) using imagery from the SPOT-5 satellite. Land Cover Data Base (LCDB) The New Zealand Land Cover Database (LCDB) is a thematic classification of land cover. LCDB-1, which was released in 2000, used SPOT 2 and SPOT 3 satellite imagery to resolve 16 land cover classes. LCDB-2 was released in 2004. It used LANDSAT 7 ETM+ satellite imagery and the thematic classification was increased to 43 classes. The current version (LCDB3) uses SPOT 5 satellite imagery acquired between November 2006 and October 2008. It maps 33 land cover classes and is designed to be compatible with earlier LCDB versions. The polygon features contain a code and boundary representing the land cover type at each of three periods; summer 1996/97, summer 2001/02, and summer 2008/09. The data set is designed to be compatible in scale and accuracy with Land Information New Zealand's 1:50,000 topographic database.

2. What is the area of natural and planted forest and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

2.1 Categories and definitions

Term	Definition
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.
Naturalized introduced species	Other naturally regenerated forest where the tree species are predominantly non-native and do not need human help to reproduce/maintain populations over time.
Introduced species	A species, subspecies or lower taxon occurring <i>outside</i> its natural range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).
Category	Definition
Primary forest	Naturally regenerated forest of native species where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities.
...of which of introduced species (<i>sub-category</i>)	Other naturally regenerated forest where the trees are predominantly of introduced species.
...of which naturalized (<i>sub-sub category</i>)	Other naturally regenerated forest where the trees are predominantly of naturalized introduced species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
...of which of introduced species (<i>sub-category</i>)	Planted forest where the planted/seeded trees are predominantly of introduced species.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
...of which planted (<i>sub-category</i>)	Mangroves predominantly composed of trees established through planting.

2.2 National data

2.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Ministry of Forestry (1991). New Zealand Forestry Statistics 1991.	Indigenous forest area estimates	1990	Nature reserves, scientific reserves, national parks.
2	Ministry of Agriculture and Forestry (2001). New Zealand Forestry Statistics 2000.	Indigenous forest area estimates	2000	Nature reserves, scientific reserves, national parks.

3	Ministry for the Environment (2012) LUCAS New Zealand Land Use Map 1990-2008. Version 11	Planted forest, indigenous/regenerating forest area estimates.	1990 2000 2005 2010	Available from: http://koordinates.com/layer/4316-lucas-new-zealand-land-use-map-1990-2008-v011/#
4	Ministry of Agriculture and Forestry (2000). New Zealand Land Cover Database. Version 1.	Forest (including mangrove) area estimates.	1990 2000	Available from: http://www.lcdb.scinfo.org.nz/
5	Ministry for the Environment (2004). New Zealand Land Cover Database. Version 2.	Forest (including mangrove) area estimates.	2000 2005	Available from: http://koordinates.com/login/?next=/layer/1072-land-cover-database-version-2-lcdb2/
6	Landcare Research NZ Ltd (2012) New Zealand Land Cover Database. Version 3.	Forest (including mangrove) area estimates.	2005 2010 2015	Available from: http://iris.scinfo.org.nz/layer/304-lcdb-v30-land-cover-database-version-3/#
7	Department of Conservation (2005). The Application in New Zealand of the IUCN System of Management Categories for Protected Natural Areas. 16 p.	IUCN categories	2005 2010 2015	Report prepared by the New Zealand Department of Conservation for the New Zealand Committee of IUCN and the New Zealand Conservation Authority.
8	Department of Conservation (2006) Land administered by the Department of Conservation.	Area estimates for IUCN categories	N/A	GIS database layer
9	Department of Conservation (2008) Land administered by the Department of Conservation.	Area estimates for IUCN categories	N/A	GIS database layer
10	Department of Conservation (2013) Land administered by the Department of Conservation.	Area estimates for IUCN categories	N/A	GIS database layer
11	Lovelock, C.E. et al. (2007). Mangrove growth in New Zealand estuaries: the role of nutrient enrichment at sites with contrasting rates of sedimentation. <i>Oecologia</i> 153:633-641	Mangrove expansion	N/A	See comments
12	NIWA (2008). What ails our estuaries? Mangrove spread. In: www.niwa.cri.nz/rc/freshwater/nzestuaries/ails	Mangrove expansion	N/A	See comments

2.2.2 Classification and definitions

National class	Definition
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Primary forest	Indigenous forest within protected areas that have as a main management objective to protect and preserve representative indigenous forest ecosystems (National Parks, Nature Reserves, and Scientific Reserves/IUCN categories Ia, Ib, II). Includes LCDB classes indigenous forest and broadleaved hardwood forest
Other naturally regenerated forest	Other indigenous/regenerating forest excluding National Parks, Nature Reserves, and Scientific Reserves/IUCN categories Ia, Ib, II
Planted forest	Forests planted in exotic tree species predominately grown for wood or wood fibre and at least 1 ha in extent. In New Zealand approximately 90 percent of the area is planted in <i>Pinus radiata</i> . The area reported is the gross stocked forest area which generally includes mappable gaps such as roads, landings, and areas within forest boundaries that are not planted in exotic forest. Harvested areas awaiting replanting are included in the area. All forests in this class will meet or exceed 30% canopy cover and 5 metres in height at maturity.
Mangroves	Area of forest or shrubland with mangroves as the dominant or sole canopy cover.
Sanctuary area, Ecological area, Nature reserve, Scientific reserve	IUCN Category Ia – Strict Nature Reserve: protected area managed mainly for science
Wilderness area	IUCN Category Ib – Wilderness Area: protected area managed mainly for wilderness protection
National Park	IUCN Category II – National Park: protected area managed mainly for ecosystem protection and recreation.

2.2.3 Original data

a. Primary forest		
<p>Indigenous forest area within National Parks and reserves was used to report primary forest for years 1990 and 2000. These estimates are based on the New Zealand Forest Statistics (MoF, 1991; MAF, 2001). The figures are not directly comparable with the spatial analysis estimates used to report years 2005, 2010 and 2015.</p>		
National Class	Forest area (1 000 ha)	
	1990	2000
Nature Reserves	186	n.a.
Scientific Reserves	9	615
National Parks	2 362	2 891
Total	2 557	3 506

Tall indigenous forest areas within IUCN categories Ia, Ib, and II reported in Question 6 (6.2.3) were used to report primary forest for years 2005 and 2010. These estimates are based on GIS analysis of Department

of Conservation land area in 2006 and 2008. The extent of forest within each of the IUCN categories was determined from the land cover data base (LCDB2, LCDB3) maps.

National Class	Forest area (1 000 ha)	
	2005	2010
IUCN Category Ia	160	160
IUCN Category Ib	37	37
IUCN Category II	1 947	1 947
Total	2 144	2 144

b. Other naturally regenerated forests

Total indigenous/regenerating forest areas reported in Question 1 (1.3.2) were used in this table. The difference between these areas and Primary forest areas was considered as Other Naturally regenerated forest.

National Class	Forest area (1 000 ha)			
	1990	2000	2005	2010
Primary forest	n.a.	n.a.	2144	2144
Other Naturally regenerated forest	n.a.	n.a.	5932	5925
Total tall indigenous/regenerating forest	8112	8087	8076	8069

c. Planted forests

Planted forest areas reported in Question 1(1.3.2) were used in this table.

d. Mangroves

In New Zealand mangroves are found around the coasts of the northern half of the North Island. There is one species (*Avicennia marina*) which forms a shrub or small tree to 8 m. Data on the extent of mangrove forest and shrubland communities are available from the New Zealand Land Cover Data Base (LCDB) for the years 1996, 2001 and 2008. These estimates are used to report the extent of mangrove communities between 1990 and 2010.

National Class	Forest area (1000 ha)			
	1990	2000	2005	2010
Mangrove	28	28	28	28

2.3 Analysis and processing of national data

2.3.1 Adjustment

No calibration was needed for Primary forest, Other naturally regenerated forests or Planted forests as estimates from Questions 1 (1.3.2) and 6 (6.2.3) were used.

Mangrove area estimates were adjusted to accommodate the difference in total land area between the LCDB (26 842 “000” ha) and the official land area for New Zealand, as reported by Land Information New Zealand (LINZ) in the New Zealand Official Yearbook 2012 (Statistics New Zealand, 2012). LINZ is the government agency responsible for measuring and providing official land area information in New Zealand. This coincides with the New Zealand data reported in FAOSTAT (26 771 “000” ha).

2.3.2 Estimation and forecasting

a. Primary forests and Other naturally regenerated forests

Tall indigenous forest areas within IUCN categories Ia, Ib, and II reported in Question 6 (6.2.3) were used to report primary forest for 2015. This estimate is based on GIS analysis of Department of Conservation land area in 2013. The extent of forest within each of the IUCN categories was determined from the land cover data base (LCDB3) map. No additional forecasting was needed as estimates from 1.3.2 were used.

b. Planted forests

No estimation or forecasting was needed as estimates from 1.3.2 were used. All the reported planted forest figures are from exotic species.

c. Mangroves

The area mapped as mangrove forest or shrubland increased marginally (average of 60 ha per annum) between 1996 and 2008. This rate of increase was used to derive the 2015 area estimate.

2.3.3 Reclassification

Primary forests, Other naturally regenerating forests, Planted forests .

No further reclassification was required

Mangroves

Reclassified (percentage allocation) according to FRA 2015 categories as follows,

National Class	FRA 2015 Categories				
	Forest	Other wooded land	Other land with tree cover	Other land	Inland water
Mangrove	20 %	80%			

2.4 Data

Table 2a

Categories		Forest area (000 hectares)				
		1990	2000	2005	2010	2015
	Primary forest	N/A	N/A	2144	2144	2160
	Other naturally regenerated forest	N/A	N/A	5932	5925	5905
	... of which of introduced species	N/A	N/A	N/A	N/A	N/A
	... of which naturalized	N/A	N/A	N/A	N/A	N/A
	Planted forest	1546	2052	2107	2082	2087
	... of which of introduced species	1546	2052	2107	2082	2087
TOTAL		1546.00	2052.00	10183.00	10151.00	10152.00

Table 2b

Primary forest converted to (000 ha)								
1990-2000			2000-2010			2010-2015		
Other natural regeneration	Planted	Other land	Other natural regeneration	Planted	Other land	Other natural regeneration	Planted	Other land
0	0	0	0	0	0	0	0	0

Table 2c

Categories	Area (000 hectares)				
	1990	2000	2005	2010	2015
Mangroves (forest and OWL)	28	28	28	28	28

... of which planted	0	0	0	0	0
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Tiers

Category	Tier for status	Tier for reported trend
Primary forest	Tier 2	Tier 2
Other naturally regenerated forest	Tier 2	Tier 2
Planted forest	Tier 3	Tier 3
Mangroves	Tier 2	Tier 2

Tier Criteria

Category	Tier for status	Tier for reported trend
Primary forest/Other naturally regenerated forest/Planted forest	<p>Tier 3 : Data sources: Recent (less than 10 years) National Forest Inventory or remote sensing with ground truthing or data provided by official agencies or programme for repeated compatible NFIs</p> <p>Tier 2 : Data sources: Full cover mapping/ remote sensing or old NFI (more than 10 years) Tier 1 : Other</p>	<p>Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other</p>

2.5 Comments

Category	Comments related to data definitions etc	Comments on reported trend
Primary forest	N/A	Since FRA 2010 the Department of Conservation has synchronised its cadastral data with Land Information New Zealand, the government agency responsible for measuring and providing official land area information in New Zealand. The small reduction in forest area within IUCN categories Ia and Ib is likely to have resulted from this change.
Other naturally regenerating forest	N/A	N/A
Planted forest	see Question 1	see Question 1
Mangroves	Most mangrove forests are mapped by LCDB as being off shore (i.e. outside the land area). The mangrove species found in New Zealand (<i>Avicennia marina</i>) is classified as a tree because it can exceed 5m height at maturity. Most mangrove communities however do not attain forest status. Whether this is the result of environmental constraints or human activity is not clear.	Mangrove spread around the New Zealand coastline is by natural regeneration. Mangrove spread has been attributed to increased sedimentation and nutrient availability in coastal and estuarine areas (Lovelock et al., 2007; NIWA, 2008).

Other general comments to the table

The New Zealand Commissioner for the Environment has recently called for conservation lands to be reclassified to better reflect their indigenous biodiversity values. If this occurs the area estimates for some IUCN categories are likely to increase substantially.

3. What are the stocks and growth rates of the forests and how have they changed?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

3.1 Categories and definitions

Category	Definition
Growing stock	Volume over bark of all living trees with a minimum diameter of 10 cm at breast height (or above buttress if these are higher). Includes the stem from ground level up to a top diameter of 0 cm, excluding branches.
Net Annual Increment (NAI)	Average annual volume of gross increment over the given reference period less that of natural losses on all trees, measured to minimum diameters as defined for "Growing stock".
Above-ground biomass	All living biomass above the soil including stem stump branches bark seeds and foliage.
Below-ground biomass	All biomass of live roots. Fine roots of less than 2 mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood	All non-living woody biomass not contained in the litter either standing lying on the ground or in the soil. Dead wood includes wood lying on the surface dead roots and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in above-ground biomass	Carbon in all living biomass above the soil including stem stump branches bark seeds and foliage.
Carbon in below-ground biomass	Carbon in all biomass of live roots. Fine roots of less than 2 mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Carbon in dead wood	Carbon in all non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in litter	Carbon in all non-living biomass with a diameter less than the minimum diameter for dead wood (e.g. 10 cm) lying dead in various states of decomposition above the mineral or organic soil.
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a soil depth of 30 cm.

3.2 National data

3.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Ministry for the Environment (2013) New Zealand's Greenhouse Gas Inventory 1990 – 2011.	Planted forest, tall indigenous forest, regenerating forest – biomass and carbon estimates. Soil carbon	1990 2000 2005 2010	Available from: http://www.mfe.govt.nz/publications/climate/greenhouse-gas-inventory-2013/index.html

2	Beets PN, Kimberley MO, Goulding CJ, Garrett LG, Oliver GR, Paul TSH (2009). Natural forest plot data analysis: carbon stock analyses and remeasurement strategy. Report prepared by the New Zealand Forest Research Institute Ltd (Scion) for the New Zealand Ministry for the Environment.	Tall indigenous forest, regenerating forest, shrubland – growing stock estimates	1990 2000 2005 2010	N/A
3	Ministry for the Environment (2012) LUCAS New Zealand Land Use Map 1990-2008. Version 11	Planted forest, tall indigenous forest, regenerating forest and shrubland area estimates.	1990 2000 2005 2010	Available from: http://koordinates.com/layer/4316-lucas-new-zealand-land-use-map-1990-2008-v011/#
4	Landcare Research NZ Ltd (2012) New Zealand Land Cover Database. Version 3.	Planted forest, tall indigenous forest, regenerating forest and shrubland area estimates.	1990 2000 2005 2010	Available from: http://iris.scinfo.org.nz/layer/304-lcdb-v30-land-cover-database-version-3/#
5	Goulding CJ (2005). Measurement of trees. In: Colley M (ed). Forestry Handbook. New Zealand Institute of Forestry.	Planted forest, growing stock estimates	1990 2000 2005 2010	N/A

3.2.2 Classification and definitions

National class	Definition
Standing Volume	The total volume of wood contained in stems of all age classes (in cubic metres). For planted forests, the standing volume includes some non-recoverable volume, but excludes bark.
Total Recoverable Volume Inside Bark	Volume of wood recovered during harvesting in planted forests, excluding bark (in cubic metres)
Above ground live (AGL) biomass	Live biomass of trees, tree ferns and shrubs.
Below ground (BG) biomass	Based on existing studies, this is assumed to be 20% AGL for planted forests, and 25% AGL for indigenous and regenerating forests.
Dead wood (DW)	Dead standing stems and logs with a diameter # 10 cm.
Litter (L)	Fallen branches (# 10 cm diameter), twigs, dead leaves, and the fermented humic horizons.
Biomass carbon	Woody biomass is assumed to be 50% carbon
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a soil depth of 30 cm.

3.2.3 Original data

Data on standing volume, biomass, and carbon stocks were obtained from the Land Use and Carbon Analysis System (LUCAS) used for the national greenhouse gas inventory (MfE 2013). This reports carbon stocks and fluxes annually from 1990. The standing volume and biomass estimates are a bi-product of the carbon analysis.

Growing stock**1. Planted forest**

Growing stock estimates (under bark) for planted forests

National Class	Volume (million cubic meters)				
	1990	2000	2005	2010	2011
Planted forest (under bark)	289	436	497	574	587

2. Tall indigenous forest, regenerating forest, shrubland

Growing stock estimates (over bark) were obtained from the 2002-2007 LUCAS natural forest and shrubland dataset (Beets et al. 2009). Subdivision of the dataset into tall indigenous forest, regenerating forest and shrubland classes was based on the land cover database (LCDB3) classes. Average stem volumes were 458.4, 80.1 and 71.1 m³/ha for tall forest, regenerating forest and shrubland respectively.

Average stem volume (m³/ha) was multiplied by forest/shrubland area (Table 1.3.2) to obtain the national estimate. This assumes that average stem volume remains constant over time. While we expect the standing volume per ha of regenerating (and possibly tall indigenous) forest to increase over time, confirmation of this will not be available until the remeasure of the plot network is completed in 2014.

The results of this analysis were used to report 2005 and 2010.

National Class	Volume (million cubic meters)			
	1990	2000	2005	2010
Tall indigenous forest (over bark)	n.a.	n.a.	3136	3132
Regenerating forest (over bark)	n.a.	n.a.	99	99
Shrubland (over bark)	n.a.	n.a.	80	80

Biomass stock

Data on biomass stocks were obtained from the Land Use and Carbon Analysis System (LUCAS). Biomass was assumed to be 50% carbon.

1. *Planted forest*

National Class	Biomass (million tonnes)				
	1990	2000	2005	2010	2011
Above ground live	196	311	355	400	406
Below ground	42	66	75	85	86
Dead wood	40	58	72	80	83

2. *Tall indigenous forest*

The LUCAS inventory reports all non-planted forests as ‘natural forest’. Subdivision of ‘natural forest’ biomass estimates into tall indigenous and regenerating forest was achieved using the Beets et al. (2009) analysis of the LUCAS natural forest dataset. Based on this analysis 83.5% of ‘natural forest’ biomass was assigned to tall forest, and the remaining 16.5% to the regenerating forest class.

National Class	Biomass (million tonnes)				
	1990	2000	2005	2010	2011
Above ground live	1505	1500	1498	1497	1497
Below ground	376	375	374	374	374
Dead wood	200	200	199	199	199

3. *Regenerating forest*

National Class	Biomass (million tonnes)				
	1990	2000	2005	2010	2011
Above ground live	297	296	296	296	296
Below ground	74	74	74	74	74
Dead wood	40	39	39	39	39

4. *Shrubland*

Woody vegetation that does not meet the forest land criteria is reported here as shrubland. The equivalent LUCAS and FRA categories are Grassland with Woody Biomass and Other Wooded Land.

National Class	Biomass (million tonnes)				
	1990	2000	2005	2010	2011
Above ground live	38	36	35	35	35
Below ground	10	9	9	9	9
Dead wood	7	7	7	7	7

Carbon stock

Data on carbon stocks were obtained from the Land Use and Carbon Analysis System (LUCAS). Each biomass carbon stock estimate is 50% of the equivalent biomass stock estimate.

1. Planted forest

National Class	Carbon (million tonnes)				
	1990	2000	2005	2010	2011
Above ground live	98	156	177	200	203
Below ground	21	33	38	42	43
Dead wood	20	29	36	40	42
Litter	12	15	18	19	19
Soil carbon	152	203	207	203	203

2. Tall indigenous forest

National Class	Carbon (million tonnes)				
	1990	2000	2005	2010	2011
Above ground live	752	750	749	748	748
Below ground	188	188	187	187	187
Dead wood	100	100	100	100	100
Litter	131	130	130	130	130
Soil carbon	643	633	640	640	640

3. Regenerating forest

National Class	Carbon (million tonnes)				
	1990	2000	2005	2010	2011
Above ground live	149	148	148	148	148
Below ground	37	37	37	37	37
Dead wood	20	20	20	20	20
Litter	26	26	26	26	26
Soil carbon	127	125	127	126	126

4. Shrubland

National Class	Carbon (million tonnes)				
	1990	2000	2005	2010	2011
Above ground live	19	18	18	18	17
Below ground	5	5	4	4	4
Dead wood	4	3	3	3	3
Litter	7	7	7	7	7
Soil carbon	126	115	113	112	112

3.3 Analysis and processing of national data**3.3.1 Adjustment**

Growing stock, biomass and carbon estimates were adjusted to accommodate the difference in total land area between the land use maps (LUM) (26 753 “000” ha) and the official land area for New Zealand, as reported by Land Information New Zealand (LINZ) in the New Zealand Official Yearbook 2012 (Statistics New Zealand, 2012). LINZ is the government agency responsible for measuring and providing official land area information in New Zealand. This coincides with the New Zealand data reported in FAOSTAT (26 771 “000” ha). This adjustment did not alter the figures reported in section 3.2.3.

3.3.2 Estimation and forecasting

Growing stock**1. Planted forest**

New Zealand's planted forests standing volume is reported as "under bark". A multiplying factor of 1.17 was used to produce the "over bark" figure. All the planted forest species are commercial. Approximately 85% of the total growing stock is commercial i.e. recovered merchantable volume (Goulding 2005). The proportion of broadleaved and coniferous volume is as reported in FRA2010.

National Class	Volume (million cubic meters)				
	1990	2000	2005	2010	2015
Planted forest (over bark)	338	510	581	671	746
...of which coniferous	338	503	573	661	735
...of which broadleaved	0	7	8	10	11
Commercial growing stock	288	433	494	570	634

Standing volume of planted forests was projected to 2015 using the average annual increment for the last 5 years for which data are available.

National Class	Annual increment (million cubic meters)					Average (5 years)
	2007	2008	2009	2010	2011	

Planted forest (over bark)	15	16	16	16	14	15
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2. Tall indigenous forest, regenerating forest and shrubland

New Zealand's standing volume estimates for tall indigenous forest, regenerating forest and shrubland are reported as "over bark". The proportion of stem volume contributed by broadleaved (87.7%) and coniferous (12.3%) species is taken from Beets et al. (2009).

Standing volume of tall indigenous forest, regenerating forest and shrubland was projected to 2015 as described in Section 3.2.3.

National Class	Volume (million cubic meters)				
	1990	2000	2005	2010	2015
Tall indigenous and regenerating forest (over bark)	n.a.	n.a.	3235	3231	3230
...of which coniferous	n.a.	n.a.	398	397	397
...of which broadleaved	n.a.	n.a.	2837	2834	2833
Shrubland (over bark)	n.a.	n.a.	80	80	75
...of which coniferous	n.a.	n.a.	10	10	9
...of which broadleaved	n.a.	n.a.	70	70	66

Biomass stock

1. Planted forest

Biomass stock of planted forests was projected to 2015 using the average annual increment for the last 5 years for which data are available.

National Class	Biomass (million tonnes)				
	1990	2000	2005	2010	2015
Above ground	196	311	355	400	440
Below ground	42	66	75	85	95
Dead wood	40	58	72	80	90

National Class	Annual increment (million tonnes)					Average (5 years)
	2007	2008	2009	2010	2011	
Above ground	10	10	9	7	6	8
Below ground	2	2	2	2	1	2
Dead wood	0	3	2	3	3	2

2. Tall indigenous forest

Above ground, below ground and dead wood stocks in tall indigenous forests continued their slow decline over the last 5 years for which data are available (2002 -2007). The changes however were too small to be reported here.

National Class	Biomass (million tonnes)				
	1990	2000	2005	2010	2015
Above ground	1505	1500	1498	1497	1497
Below ground	376	375	374	374	374

Dead wood	200	200	199	199	199
-----------	-----	-----	-----	-----	-----

3. *Regenerating forest*

As for tall indigenous forest.

National Class	Biomass (million tonnes)				
	1990	2000	2005	2010	2015
Above ground	297	296	296	296	296
Below ground	74	74	74	74	74
Dead wood	40	39	39	39	39

4. *Shrubland*

As for tall indigenous forest.

National Class	Biomass (million tonnes)				
	1990	2000	2005	2010	2015
Above ground	38	36	35	35	35
Below ground	10	9	9	9	9
Dead wood	7	7	7	7	7

Carbon stock

1. *Planted forest*

Carbon stock was projected to 2015 using the average annual increment for the last 5 years for which data are available.

National Class	Biomass (million tonnes)				
	1990	2000	2005	2010	2015
Above ground	98	156	177	200	220
Below ground	21	33	38	42	47
Dead wood	20	29	36	40	45
Litter	12	15	18	19	19

Soil carbon	152	203	207	203	203
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National Class	Annual increment (million tonnes)					Average (5 years)
	2007	2008	2009	2010	2011	
Above ground	5	5	5	4	3	4
Below ground	1	1	1	1	1	1
Dead wood	0	1	1	1	1	1
Litter	0	0	0	0	0	0
Soil carbon	-2	0	0	0	1	0

2. Tall indigenous forest

See Biomass stock

National Class	Biomass (million tonnes)				
	1990	2000	2005	2010	2015
Above ground	752	750	749	748	748

Below ground	188	188	187	187	187
Dead wood	100	100	100	100	100
Litter	131	130	130	130	130
Soil carbon	643	633	640	640	640

3. *Regenerating forest*

See Biomass stock.

National Class	Biomass (million tonnes)				
	1990	2000	2005	2010	2015
Above ground	149	148	148	148	148
Below ground	37	37	37	37	37
Dead wood	20	20	20	20	20
Litter	26	26	26	26	26
Soil carbon	127	125	127	126	126

4. *Shrubland*

See Biomass stock.

National Class	Biomass (million tonnes)				
	1990	2000	2005	2010	2015
Above ground	19	18	18	18	17
Below ground	5	5	4	4	4
Dead wood	4	3	3	3	3
Litter	7	7	7	7	7
Soil carbon	126	115	113	112	112

3.3.3 Reclassification

Growing, biomass and carbon stock

No reclassification was required.

3.4 Data

Table 3a

Category		Growing stock volume (million m ³ over bark)									
		Forest					Other wooded land				
		1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
	Total growing stock	3548	3741	3816	3902	3975	N/A	N/A	80	80	75
	... of which coniferous	N/A	N/A	971	1058	1131	N/A	N/A	10	10	9
	... of which broadleaved	N/A	N/A	2845	2844	2844	N/A	N/A	70	70	66

Table 3b

Category/Species name			Growing stock in forest (million cubic meters)			
Rank	Scientific name	Common name	1990	2000	2005	2010
1 st	<i>Pinus radiata</i>	Radiata pine	338	467	532	614
2 nd	<i>Nothofagus menziesii</i>	Silver beech	N/A	N/A	495	495
3 rd	<i>Nothofagus fusca</i>	Red beech	N/A	N/A	401	400
4 th	<i>Weinmannia racemosa</i>	Kamaha	N/A	N/A	285	285
5 th	<i>Nothofagus solandri</i> var. <i>cliffortioides</i>	Mountain beech	N/A	N/A	195	195
6 th	<i>Dacrydium cupressinum</i>	Rimu	N/A	N/A	136	136
7 th	<i>Beilschmiedia tawa</i>	Tawa	N/A	N/A	122	122
8 th	<i>Metrosideros umbellata</i>	Southern rata	N/A	N/A	84	84
9 th	<i>Nothofagus truncata</i>	Hard beech	N/A	N/A	81	81

10 th	Nothofagus solandri	Black beech	N/A	N/A	60	59
Remaining			N/A	N/A	1425	1431
TOTAL			338.00	467.00	3816.00	3902.00

THE PRE-FILLED VALUES FOR GROWING STOCK REFER TO THE FOLLOWING THRESHOLD VALUES (SEE TABLE BELOW)

Item	Value	Complementary information
Minimum diameter (cm) at breast height of trees included in growing stock (X)	>0, 2.5	Planted forest: all crop trees included in estimate (>0), Tall indigenous forest, regenerating forest and shrubland (2.5). In New Zealand diameter at breast height (DBH) is measured over bark at a height of 1.35 m above ground level in tall indigenous forests, regenerating forest and shrublands. Planted forest measurements are taken at 1.40m.
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	0, 0	Planted forest (0), Tall indigenous forest, regenerating forest and shrubland (0)
Minimum diameter (cm) of branches included in growing stock (W)	0, 10	Planted forest: no branches included, Tall indigenous forest, regenerating forest and shrubland (10)
Volume refers to above ground (AG) or above stump (AS)	AG, AG	Planted forest (AG), Tall indigenous forest, regenerating forest and shrubland (AG)

PLEASE NOTE THAT THE DEFINITION OF GROWING STOCK HAS CHANGED AND SHOULD BE REPORTED AS GROWING STOCK DBH 10 CM INCLUDING THE STEM FROM GROUND LEVEL UP TO A DIAMETER OF 0 CM, EXCLUDING BRANCHES.

Table 3c

Category		Net annual increment (m ³ per hectare and year)				
		Forest				
		1990	2000	2005	2010	2015
	Net annual increment	N/A	N/A	17	18	15
	... of which coniferous	N/A	N/A	17	17	14
	... of which broadleaved	N/A	N/A	0	1	1

Table 3d

Category	Biomass (million metric tonnes oven-dry weight)
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		Forest					Other wooded land				
		1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
	Above ground biomass	1998	2107	2149	2193	2233	38	36	35	35	35
	Below ground biomass	492	515	523	533	543	10	9	9	9	9
	Dead wood	280	297	310	318	328	7	7	7	7	7
TOTAL		2770.00	2919.00	2982.00	3044.00	3104.00	55.00	52.00	51.00	51.00	51.00

Table 3e

Category		Carbon (Million metric tonnes)									
		Forest					Other wooded land				
		1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
	Carbon in above ground biomass	999	1054	1074	1096	1116	19	18	18	18	17
	Carbon in below ground biomass	246	258	262	266	271	5	5	4	4	4
	<i>Subtotal Living biomass</i>	1245	1312	1336	1362	1387	24	23	22	22	21
	Carbon in dead wood	140	149	156	160	165	4	3	3	3	3
	Carbon in litter	169	171	174	175	175	7	7	7	7	7
	<i>Subtotal Dead wood and litter</i>	309	320	330	335	340	11	10	10	10	10
	Soil carbon	922	961	974	969	969	126	115	113	112	112
TOTAL		2476.00	2593.00	2640.00	2666.00	2696.00	161.00	148.00	145.00	144.00	143.00

Tiers

Variable/category	Tier for status	Tier for trend
Total growing stock	Tier 3	Tier 2

Net annual increment	Tier 3	Tier 2
Above ground biomass	Tier 3	Tier 3
Below ground biomass	Tier 3	Tier 3
Dead wood	Tier 3	Tier 3
Carbon in above-ground biomass	Tier 3	Tier 3
Carbon in below ground biomass	Tier 3	Tier 3
Carbon in dead wood and litter	Tier 3	Tier 3
Soil carbon	N/A	N/A

Tier criteria

Category	Tier for status	Tier for reported trend
Total growing stock	Tier 3: Data sources Recent 10 years National Forest Inventory or remote sensing with ground truthing or programme for repeated compatible NFI 10 years Domestic volume functions Tier 2: Data sources/registers and statistics modelling or old NFI 10 years or partial field inventory Tier 1: Other data sources	Tier 3: Estimate based on repeated compatible tiers 3 (tier for status) Domestic growth functions Tier 2: Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 tier for status Tier 1: Other
Net annual increment	Tier 3: Scientifically tested national volume and growth functions Tier 2: Selection of volume and growth functions as relevant as possible Tier 1: Other	Tier 3: Confirmation/adjustment of functions used through scientific work Tier 2: Review work done to seek alternative functions Tier: 1 Other
Biomass	Tier 3: Country-specific national or sub-national biomass conversion expansion factors applied or other domestic or otherwise nationally relevant biomass studies Tier 2: Application of country specific national or sub-national biomass conversion factors from other country with similar climatic conditions and forest types Tier 1: International/regional default biomass expansion factors applied	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other
<ul style="list-style-type: none"> Carbon in above ground biomass Carbon in below ground biomass Carbon in dead wood and litter Soil carbon 	Tier 3: Country-specific national or sub-national biomass conversion expansion factors applied Tier 2: Application of country specific national or sub-national biomass conversion factors form from other country with similar climatic conditions and forest types Tier 1: International/regional default biomass expansion factors applied	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

3.5 Comments on growing stock biomass and carbon

Category	Comments related to data definitions etc	Comments on the reported trend
Total growing stock	Growing stock estimates for tall indigenous forest, regenerating forest and shrubland are based on analysis of data from the initial (2002-07) measurement of the LUCAS natural forest and shrubland plot network (Beets et al. 2009).	Time series estimates for tall indigenous forest, regenerating forest and shrubland assume that average (per ha) stem volume remains constant over time. We expect the standing volume per ha of regenerating (and possibly tall indigenous) forest will increase over time. Confirmation of this will not be available until the remeasure of the plot network is completed in 2014.
Growing stock of broadleaved coniferous	N/A	N/A
Growing stock composition	N/A	N/A
Net annual increment	N/A	N/A
Above-ground biomass	N/A	N/A
Below-ground biomass	N/A	N/A
Dead wood	N/A	N/A
Carbon in above-ground biomass	N/A	N/A
Carbon in below-ground biomass	N/A	N/A
Carbon in dead wood	N/A	N/A
Carbon in litter	N/A	N/A
Soil carbon	National inventory currently uses IPCC default values to estimate soil carbon stocks.	Comments on data apply also to trend.

Other general comments to the table

Please note that New Zealand is unable to report growing stock for stems with DBH # 10 cm.

4. What is the status of forest production and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

4.1 Categories and definitions

Term	Definition
Primary designated function	The primary function or management objective assigned to a management unit either by legal prescription documented decision of the landowner/manager or evidence provided by documented studies of forest management practices and customary use.
Non wood forest product (NWFP)	Goods derived from forests that are tangible and physical objects of biological origin other than wood.
Commercial value of NWFP	For the purpose of this table, value is defined as the commercial market value at the forest gate.
Category	Definition
Production forest	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Multiple use forest	Forest area designated for more than one purpose and where none of these alone is considered as the predominant designated function.
Total wood removals	The total of industrial round wood removals and woodfuel removals.
...of which woodfuel	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

4.2 National data

4.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Ministry for the Environment (2012) LUCAS New Zealand Land Use Map 1990-2008. Version 11	Planted forest, tall indigenous forest area estimates.	1990 2000 2005 2010	Available from: http://koordinates.com/layer/4316-lucas-new-zealand-land-use-map-1990-2008-v011/#
2	Ministry of Forestry (1991). New Zealand Forestry Statistics 1991.	State owned indigenous forest area estimate	1990	Used to report 1990
3	Ministry of Agriculture and Forestry (2001). New Zealand Forestry Statistics 2000.	State owned indigenous forest area estimate	2000	N/A
4	Department of Conservation (2006). Land administered by the Department of Conservation.	State owned indigenous forest area estimate	2005	GIS database layer

5	Department of Conservation (2008). Land administered by the Department of Conservation.	State owned indigenous forest area estimate	2010	GIS database layer
6	Department of Conservation (2013). Land administered by the Department of Conservation.	State owned indigenous forest area estimate	2015	GIS database layer
7	Ministry for Primary Industries database on East Coast Forestry Project (accessed August 2013)	Erosion control/reducing flood risk	2000 2005 2010	N/A
8	Newsome PF, Wilde, RH, Willoughby EJ. 2000. Land Resource Information System Spatial Data Layers. Palmerston North: Landcare Research NZ Ltd.	Coastal stabilisation	1990 2000 2005 2010	IPCC soils layer for New Zealand
9	Griffiths AD (2002). Indigenous forestry on private land: present trends and future potential. MAF Technical Paper No. 01/6.	Sustainable forest management	1990 2000 2005 2010	N/A
10	Indigenous Forestry Unit, Ministry for Primary Industries: SFM plans and permits database (accessed October 2013).	Indigenous forest area under sustainable forest management	1990 2000 2005 2010	N/A
11	Queen Elizabeth II Trust. Database of land protected by QEII covenants (accessed October 2013).	Indigenous forest area protected by QEII covenants.	1990 2000 2005 2010	N/A
12	Nga Whenua Rahui database (accessed October 2013)	Indigenous forest area protected by Nga Whenua Rahui covenants.	2000 2005 2010	N/A
13	Ministry for Primary Industries Roundwood removals database (accessed October 2013)	Total wood removals	1990-2011	N/A
14	Nugent G, Buddle BM, Knowles GJE (submitted). Epidemiology and control of Mycobacterium bovis infection in brushtail possums (Trichosurus vulpecula), the primary wildlife host of bovine tuberculosis in New Zealand. New Zealand Veterinary Journal.	Wild deer meat and skins	2010	Estimate of wild deer harvest.
15	Ministry of Agriculture and Forestry 2010. Horticulture and arable monitoring report. Apiculture.	Honey production	2010	Available from: http://www.mpi.govt.nz/news-resources/publications.aspx?title=Apiculture .

4.2.2 Classification and definitions

National class	Definition
Planted forest	Forests planted in exotic tree species predominantly grown for wood or wood fibre and at least 1 ha in extent. In New Zealand approximately 90 percent of the area is planted in <i>Pinus radiata</i> . The area reported is the gross stocked forest area which generally includes mappable gaps such as roads, landings, and areas within forest boundaries that are not planted in exotic forest. Harvested areas awaiting replanting are included in the area. All forests in this class will meet or exceed 30% canopy cover and 5 metres in height at maturity.
Tall indigenous forest	Areas of naturally regenerating forest at least 1 ha in extent that are dominated by tall indigenous forest canopy species. All forests in this class exceed 30% canopy cover and 5 metres in height.
Regenerating forest	Areas of naturally regenerating woody vegetation at least 1ha in extent that will meet or exceed the indigenous forest thresholds (trees at least 5 meters in height and a canopy cover of at least 30 percent) at maturity.
N/A	N/A

4.2.3 Original data

Planted forest

The primary function of planted forests is timber production. Planted forest areas reported in Question 1 (1.3.1a) were used for this table.

National Class	Forest area (1000 hectares)				
	1990	2000	2005	2010	2011
Planted forest	1546	2052	2107	2082	2091

Planted forest areas established for (i) erosion control/reducing flood risk (East Coast Forestry Project) and (ii) stabilisation of coastal sand dunes are presented in the following table. Area estimates for (i) were sourced from the Ministry for Primary Industries database used to determine subsidy payments to land owners who are part of the East Coast Forestry Project. They differ from those reported in FRA2010.

The area of planted forest established on coastal sand dunes was obtained by intersecting the LUM (1990 – 2008) with the IPCC soils layer used for national reporting of soil carbon. LUM estimates for sand dune forests planted before 1990 remained constant between 1990 and 2008. The area of new planting (1990 – 2008) was partitioned in proportion to the national trend (Question 1.2.3).

Years	East Coast Forestry project		Coastal sand dune forests	
	Established area (000 ha)	Cumulative established area (000 ha)	Established area (000 ha)	Cumulative established area (000 ha)
1990			0	62
1991			0	62
1992			0	62
1993	2	2	1	63
1994	3	5	1	64
1995	2	7	1	64
1996	5	12	1	65
1997	4	16	1	65
1998	4	20	0	66
1999	4	23	0	66
2000	2	26	0	66
2001	1	27	0	66
2002	2	29	0	67
2003	1	30	0	67
2004	2	31	0	67
2005	0	32	0	67
2006	1	33	0	67
2007	0	33	0	67
2008	1	34	0	67
2009	1	34	n.a.	n.a.
2010	1	35	n.a.	n.a.
2011	2	38	n.a.	n.a.
2012	1	39	n.a.	n.a.

2013	2	41	n.a.	n.a.
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Tall indigenous forest

Tall indigenous forest area estimates reported in Question 1 (1.3.1.b) were used in this table. Regenerating forest is not reported here because we are unable to partition this class of forest between state and private ownership over the time series.

The primary function for most tall indigenous forests is the conservation of indigenous biodiversity. This includes almost all state-owned forests. Area estimates for state-owned forests in 1990 and 2002 are taken from New Zealand Forestry Statistics (MoF 1991; MAF 2001). More recent estimates are based on GIS analysis of Department of Conservation land area in 2006, 2008 and 2013. These are used to report forest areas for 2005, 2010 and 2015 respectively. Tall indigenous forest managed under the provisions of the Queen Elizabeth II National Trust Act (1977) and the Nga Whenua Rahui programme is used to report privately owned indigenous forest managed for the conservation of biodiversity.

The area of privately-owned forest was taken as the difference between total forest area and state-owned forest area. There is a relatively small area of these forests that is still managed for timber production. Forests used for timber production are managed under the Forest Act 1949 (Part 3A, amended 1993) which specifies provisions and procedures for the sustainable management of indigenous forests (Griffiths 2002). The Indigenous Forestry Unit (IFU) of the Ministry for Primary Industries (MPI) administers the Indigenous Forestry provisions of the Forest Act, approving plans and permits and monitoring and enforcing compliance. Forest area under Sustainable Forest Management (SFM) plans and permits was sourced from the IFU database. Privately owned tall indigenous forest for timber production after 1990 is included within ‘... for timber production under SFM’.

There is a proportion of privately owned forest for which we were not able to identify a primary function (unknown function). These forest areas could potentially be used for either SFM or conservation purposes.

National class	Forest area (1000 ha)			
	1990	2000	2005	2010
State owned tall indigenous forest	4 905	4 881	4 995	5003
...for conservation of biodiversity	4 741	4 869	4 983	4991
...for timber production	164	12	12	12
Privately owned tall indigenous forest	1966	1969	1845	1831
...for conservation of biodiversity/ covenants	1	110	144	170

...for timber production	124	0	0	0
...for timber production under SFM	0	34	98	81
...unknown function	1841	1825	1603	1580
Total	6871	6850	6840	6834

4.3 Analysis and processing of national data

4.3.1 Adjustment

Planted forest

No calibration was needed as estimates from Question 1(1.3.1a) were used.

Tall indigenous forest

No calibration was needed as estimates from Question 1(1.3.1b) were used.

4.3.2 Estimation and forecasting

Planted forests

Planted forest areas reported here are taken from Question 1 (1.3.2). The area of planted forest for timber production is taken as the difference between total planted forest area and planted forest area for protection of soil and water.

Planted forest established for (i) erosion control/reducing flood risk (East Coast Forestry Project) and (ii) stabilisation of coastal sand dunes is reported as planted forest areas for protection of soil and water. Forest area is projected to 2015 using the average rate of increase for the previous 5 years. Forest area managed primarily for timber production is calculated as the difference between planted forest area and planted forest area for the protection of soil and water. Because these forests also function to produce timber they are reported as multiple use forests (Table 4a).

Years	Cumulative established area (1000 ha)
1990	62
2000	92

2005	99
2010	102
2015	111

The estimates for planted forest functions are presented in the following table,

National class	Forest area (1000 ha)				
	1990	2000	2005	2010	2015
Planted forest areas	1546	2052	2107	2082	2087
...for timber production	1484	1960	2008	1980	1976
...for protection of soil and water	62	92	99	102	111

Tall indigenous forest

Most areas of privately owned tall indigenous forest do not have a formally designated function (unknown function). The function of these forests is reported as for conservation of biodiversity, because this is the predominant function for other tall indigenous forests. The area of privately owned tall indigenous forest for conservation of biodiversity is taken as the difference between privately owned tall indigenous forest and privately owned tall indigenous forest for timber production. Forest area used for timber production is projected to 2015 using the average rate of change for 2008-2012.

The estimates for tall indigenous forest functions are presented in the following table,

National class	Forest area (1000 ha)				
	1990	2000	2005	2010	2015
State owned tall indigenous forest	4 905	4 881	4 995	5003	5181
...for conservation of biodiversity	4741	4 869	4 983	4991	5169
...for timber production	164	12	12	12	12
Privately owned tall indigenous forest	1966	1969	1845	1831	1650

...for conservation of biodiversity	1842	1935	1747	1750	1573
...for timber production	124	34	98	81	77
Total	6871	6850	6840	6834	6831

4.3.3 Reclassification

Reporting year: 1990						
National category	FRA 2015 categories (1000 ha)					
	Production	Protection	Conservation	Social	Multiple	Total
Planted forests	1484				62	1546
Tall indigenous forests	288		6583			6871
Total	1772		6583		62	8417
Reporting year: 2000						
National category	FRA 2015 categories (1000 ha)					
	Production	Protection	Conservation	Social	Multiple	Total
Planted forests	1960				92	2052
Tall indigenous forests	46		6792			6850
Total	2018		6792		92	8902
Reporting year: 2005						
National category	FRA 2015 categories (1000 ha)					
	Production	Protection	Conservation	Social	Multiple	Total

Planted forests	2008				99	2107
Tall indigenous forests	110		6718			6840
Total	2130		6718		99	8947

Reporting year: 2010

National category	FRA 2015 categories (1000 ha)					
	Production	Protection	Conservation	Social	Multiple	Total
Planted forests	1980				102	2082
Tall indigenous forests	93		6741			6834
Total	2073		6741		102	8916

Reporting year: 2015

National category	FRA 2015 categories (1000 ha)					
	Production	Protection	Conservation	Social	Multiple	Total
Planted forests	1976				111	2087
Tall indigenous forests	89		6742			6831
Total	2065		6742		111	8918

4.4 Data

Table 4a

Categories	Forest area (000 hectares)				
	1990	2000	2005	2010	2015
 Production forest	1772	2018	2130	2073	2065

	Multiple use forest	62	92	99	102	111
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Table 4b

Rank	Name of product	Key species	Commercial value of NWFP removals 2010 (value 1000 local currency)	NWFP category
1 st	Honey	N/A	25842	11
2 nd	Wild deer meat	Cervus elephus	4050	12
3 rd	N/A	N/A	N/A	N/A
4 th	N/A	N/A	N/A	N/A
5 th	N/A	N/A	N/A	N/A
6 th	N/A	N/A	N/A	N/A
7 th	N/A	N/A	N/A	N/A
8 th	N/A	N/A	N/A	N/A
9 th	N/A	N/A	N/A	N/A
10 th	N/A	N/A	N/A	N/A
TOTAL			29892.00	

2010	
Name of local currency	New Zealand dollar

Category
Plant products / raw material
1 Food
2 Fodder
3 Raw material for medicine and aromatic products
4 Raw material for colorants and dyes
5 Raw material for utensils handicrafts construction
6 Ornamental plants
7 Exudates

8 Other plant products
Animal products / raw material
9 Living animals
10 Hides skins and trophies
11 Wild honey and beeswax
12 Wild meat
13 Raw material for medicine
14 Raw material for colorants
15 Other edible animal products
16 Other non-edible animal products

Table 4c Pre-filled data from FAOSTAT

Year	FRA 2015 category (1000 m ³ u.b.)	
	Total wood removals	...of which woodfuel
1990	13127	50
1991	13820	50
1992	14253	50
1993	14907	50
1994	15948	50
1995	16594	50
1996	16322	50
1997	16921	0
1998	15302	0
1999	17750	0
2000	19279	0
2001	20671	0
2002	22098.5	0
2003	21252.4	0

2004	19810.1	0
2005	19025.7	0
2006	19362.7	0
2007	20319.6	0
2008	19398.8	0
2009	20749.2	0
2010	24406.5	0
2011	26050.1	0

Tiers

Category	Tier for status	Tier for reported trend
Production forest	Tier 3	Tier 3
Multiple use forest	Tier 3	Tier 3

Tier Criteria

Category	Tier for status	Tier for reported trend
Production forest Multiple use forest	Tier 3: Updated including field verifications national forest maps including functions Tier 2: Forest maps older than 6 years including forest functions Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

4.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Production forest	N/A	N/A
Multiple use forest	N/A	N/A
Total wood removals	New Zealand Ministry for Primary Industries data on total wood removals have been substituted for FAOSTAT figures.	Comment on data applies also to trend
Commercial value of NWFP	All honey production in New Zealand is from managed hives. Honey production from forests and other wooded land was estimated to be 33% of the national production (Ministry for Primary Industries estimate)	N/A

Other general comments to the table
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N/A

5. How much forest area is managed for protection of soil and water and ecosystem services?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

5.1 Categories and definitions

Category	Definition
Protection of soil and water	Forest area designated or managed for protection of soil and water
...of which production of clean water (<i>sub-category</i>)	Forest area primarily designated or managed for water production, where most human uses are excluded or heavily modified to protect water quality.
...of which coastal stabilization (<i>sub-category</i>)	Forest area primarily designated or managed for coastal stabilization.
...of which desertification control (<i>sub-category</i>)	Forest area primarily designated or managed for desertification control.
...of which avalanche control (<i>sub-category</i>)	Forest area primarily designated or managed to prevent the development or impact of avalanches on human life assets or infrastructure.
...of which erosion, flood protection or reducing flood risk (<i>sub-category</i>)	Forest area primarily designated or managed for protecting communities or assets from the impacts of erosion riparian floods and landslides or for providing flood plain services.
...of which other (<i>sub-category</i>)	Forest area primarily designated or managed for other protective functions.
Ecosystem services, cultural or spiritual values	Forest area primarily designated or managed for selected ecosystem services or cultural or spiritual values.
...of which public recreation (<i>sub-category</i>)	Forest area designated or managed for public recreation.
...of which carbon storage or sequestration (<i>sub-category</i>)	Forest area designated or managed for carbon storage or sequestration.
...of which spiritual or cultural services (<i>sub-category</i>)	Forest area designated or managed for spiritual or cultural services.
...of which other (<i>sub-category</i>)	Forest area designated or managed for other ecosystem services.

5.2 National data

5.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Landcare Research NZ Ltd (2012) New Zealand Land Cover Database. Version 3.	Production of clean water	2010	Available from: http://iris.scinfo.org.nz/layer/304-lcdb-v30-land-cover-database-version-3/#

2	Ministry for the Environment (2012) LUCAS New Zealand Land Use Map 1990-2008. Version 11	Coastal stabilisation	1990 2000 2005 2010	Available from: http://koordinates.com/layer/4316-lucas-new-zealand-land-use-map-1990-2008-v011/#
3	Newsome PF, Wilde, RH, Willoughby EJ. 2000. Land Resource Information System Spatial Data Layers. Palmerston North: Landcare Research NZ Ltd.	Coastal stabilisation	1990 2000 2005 2010	IPCC soils layer for New Zealand
4	Ministry for Primary Industries: East Coast Forestry Project database (accessed August 2013)	Erosion control/reducing flood risk	2000 2005 2010	N/A
5	Landcare Research EBEX21 database (accessed September 2013).	Forest area for carbon sequestration	2002 - 2008	Available from: http://www.ebex21.co.nz/
6	Ministry for Primary Industries – Afforestation Grants Scheme, Emissions Trading Scheme, and Permanent Forest Sink Initiative databases (accessed October 2013).	Forest area for carbon sequestration	2009 - 2012	N/A

5.2.2 Classification and definitions

National class	Definition
Protection of soil and water	Includes: • Tall indigenous and regenerating forests managed primarily for the conservation of biodiversity. • Tall indigenous and regenerating forests managed primarily for the production of clean water. • Planted forests established for the stabilisation of coastal sand dunes. • Planted forests established for erosion control or reducing flood risk.
Production of clean water	Tall indigenous and regenerating forests managed by local or regional government agencies for the primary purpose of producing clean water for urban communities.
Coastal stabilisation	Radiata pine plantations mostly established by the former New Zealand Forest Service to prevent coastal sand dunes from encroaching onto farmland.
Erosion control/reducing flood risk	Government-subsidised forestry plantings on erosion-prone land in the east coast of the North Island. Plantings are mostly radiata pine (84%) but include smaller areas of exotic hardwoods and softwoods (8%) and indigenous regeneration (7%).
Carbon storage or sequestration	Forest area qualifying for tradable carbon units under an approved scheme. Within the AGS and ETS these are mostly planted forests that are managed primarily for timber production.

5.2.3 Original data

Protection of soil and water

Forests managed primarily for the conservation of biodiversity (Table 6) are included here, along with the subcategories detailed below.

Production of clean water

Catchment areas used for the supply of clean water to urban populations were intersected with LCDB3 to establish the area of forest they contained. The dataset includes all of the major metropolitan areas within the country.

National class	LCDB class	000 ha
Regenerating forest	Manuka and/or kanuka	116
Tall indigenous and regenerating forest	Broadleaved indigenous hardwoods	98
Tall indigenous forest	Indigenous forest	386
Total		600

Coastal stabilisation

The area of planted forest established on coastal sand dunes was obtained by intersecting the LUM (1990 – 2008) with the IPCC soils layer used for national reporting of soil carbon. LUM estimates for sand dune forests planted before 1990 remained constant between 1990 and 2008. The area of new planting (1990 – 2008) was partitioned in proportion to the national trend (Section 1.2.3).

Years	Established area (000 ha)	Cumulative established area (000 ha)
1990	0	62
1991	0	62
1992	0	62
1993	1	63
1994	1	64
1995	1	64

1996	1	65
1997	1	65
1998	0	66
1999	0	66
2000	0	66
2001	0	66
2002	0	67
2003	0	67
2004	0	67
2005	0	67
2006	0	67
2007	0	67
2008	0	67
Total	5	

Erosion control/reducing flood risk

Data were sourced from the Ministry for Primary Industries' database used to determine subsidy payments to land owners who are part of the East Coast Forestry Project. They differ from those reported in FRA2010.

Years	Established area (000 ha)	Cumulative established area (000 ha)
1993	2	2
1994	3	5
1995	2	7
1996	5	12
1997	4	16
1998	4	20
1999	4	23
2000	2	26

2001	1	27
2002	2	29
2003	1	30
2004	2	31
2005	0	32
2006	1	33
2007	0	33
2008	1	34
2009	1	34
2010	1	35
2011	2	38
2012	1	39
2013	2	41
Total	41	

Carbon storage or sequestration

Small areas of New Zealand forest have been managed for carbon sequestration since the early 2000s. Between 2008 and 2012 (the first commitment period for the Kyoto Protocol) the New Zealand government established three schemes to encourage forest owners to manage their forests for carbon sequestration purposes. These are the Afforestation Grants Scheme (AGS), the Permanent Forest Sinks Initiative (PFSI), and the Emissions Trading Scheme (ETS).

Data on forest area managed for carbon sequestration before 2008 were sourced from the Landcare Research EBEX21 programme. Data on the New Zealand government carbon sequestration schemes were sourced from the Ministry for Primary Industries. Forests registered with EBEX21 were transferred to the PFSI in 2009.

National class	Forest area (1000 ha)					
	2001	2002	2003	2004	2005	2006
EBEX21	0	1	1	1	1	2
Afforestation Grants Scheme	0	0	0	0	0	0

Permanent Forest Sink initiative	0	0	0	0	0	0
Emissions Trading Scheme	0	0	0	0	0	0
National class						
National class	Forest area (1000 ha)					
	2007	2008	2009	2010	2011	2012
EBEX21	3	0	0	0	0	0
Afforestation Grants Scheme	0	0	3	6	9	12
Permanent Forest Sink initiative	0	0	4	9	15	15
Emissions Trading Scheme	0	0	50	127	242	370

5.3 Analysis and processing of national data

5.3.1 Adjustment

Production of clean water

No calibration was needed for these data.

Coastal stabilisation

Forest area estimates were adjusted to accommodate the difference in total land area between the land use maps (LUM) (26 753 “000” ha) and the official land area for New Zealand (26 771 “000” ha), as reported in the New Zealand Official Yearbook 2012 (Statistics New Zealand, 2012). This coincides with the New Zealand data reported in FAOSTAT.

Erosion control/reducing flood risk

No calibration was needed for these data.

Carbon storage or sequestration

No calibration was needed for these data.

5.3.2 Estimation and forecasting

Production of clean water

We do not have time series data for this variable. There is no indication of recent or proposed changes to the catchment areas used for production of clean water. For this reason the current (2013) estimate is used to report 2010 and 2015.

Coastal stabilisation

Forest area is projected to 2015 using the average rate of increase for the previous 5 years.

Erosion control/reducing flood risk

Forest area is projected to 2015 using the average rate of increase for the previous 5 years.

Carbon storage or sequestration

The Ministry for Primary Industries forecasts a small increase (1500 ha) in forests registered with the PFSI and a decrease (10,000 ha) in forests registered with the ETS between 2013 and 2015. The Afforestation Grants Scheme closed in 2013. AGS forests will be monitored for the next 10 years to ensure their carbon sequestration function is maintained.

5.3.3 Reclassification

Not required

5.4 Data

Table 5a

Categories		Forest area (1000 hectares)				
		1990	2000	2005	2010	2015
	Protection of soil and water	6583	6792	6718	6741	6742
	... of which production of clean water	N/A	N/A	N/A	600	600
	... of which coastal stabilisation	62	64	66	67	67
	... of which desertification control	0	0	0	0	0

	... of which avalanche control	0	0	0	0	0
	... of which erosion, flood protection or reducing flood risk	0	7	32	35	44
	... of which other (please specify in comments below the table)	0	0	0	0	0

Other

N/A

Table 5b

Categories	Forest area (1000 hectares)				
	1990	2000	2005	2010	2015
Ecosystem services, cultural or spiritual values	N/A	N/A	1	142	388
...of which public recreation	N/A	N/A	N/A	N/A	N/A
...of which carbon storage or sequestration	0	0	1	142	388
...of which spiritual or cultural services	N/A	N/A	N/A	N/A	N/A
...of which other (please specify in comments below the table)	N/A	N/A	N/A	N/A	N/A

Tiers

Category	Tier for reported trend	Tier for status
Protection of soil and water	Tier 3	Tier 3
Ecosystem services, cultural or spiritual values	Tier 3	Tier 3

Tier criteria

Category	Tier for status	Tier for reported trend
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Protection of soil and water	Tier 3: High reliability data derived either from high intensity sample survey or data obtained from national or state agencies responsible for regulations or legislation relating to soil and water protection. Tier 2: Approaches based on low intensity or incomplete sample-based surveys or studies that provide data for specific areas that is extrapolated through statistical analysis to national level estimates. Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other
<ul style="list-style-type: none"> • Cultural or spiritual values • Public recreation • Spiritual or cultural services • Other 	Tier 3: High reliability data derived either from high intensity sample survey or data obtained from national or state agencies responsible for regulations. Tier 2: Approaches based on low intensity or incomplete sample-based surveys or studies that provide data for specific areas that is extrapolated through statistical analysis to national level estimates. Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

5.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Protection of soil and water	N/A	N/A
Production of clean water	Estimate covers the 15 main metropolitan areas within New Zealand.	N/A
Coastal stabilization	N/A	N/A
Desertification control	N/A	N/A
Avalanche control	N/A	N/A
Erosion, flood protection or reducing flood risk	N/A	N/A
Other protective functions	N/A	N/A
Ecosystem services, cultural or spiritual values	N/A	N/A
Public recreation	N/A	N/A
Carbon storage or sequestration	N/A	N/A
Spiritual or cultural services	N/A	N/A
Other ecosystem services	N/A	N/A

Other general comments to the table

N/A

6. How much forest area is protected and designated for the conservation of biodiversity and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

6.1 Categories and definitions

Category	Definition
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.

6.2 National data

6.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Department of Conservation (2005). The Application in New Zealand of the IUCN System of Management Categories for Protected Natural Areas. 16 p.	IUCN categories	2005 2010 2015	Report prepared by the New Zealand Department of Conservation for the New Zealand Committee of IUCN and the New Zealand Conservation Authority.
2	Department of Conservation (2006) Land administered by the Department of Conservation.	Area estimates for IUCN categories	2005	GIS database layer
3	Department of Conservation (2008) Land administered by the Department of Conservation.	Area estimates for IUCN categories	N/A	GIS database layer
4	Department of Conservation (2013) Land administered by the Department of Conservation.	Area estimates for IUCN categories	N/A	GIS database layer

6.2.2 Classification and definitions

National class	Definition
Tall indigenous forest	Areas of naturally regenerating forest greater than 1 ha in extent that are dominated by tall indigenous forest canopy species. All forests in this class exceed 30% canopy cover and 5 metres in height.

Regenerating forest	Areas of naturally regenerating woody vegetation greater than 1ha in extent that will meet or exceed the indigenous forest thresholds (trees higher than 5 metres and a canopy cover of more than 30 percent) at maturity.
Sanctuary area, Ecological area, Nature reserve, Scientific reserve	IUCN Category Ia – Strict Nature Reserve: protected area managed mainly for science
Wilderness area	IUCN Category Ib – Wilderness Area: protected area managed mainly for wilderness protection
National Park	IUCN Category II – National Park: protected area managed mainly for ecosystem protection and recreation.
Natural Monument	IUCN Category III – Natural Monument: protected area managed mainly for conservation of specific natural features.
Habitat/Species Management Area.	IUCN Category IV – Habitat/Species Management Area: protected area managed mainly for conservation through management intervention.
Protected Landscape	IUCN Category V – Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation.
Managed Resource Protected Area	IUCN Category VI – Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems

6.2.3 Original data

Forest area within protected areas (IUCN Categories I-IV)			
New Zealand protected areas are defined by national legislation. This includes the National Parks Act 1980, Reserves Act 1977, Conservation Act 1987, Queen Elizabeth the Second National Trust Act 1977, Wildlife Act 1953 and Crown Forest Assets Act 1989.			
Tall indigenous forest area estimates in Question 4 (4.3.2) were used to report Conservation of Biodiversity, and forest area estimates for IUCN protected area categories I-IV were used to report Forest Area within Protected Areas. The IUCN protected area estimates are based on GIS analysis of Department of Conservation land area in 2006, 2008 and 2013. These are used to report forest area for 2005, 2010 and 2015 respectively. Regenerating forest areas are not reported here because we are unable to provide time series data for this class of forests.			
IUCN category	Forest area (1000 ha)		
	2005	2010	2015
Category Ia	160	160	158
Category Ib	37	37	36
Category II	1 947	1 947	1966
Category III	1 424	1 444	1573
Category IV	19	19	19

Subtotal	3 587	3 607	3752
Category V	4	4	6
Category VI	n.a.	0	10
Unclassified	1 404	1 392	1413
Total	4 995	5 003	5181

6.3 Analysis and processing of national data

6.3.1 Adjustment

See Question 4 (4.3.1).

6.3.2 Estimation and forecasting

See Question 4 (4.3.2).

6.3.3 Reclassification

See Question 4 (4.3.3).

6.4 Data

Table 6

Categories		Forest area (000 hectares)				
		1990	2000	2005	2010	2015
	Conservation of biodiversity	6583	6792	6718	6741	6742
	Forest area within protected areas	N/A	N/A	3587	3607	3752

Tiers

Category	Tier for status	Tier for reported trend
Conservation of biodiversity	Tier 3	Tier 2

Forest area within protected areas	Tier 3	Tier 2
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Tier criteria

Category	Tier for status	Tier for reported trend
<ul style="list-style-type: none"> Conservation of biodiversity Forests within protected areas 	Tier 3: Data obtained from national or state agencies responsible for conservation and protected area or legislation relating to area protection. Tier 2: Studies that provide data for specific areas that is extrapolated through statistical analysis to national level estimates Tier 1 Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

6.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Conservation of biodiversity	The area of tall indigenous forest managed for the conservation of biodiversity has been obtained by subtracting the area of tall indigenous forest used for production from the total area of tall indigenous forest. Data are sourced from Question 4 (4.3.3). These forests also serve to protect soil and water values.	Comments on data apply also to trend.
Forest area within protected areas	Includes tall indigenous forest area within protected areas (IUCN categories I-IV).	Comments on data apply also to trend.

Other general comments to the table

N/A

7. What is the area of forest affected by woody invasive species?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

7.1 Categories and definitions

Category	Definition
Invasive species	Species that are non-native to a particular ecosystem and whose introduction and spread cause, or are likely to cause, socio-cultural, economic or environmental harm or harm to human health.

7.2 National data

7.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Froude, V. A. 2011. Wilding conifers in New Zealand: Status report. Unpubl. report prepared for the New Zealand Ministry of Agriculture and Forestry. 206 p.	Invasive species area	2010	Available from: http://www.wildingconifers.org.nz/files/Wilding_Conifer_Status_Report.pdf
2	Clifford V, Paul T, Pearce G 2013. Quantifying the change in high country fire hazard from wilding trees. Unpubl. report prepared by the New Zealand Forest Research Institute Ltd (trading as Scion). 65 p.	Invasive species area	2010	Available from: http://www.fire.org.nz/Research/published-reports/documents/report127_SCION_WildingTreesFireHazard.pdf
3	Davis M, Coker G, Howell C, Henley D 2011. Establishment of <i>Pseudotsuga menziesii</i> and <i>Pinus nigra</i> seedlings in <i>Kunzea ericoides</i> and <i>Leptospermum scoparium</i> shrubland communities. <i>New Zealand Journal of Ecology</i> 35: 280-286.	Invasive species area	2010	N/A
4	New Zealand Department of Conservation – Weeds database (accessed October 2013)	Invasive species extent	2010	N/A

7.2.2 Classification and definitions

National class	Definition
Invasive species extent	The area (expressed as a percentage of the total land area) over which the invasive species is present.

N/A	N/A
N/A	N/A
N/A	N/A

7.2.3 Original data

Area affected by woody invasive species

Woody invasive species are changing the character and affecting the indigenous biodiversity of a wide range of New Zealand ecosystems. Some (e.g. *Pseudotsuga menziesii*) are able to establish into existing indigenous forests (Froude 2011). Most however modify non woody (e.g. grassland, wetland) ecosystems, or alter the trajectory of forest or shrubland successions (Davis et al. 2011). Some are escapees from forestry (e.g. *Pinus contorta*, *Pseudotsuga menziesii*) or agriculture (e.g. *Ulex europaeus*). Others (e.g. *Buddleja davidii*, *Calluna vulgaris*) were originally introduced as ornamentals.

Information on the area affected by wilding conifer species was obtained from two recently completed reports (Froude 2011, Clifford et al. 2013). Information on the extent of other woody invasives was sourced from the Department of Conservation Weeds database. This records the presence/absence of weed species at a hectad (10×10 ha) scale across the main islands of New Zealand.

7.3 Analysis and processing of national data

7.3.1 Adjustment

No calibration was needed for these data.

7.3.2 Estimation and forecasting

Data and information provided relate most closely to 2010. No time series data are available.

7.3.3 Reclassification

Seven of the woody invasive species listed below are trees. The remaining three (*Buddleja davidii*, *Cytisus scoparius* and *Ulex europaeus*) are shrubs. Left alone, all are able to form the dominant canopy cover in shrubland, regenerating forest, and in the case of most of the tree species, tall forest.

7.4 Data

Table 7

Scientific name of woody invasive species	Forest area affected (000 ha)	
	2005	2010
Acer pseudoplatanus	N/A	N/A
Buddleja davidii	N/A	N/A
Cytisus scoparius	N/A	N/A
Paraserianthes lophantha	N/A	N/A
Pinus contorta	N/A	N/A
Pinus nigra	N/A	N/A
Pseudotsuga menziesii	N/A	N/A
Salix cineria	N/A	N/A
Salix fragilis	N/A	N/A
Ulex europaeus	N/A	N/A
Total	N/A	N/A

Tiers

Category	Tier for status	Tier for reported trend
Invasive species	Tier 1	Tier 1

Tier Criteria

Category	Tier for status	Tier for reported trend
Invasive species	Tier 3: Systematic assessment in forest inventory or other survey (e.g. by conservation department) within the last 5 years) Tier 2: Systematic assessment in forest inventory or other survey (e.g. by conservation department conducted more than 5 years ago) Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

7.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
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Invasive species	Answer to reviewer question. We have no species-specific data on the area of forest or other land affected by woody invasive species. The wilding conifer data are not species-specific. The information in the original data section is presence/absence at a 100 km ² scale. I wish we could have done better, but the data are just not there.	N/A
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Other general comments to the table

Acer pseudoplatanus (sycamore) – present over 29% of New Zealand. Tree to 20m. Very common in modified habitats. Invades regenerating shrubland and appears to prevent the expansion of beech (*Nothofagus*) forest. Does not invade closed canopy forest. *Buddleja davidii* – present over 23% of New Zealand. Shrub to 4m. Widespread on disturbed ground throughout. Can dominate early in successions on fresh alluvium. Where sites remain stable it is replaced by indigenous broad-leaved tree species. *Cytisus scoparius* (Scotch broom) – present over 50% of New Zealand. Shrub to 4m. Widespread, but large areas are still vulnerable to invasion and its spread continues in many areas. On sites with well developed soils, close proximity to indigenous seed sources, and an absence of fire, broom is replaced by indigenous woody species. On periodically disturbed sites it can persist for long periods as the dominant canopy species. *Paraserianthes lophantha* (brush wattle) – present over 11% of New Zealand. An aggressive shrub or small tree which invades shrubland, riverbanks and coastal sites, often forming dense stands and displacing native trees. *Pinus contorta* (Lodgepole pine) – present over 10% of New Zealand. The most aggressive naturalised conifer at medium to high altitudes in New Zealand. *Pinus nigra* (Corsican pine) – present over 5% of New Zealand. *Pseudotsuga menziesii* (Douglas fir) – present over 12% of New Zealand. Relatively shade tolerant. Able to spread into shrublands and regenerating forests. Able to establish into mature beech (especially mountain beech) forest. *Salix cineria* (grey willow) – present over 17% of New Zealand. Shrub or small tree to 7m. Often forms the dominant vegetation in swampy habitats. *Salix fragilis* (crack willow) – present over 30% of New Zealand. Tree to 25m, sometimes only a shrub. Widespread and often abundant throughout. Forms dense stands in rivers and drains and is locally abundant. *Ulex europaeus* (gorse) – present over 60% of New Zealand. Shrub to 4m. Widespread, although it has still not reached the limits of its potential range. Rapidly achieves stand dominance over more browse-susceptible native shrubs. In mild conditions on formerly forested sites and in the absence of fire, it is replaced by native broadleaved species in two to three decades. In cooler climates this process is much slower. Wilding conifers – Ten introduced conifer species (*Pinus contorta*, *P. sylvestris*, *P. mugo*, *P. nigra*, *P. ponderosa*, *P. muricata*, *P. pinaster*, *P. radiata*, *Pseudotsuga menziesii* and *Larix decidua*) are considered invasive. While most are not now planted commercially, *Pinus radiata* and *Pseudotsuga menziesii* remain the mainstay of plantation forestry in New Zealand. *Pinus contorta* and *Pseudotsuga menziesii* are the species causing most concern. Information on wilding conifer spread is not available for individual species at a national scale. A large area in the eastern South Island is affected by wilding conifers. In 2007 this was estimated to be c. 805,000ha. This included 185,000ha mapped as having a wilding cover, and 660,000ha where wildings had been controlled but in which they were still considered to be present, albeit often at very low levels. The area affected by wilding conifers in the North Island is estimated to be c. 300,000ha.

8. How much forest area is damaged each year?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

8.1 Categories and definitions

Category	Definition
Number of fires	Number of fires per year
Burned area	Area burned per year
Outbreaks of insects	A detectable reduction in forest health caused by a sudden increase in numbers of harmful insects.
Outbreaks of diseases	A detectable reduction in forest health caused by a sudden increase in numbers of harmful pathogens, such as bacteria, fungi, phytoplasma or virus.
Severe weather events	Damage caused severe weather events, such as snow, storm, drought, etc.

8.2 National data

8.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	National Rural Fire Authority (NRFA) database (accessed July 2013).	Number of fires, Total land area burned, Forest area burned	2003 to 2012	N/A
2	New Zealand Forest Research Institute (Scion) Forest Health database (accessed September 2013).	Insect and disease outbreaks	1990-2013	Data on pest and disease outbreaks are collected during nationwide new pest detection surveys.
3	New Zealand Forest Research Institute (Scion) Forest Health Reference Laboratory records (accessed September 2013).	Insect and disease outbreaks	1990-2013	Number of samples submitted provides a measure of the extent and severity of pest and disease outbreaks.
4	New Zealand Forest Research Institute (Scion) Quarantine Pest Trapping Network records (accessed September 2013).	Insect outbreaks	2008-2013	Numbers of bark beetles trapped provides a measure of pest outbreak status.
5	Bulman LS, Gadgil PD, Kershaw DJ, Ray JW. 2004. Assessment and control of Dothistroma needle-blight. Forest Research Bulletin No. 229. 48 p.	Disease outbreaks	1995-2003	N/A
6	New Zealand Dothistroma Control Committee records (accessed October 2013)	Disease outbreaks	2004- present	N/A

7	Ministry for Primary Industries: Kauri Dieback database (accessed October 2013)	Disease outbreaks	1972-present	N/A
8	Moore JR, Manley BR, Park D, Scarrott CJ 2012. Quantification of wind damage to New Zealand's planted forests. Forestry 86: 173-183.	Wind damage statistics	1945 - 2010	N/A

8.2.2 Classification and definitions

National class	Definition
Number of fires	Total number of recorded wildfires occurring across all land use classes (forest, shrubland, grassland).
Total land area burned	Area of forest, shrubland and grassland burned by wildfires each year.
Forest area burned	Area of planted forest, tall indigenous forest and regenerating forest burned by wildfires each year.
Outbreaks of insects	A reduction in forest health caused by increased numbers of harmful insects.
Outbreaks of diseases	A reduction in forest health caused by increased levels of harmful pathogens, such as bacteria, fungi, phytoplasma or virus.
Severe weather events	Damage caused severe weather events, such as snow, storm, drought, etc.

8.2.3 Original data

Fire			
Data were sourced from the National Rural Fire Authority Database. Note that the number of fires is the total number of recorded wildfires across all land use classes. We are unable to identify forest fires separately. Many fires affect multiple land use classes.			
Year	Number of fires	Total land area burned (ha)	Forest area burned (ha)
2003	4443	6928	241
2004	4585	4811	327
2005	4489	3871	373
2006	4115	4226	473

2007	4774	7484	961
2008	4620	4603	691
2009	4020	4290	1004
2010	3533	3698	740
2011	3208	1969	550
2012	3235	4146	517

Insect and disease outbreaks

Description/name	Year(s) of outbreak	Area damaged (000 hectares)
Mortality and morbidity of <i>Pinus radiata</i> caused by the bark beetle <i>Hylastes ater</i> . Estimated average area per year affected.	1990-2000	60
Mortality and morbidity of <i>Pinus radiata</i> caused by the bark beetle <i>Hylastes ater</i> . Estimated average area per year affected.	2001-2005	40
Mortality and morbidity of <i>Pinus radiata</i> caused by the bark beetle <i>Hylastes ater</i> . Estimated average area per year affected.	2006-2013	2
<i>Dothistroma septosporum</i> (needle blight), central North Island	1995	115
<i>Dothistroma septosporum</i> (needle blight), central North Island	2002	182
<i>Dothistroma septosporum</i> (needle blight), central North Island	2005	121
<i>Dothistroma septosporum</i> (needle blight), central North Island	2006	135

Red needle cast. A new disease caused by <i>Phytophthora pluvialis</i> . Discovered in 2008. Periodic outbreaks have been recorded from the East Cape of the North Island, central North Island and Northland. Area affected is an estimated average annual area.	2008-2013	40
Kauri dieback. First identified in the early 1970s. Causal agent is <i>Phytophthora</i> 'taxon Agathis' (PTA). Occurs at widely spread locations in Auckland and Northland.	1972 - 2013	1
Physiological needle blight – a disease of undetermined cause that occurs as periodic localised outbreaks in the western areas of North and South Islands, Northland and East Cape.	1996	20
Physiological needle blight	1998	25
Physiological needle blight	2002	30
Physiological needle blight	2008	20

Severe weather events

Wind, snow and landslides associated with sustained periods of heavy rain have all been recorded as damaging New Zealand forests. The majority of damage appears to be wind-related. Data on the area of planted forests damaged by wind were sourced from the New Zealand Forest Research Ltd (Scion). We have been unable to find data on damage caused to planted forests by snow or landslides, or to find equivalent data for indigenous forests.

Date	Area of forest damaged (ha)	Location of affected forests
November 1994	614	East Coast North Island
April 1996	900	Central North Island
October 2004	1138	Nelson
July 2008	1625	Nelson

February 2004	2463	Southern North Island
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8.3 Analysis and processing of national data

8.3.1 Adjustment

<p>Fire</p> <p>No calibration required</p> <p>Insect and disease outbreaks</p> <p>No calibration required</p> <p>Severe weather events</p> <p>No calibration required</p>
--

8.3.2 Estimation and forecasting

No estimation and forecasting requested for Question 8.

8.3.3 Reclassification

No reclassification required.

8.4 Data

Table 8a

Category		000 ha, number of fires									
		2003		2004		2005		2006		2007	
		000 ha	#	000 ha	#	000 ha	#	000 ha	#	000 ha	#
	Total land area burned	7	4443	5	4585	4	4489	4	4115	7	4774
	... of which forest area burned	0	N/A	0	N/A	0	N/A	0	N/A	1	N/A

Category		2008		2009		2010		2011		2012	
		000 ha	#								
	Total land area burned	5	4620	4	4020	4	3533	2	3208	4	3235
	... of which forest area burned	1	N/A								

Table 8b

Outbreak category	Description/name	Year(s) of latest outbreak	Area damaged (000 hectares)
1	Bark beetle <i>Hylastes ater</i> damage to <i>Pinus radiata</i> plantations. Estimated average area per year affected.	2006-2013	2
2	Needle blight <i>Dothistroma septosporum</i> damage to <i>Pinus radiata</i> plantations. Estimated average area per year affected.	2006	135
2	Red needle cast <i>Phytophthora pluvialis</i> damage to <i>Pinus radiata</i> plantations. Area affected is an estimated average annual area.	2008-2013	40
2	Kauri dieback <i>Phytophthora 'taxon Agathis'</i> induced mortality of the endemic conifer <i>Agathis australis</i> .	1972-2013	1
2	Physiological needle blight	2008	20
3	Wind damage to planted forests	2008	2
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Outbreak category

1 Insects

2 Diseases

3 Severe weather events

Tiers

Category	Tier for status	Tier for trend
Area affected by fire	Tier 3	Tier 3
<ul style="list-style-type: none"> Insects Diseases Severe weather events 	Tier 2	Tier 2

Tier criteria

Category	Tier for status	Tier for reported trend
Burned area	Tier 3 : National fire monitoring routines Tier 2 : Remote sensing surveys Tier 1 : Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other
<ul style="list-style-type: none"> Insects Diseases Severe weather events 	Tier 3 : Systematic survey (e.g. via inventory or aerial damage assessment) Tier 2 : Management records Tier 1 : Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

8.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Burned area	N/A	N/A
Insects	Hylastes ater is being displaced by another bark beetle, Hylurgus ligniperda. Hylurgus causes no damage to living seedlings or trees. Over recent years numbers of H. ligniperda beetles trapped have vastly outnumbered H. ater. Hylastes beetles are now only damaging small areas of planted forest in the southern South Island, and this damage will subside once Hylurgus becomes established.	The trend for Hylastes damage is downwards, and now there is very little damage over most parts of the country. No other insect damage is significant for planted forests.
Diseases	The Dothistroma needle blight data are the most reliable. They are based on an annual aerial survey of susceptible planted forests. The aerial survey is used to identify the extent and severity of Dothistroma outbreaks, and the areas for aerial spraying to control the disease. For other diseases the data are less robust, and estimates of the area affected are based on observations rather than on structured surveys. Area currently affected by kauri dieback is estimated to be < 1000 ha.	Dothistroma outbreaks are governed by weather and since 2006 there has not been the warm wet weather coupled with the high inoculum loadings needed to induce an outbreak. Disease cycles tend to occur over 4-5 years but apart from that there is little apparent trend. Red needle cast outbreaks are localised, and do not occur over a large part of the plantation forest estate. There is no apparent trend. Based on present distribution of kauri dieback, the potential affected area is estimated at between 55,000 and 100,000 ha.

Severe weather events	Severe winds damaged 5,000 ha of central North Island forests in April 1982, 11,000 ha of Canterbury forests in July 1975 and 25,700 ha of central North Island forests in March 1988.	N/A
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Other general comments to the table
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N/A

9. What is the forest area with reduced canopy cover?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

Category	Definition
Reduction in canopy cover	Forest that has undergone a reduction of canopy cover of more than 20% between the years 2000 and 2010 within the forest canopy cover range of 30-80% as detected by the MODIS VCF sensor.

Table 9

Category	Area of forest with reduced canopy cover (000 ha)
Reduction in canopy cover	72

Tiers

Category	Tier for reported trend
Reduction in canopy cover	Tier 2

Tier criteria

Category	Tier for reported trend
Reduction in canopy cover	Tier 3 : Remote sensing with ground truthing and/or Landsat imagery Tier 2 : Remote sensing using Modis (using pre-filled data provided by FAO) Tier 1 : Expert opinion

Comments

Category	Comments related to data definitions etc
Reduction in canopy cover	Intersection of the area of forest with reduced canopy cover with the New Zealand land use (LUM) and land cover (LCDB) maps shows that both planted and indigenous forest areas have undergone a reduction in canopy cover of more than 20% within the forest canopy cover range of 30-80%. Reduced cover within planted forests is explicable in terms of standard silviculture and harvesting regimes. Indigenous forest areas with reduced canopy cover are predominantly (i) small scattered areas of forest on steep erosion-prone slopes, and (ii) forest on more gentle terrain bordering farmland.

Other general comments

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10. What forest policy and regulatory framework exists to support implementation of sustainable forest management SFM?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

10.1 Categories and definitions

Category	Definition
Policies supporting sustainable forest management	Policies or strategies that explicitly encourage sustainable forest management.
Legislation and regulations supporting sustainable forest management	Legislation and regulations that govern and guide sustainable forest management, operations and use.

10.2 National data

10.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Forests Act 1949 and subsequent amendments	Policies	1949 - present	Available from: http://legislation.govt.nz
2	Indigenous Forest Policy 1990	Policies	1990 - present	Available from: http://legislation.govt.nz
3	Climate Change Response Act 2002	Policies	2002 - present	Available from: http://legislation.govt.nz
4	National Parks Act 1980	Legislation and regulations	1980 - present	Available from: http://legislation.govt.nz
5	Conservation Act 1987	Legislation and regulations	1987 - present	Available from: http://legislation.govt.nz
6	Resource Management Act 1991	Legislation and regulations	1991 - present	Available from: http://legislation.govt.nz
7	Biosecurity Act 1993	Legislation and regulations	1993 - present	Available from: http://legislation.govt.nz

10.2.2 Classification and definitions

National class	Definition
Policies supporting sustainable forest management	Policies or strategies that explicitly encourage sustainable forest management.
Legislation and regulations supporting sustainable forest management	Legislation and regulations that govern and guide sustainable forest management, operations and use.
N/A	N/A

N/A	N/A
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10.2.3 Original data

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10.3 Data

Table 10

Category	Sub-national			
	National	Sub-national		
		Regional	Provincial/State	Local
Policies supporting sustainable forest management	yes	yes	no	yes
... of which, in <u>publicly</u> owned forests	yes	yes	no	yes
... of which, in <u>privately</u> owned forests	yes	yes	no	yes
Legislation and regulations supporting sustainable forest management	yes	yes	no	yes
... of which, in <u>publicly</u> owned forests	yes	yes	no	yes
... of which, in <u>privately</u> owned forests	yes	yes	no	yes

10.4 Comments

Variable / category	Comments related to data definitions etc
Policies supporting sustainable forest management	<p>New Zealand does not have a national forest policy. A national indigenous forest policy (1990) is operative and is the basis for the Part 3A provisions of the Forests Act 1949 that controls the harvesting, milling and export of timber from privately owned indigenous forests (sustainable forest management). An amendment to this policy resulted in the cessation of all harvesting from indigenous forests on state-owned land in 2002, with the exception of 12,000 hectares which the state agreed to make available for timber production to protect privately-owned old growth indigenous forests that abut Fiordland National Park. As a result of implementing the Resource Management Act 1991, regional and local governments have policies that promote the sustainable management of natural resources, including forests. Climate change policy has resulted in the inclusion of forestry in New Zealand's Emissions Trading Scheme. This enables forest owners to benefit financially from the carbon being sequestered in their forests, and makes them liable for carbon loss when trees are harvested.</p>

<p>Legislation and regulations supporting sustainable forest management</p>	<p>The Biosecurity Act 1993 sets the framework for New Zealand’s biosecurity system. Biosecurity is critical for the sustainable management of New Zealand’s forests as the country is free of many overseas forest pests and diseases. New Zealand’s overarching legislation governing sustainable resource management is the Resource Management Act 1991. The purpose of the Act is to promote the sustainable management of natural and physical resources. It sets the framework for regional and district plans that contain policies and rules to avoid, remedy or mitigate adverse effects from the management of forests (and other resources). This is the principal legislation supporting the sustainable management of New Zealand’s plantation forests. Nearly all state-owned indigenous forest is managed under the Conservation Act 1987 or the National Parks Act 1980 by the Department of Conservation. The Conservation Act requires the management of land for conservation purposes, and the National Parks Act requires such parks to be preserved as far as possible in their natural state. The Department of Conservation develops conservation management strategies or more detailed conservation management plans in areas of high activity. Part 3A of the Forests Act 1949 requires the harvesting of timber from privately-owned indigenous forest to be under Government (Ministry for Primary Industries) approved sustainable forest management plans (minimum term of 50 years) or permits (10 year term), or other minor provisions.</p>
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Other general comments

11. Is there a national platform that promotes stakeholder participation in forest policy development?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

11.1 Categories and definitions

Category	Definition
National stakeholder platform	A recognized procedure that a broad range of stakeholders can use to provide opinions, suggestions, analysis, recommendations and other input into the development of national forest policy.

11.2 National data

11.2.1 Data sources

	References to sources of information	Years	Additional comments
1	Ministry of Agriculture and Forestry (2004). National report to the fifth session of the United Nations Forum on Forests. New Zealand. 26 p.	n.a.	Available from: www.un.org/esa/forests/pdf/national_reports/unff5/new_zealand.pdf
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A

Table 11

Is there a national platform that promotes or allows for stakeholder participation in forest policy development?	no
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11.3 Comments

Category	Comments related to data definitions etc
National stakeholder platform	There is no national forest policy and there is no platform specifically promoting stakeholder participation in the development of forest policy. The development of policy on forestry (or other resource management) issues at the national, regional and/or local levels follows procedures that provide for public/stakeholder participation. At the national level this may be through correspondence or discussion with the Minister responsible for the forestry portfolio, public submission processes and/or presentations to select committees considering the policy (and legislative) issue. Select committees are committees of Parliament. At the regional and local government levels participatory mechanisms include forums, submissions and statutory procedures that provide for submissions, hearings and judicial review of decisions.

Other general comments

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12. What is the forest area intended to be in permanent forest land use and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

12.1 Categories and definitions

Category	Definition
Forest area intended to be in permanent forest land use	Forest area that is designated or expected to be retained as forest and is highly unlikely to be converted to other land use.
...of which permanent forest estate (<i>sub-category</i>)	Forest area that is designated by law or regulation to be retained as forest and may not be converted to other land use.

12.2 National data

12.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Ministry for the Environment (2012) LUCAS New Zealand Land Use Map 1990-2008. Version 11	Tall indigenous forest area estimates.	1990 2000 2005 2010	Available from: http://koordinates.com/layer/4316-lucas-new-zealand-land-use-map-1990-2008-v011/#
2	Queen Elizabeth II Trust. Database of land protected by QEII covenants (accessed October 2013).	Tall indigenous forest area protected by QEII covenants.	1990 2000 2005 2010	N/A
3	Nga Whenua Rahui database (accessed October 2013)	Tall indigenous forest area protected by Nga Whenua Rahui covenants.	2000 2005 2010	N/A
4	N/A	N/A	N/A	N/A

12.2.2 Classification and definitions

National class	Definition
Forest area intended to be in permanent forest land use	Forest area protected by legislation and/or managed under covenants designed to protect indigenous vegetation.
...of which permanent forest estate (sub-category)	Forest area protected by legislation.
N/A	N/A
N/A	N/A

12.2.3 Original data

Area of permanent forest estate

State-owned indigenous forests managed for conservation of biodiversity and privately-owned indigenous forests managed under the provisions of the Queen Elizabeth II National Trust Act (1977) and the Nga Whenua Rahui programme are reported as forest area intended to be in permanent forest land use. State-owned indigenous forests managed for conservation of biodiversity are reported as permanent forest estate. Forest area estimates reported in Question 4 (4.2.3) were used in this table.

National class	Forest area (1000 ha)			
	1990	2000	2005	2010
Permanent forest land use	4 742	4 979	5 127	5 161
Permanent forest estate	4 741	4 869	4 983	4 991

12.3 Analysis and processing of national data

12.3.1 Adjustment

No calibration was needed as estimates from Question 4 (4.2.3) were used.

12.3.2 Estimation and forecasting

Not requested

12.3.3 Reclassification

Not required

12.4 Data

Table 12

Categories	Forest area 2010 (000 ha)
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	Forest area intended to be in permanent forest land use	5161
	... of which permanent forest estate	4991

Tiers

Category	Tier for status
Forest area intended to be in permanent forest land use	Tier 3
Permanent forest estate	Tier 3

Tier Criteria

Category	Tier for status
Forest area intended to be in permanent forest land use	Tier 3 : National or sub-national land use plans strategy documents or other reports within the past 10 years Tier 2 : National or sub-national land use plans strategy documents or other reports within the past 20 years Tier 1 : Other
Permanent forest estate	Tier 3 : National or sub-national land use plans strategy documents or other reports within the past 10 years Tier 2 : National or sub-national land use plans strategy documents or other reports within the past 20 years Tier 1 : Other

12.5 Comments

Category	Comments related to data definitions etc
Forest area intended to be in permanent forest land use	N/A
Permanent forest estate	Area (12 000 ha) of state-owned forest available for timber production excluded from this estimate.

Other general comments

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13. How does your country measure and report progress towards SFM at the national level?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

13.1 Categories and definitions

Category	Definition
Forest area monitored under a national forest monitoring framework	Forest area monitored by a national monitoring framework or systems that provide measurement based periodic monitoring of forest extent and quality.
Forest reporting at national scale	National reporting of forest extent and characteristics that includes some measure of progress toward sustainable forest management.

13.2 National data

13.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	National Exotic Forest Description (NEFD) – annual publication now produced by the Ministry for Primary Industries	Forest area monitored	1990 to present	Available from: http://www.mpi.govt.nz/
2	Ministry for the Environment (2013) New Zealand's Greenhouse Gas Inventory 1990 – 2011.	Forest area monitored	1990 to 2011	Forest inventory – Land Use and Carbon Analysis System (LUCAS). Available from: http://www.mfe.govt.nz/publications/climate/greenhouse-gas-inventory-2013/index.html
3	Ministry for the Environment (2012) LUCAS New Zealand Land Use Map 1990-2008. Version 11	Forest area monitored	1990 to 2008	Forest inventory – Land Use Maps (LUM) Available from: http://koordinates.com/layer/4316-lucas-new-zealand-land-use-map-1990-2008-v011/#
4	Ministry of Agriculture and Forestry (2000). New Zealand Land Cover Database. Version 1.	Forest area monitored	1996/97	Forest inventory – Land Cover Data Base (LCDB) version 1. Available from: http://www.lcdb.scinfo.org.nz/
5	Ministry for the Environment (2004). New Zealand Land Cover Database. Version 2.	Forest area monitored	2000/01	Forest inventory – Land Cover Data Base (LCDB) version 2. Available from: http://koordinates.com/login/?next=/layer/1072-land-cover-database-version-2-lcdb2/

6	Landcare Research NZ Ltd (2012). New Zealand Land Cover Database. Version 3.	Forest area monitored	2008	Forest inventory – Land Cover Data Base (LCDB) version 3. Available from: http://iris.scinfo.org.nz/layer/304-lcdb-v30-land-cover-database-version-3/#
7	Ministry of Agriculture and Forestry (2009). Sustainable management of New Zealand's forests.	Forest reporting	2008	The 2008 New Zealand country report on the Montreal Process criteria and indicators.

13.2.2 Classification and definitions

National class	Definition
Forest area monitored under a national forest monitoring framework	Forest area monitored by a national monitoring framework or system(s) that provide measurement based periodic monitoring of forest extent and quality.
Forest reporting at national scale	National reporting of forest extent and characteristics that includes some measure of progress toward sustainable forest management.
N/A	N/A
N/A	N/A

13.3 Data

Table 13a

Category	% of total forest area	Most recent year	Check all boxes that apply					
			Continuous	Periodic	Permanent ground plots	Temporary ground plots	Aerial/remote sensing sample based	Aerial/remote sensing full coverage
Forest inventory	100	2012	no	yes	yes	no	no	yes
Other field assessments	N/A	N/A	no	no	no	no	no	no
Updates to other sources	N/A	N/A	no	no				
Expert estimate	N/A	N/A						

Table 13b

Type of forest reporting used at national scale	Check boxes that apply
1 Criteria and Indicators reporting	yes

2 Periodic national state of the forest report	no
3 Other (please document)	no
4 None	no

Other type of forest reporting

N/A

13.4 Comments

Category	Comments
Forest area monitored under a national forest monitoring framework	The National Exotic Forest Description (NEFD) provides an annual grower-based assessment of forest extent and characteristics (species composition, stand age, silvicultural regime) for planted forests. The Land Use and Carbon Analysis System (LUCAS) network of permanent monitoring plots in indigenous forests provides a periodic (c. 5 year) assessment of forest characteristics (plant biodiversity, stand structure, biomass and carbon stocks). National plot network. Initial measurement 2002-2007. Remeasurement due for completion in 2014. The Land Use and Carbon Analysis System (LUCAS) networks of permanent monitoring plots in planted forests (pre 1990 and post-1989 forests) provide a periodic (c. 5 year) assessment of forest characteristics (stand structure, biomass and carbon stocks). National plot networks. Pre 1990 plots last measured 2010. Post 1989 plots last measured 2011/12. The Land Use Map (LUM 1990-2008) provides annual estimates of forest area. The Land Cover Data Base maps (LCDB1, 2 & 3) provide estimates of forest area for 1996/97, 2000/01 and 2008.
Forest reporting at national scale	The Montreal Process report, produced c. 5 yearly by the Ministry for Primary Industries (and its predecessor organisations) reports criteria and indicators of sustainable management for all New Zealand's forests.
N/A	N/A

Other general comments

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14. What is the area of forest under a forest management plan and how is this monitored?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

14.1 Categories and definitions

Category	Definition
Forest area with management plan	Forest area that has a long-term documented management plan, aiming at defined management goals which is periodically revised
...of which for production (<i>sub-category</i>)	Forest management plan mainly focused on production
...of which for conservation (<i>sub-category</i>)	Forest management plan mainly focused on conservation
Monitoring of forest management plans	Government monitoring of forest management plan implementation conducted through field visits or audits of forest management plan performance

14.2 National data

14.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Department of Conservation policies and plans (accessed October 2013)	Forest area with management plan for conservation	2010	Available from: http://doc.govt.nz/publications/about-doc/role/policies-and-plans/
2	Queen Elizabeth II Trust. Database of land protected by QEII covenants (accessed October 2013).	Indigenous forest area protected by QEII covenants.	1990 2000 2005 2010	N/A
3	Nga Whenua Rahui database (accessed October 2013)	Indigenous forest area protected by Nga Whenua Rahui covenants.	2000 2005 2010	N/A
4	NZ Forest Accord (1991)	Forest area with management plan for production	N/A	Available from: http://www.nzfoa.org.nz/
5	Principles for Commercial Plantation Forest Management (1995)	Forest area with management plan for production	N/A	Available from: http://www.nzfoa.org.nz/
6	Griffiths AD (2002). Indigenous forestry on private land: present trends and future potential. MAF Technical Paper No. 01/6.	Sustainable forest management plans and permits	N/A	N/A

14.3 Data

Table 14a

Forest plan type	Forest area 2010 (000 ha)
Forest area with management plan	7336
... of which for production	2175
... of which for conservation	5161

Table 14b

Indicate which (if any) of the following are required in forest management plans in your country	
1 Soil and water management	no
2 High conservation value forest delineation	no
3 Social considerations community involvement	no

Table 14c

Percent of area under forest management plan that is monitored annually	N/A

Tiers

Category	Tier for status
Forest area with management plan	Tier 2
Percent of area under forest management plan that is monitored annually	Tier 1

Tier criteria

Category	Tier for status
Forest area with management plan	Tier 3 : Reports that describe national records 5 years old or less that contain long-term forest monitoring plans Tier 2 : Industry or other records indicating the presence of a long-term forest management plan Tier 1 : Other
Percent of area under forest management plan that is monitored annually	Tier 3 : Government documentation of monitoring extent Tier 2 : Reports from forest managers or other documental sources Tier 1 : Other

14.4 Comments

Category	Comments
Forest area with management plan	Includes indigenous forest legally protected, indigenous forest in protection covenants, indigenous forests managed for timber production, and all planted forest. Data from Question 4 (4.2.3) are used to report the area of forest under management plans.

<p>... of which for production</p>	<p>The Department of Conservation has Management Strategies and Plans for all the areas under its authority, as required by the Conservation Act 1987. The purpose of these plans is to implement general policies and establish objectives for the integrated management of resources within each of its conservancies. Indigenous forest managed under the provisions of the Queen Elizabeth II National Trust Act (1977) and the Nga Whenua Rahui programme are used to report privately owned indigenous forest with management plans for conservation.</p>
<p>... of which for conservation</p>	<p>Most planted forests are managed under the NZ Forest Accord (1991) and the Principles for Commercial Plantation Forest Management (1995) that require good management practices that meet all statutory requirements, including management plans. All indigenous forest areas utilised for timber production are managed in accordance with the Forest Act (1949), and since 1993 have required sustainable forest management plans and permits (Griffiths 2002).</p>

Other general comments

15. How are stakeholders involved in the management decision making for publicly owned forests?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

15.1 Categories and definitions

Category	Definition
Stakeholder involvement	Stakeholder involvement is defined as significant inputs into at least one aspect of forest management at the operational scale

Table 15

Please indicate the type of stakeholder involvement in forest management decision making required in your country	
1. Planning phase	no
2. Operations phase	no
3. Review of operations	no

Tiers

Category	Tier for status
Type of stakeholder inputs	Tier 1

Tier criteria

Category	Tier for status
Type of stakeholder inputs	Tier 3 : Government (national or sub-national) documentation of stakeholder inputs Tier 2 : Government (national or subnational) requirement but stakeholder inputs not documented Tier 1 : Other

15.2 Comments

Category	Comments
Plantation forests	Only about 5% of the plantation forest estate is now in public ownership. For this resource there is no stakeholder involvement in management decision making at the operational level unless consent is required for a particular activity under the Resource Management Act (1991) and public submissions are provided for as part of the consent process.

<p>Indigenous forests</p>	<p>Approximately 75% of the indigenous forest estate is in public ownership and managed by the Department of Conservation. While Conservation Boards are independent bodies, established under Statute to advise on management of the public conservation estate, including the forested areas, there is no specific process for stakeholder involvement at the operational level. However partnerships with the community (the public, Maori tribal groups, non-government organisations, businesses, all levels of government) for specific projects are increasingly important. Higher level planning does provide for public input. M#ori tribal groups have an increasing involvement in the management of publically owned indigenous forests on New Zealand’s conservation estate. A range of instruments has been developed to address M#ori interests including transferring ownership of individual areas of high cultural significance, and mechanisms to involve and recognise tangata whenua (literally - people of the land) in Department of Conservation management activities.</p>
<p>N/A</p>	<p>N/A</p>

Other general comments

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16. What is the area of forest under an independently verified forest certification scheme?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

16.1 Categories and definitions

Category	Definition
FSC certification	Forest area certified under the Forest Stewardship Council certification scheme
PEFC certification	Forest area certified under the Programme for the Endorsement of Forest Certification scheme
Other international forest management certification	Forest area certified under an international forest management certification scheme with published standards and is independently verified by a third-party, excluding FSC and PEFC certification.
Certified forest area using a domestic forest management certification scheme	Area certified under a forest management certification scheme with published standards that are nationally recognized and independently verified by a thirdparty

16.2 Data

Table 16a

International forest management certification		Forest area (000 ha)						
		2000	2001	2002	2003	2004	2005	2006
	FSC	19.7	209.68	458.35	658.15	900.25	902.11	876.47
	PEFC	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0
		2007	2008	2009	2010	2011	2012	
	FSC	520.67	810.94	986.07	1071.84	1385.83	1499.47	
	PEFC	0	0	0	0	0	0	
	Other	0	0	0	0	0	0	

Table 16b

Domestic forest management certification		Forest area (000 ha)						
		2000	2001	2002	2003	2004	2005	2006
	N/A	0	0	0	0	0	0	0
	N/A	0	0	0	0	0	0	0
	N/A	0	0	0	0	0	0	0

		2007	2008	2009	2010	2011	2012	
		0	0	0	0	0	0	
		0	0	0	0	0	0	
		0	0	0	0	0	0	

Tier criteria

Category	Tier for status
International forest management certification	Tier 3: International forest management scheme records maintained by the certifying organization for the reporting year Tier 2: International forest management scheme records reported by the certifying organization for a period 2 years prior to the reporting year Tier: 1 Other
Domestic forest management certification	Tier 3: National registry reports for domestic forest management certification maintained by the certifying organization for the reporting year Tier 2: Domestic forest management scheme records reported by the certifying organization for a period 2 years prior to the reporting year Tier: 1 Other

Tiers

Category	Tier for status
International forest management certification	Tier 3
Domestic forest management certification	Tier 1

16.3 Comments

Category	Comments related to data definitions etc
Certified forest area using an international forest management certification scheme	N/A
Domestic forest management certification	New Zealand does not operate a separate domestic forest management certification scheme.

Other general comments

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17. How much money do governments collect from and spend on forests?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

17.1 Categories and definitions

Category	Definition
Forest revenue	All government revenue collected from the domestic production and trade of forest products and services. For this purpose revenue include: <ul style="list-style-type: none"> • <u>Goods</u> : roundwood; sawnwood; biomass; woodbased panels; pulp and paper and non-wood forest products. • <u>Services</u> : including concession fees and royalties, stumpage payments, public timber sales revenue taxes and charges based on forest area or yield, taxes on domestic trade and export of forest products, special levies on forestry activities and payments into forest related funds, other miscellaneous inspection, licence and administrative fees levied by forest administrations, permit and licence fees for recreation and other forest related activities.
Public expenditure on forestry	All government expenditure on forest related activities.

17.2 National data

17.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Department of Conservation (2000). Annual report for the year ended 30th June 2000.	Operational expenditure	2000	N/A
2	Ministry of Agriculture and Forestry (2000). Annual report for the year ended 30th June 2000.	Revenue/ Operational expenditure/ Transfer payments	2000	N/A
3	New Zealand Forest Research Institute Ltd (2000). Annual report for the year ended 30th June 2000.	Revenue/ Operational expenditure	2000	Trading as Forest Research.
4	Queen Elizabeth the Second National Trust (2000). Annual report for the year ended 30 June 2000.	Operational expenditure/ Transfer payments	2000	Expenditure and payments assumed to be in proportion to percentage of covenanted area that is forested (85%).
5	Landcare Research New Zealand Ltd (2000). Annual report for the year ended 30th June 2000.	Revenue/ Operational expenditure	2000	Trading as Landcare Research.
6	Department of Conservation (2005). Annual report for the year ended 30th June 2005.	Operational expenditure	2005	N/A

7	Ministry of Agriculture and Forestry (2005). Annual report for the year ended June 2005.	Revenue/ Operational expenditure/ Transfer payments	2005	N/A
8	New Zealand Forest Research Institute Ltd (2005). Annual report for the year ended 30th June 2005.	Revenue/ Operational expenditure	2005	Trading as Scion. Formerly Forest Research
9	Queen Elizabeth the Second National Trust (2005). Annual report for the year ended 30 June 2005.	Operational expenditure/ Transfer payments	2005	Expenditure and payments assumed to be in proportion to percentage of covenanted area that is forested (79%).
10	Landcare Research New Zealand Ltd (2005). Annual report for the year ended 30th June 2005.	Revenue/ Operational expenditure	2005	Trading as Landcare Research.
11	School of Forestry. University of Canterbury. Finance reports.	Revenue/ Operational expenditure	2000 2005 2010	N/A
12	Department of Conservation. Finance reports.	Revenue	2000 2005	N/A
13	Land Information New Zealand. Crown Property Management finance records.	Operational expenditure	2000 2005 2010	Expenditure related to the Crown Forest Assets Act.
14	New Zealand Trade and Enterprise finance records.	Transfer payments	2005 2010	New Zealand Trade and Enterprise (NZTE) started in 2003
15	Wood Processing Strategy Budget (2008). MAF estimate (John Eyre)	Transfer payments	2000	The Wood Processing Strategy operated between 2000 and 2003.
16	Forest Industries Development Agenda. MAF estimate (John Eyre).	Transfer payments	2005	N/A
17	Nga Whenua Rahui Fund. Department of Conservation finance records.	Transfer payments	2005	N/A
18	Crown Forestry Rental Trust finance records.	Operational expenditure	2000 2005 2010	N/A
19	Department of Conservation (2010). Annual report for the year ended 30th June 2010.	Revenue/Operational expenditure	2010	N/A
20	New Zealand Forest Research Institute Ltd (2010). Annual report for the year ended 30th June 2010.	Revenue/ Operational expenditure	2010	Trading as Scion. Formerly Forest Research
21	Landcare Research New Zealand Ltd (2010). Annual report for the year ended 30th June 2010.	Revenue/ Operational expenditure	2010	Trading as Landcare Research.

22	Queen Elizabeth the Second National Trust (2010). Annual report for the year ended 30th June 2010.	Operational expenditure/ Transfer payments	2010	Expenditure and payments assumed to be in proportion to percentage of covenanted area that is forested (79%).
23	Nga Whenua Rahui Fund. Department of Conservation (2010). Annual report for the year ended 30th June 2010.	Transfer payments	2010	N/A
24	Ministry of Agriculture and Forestry (2010). Financial records.	Revenue/ Operational expenditure/ Transfer payments	2010	N/A

17.3 Data

Table 17

Category	Revenues / expenditures (000 local currency)		
	2000	2005	2010
Forest revenue	124479	151264	204949
Public expenditure on forestry	237722	269221	332156
	2000	2005	2010
Name of Local Currency	New Zealand dollar	N/A	N/A

17.4 Comments

Category	Comments related to data definitions etc
Forest revenue	The New Zealand Forest Research Institute Ltd (trading as Scion) and Landcare Research New Zealand Ltd (trading as Landcare Research) are government-owned research companies.
Public expenditure on forestry	The Forest Industries Development Agenda (FIDA) supersedes the Wood Processing Strategy (2000 - 2003) and builds on its earlier initiatives and outcomes. New Zealand Trade and Enterprise (NZTE) works with forest industries to develop capabilities to enable better response to market opportunities. Nga Whenua Rahui is a contestable government fund established in 1991 to provide funding for the protection of indigenous ecosystems on M#ori land.
Other general comments	The data provided here covers only the core forestry institutions, and as such is likely to understate total forestry expenditure and revenue.

Other general comments

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18. Who owns and manages the forests and how has this changed?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

18.1 Categories and definitions

Category	Definition
Public ownership	Forest owned by the State or administrative units of the public administration or by institutions or corporations owned by the public administration.
...of which owned by the state at national scale (<i>sub-category</i>)	Forest owned by the State at the national scale or administrative units of the public administration or by institutions or corporations owned by the public administration.
...of which owned by the state at the sub-national government scale (<i>sub-category</i>)	Forest owned by the State at the sub-national government scale or administrative units of the public administration or by institutions or corporations owned by the public administration.
Private ownership	Forest owned by individuals, families, communities, private cooperatives corporations and other business entities, private, religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
...of which individuals (<i>sub-category</i>)	Forest owned by individuals and families.
...of which private business entities and institutions (<i>sub-category</i>)	Forest owned by private corporations cooperatives companies and other business entities as well as private nonprofit organizations such as NGOs nature conservation associations, and private religious and educational institutions etc.
...of which local tribal and indigenous communities (<i>sub-category</i>)	Forest owned by a group of individuals belonging to the same community residing within or in the vicinity of a forest area or forest owned by communities of indigenous or tribal people The community members are coowners that share exclusive rights and duties and benefits contribute to the community development.
Unknown ownership	Forest area where ownership is unknown includes areas where ownership is unclear or disputed.
Categories related to management rights of public forests	Definition
Public Administration	The Public Administration (or institutions or corporations owned by the Public Administration) retains management rights and responsibilities within the limits specified by the legislation.
Individuals households	Forest management rights and responsibilities are transferred from the Public Administration to individuals or households through long-term leases or management agreements.
Private companies	Forest management rights and responsibilities are transferred from the Public Administration to corporations, other business entities private cooperatives, private nonprofit institutions and associations, etc., through long-term leases or management agreements.
Communities	Forest management rights and responsibilities are transferred from the Public Administration to local communities (including indigenous and tribal communities) through long-term leases or management agreements.
Other form of management rights	Forests for which the transfer of management rights does not belong to any of the categories mentioned above.

18.2 National data

18.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Ministry of Forestry 1992. National Exotic Forest Description as at 1 April 1991.	Planted forest area ownership	1990	N/A
2	Ministry of Agriculture and Forestry 2001. National Exotic Forest Description as at 1 April 2000.	Planted forest area ownership	2000	N/A
3	Ministry of Agriculture and Forestry 2006a. National Exotic Forest Description as at 1 April 2005.	Planted forest area ownership	2005	N/A
4	Ministry of Agriculture and Forestry 2006b. GIS analysis of Maori Land ownership.	Planted and indigenous forest area in Maori ownership	2000	N/A
5	Ministry of Agriculture and Forestry 2011. National Exotic Forest Description as at 1 April 2010.	Planted forest area ownership	2010	N/A

18.2.2 Classification and definitions

National class	Definition
Registered public company	A company in which members of the public can invest, and which is registered on the NZ Stock Exchange.
Privately owned	Includes all privately owned forests. The legal entities included in this category are private companies, partnerships, individuals and trusts, which includes M#ori trusts and incorporations.
State owned enterprise	State owned companies or trusts
Local government	Government at the regional or district/city level
Central government	Government at the country level

18.2.3 Original data

Planted forest

Data on the ownership of planted forests were obtained from National Exotic Forest Description (NEFD) reports (Ministry of Forestry 1992; Ministry of Agriculture and Forestry 2001, 2006a, 2011). Ownership data were not available for 1990. Data from 1991 were therefore used to report 1990. NEFD records ownership data on a net stocked basis that excludes harvested areas awaiting restocking. Planted forest area owned by indigenous/tribal communities (M#ori) was available for 2000 (MAF, 2006b).

Tall indigenous forest

Data on the ownership of tall indigenous forests were sourced from Question 4 (4.2.3). Regenerating forest is not reported here because we are unable to partition this class of forest between state and private ownership over the time series. Indigenous forest area owned by indigenous/tribal communities (M#ori) was available for 2000 (MAF, 2006b).

Forests owned by state owned enterprises, local and central government are publically owned. All other forests are privately owned.

Category of Forest/ Ownership	Forest area (1000 hectares)			
	1990	2000	2005	2010
<i>Planted forest</i>				
State owned enterprise	311	45	31	10
Local government	58	55	58	52
Central government	49	48	46	60
Registered public company	500	790	437	31
Privately owned	371	831	1239	1 584
...of which owned by individuals	n.a.	n.a.	n.a.	n.a.
...of which owned by private business entities and institutions	n.a.	n.a.	n.a.	n.a.
...of which owned by local communities	n.a.	n.a.	n.a.	n.a.
...of which owned by indigenous / tribal communities	n.a.	122	n.a.	n.a.
...of which owned by other type of ownership	n.a.	n.a.	n.a.	n.a.
SUB TOTAL	1 289	1 769	1 811	1 738

<i>Tall indigenous forest</i>				
State owned	4905	4881	4995	5003
Privately owned	1966	1969	1845	1831
...of which owned by indigenous / tribal communities	n.a.	293	n.a.	n.a.
SUB TOTAL	6871	6850	6840	6834
TOTAL FORESTS	8160	8619	8651	8572

18.3 Analysis and processing of national data

18.3.1 Adjustment

Planted forest areas were adjusted on a pro-rata basis to fit the total planted forest areas in Question 1. Area estimates for tall indigenous forest were adjusted on a pro-rata basis to fit the tall indigenous + regenerating forest area reported in Question 1.

Category of Forest/ Ownership	Forestarea (1000 hectares)			
	1990	2000	2005	2010
<i>Planted forest</i>				
State owned enterprise	373	52	36	12
Local government	70	64	67	62
Central government	59	56	54	72
Registered public company	600	916	508	37
Privately owned	445	964	1442	1898
...of which owned by individuals	n.a.	n.a.	n.a.	n.a.

...of which owned by private business entities and institutions	n.a.	n.a.	n.a.	n.a.
...of which owned by local communities	n.a.	n.a.	n.a.	n.a.
...of which owned by indigenous / tribal communities	n.a.	122	n.a.	n.a.
...of which owned by other type of ownership	n.a.	n.a.	n.a.	n.a.
SUB TOTAL	1546	2052	2107	2081
<i>Indigenous forest</i>				
State owned	5791	5762	5898	5907
Privately owned	2321	2325	2178	2162
...of which owned by indigenous / tribal communities	n.a.	293	n.a.	n.a.
SUB TOTAL	8112	8087	8076	8069
TOTAL FORESTS	9658	10139	10183	10151

18.3.2 Estimation and forecasting

No estimation or forecasting was needed for these data.

18.3.3 Reclassification

Based on these data forest ownership can be summarised as follows,

Forest ownership	Forestarea (1000 ha)			
	1990	2000	2005	2010
Public ownership	5406	5053	5152	5149
Private ownership	3011	3849	3795	3766
TOTAL	8417	8902	8947	8915

18.4 Data

Table 18a

Categories		Forest area (1000 hectares)			
		1990	2000	2005	2010
	Public ownership	6293	5934	6055	6054
	... of which owned by the state at national scale	6223	5870	5988	5991
	... of which owned by the state at the sub-national government scale	70	64	67	62
	Private ownership	3366	4205	4128	4097
	... of which owned by individuals	N/A	N/A	N/A	N/A
	... of which owned by private business entities and institutions	N/A	N/A	N/A	N/A
	... of which owned by local, tribal and indigenous communities	N/A	415	N/A	N/A
	Unknown ownership	0	0	0	0
TOTAL		9659.00	10139.00	10183.00	10151.00

Tiers

Category	Tier for status	Tier for reported trend
Public ownership	Tier 3	Tier 3

Private ownership	Tier 3	Tier 3
Unknown ownership	Tier 3	Tier 3

Tier criteria

Category	Tier for status	Tier for reported trend
Ownership	Tier 3: National forestry statistics registers of land titles or maps on land ownership or all forest area under one ownership category that is five years old or less. Tier 2: National forestry statistics registers of land titles or maps on land ownership or questionnaires that are more than five years old. Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

Table 18b - Holder of management rights of public forests

Categories	Forest area (000 hectares)			
	1990	2000	2005	2010
Public Administration	6129	5922	6043	6042
Individuals	0	0	0	0
Private companies	164	12	12	12
Communities	0	0	0	0
Other	0	0	0	0
TOTAL	6293.00	5934.00	6055.00	6054.00

Category	Tier for reported trend	Tier for status
Public Administration	Tier 3	Tier 3
Individuals	Tier 3	Tier 3
Private companies	Tier 3	Tier 3
Communities	Tier 3	Tier 3
Other	Tier 3	Tier 3

18.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Public ownership	N/A	N/A

Private ownership	N/A	N/A
Unknown ownership	All land within New Zealand is formally owned.	N/A
Management rights	Private companies with management rights to public forests – these are logging concessions to state-owned forests.	In the early 2000s logging of state-owned indigenous forests ceased. The one exception was a 12,000 ha block of indigenous forest in western Southland that was made available for timber production in exchange for the protection of a block of virgin old growth forest that abuts Fiordland National Park.

Other general comments to the table

N/A

19. How many people are directly employed in forestry?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

19.1 Categories and definitions

Category	Definition
Full-time equivalents (FTE)	A measurement equal to one person working full-time during a specified reference period.
Employment in forestry	Employment in activities related to production of goods derived from forests. This category corresponds to the ISIC/NACE Rev. 4 activity A02 (Forestry and logging).

19.2 National data

19.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Ministry of Forestry (1993). New Zealand Forestry Statistics 1993.	Persons engaged	1990	Based on: New Zealand Standard Industrial Classification (NZSIC) 1987 codes.
2	Ministry of Agriculture and Forestry (2004). Employment in Forestry and Wood Processing Activities as at February 2003. (SR 15/2004)	Persons engaged	2000	Based on: Australian and New Zealand Standard Industrial Classification (ANZSIC) 1993 codes.
3	Ministry of Agriculture and Forestry (2005). Employment in Forestry and Wood Processing Activities as at February 2004. (SR 22/2005)	Employee counts	2000	Based on: ANZSIC 1993 codes.
4	Ministry of Agriculture and Forestry (2008). Employment in Forestry and Wood Processing Activities as at February 2007. (SR 02/2008)	Employee counts	2005	Based on: ANZSIC 1993 codes.
5	Ministry for Primary Industries (2013). Employment in Forestry and Wood Processing Activities as at February 2012. (SR 02/2012)	Employee counts	2000 2005 2010	Based on: ANZSIC 2006 codes.

19.2.2 Classification and definitions

National class	Definition
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Persons engaged/Full-time equivalent	Total number of full-time employees (number of persons working 30 hours or more per week plus half the number of persons working part-time). It includes working proprietors who did not pay themselves a salary or wage.
Employee count	Head-count of all salary and wage earners without differentiation of employees and working proprietors.
NZSIC 1987 (for 1990)	N/A
1210	Forestry and services to forestry
1220	Logging & other timber felling
1230	Forestry & logging management & consulting
ANZSIC 1993	N/A
A030100	Forestry: Growing standing timber both in native forests, plantations or timber tracts.
A030200	Logging: Felling trees for logs, cutting and shaping trees, or gathering other forest products.
A030300	Services to forestry: Providing services such as reforestation, afforestation, conservation or plantation maintenance on a fee or contract basis, operating nurseries, or providing fire fighting services.
ANZSIC 2006 (for 2000, 2005 and 2010)	N/A
A030100	Forestry: Growing standing timber both in native forests, plantations or timber tracts.
A030200	Logging: Felling trees for logs, cutting and shaping trees, or gathering other forest products.
A051000	Forestry support services: Providing services such as reforestation, afforestation, conservation or plantation maintenance on a fee or contract basis, operating nurseries, or providing fire fighting services.

19.2.3 Original data

The following tables present the estimates for forestry employment. These estimates are collected by Statistics New Zealand and reported periodically by the Ministry for Primary Industries.

The 1990 data are based on the number of persons engaged in the forestry industry as a full-time equivalent (FTE) measure of employees and working proprietors. In 2003, FTE was discontinued and replaced by an employee count (EC) measure in 2004. The EC measure was estimated from year 2000 to allow comparisons with previous years. Since FRA2010, ANZSIC 1993 has been updated to ANZSIC 2006. This has resulted in some changes to the categories previously reported. The 2010 values, and the updated historic values, have been included in the ANZSIC 2006 table below.

NZSIC 1987	Definition	Persons engaged
------------	------------	-----------------

		1990
1210	Forestry & services to forestry	3 342
1220	Logging & other timber felling	2 280
1230	Forestry & logging management & consulting	259
Total		5 881

ANZSIC 2006	Definition	Employee count		
		2000	2005	2010
A030100	Forestry	1 320	960	670
A030200	Logging	3 620	3 620	3 600
A030300	Forestry support services	3 130	3 130	2 120
Total		8 070	7 710	6 390

19.3 Data

Table 19

Category		Employment (000 years FTE)			
		1990	2000	2005	2010
	Employment in forestry	5.881	8.07	7.71	6.39
	... of which female	N/A	N/A	N/A	N/A

19.4 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Employment in forestry	Defined as people employed in forestry and logging, and related support services. Expressed on a full time equivalent basis.	Employment figures for 1990 (persons engaged) are not strictly comparable with 2000, 2005 and 2010 (employee count).

Other general comments to the table

Persons engaged in forestry and first stage processing is regarded as the most appropriate indicator of employment generated by the New Zealand forest industry. This includes Forestry and Logging, Log Sawmilling, Wood Chipping, Timber Resawing and Dressing, Plywood and Veneer Manufacturing, Fabricated Wood Manufacturing, and Pulp, Paper and Paperboard Manufacturing. The 1990 figure for forestry and first stage processing was 18 239, making up 1.15% of the total national labour force as at March quarter (MoF 1993). The corresponding 2000, 2005 and 2010 figures were 23 600, 23 549 and 17 588 respectively, which represented 1.23%, 1.09% and 0.76% of the total national labour force as at March quarter for the corresponding years (MPI 2013).

20. What is the contribution of forestry to Gross Domestic Product (GDP)?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

20.1 Categories and definitions

Category	Definition
Gross value added from forestry (at basic prices)	This category corresponds to the ISIC/NACE Rev. 4 activity A02 (Forestry and logging).

20.2 Data

Table 20 (Pre-filled data from UNdata/EUROSTAT)

Category	Million	Currency	Year for latest available information
Gross value added from forestry (at basic prices)	1022	New Zealand dollar	2010

20.3 Comments

Category	Comments
Gross value added from forestry (at basic prices)	Statistics New Zealand produces two measures of GDP for the forestry and logging industry. 1. GDP at constant (1995/96) prices. The estimate for the latest year (June 2013) is \$NZ1, 555 million. 2. GDP at current prices. The estimate for the latest year (March 2010) is \$NZ1, 022 million.

Other general comments

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21. What is forest area likely to be in the future

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

21.1 Categories and definitions

Category	Definition
Government target/aspiration for forest area	Government target/aspiration for forest area for a specific year.
Forests earmarked for conversion	Forest area that is allocated/classified or scheduled to be converted into non-forest uses.

21.2 National data

21.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Manley B (2013) Deforestation Survey 2012. Ministry for Primary Industries Technical Paper No. 2013/02. 16 p.	Planted forests earmarked for conversion	2008-2020	Survey of planted forest owners to determine extent of deforestation between 2008 and 2012, and forecast deforestation intentions from 2013 to 2020.
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

21.3 Data

Table 21a

Category	Forest area (000 ha)	
	2020	2030
Government target/aspiration for forest area	N/A	N/A

Table 21b

Category	Forest area (000 ha)
	2013
Forests earmarked for conversion	5

21.4 Comments

Category	Comments
Government target/aspiration for forest area	<p>Central Government does not have a specific national target for forest area in New Zealand. Government policy is that indigenous forest on public conservation land will not be harvested. The one exception to this policy is 12,000 ha of indigenous forest in western Southland that was made available for timber production in exchange for the protection of virgin old growth forest that abuts Fiordland National Park. Privately owned indigenous forests are available for harvesting under the provisions of the Forests Act. This requires harvesting of indigenous forests to have an approved Sustainable Forest Management Plan or Permit. Forest clearance is governed under the Resource Management Act which is administered by Regional and District Councils. Subject to the provisions in Council plans, small areas of indigenous forest may be able to be cleared. The provisions of the Forests Act also apply if forest is to be harvested for timber production. The East Coast Forestry Project, a regional soil erosion mitigation scheme funded by central government, has a goal of planting trees on 60,000 ha of erosion-prone land (see Question 4).</p>
Forests earmarked for conversion	<p>Planted forest areas that are being cleared are generally on land that is suitable for conversion to dairy farms.</p>

Other general comments

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