Australian Government

Department of Agriculture, Fisheries and Forestry
ABARES

Australia's forests at a glance 2012

with data to 2010–11

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Information sources

National Forest Inventory and National Plantation Inventory

The Australian Bureau of Agricultural and Resource Economics and Sciences, under the auspices of the National Forest Inventory, collects and communicates information on Australia's forests. The National Forest Inventory is an authoritative and comprehensive source of information for national and regional monitoring and reporting and for supporting decision-making on Australia's forests. It works with state, territory and private forest owners and managers to collect and collate data for national reporting on Australia's forests in publications such as *Australia's State of the Forests Report* (2008).

The National Plantation Inventory is a program of the National Forest Inventory and has been collecting data and reporting on Australia's forestry plantations since 1993. Its objective is to document the contribution that tree plantations make to communities, the economy and the environment, and the plantation resources in each region around the country. Comprehensive map-based reports are published about every five years and update reports are provided in other years.

Australian forest and wood products statistics

The Australian Bureau of Agricultural and Resource Economics and Sciences compiles and publishes quarterly forest and wood products statistics from a range of sources. Production data are from ABARES and the Australian Bureau of Statistics (ABS) surveys and datasets, state forest services and industry organisations. Data on imports and exports of wood products are from the ABS.

Australia's forests at a glance 2012

The native forest information presented in this booklet is sourced from information compiled in *Australia's State of the Forest Report* (2008).

The plantation information presented in this booklet is sourced from *Australian plantation statistics* (2011), *Australia's plantation log supply 2010–2054* (2012) and *Australian plantation statistics 2012 update* (2012).

The information on the effects of climate change in this booklet is sourced from studies reported in *Potential effects of climate change on forests and forestry in Australia* (2011).

The main source of economic information presented in this booklet is from *Australian forest and wood products statistics, September and December quarters 2011* (2012).

Australia's forests in summary

Total land area	769.2 million hectares
Total forest area	149.4 million hectares
Forest as a proportion of land area	19 per cent
Native forest area	147.4 million hectares
Forest area in nature conservation reserves	23.0 million hectares
Public native forests where timber production is permitted (gross area)	9.4 million hectares
Total carbon stored in forests	>12 billion tonnes
Plantation forest area	2.0 million hectares
Total log volume harvested	26.5 million cubic metres
Total imports of wood products	$4.4 billion
Total exports of wood products	$2.5 billion
Major wood product imports (value)	
Paper and paperboard	$2 223 million
Manufactured paper products	$557 million
Sawn wood	$473 million
Panels	$289 million

Major wood product exports (value)	
Woodchips	$884 million
Paper and paperboard	$747 million
Sawn wood	$115 million
Panels	$98 million
No. employed in Australian Bureau of Statistics categories of forestry, logging and wood manufacturing	66 000 people
Value of turnover in forest product industries (2009–10)	$22.3 billion
Forestry and forest products industries contribution to gross domestic product (2009–10)	0.6 per cent

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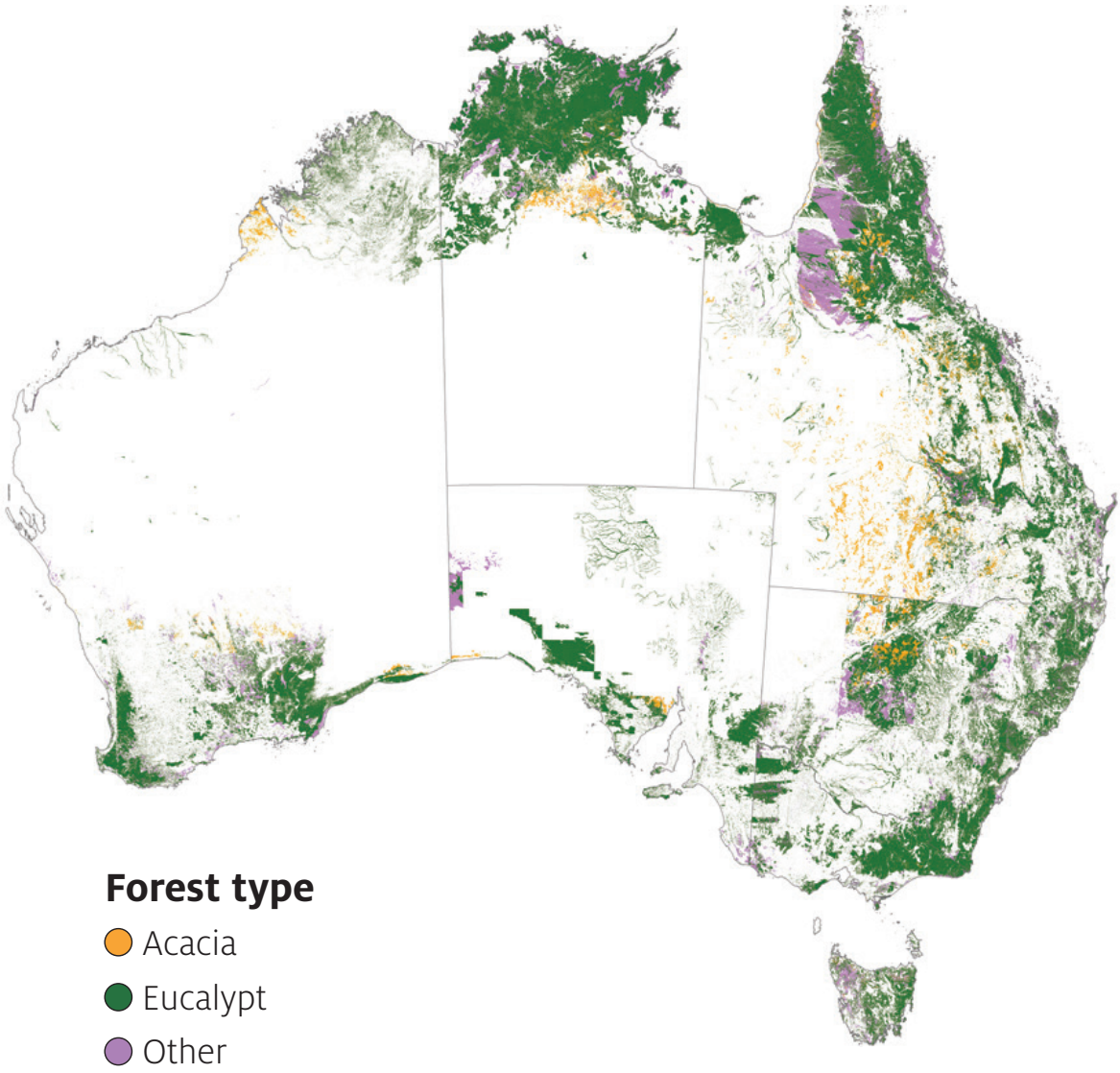
Overview

Forest area

A forest is an area, incorporating all living and non-living components, that is dominated by trees having usually a single stem and a mature or potentially mature stand height exceeding 2 metres and with existing or potential crown cover of overstorey strata equal to or greater than 20 per cent. This includes Australia's diverse native forests and plantations, regardless of age, and encompasses areas of trees that are sometimes described as woodlands.

Australia has 147.4 million hectares of native forest and 2.0 million hectares of forestry plantations. Together these cover about 19 per cent of the continent. Australia has about 4 per cent of the world's forests on 5 per cent of the world's land area.

Australia's forests



Considerable native vegetation, including forest, has been removed in the past 200 years to make way for crops and pastures. The area of tall open eucalypt forests remaining is 86.6 per cent of the original extent.

Estimated change in Australia's native vegetation extent, pre-European settlement to present

Major native vegetation group	Proportion remaining (%)
Acacia forests and woodlands	82.5
Callitris forests and woodlands	80.2
Casuarina forests and woodlands	89.7
Eucalypt low woodlands	73.2
Eucalypt tall open forests	86.6
Mallee woodlands and shrublands	70.2
Other shrublands	78.3
Rainforests and vine thickets	65.3
Total of above vegetation groups	75.2
Total of all vegetation groups **a**	87.5

a Includes major vegetation groups not listed above, such as hummock grasslands and Acacia shrublands.

Types and class of forest

Forests are categorised nationally by forest type (dominant genus) and by height and crown cover class (forest structure).

Australia's native forest types are dominated by eucalypts (78 per cent), acacias (7 per cent) and melaleucas (5 per cent). About half of Australia's plantations are exotic conifers (predominantly *Pinus radiata*); the other half is mostly native broadleaved species.

The primary determinants of forest type and class distribution are climate and soil properties followed by fire frequency and intensity.

Did you know?

Australia's native forest is 98 per cent broadleaved; the area of native conifers is small.

Area, by forest type

Forest type	Area ('000 ha)
Native forests a	
Acacia	10 365
Callitris	2 597
Casuarina	2 229
Eucalypt	116 449
Mangrove	980
Melaleuca	7 556
Rainforest	3 280
Other forest	3 942
Total native forest	147 397
Plantation b	
Broadleaved	980
Coniferous	1 025
Unknown	12
Total plantation	2 017
Total forest	149 414

a 2008 area. **b** 2010–11 area.
Note: Values are rounded.

Forest crown cover

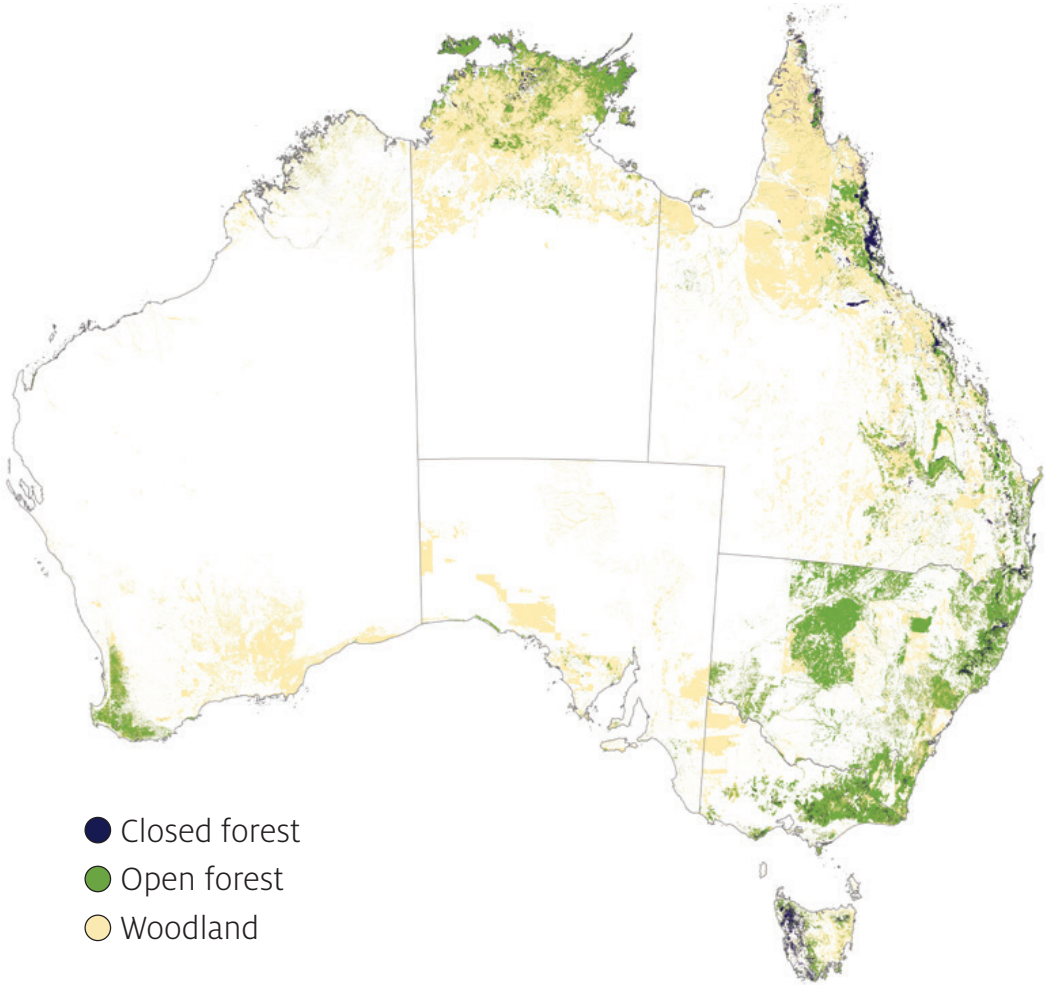
Crown cover is the percentage of ground covered by the canopy of trees, defined by the vertical projection of their outer edge irrespective of small openings in the canopy. The National Forest Inventory uses three national crown cover classes.

Native forest areas, by crown cover class

Crown cover class	Total ('000 ha)
Woodland (20–50% crown cover)	99 007
Open forest (51–80% crown cover)	44 120
Closed forest (81–100% crown cover)	4 270
Total native forest	147 397

Note: Values are rounded.

Native forests, by crown cover class



Forest height

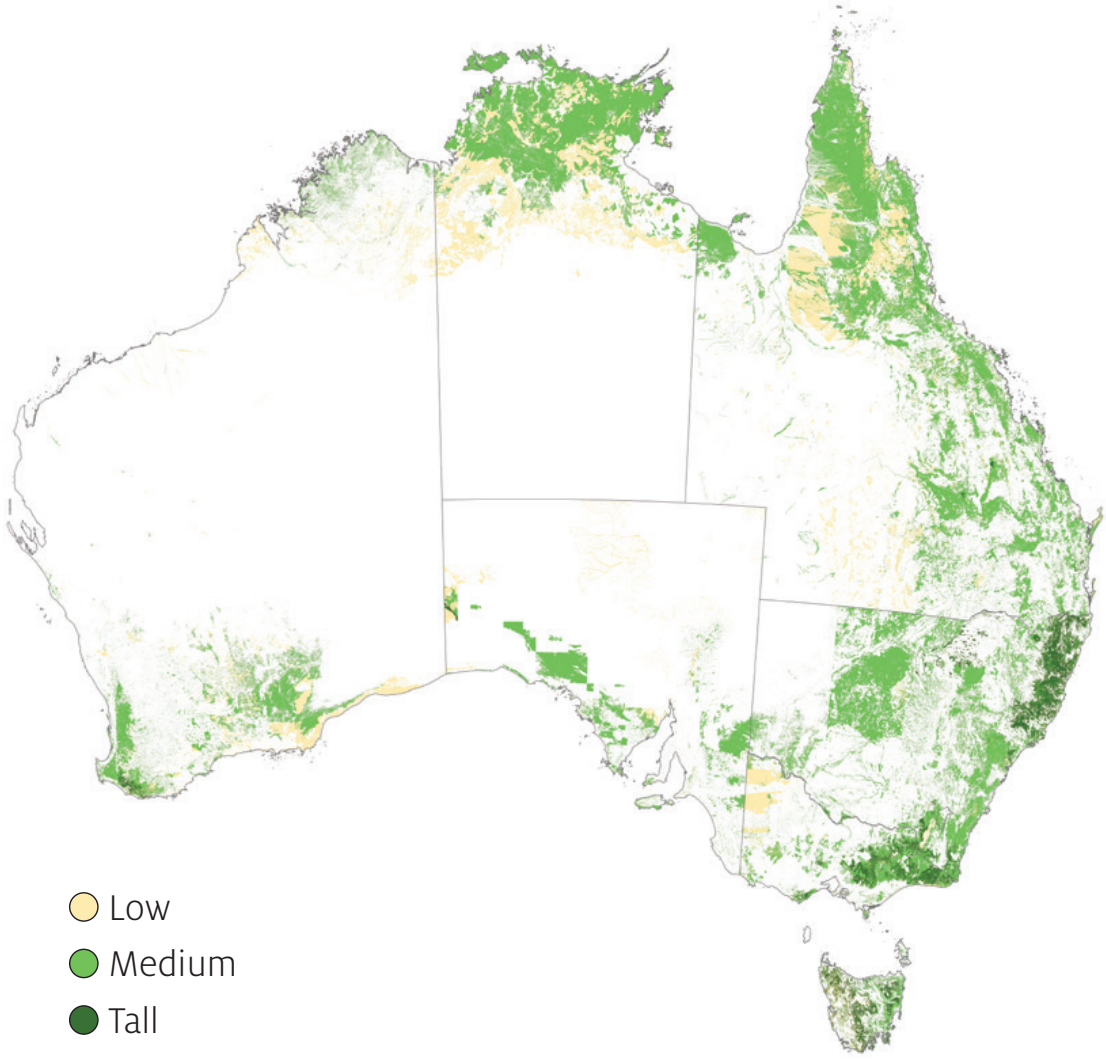
Forests are mapped into three national height classes based on potential mature stand height.

Native forest area, by height class

Height class	Total ('000 ha)
Low (2–10 metres)	35 846
Medium (10–30 metres)	104 024
Tall (>30 metres)	7 329
Unknown	199
Total native forest	147 397

Note: Values are rounded.

Australia's forest, by height class

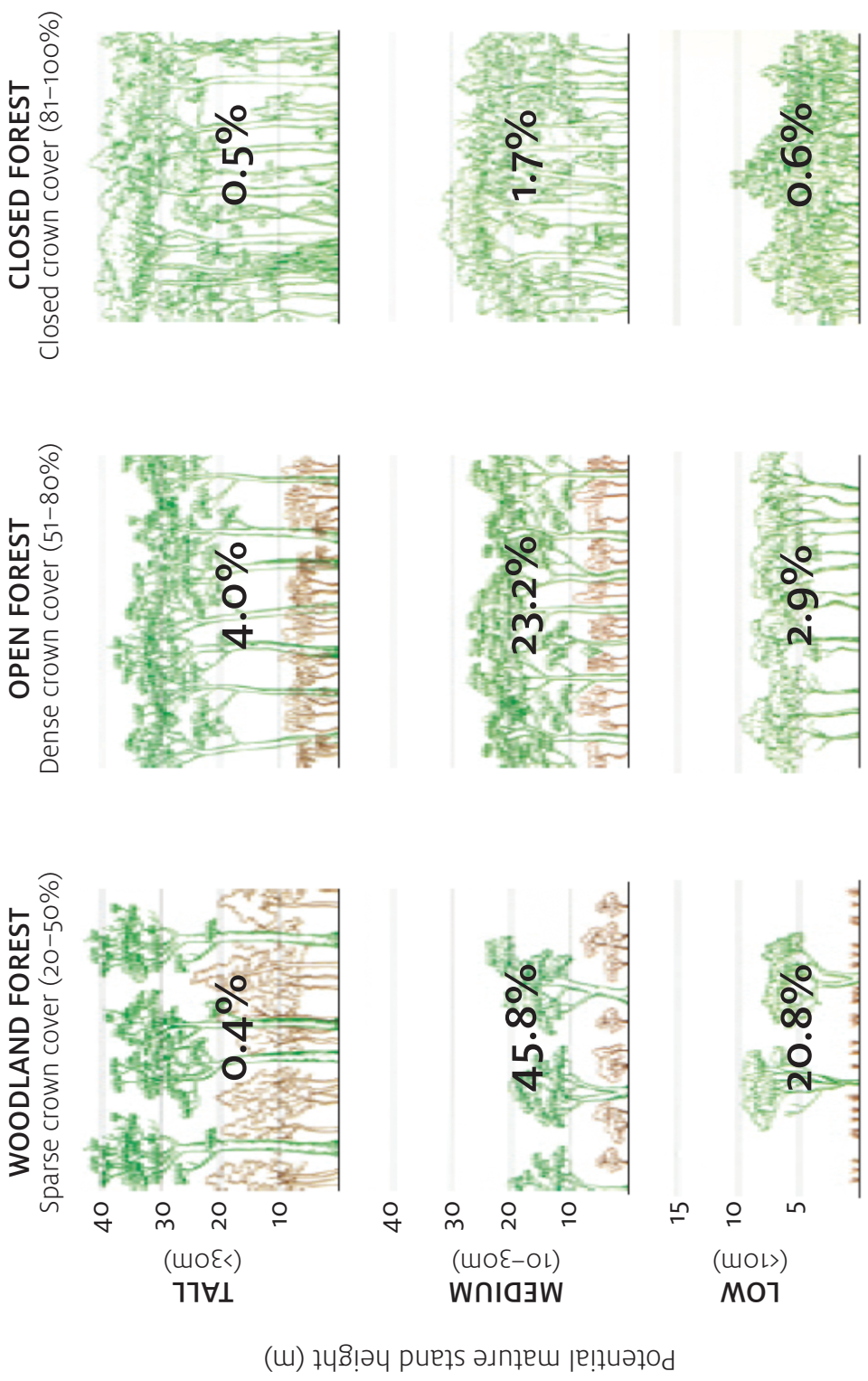


Native forest by crown cover and height class

Did you know?

Nearly 46 per cent of Australia's forest is medium height woodland forest and less than 1 per cent is tall closed forest.

Proportion of Australia's forest extent in each class



Source: Australian Land Information Group & JA Carnahan 1990, *Atlas of Australian Resources, Vegetation*, Australian Government Publishing Service, Canberra. Percentages are from the National Forest Inventory.

Old-growth forests

Old-growth forests are ecologically mature forests where the effects of past disturbances are now negligible. They were surveyed where assessments were conducted for regional forest agreements more than a decade ago. No comprehensive survey of old-growth forests has been conducted across the rest of Australia. Old-growth forests in Western Australia were remapped in 2007.

In regional forest agreement regions:

- more than 5 million hectares of forest, or 22 per cent, were classified as old-growth
- 73 per cent of these known old-growth forests are in conservation reserves; some of the remainder are available for timber production.

Did you know?

79 per cent of Tasmania's identified old-growth forests are in nature conservation reserves.

Area of old-growth forest in areas surveyed for regional forest agreements

Jurisdiction	Native forest in region ('000 ha)	Area of old-growth identified ('000 ha)	Area of old-growth in reserves **a** ('000 ha)	Proportion in reserves (%)
NSW **b**	8 989	2 536	1 742	69
Vic. **c**	5 774	673	460	68
Qld **b**	3 230	270	196	73
WA **d**	1 909	331	331	100
Tas.	3 116	1 229	973	79
Total	23 018	5 039	3 702	73**e**

a Includes nature conservation reserves and formal and informal reserves on other tenures. **b** Area surveyed in Queensland did not result in establishment of a regional forest agreement. New reserves have been established in New South Wales and Queensland since this information was prepared. The area of old-growth in reserves is therefore an underestimate. **c** The area of old-growth forest in Victoria was reduced as a result of conversion to regrowth by fires, predominantly in 2003. **d** Data from original regional forest agreement old-growth mapping. **e** Proportion of total area for the five states listed.

Note: Old-growth forest has not been assessed in the Australian Capital Territory, Northern Territory or South Australia.

Native forest tenure and ownership

Tenure is important in forest management. The owner of the land (and in most cases the forest) has primary responsibility for its management. Six tenure categories are recognised.

Multiple-use public forests—Crown lands managed for a range of values including timber harvesting, water supply, conservation, recreation and environmental protection. Significant proportions of multiple-use forests are informal reserves where timber harvesting is not permitted.

Nature conservation reserves—Crown lands formally reserved for environmental, conservation and recreational purposes.

Forest on 'other Crown land'—Crown lands held for a variety of purposes.

Private forests—forests on privately owned land.

Leasehold forest—forest on privately managed leased Crown land generally used for grazing.

Unresolved tenure—forest for which ownership status has not been determined.

Each tenure category (except multiple-use public forests) contains native forests managed by Indigenous communities.

Did you know?

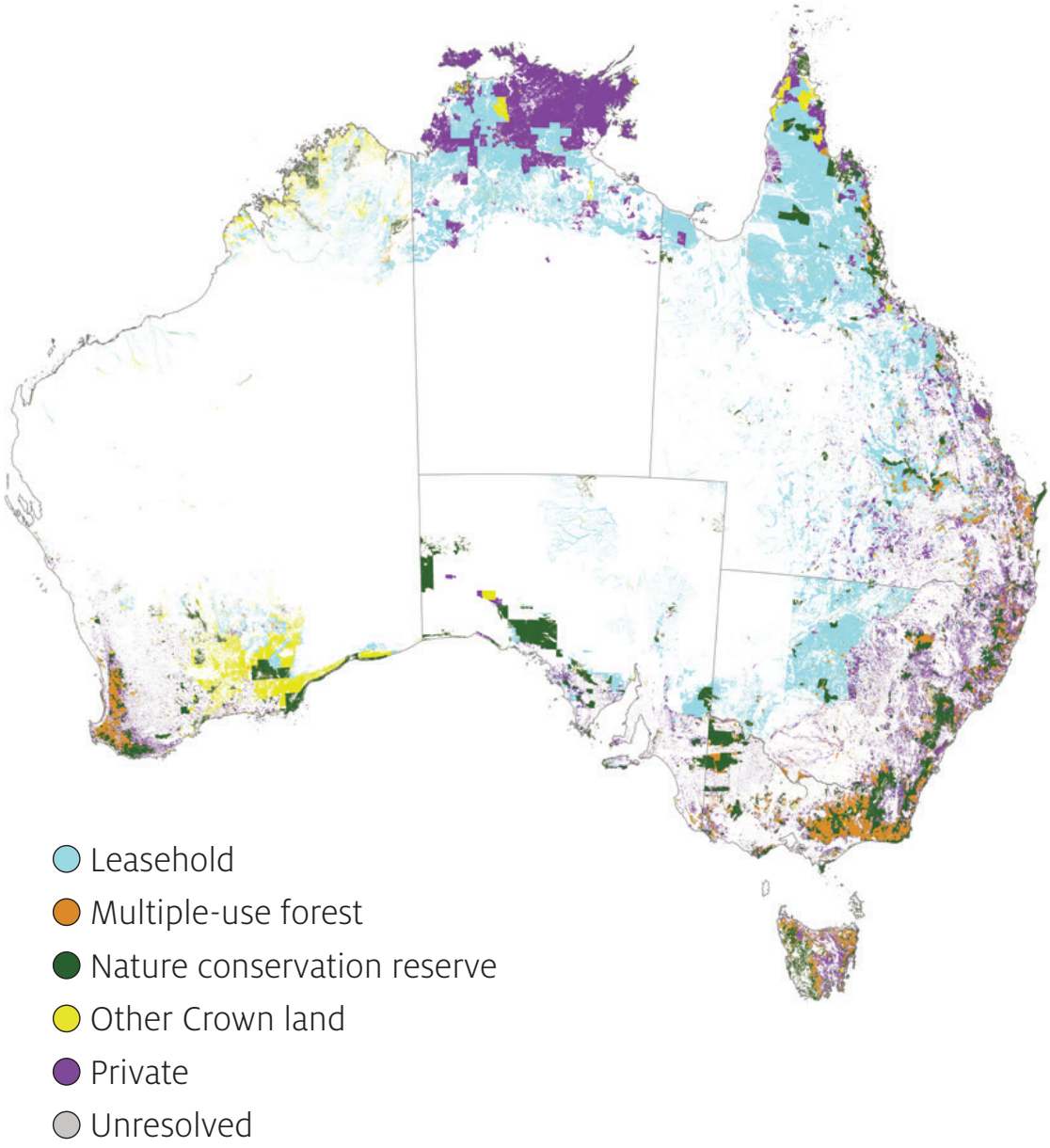
About 70 per cent of Australia's forest is on privately managed land—26 per cent on land with freehold private title or managed by Indigenous communities and a further 44 per cent on leasehold land where the predominant land use is grazing.

Native forest area, by tenure category

Tenure	Area ('000 ha)	Proportion of total (%)
Multiple-use public forest	9 410	6
Nature conservation reserve	22 371	15
Other Crown land	10 862	7
Private forest	38 099	26
Leasehold forest	65 132	44
Unresolved tenure	1 524	1
Total native forest	147 397	100

Note: Data supplied by the states and territories. The 22.4 million hectares of formal nature conservation reserve (IUCN categories I-IV) are derived from the Collaborative Australian Protected Area Database. This database includes additional reserved lands found in 'Other Crown land' and 'Private land' categories. Values are rounded.

Australia's forest cover, by tenure



Forests in reserves

Governments have developed regional forest agreements for most of the main native forest timber production areas. Regional forest agreements are 20-year plans for conserving and sustainably managing forests. They provide a comprehensive, adequate and representative nature conservation reserve system. The aim of the system is to reserve at least 15 per cent of the pre-1750 distribution of each forest type, 60 per cent of the existing distribution of each forest type if vulnerable, 60 per cent of existing old-growth forest, 90 per cent or more of high-quality wilderness forests, and all remaining rare and endangered forest ecosystems.

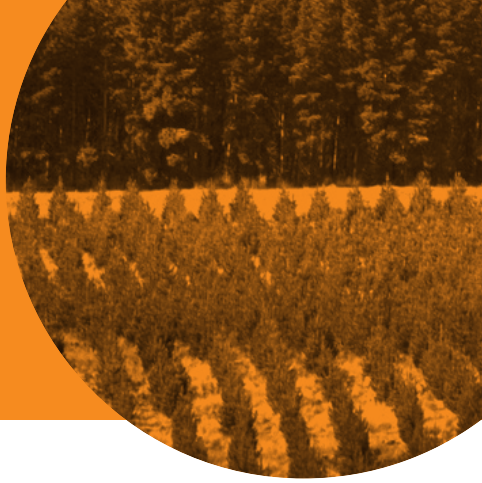
In 2008, 23 million hectares (15 per cent) of Australia's forests were in dedicated formal conservation reserves (reserved in International Union for Conservation of Nature reserve categories I–IV).

Additional forests are conserved within leasehold land, multiple-use forest and private land (through covenants or other management arrangements). Codes of forest practice and other regulatory mechanisms also require conservation of forest biodiversity and protection of other values, such as water quality.

Did you know?

The proportion of Australia's forests in nature conservation reserves recognised by the International Union for Conservation of Nature increased from 11 per cent in 1998 to 15 per cent in 2008.

Plantation forests



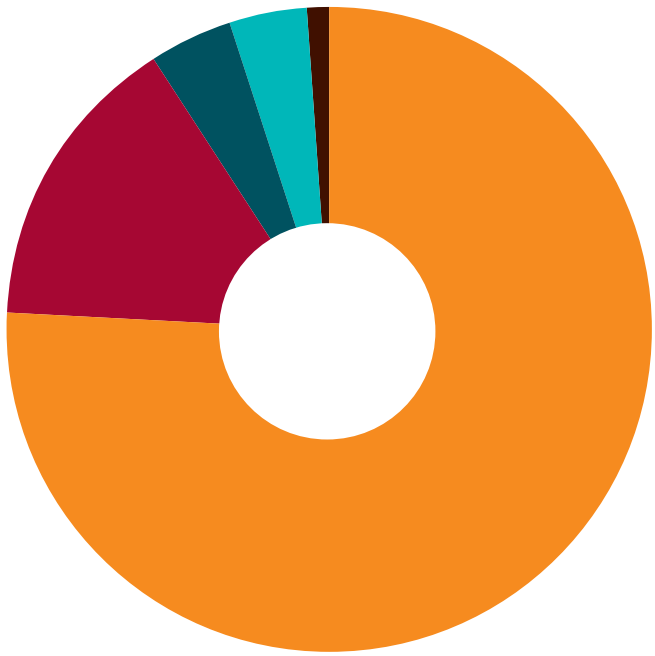
Plantations are intensively managed stands of native or exotic tree species created by regular placement of seeds or seedlings.

The primary purpose of plantation forestry is wood production. Plantations also contribute to a range of environmental values and services including water quality improvement, dryland salinity mitigation, biofuels, carbon sequestration and habitat for native plants and animals.

The two species groupings of plantations are:

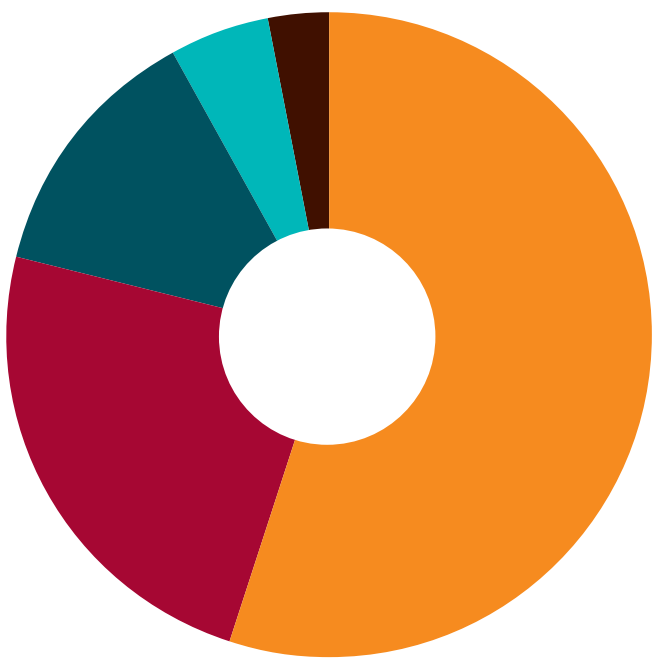
- coniferous—mainly pine species exotic to Australia
- broadleaved—mainly species native to Australia, including eucalypts.

Coniferous plantations



Radiata pine	76%
Southern pines	15%
Maritime pine	4%
Hoop pine	4%
Other coniferous	1%

Broadleaved plantations



Blue gum	55%
Shining gum	24%
Other eucalypts	13%
Other broadleaved	5%
Blackbutt and flooded gum	3%

Plantation forests

Plantation establishment began in Australia in the 1870s. By 1960 about 200 000 hectares had been established, more than 90 per cent of it introduced pines.

From the 1960s to the 1980s, stimulated by government investment, the area of pine plantations increased rapidly. By 1990 the total area was a little over 1 million hectares.

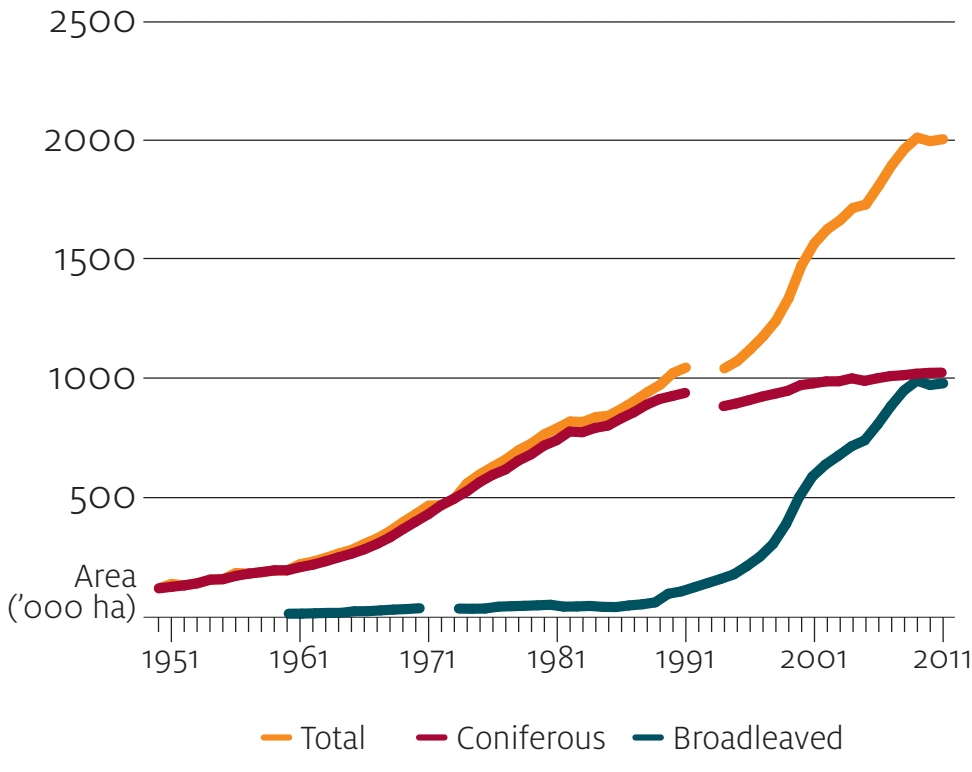
After 1990 the area of broadleaved plantations began to increase rapidly, financed by private investment through managed investment schemes, and the rate of new pine plantation establishment slowed. In some regions the coniferous area declined as harvested pine areas were replanted with broadleaved species or the land was put to other purposes. Most new plantations were eucalypts established on farmland and managed to produce woodchips for paper manufacture on 10 to 15-year rotations. A small proportion is managed for sawlog production.

Investment in plantation establishment has slowed significantly since 2007. Managed investment schemes, which funded most investment in new plantations between 1997 and 2007, funded only 26 per cent of new plantations in 2010–11. Only around 9600 hectares of new plantations were established in 2010–11.

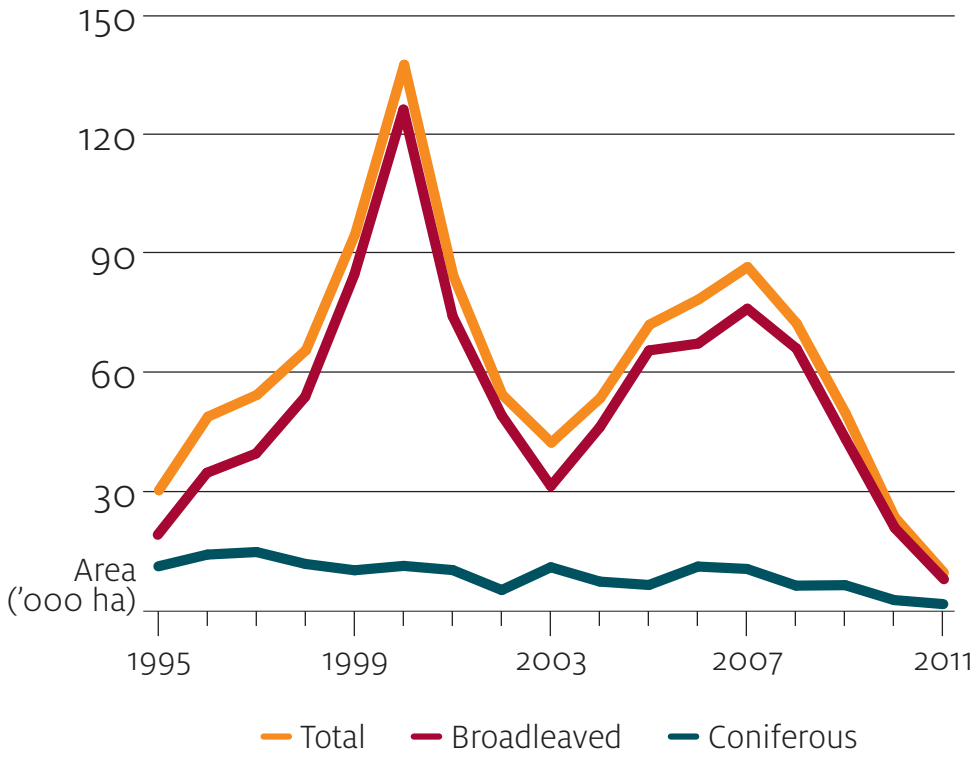
Plantation expansion

Plantation owners and managers expect marginal expansion of their net planted estates from 2010–11. Proposed new plantations may stabilise Australia's plantation estate at the current level of around 2 million hectares. In 2008–09, the total plantation area decreased for the first time since 1993, when the National Plantation Inventory started reporting on national plantation areas. The rate of new planting has declined since 2006–07, reaching their lowest level since 1995 in 2010–11.

Cumulative plantation area, by species group



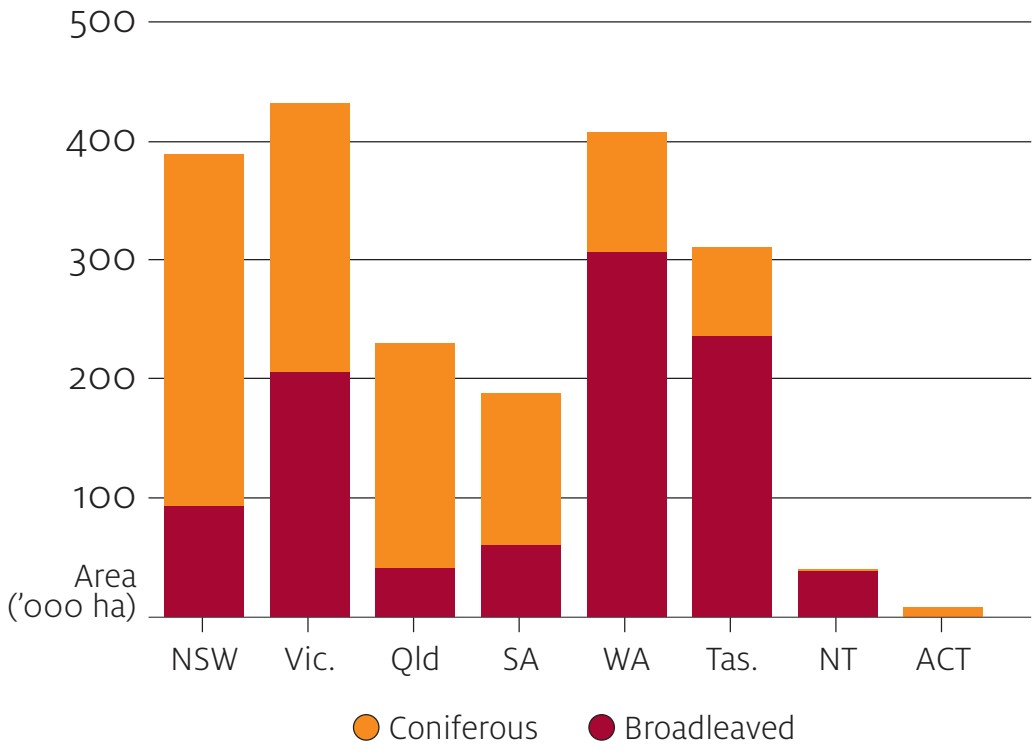
New areas of plantation, by species group



Current area of plantations

There were 2.0 million hectares of plantations in Australia in 2010–11; about half were coniferous species and half were broadleaved species. Victoria has the largest area of plantations.

Plantation area, by species group and jurisdiction



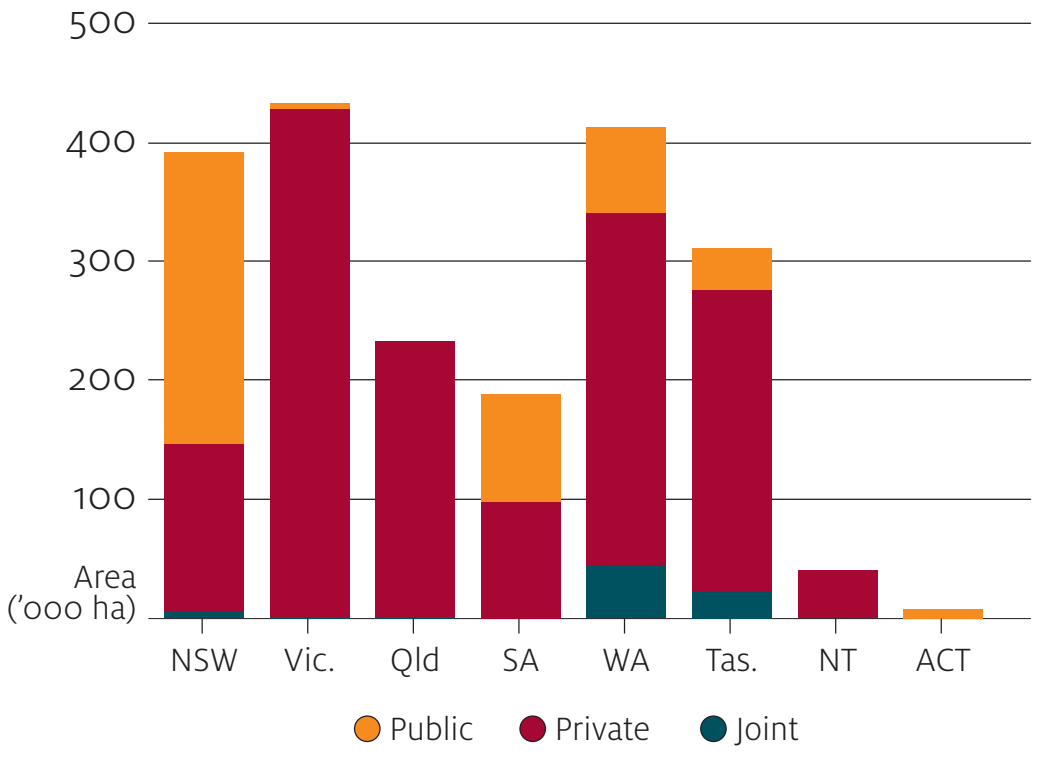
Plantation ownership

State governments were the major plantation owners up to the early 1990s. Since then, the Victorian, Queensland and Tasmanian governments have sold plantations to private investors and most of the investment in new plantations has been in the private sector. Private ownership of plantations has increased from about 30 per cent in 1990 to about 74 per cent in 2010–11. The New South Wales plantation estate is 62 per cent publicly owned, in contrast with over 99 per cent of plantations in Victoria which are

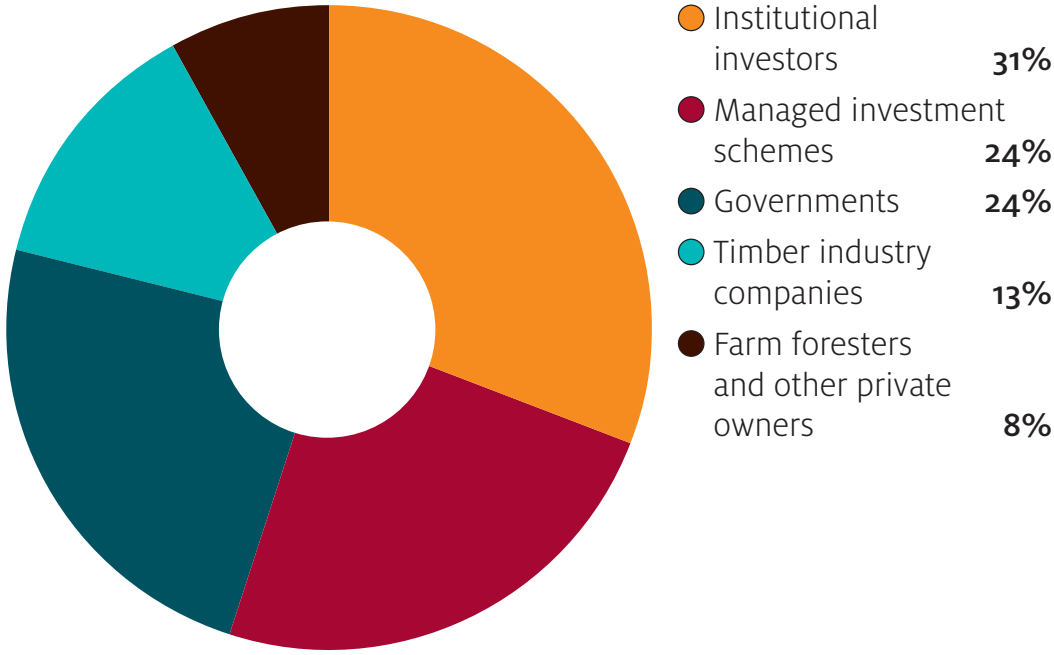
privately owned. The area of private plantations in Australia includes an estimated 100 000 hectares of small-scale farm forestry plantings.

In 2010–11 the proportion of plantations owned by institutional investors (for example, superannuation funds) increased by 3 per cent since 2009–10 to 31 per cent of all plantations. Public ownership now stands at 24 per cent; farm foresters and other private growers own 8 per cent; and timber industry companies own about 13 per cent. Historically, managed investment schemes funded most of the expansion in private plantations, but ownership by these schemes decreased from 36 per cent in 2008–09 to 24 per cent in 2010–11.

Plantation ownership, by jurisdiction



Plantation ownership, by owner type



Wood supply from plantations

Plantations produce about two-thirds of the 26.5 million cubic metres of logs harvested in Australia on average each year. The balance of the logs comes from native forests.

The potential supply of coniferous plantation sawlogs is not expected to change significantly for the next 15 to 20 years, but should then increase by around 1 million cubic metres a year to 2054. The potential supply of coniferous plantation pulpwood is not expected to change significantly from now to 2054.

The potential supply of broadleaved plantation sawlogs is expected to increase to over 1 million cubic metres by 2020 and remain around that level to 2054. Broadleaved plantation pulpwood production is projected to increase to about 13.5 million cubic metres a year during 2020–24, peaking at around 13.8 million cubic metres a year during 2030–34.

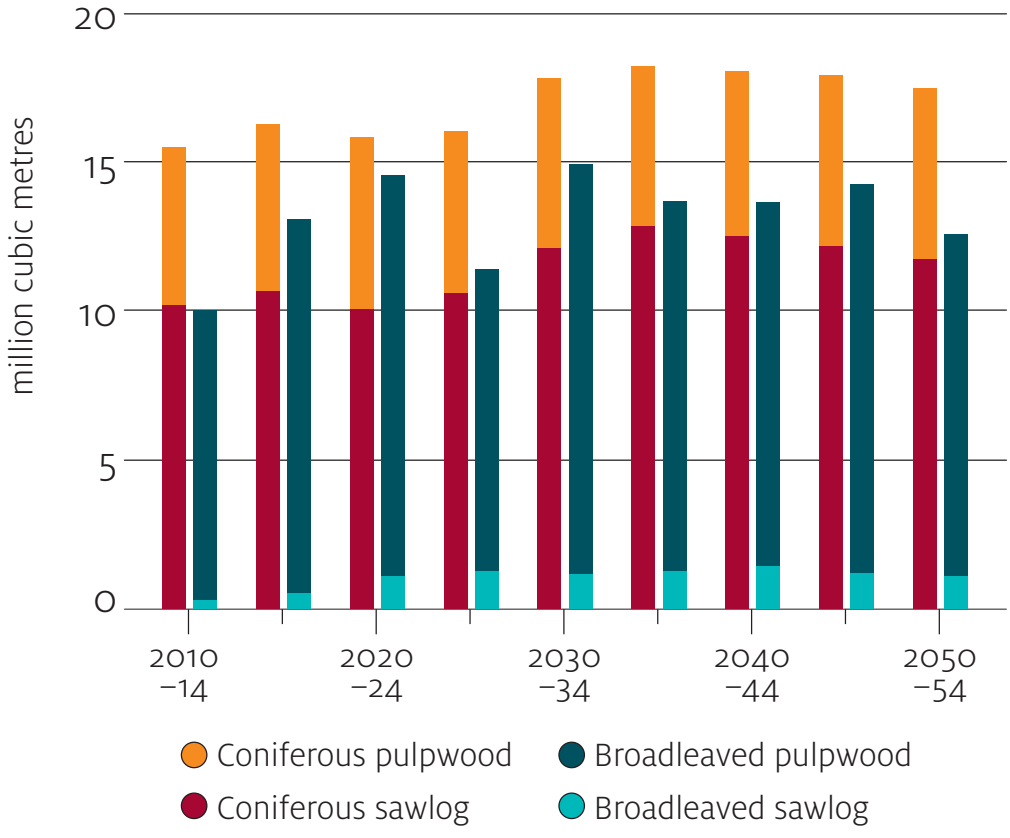
These projections do not take into account the potential effects of climate change.

Production of high quality sawlogs from plantations requires the plantations to be pruned and thinned at the appropriate age.

Did you know?

Coniferous plantations provide 79 per cent of the sawlogs produced in Australia, yet comprise only 0.7 per cent of the forest area.

Forecast future wood supplies from plantations



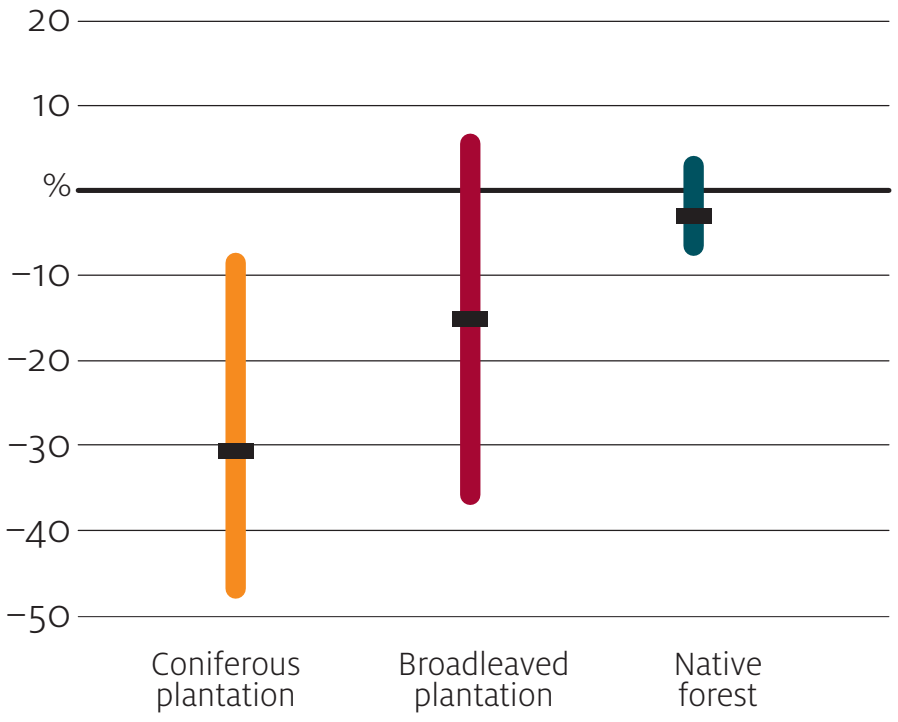
Potential effects of climate change on forests

Forest growth and wood production is highly sensitive to changes in climate. Climate modelling shows that most of Australia's production forest areas are likely to experience lower rainfalls and higher temperatures by 2050 relative to 2005.

Log availability from Australia's forests is projected to decline by 2050 due to climate change relative to the baseline projections in the absence of climate change. Coniferous plantations are expected to be more affected than broadleaved plantations. Log availability from native forests is not projected to change as much due to climate change compared with change in log availability from plantations.

The projected effects on log supply do not take into account any adaptation measures.

Potential effects of climate change on log availability, 2050 relative to baseline projections



Note: Vertical bars show the range of projections.

Forest certification and codes of practice

Forest and chain-of-custody certification assures Australian and international buyers that forest products they purchase originate from legally harvested and sustainably managed native forests and plantations.

Several private accredited certification bodies conduct forest and chain-of-custody certification in Australia. They use standards set by either the Australian Forest Certification Scheme or the Forest Stewardship Council.

The Australian Forest Certification Scheme uses the Australian Forestry Standard, which was developed by representatives of the Australian community, industry and government and is mutually endorsed under the Programme for the Endorsement of Forest Certification. The Forest Stewardship Council uses regionally adapted interim standards that comply with its international 'Principles of Responsible Forest Management'. Both schemes issue chain-of-custody certificates that identify and track certified wood and wood products through the supply chain.

The area of certified forest and plantation in Australia has grown to about 10.5 million hectares. This includes most native forests managed for timber production. About 80 per cent of Australia's certified forest area is native forest and about 85 per cent is publicly owned.

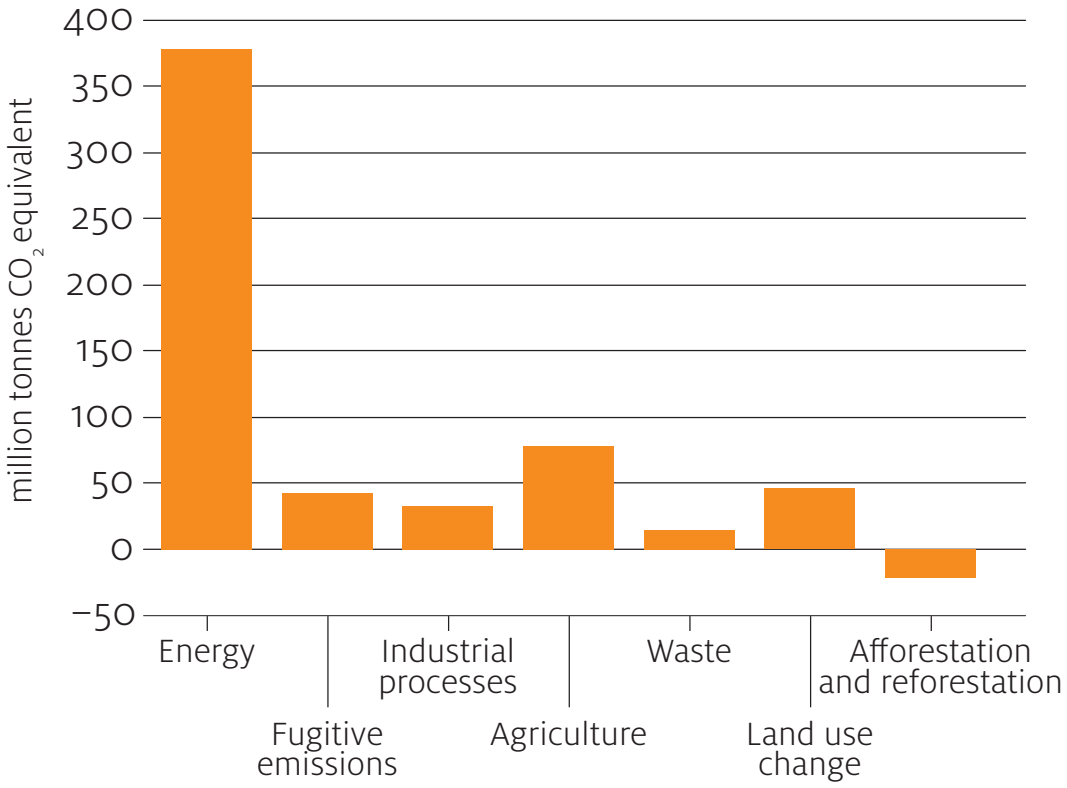
In addition to certification, multiple-use public and private forests are managed in accordance with codes of practice. Furthermore, many forest managers use environmental management systems that are independently certified to an International Organization for Standardization standard. Public forest management agencies with certified environmental management systems in place include Forests NSW, Forestry SA, Queensland's Department of Agriculture, Fisheries and Forestry, Western Australia's Forest Products Commission, VicForests, and Forestry Tasmania. Several large private forestry enterprises also have certified environmental management systems.

Forests, wood products and carbon

Trees take up carbon dioxide from the atmosphere during photosynthesis. The carbon dioxide is released when trees are burned, die or decay, and when wood products are burned or decay.

Australia's total greenhouse gas emissions from power generation, transport, agriculture, deforestation and other sources were estimated to be 592 million tonnes of carbon dioxide equivalent in 2011. Afforestation and reforestation activities sequestered 21 million tonnes of carbon dioxide equivalent in that year, which reduced total national emissions by 3.7 per cent to 570 million tonnes of carbon dioxide equivalent (DCCEE 2012).

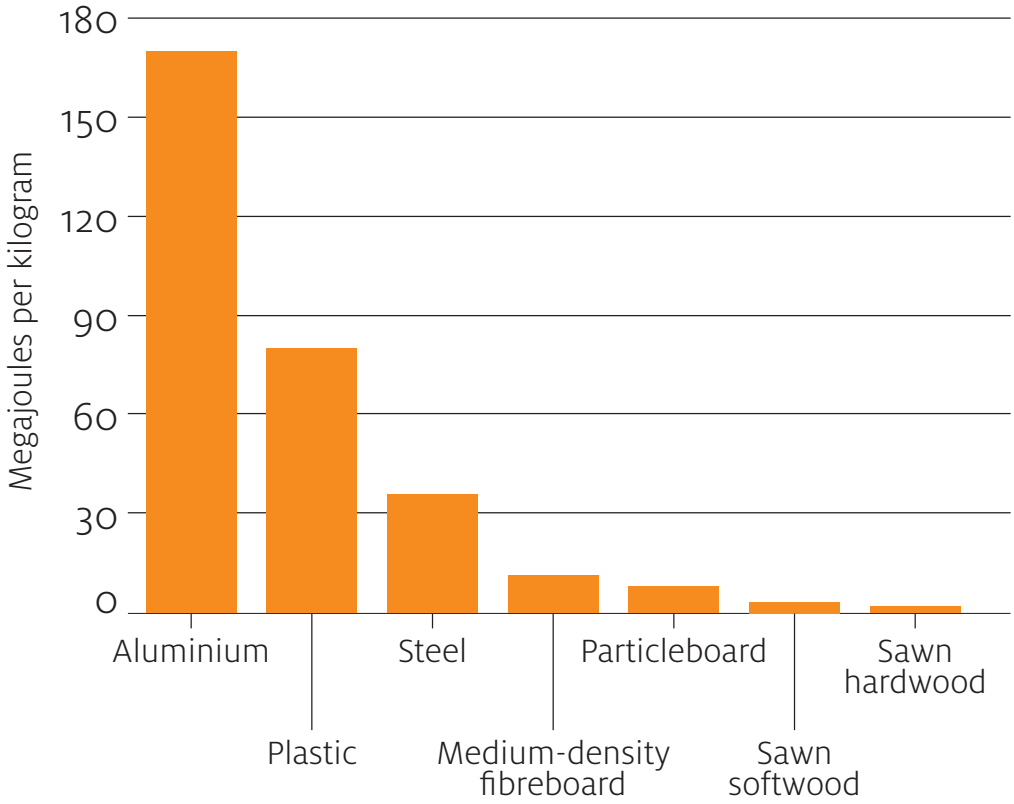
Australia's greenhouse gas emission and sequestration, 2011



Source: DCCEE, 2012, *Australian National Greenhouse Accounts—Quarterly Update of Australia's National Greenhouse Gas Inventory December Quarter 2011*, Department of Climate Change and Energy Efficiency, Canberra.

Different materials have widely different embodied energy. The embodied energy of a product is the sum of the energy used to obtain raw materials and to manufacture, package and transport the product. The embodied energy of wood products is much lower than that of many other materials.

Embodied energy in new materials



Note: The value for plastic is for PVC (polyvinylchloride). The values for timber are for kiln-dried timber.
Source: Taylor, J & Van Langenberg, K 2004, *Review of the environmental impact of wood compared with alternative products used in the production of furniture*, Forest and Wood Products Research and Development Corporation.

Fire

The extent and intensity of forest fires in Australia vary with latitude and season of rainfall. In northern Australia, where conditions are generally humid, low-intensity fires often burn across large areas. Hot, dry and windy summers in south-eastern Australia often lead to intense bushfires that are difficult to control. Such fires can cause loss of human life and destroy trees, livestock, buildings, fences, bridges and power lines. Bushfires in southern Australia can also lead to soil erosion and degrade stream water quality. The resulting natural regrowth can reduce water yields for decades.

Large fires in southern Australia since 1926

Year	Location	Area burnt a ('000 ha)
1926	Victoria	394
1939	Victoria	1 400
1943–44	Victoria	1 100
1952	North-east Victoria	>100
1961–62	Victoria	>100
1965	Eastern Victoria	378
1969	Victoria	>250
1983	Central and south-west Victoria	210
1993–94	Sydney–Blue Mountains, north coast New South Wales	>800
1995	South-east Queensland	333
1997–98	Hunter, Blue Mountains, Shoalhaven, New South Wales	>500
2001–02	Greater Sydney, New South Wales	744
2002–03	Eastern Highlands, Victoria	1 100
2002–03	Brindabella Ranges, New South Wales–Australian Capital Territory	157
2002–03	East coast–greater Sydney, New South Wales	1 460
2002–03	Arthur–Pieman, Tasmania	100
2005	Eyre Peninsula, South Australia	145
2006–07	Eastern Highlands, Victoria	1 050
2009	Central north-east Victoria	430

a Total area burnt, including vegetation types other than forests.

Sources: Bartlett, T, Leonard, M & Morgan, G 2007, 'The mega-fire phenomenon: some Australian perspectives', in *The 2007 Institute of Foresters of Australia and New Zealand Institute of Forestry Conference Papers*, Institute of Foresters of Australia, Canberra. Dexter, BD & Hodgson, A 2005, *The facts behind the fire: a scientific and technical review of the circumstances surrounding the 2003 Victorian bushfire crisis*, Forest Fire Victoria, Parkdale.

Forest industry employment

The annual turnover of wood products industries is about $22.3 billion. The industries contribute around 0.6 per cent to Australia's gross domestic product and 6 per cent of total manufacturing industry income.

The number of people employed in the forestry and wood products industries has been estimated, based on the Australian Bureau of Statistics (ABS) industry survey, to be about 87 000 in 2009–10. The number of people employed in the ABS labour force industry classifications 'forestry', and 'wood, pulp and paper manufacturing' for 2010–11 was 66 000. The ABS labour force industry classifications cover a narrower range of activities related to wood products industries than the ABS industry survey.

Estimated employment in forest-growing and wood product industry sectors

Sector	No. of employees
Forestry, logging and support services	9 000
Sawmilling and timber dressing	13 000
Other wood product manufacturing	25 000
Pulp, paper and paperboard	5 000
Converted paper products	10 000
Other pulp, paper and converted paper	6 000
Total	66 000

Multiple-use forests and timber harvesting

Timber production is allowed in state forests classified as multiple-use in New South Wales, Queensland, Victoria, Western Australia and Tasmania. Substantial areas within those native forests classified as multiple-use are reserved from timber harvesting to protect particular landscape, flora, fauna and other values. The balance is available for timber production, although a substantial portion is not suitable for commercial timber harvesting or is inaccessible. Timber may be harvested from a portion of the net available area each year. Timber is also harvested from some leasehold forested land in some states, particularly Queensland.

Harvesting from multiple use forest: areas available and annual average areas harvested a

State b	Area available c (ha)	Area clearfelled and regenerated (ha)	Area thinned or partially felled (ha)	Total harvest area (ha)	Proportion harvested (%)
NSW	1 470 000	0	43 500	43 500	3.0
Vic.	922 000	4 900	2 900	7 800	0.8
WA	848 000	430	8 820	9 250	1.1
Tas.	890 000	4 800	6 700	11 500	1.3

a Annual averages generally for previous five years as at 2010. Areas of forest cleared from mine sites are not included. **b** Information for Queensland is incompatible with the reporting format. Native forest timber harvesting in Queensland on state-controlled lands occurred on about 23 000 hectares in 2009–10. South Australia, the Northern Territory and the Australian Capital Territory have no multiple-use forest. **c** State forest area available for timber harvesting after excluding areas reserved by management plans and regional forest agreements. Timber harvesting is excluded from additional parts of the available areas to meet regulatory requirements to protect flora, fauna, catchment and other values.

Wood products

Total log production in Australia remained above 26 million cubic metres in 2010–11, representing an 8 per cent increase over the decade. However, the forest sector has undergone structural change over this time: supply of native forest logs has declined by more than 40 per cent in the last decade, while broadleaved plantation supply has increased by more than 425 per cent in the same period. Coniferous plantations continue to provide most of Australia's total log supply: 57 per cent of Australia's total log harvest in 2010–11 was from these forests.

Logs produced in Australia are processed domestically and exported as whole logs or woodchips. Domestic sawn timber production trends over the last decade have mirrored the trends in log supply: broadleaved sawn timber production declined by 45 per cent in the decade to 2010–11, while coniferous sawn timber production increased by 32 per cent.

Production of wood-based panels in Australia has been mixed, with investments in additional veneer production offsetting declines in other categories,

such as plywood and medium-density fibreboard. Similarly, overall paper and paperboard production in Australia increased by 18 per cent over the decade, with strong growth in packaging and industrial paper manufacturing offsetting weakness in other paper manufacturing industries. Most of Australia's broadleaved pulplogs continue to be exported as woodchips; in contrast, coniferous woodchip exports declined significantly over the decade, despite an increase in coniferous pulplog supply, suggesting greater domestic use of these logs.

Logs harvested

Source of logs	2000–01 ('000 m³)	2005–06 ('000 m³)	2010–11 ('000 m³)	10 year change (%)
Native forests				
Sawlogs and veneer logs	3 583	3 204	2 251	–37
Pulpwood and other logs	7 218	5 371	4 076	–44
Total	10 802	8 575	6 327	–41
Broadleaved plantations				
Sawlogs and veneer logs	82	208	114	39
Pulpwood and other logs	894	3 571	5 007	460
Total	975	3 779	5 121	425
Coniferous plantations				
Sawlogs and veneer logs	7 458	9 384	8 988	21
Pulpwood and other logs	5 239	4 995	6 054	16
Total	12 697	14 379	15 042	18
Total log harvest	24 474	26 734	26 490	8

Production and consumption of wood products

	2000–01	2005–06	2010–11	10 year change (%)
Paper and paperboard products production ('000 tonnes)				
Newsprint	465	415	439	–6
Printing and writing	554	663	342	–38
Household and sanitary	204	203	183	–10
Packaging and industrial	1 449	1 926	2 191	51
Total	2 672	3 207	3 155	18
Paper and paperboard products consumption ('000 tonnes)				
Newsprint	746	739	641	–14
Printing and writing	1 240	1 656	1 495	21
Household and sanitary	234	259	258	10
Packaging and industrial	1 365	1 485	1 618	19
Total	3 585	4 139	4 012	12
Sawn timber production ('000 m^3)				
Coniferous **a**	2 890	3 821	3 826	32
Broadleaved **b**	1 323	1 211	730	–45
Total	4 213	5 032	4 556	8
Sawn timber consumption ('000 m^3)				
Coniferous **a**	3 454	4 112	4 306	25
Broadleaved **b**	1 375	1 290	740	–46
Total	4 829	5 402	5 047	5
Veneer and panel production ('000 m^3) c				
Veneers	4	4	132	Large **d**
Plywood	157	145	140	–11
Particleboard	904	1 002	986	9
Medium density fibreboard	712	798	605	–15
Total	1 778	1 948	1 863	5

Continued...

Production and consumption of wood products *Continued*

	2000–01	2005–06	2010–11	10 year change (%)
Woodchip exports (bone dry tonnes) **e**				
Coniferous	1 100	989	787	–28
Broadleaved	3 894	4 374	4 278	10
Total	4 994	5 363	5 064	1

a Mainly sawn from plantation pine logs. **b** Mainly sawn from native forest eucalypt logs. **c** Laminated veneer lumber and hardboard cannot be reported due to confidentiality restrictions. **d** The large increase is due to commencement of structural veneer manufacturing in Tasmania in 2008. **e** Includes particles.

Wood products consumption

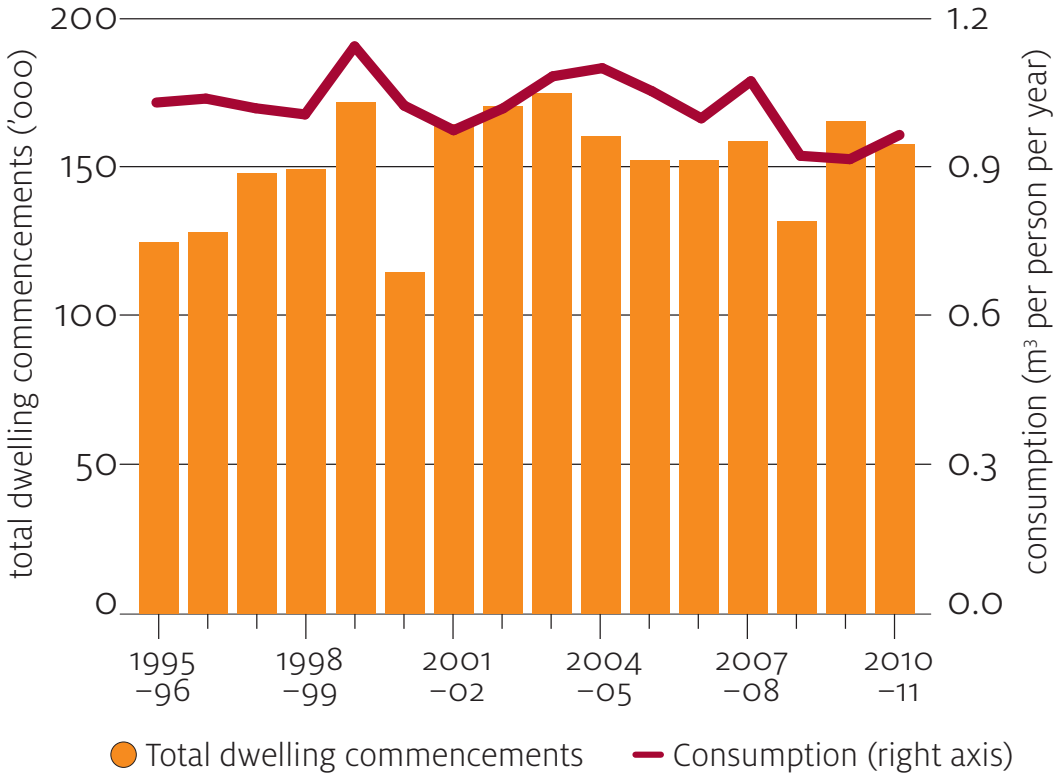
Most of Australia's wood products are used in home building and other construction. Year-on-year consumption tends to be linked to rises and falls in building industry activity. Consumption per person fluctuates around 1.05 cubic metres per year. Total national consumption has, for many years, increased in parallel with population growth.

Did you know?

For more than 50 years, Australians have consumed on average a little more than one cubic metre of log equivalent volume of wood products per person per year.

The major categories of paper and paperboard are newsprint, printing and writing papers, household and sanitary papers and packaging and industrial papers. Australia's consumption of paper and paperboard increased by about 12 per cent in the 10 years to 2010–11, mainly due to a 21 per cent increase in consumption of printing and writing papers and a 19 per cent increase in packaging and industrial products.

Dwelling commencements and wood consumption, Australia



Consumption of paper products far exceeded domestic production. The difference was made up by imports of around 1.9 million tonnes a year, on average 66 per cent of this being printing and writing papers. Imported paper and paperboard products were valued at nearly $2.2 billion and were 50 per cent of total timber product imports in 2010–11.

Most broadleaved sawn timber is used for flooring, decking, joinery, furniture and similar uses where particular appearances or colours are needed, or

for engineering and architectural applications that need particular strength, hardness and/or durability. Domestic consumption of sawn broadleaved timber declined by about 45 per cent in the 10 years to 2010–11, to 740 thousand cubic metres; about 12 per cent of that was imported.

Coniferous sawn timber is mainly used as a structural component of house frames and other buildings. Consumption of sawn coniferous timber increased by about 25 per cent in the 10 years to 2010–11 to about 4.3 million cubic metres. Australian production increased by 32 per cent to 3.8 million cubic metres in that period.

Medium-density fibreboard and particleboard are mainly used for flooring and joinery (such as kitchen benches and cupboards) and together comprise more than 85 per cent of the timber-based panels produced in Australia. Trends in domestic consumption of sawn timber products follow those in the building industry, in particular the rate of dwelling construction. Consumption of particleboard nearly equals Australian production. About 13 per cent of the medium-density fibreboard manufactured in Australia is exported.

Plywood and decorative veneers have been produced in Australia for many years. Veneer manufacture has increased since 2007 due to construction of two veneer mills in Tasmania, and 90 per cent of

the veneer produced was exported to plywood manufacturers in Malaysia. The logs used are from native regrowth forests and would otherwise be used for woodchips for paper manufacture because they are too small for sawmilling.

Many other products are harvested from Australia's forests and plantations. They include water, bark, honey, plant oils, flowers, foliage, seeds, animal meat and skins and bush foods.

Recycling

About 6.5 million tonnes of wood products are discarded each year. An estimated 75 per cent of paper and 30 per cent of other wood products are recycled; the remainder ends up in landfill.

Wood and paper products trade

The value of wood and paper product exports in 2010–11 was $2.5 billion. The value of imports was $4.4 billion, leaving a trade deficit of $1.9 billion.

Did you know?

Australia's trade deficit in wood products averages around $2 billion each year.

Wood product exports

	2000–01 ($m)	2005–06 ($m)	2010–11 ($m)	10 year change (%)
Woodchips	744	839	884	19
Paper and paperboard **a**	459	601	747	63
Recovered paper	40	140	240	500
Sawn timber **b**	63	121	115	83
Wood-based panels	207	153	98	–53
Other products	333	286	390	17
Total wood product exports	1 846	2 140	2 474	34

a Mainly packaging and writing papers. **b** There is a wide range of species and grades of sawn timber. Different species and grades are exported and imported to meet particular consumer needs.

Wood product imports

	2000–01 ($m)	2005–06 ($m)	2010–11 ($m)	10 year change (%)
Paper and paperboard **a**	2 088	2 187	2 223	6
Manufactured paper products	378	426	557	47
Sawn timber **b**	428	419	473	11
Wood-based panels	152	228	289	90
Wood pulp	317	225	180	–43
Other products	471	532	685	45
Total wood product imports	3 834	4 017	4 407	15

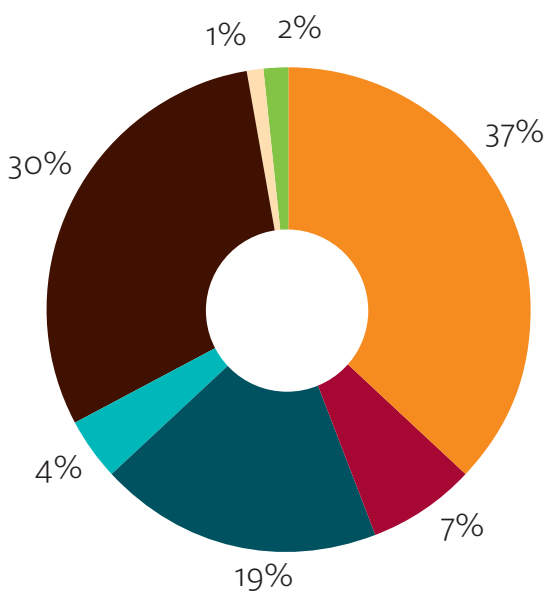
a Mainly packaging and writing papers. **b** There is a wide range of species and grades of sawn timber. Different species and grades are exported and imported to meet particular consumer needs.

State and territory summaries

New South Wales

	Area ('000 ha)	% of state	% of national total
Land area	80 064	100	10
Native forest	26 208	33	18
Plantation forest	392	<1	19
Total forest	26 600	33	18

New South Wales forest area, by tenure

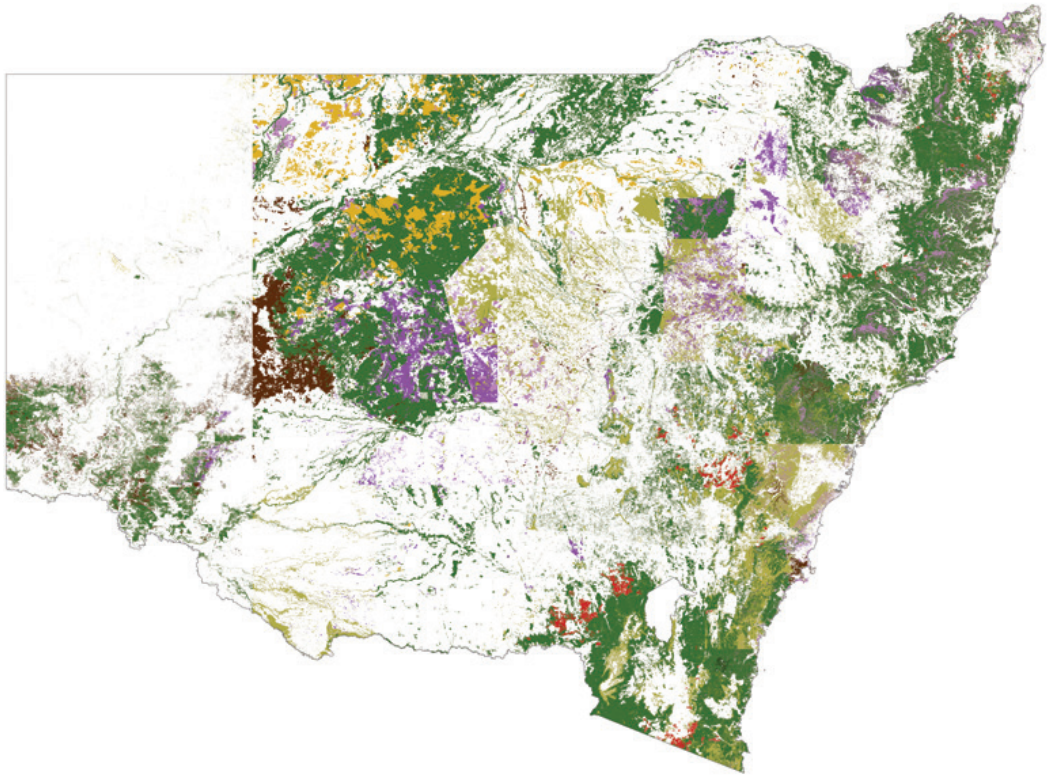


	Area ('000 ha)
Leasehold land	9 891
Multiple-use forests	1 980
Nature conservation reserves	5 148
Other Crown land	943
Private land	8 076
Unresolved tenure	170
Plantations – all tenures	392

Did you know?

Forests NSW produced 32 per cent of Australia's coniferous logs in 2010–11.

New South Wales forests, by type



- Acacia 5%
- Callitris 6%
- Casuarina 4%
- Eucalypt open 61%
- Eucalypt woodland 18%
- Other 5%
- Plantation 1%

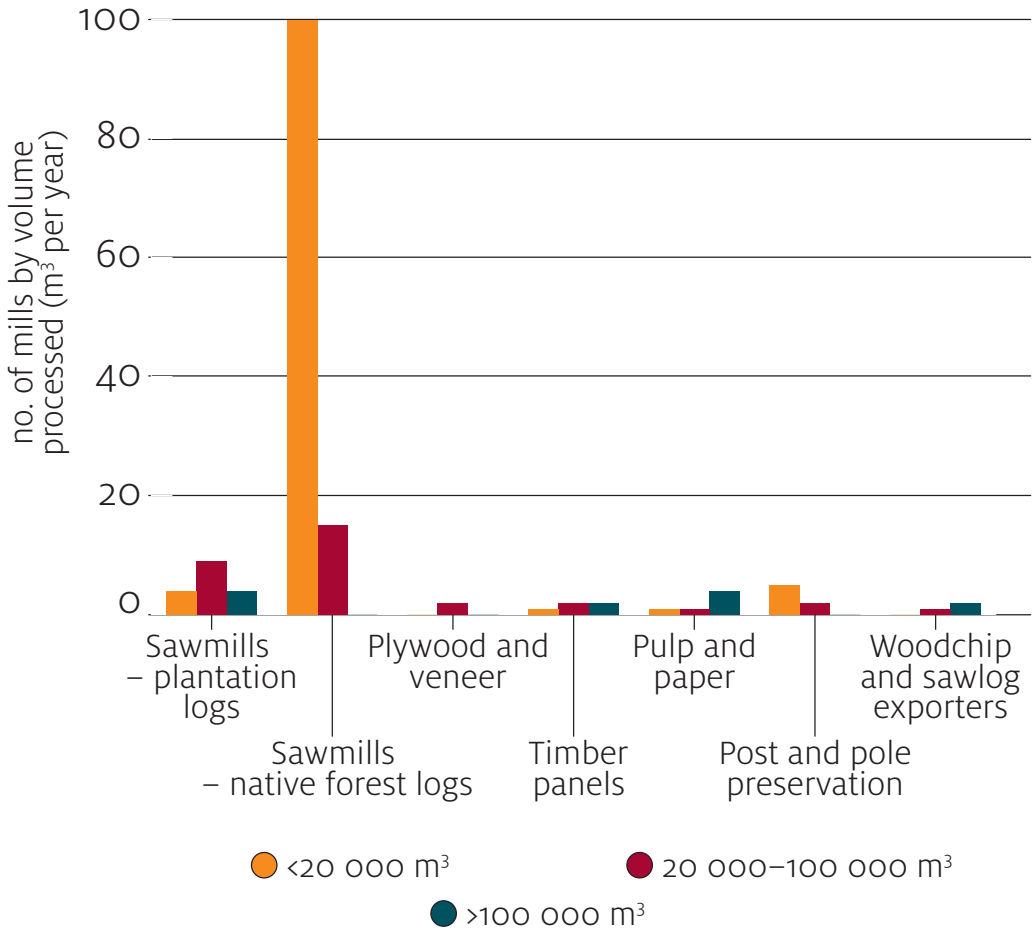
Note: Numbers following forest type represent proportion of total forest estate.

New South Wales forestry and wood products industries

ABS labour force data for 2010–11 show a total employment of about 21 250 people in the forestry and wood products manufacturing sectors in New South Wales.

The forestry and wood and paper products industries are a major part of several regional communities in New South Wales. Four local government areas (Oberon, Tumut, Bombala and Tumbarumba) directly employ more than 10 per cent of their labour force in these industries.

Type, number and size of main timber processing industries in New South Wales, 2009

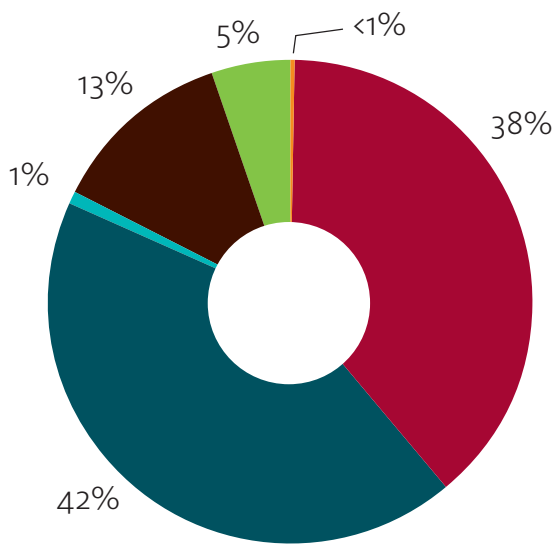


Note: More than 100 sawmills use native forest logs across all classes.

Victoria

	Area ('000 ha)	% of state	% of national total
Land area	22 742	100	3
Native forest	7 837	34	5
Plantation forest	433	2	21
Total forest	8 270	36	6

Victoria forest area, by tenure

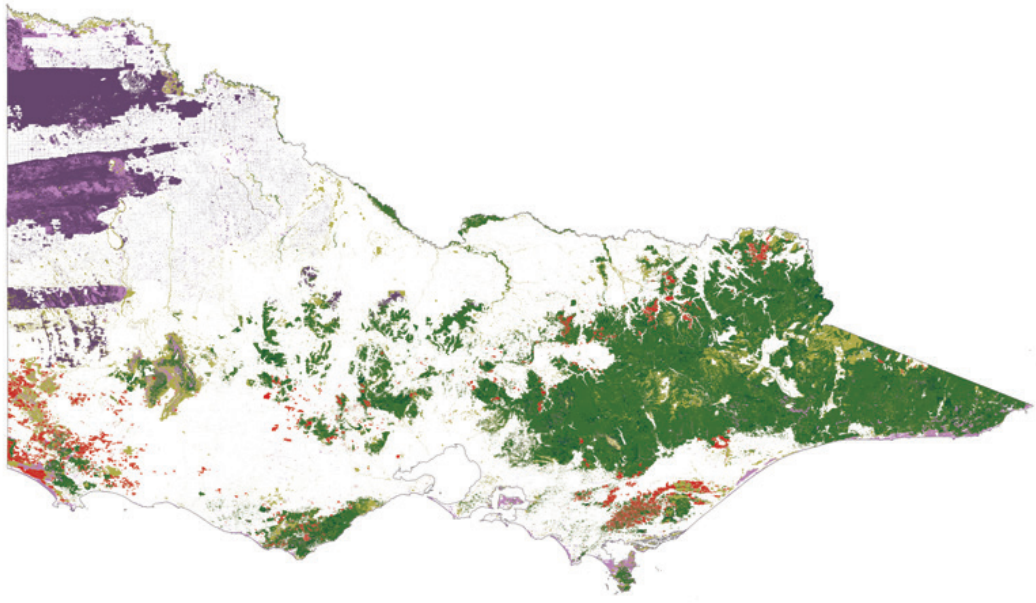


	Area ('000 ha)
Leasehold land	35
Multiple-use forests	3 163
Nature conservation reserves	3 505
Other Crown land	109
Private land	1 025
Unresolved tenure	0
Plantations – all tenures	433

Did you know?

Victoria has one of the longest running forest monitoring and research programs in the world located in the mountain ash (*Eucalyptus regnans*) forests of the Central Highlands since 1983.

Victoria forests, by type



- Eucalypt closed 3%
- Eucalypt mallee 18%
- Eucalypt open 54%
- Eucalypt woodland 13%
- Other 7%
- Plantation 5%

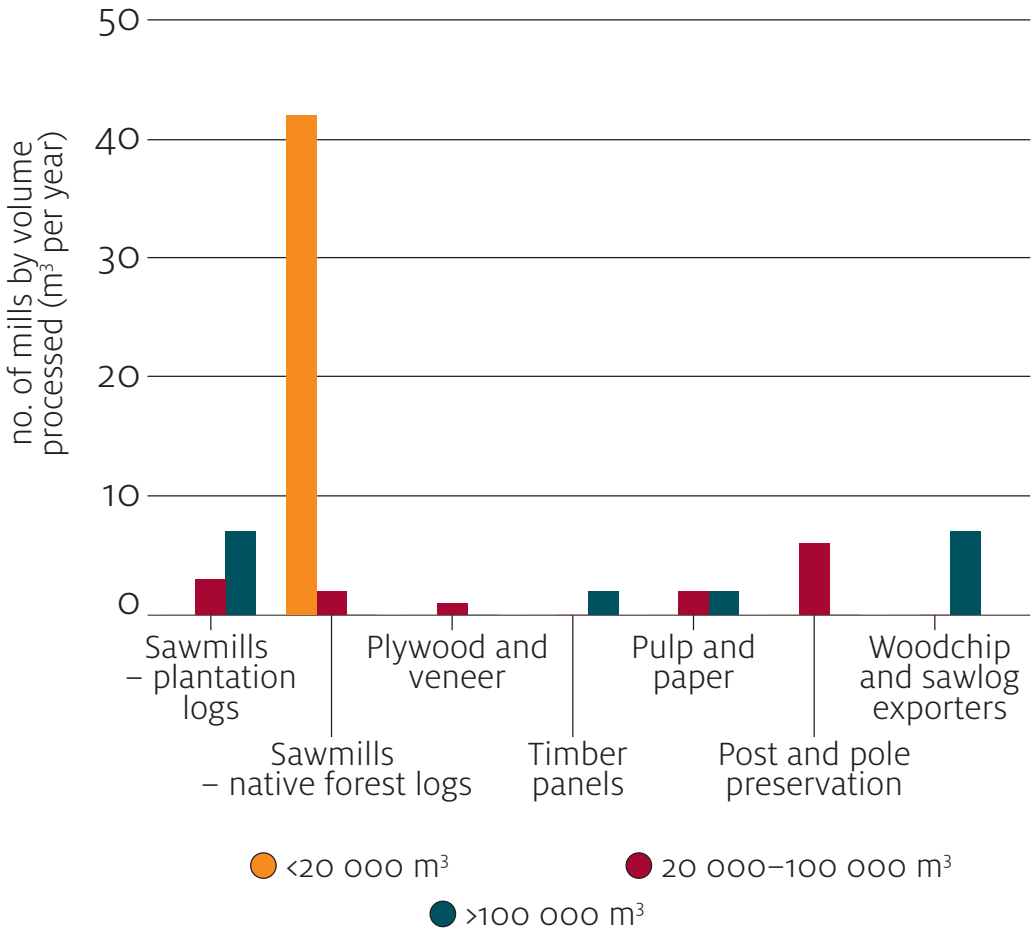
Note: Numbers following forest type represent proportion of total forest estate.

Victoria forestry and wood products industries

ABS labour force data for 2010–11 show a total employment of 19 250 people in the forestry and wood products manufacturing industries in Victoria. Thirteen local areas directly employ more than 3 per cent of their labour force in these industries.

Victoria's forest industries are based on plantation timber growing and processing in several regions, and on native forest timber growing and processing mainly in the Central Highlands region and in Gippsland.

Type, number and size of main timber processing industries in Victoria, 2009

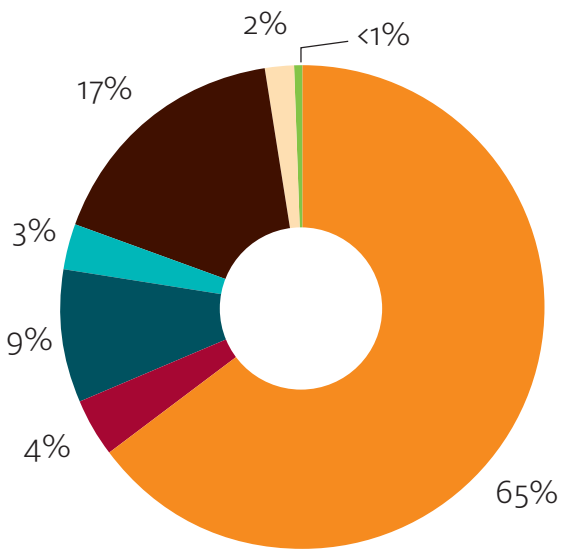


Note: More than 40 sawmills use native forest logs across all classes.

Queensland

	Area ('000 ha)	% of state	% of national total
Land area	173 065	100	22
Native forest	52 581	30	36
Plantation forest	232	<1	12
Total forest	52 813	31	35

Queensland forest area, by tenure

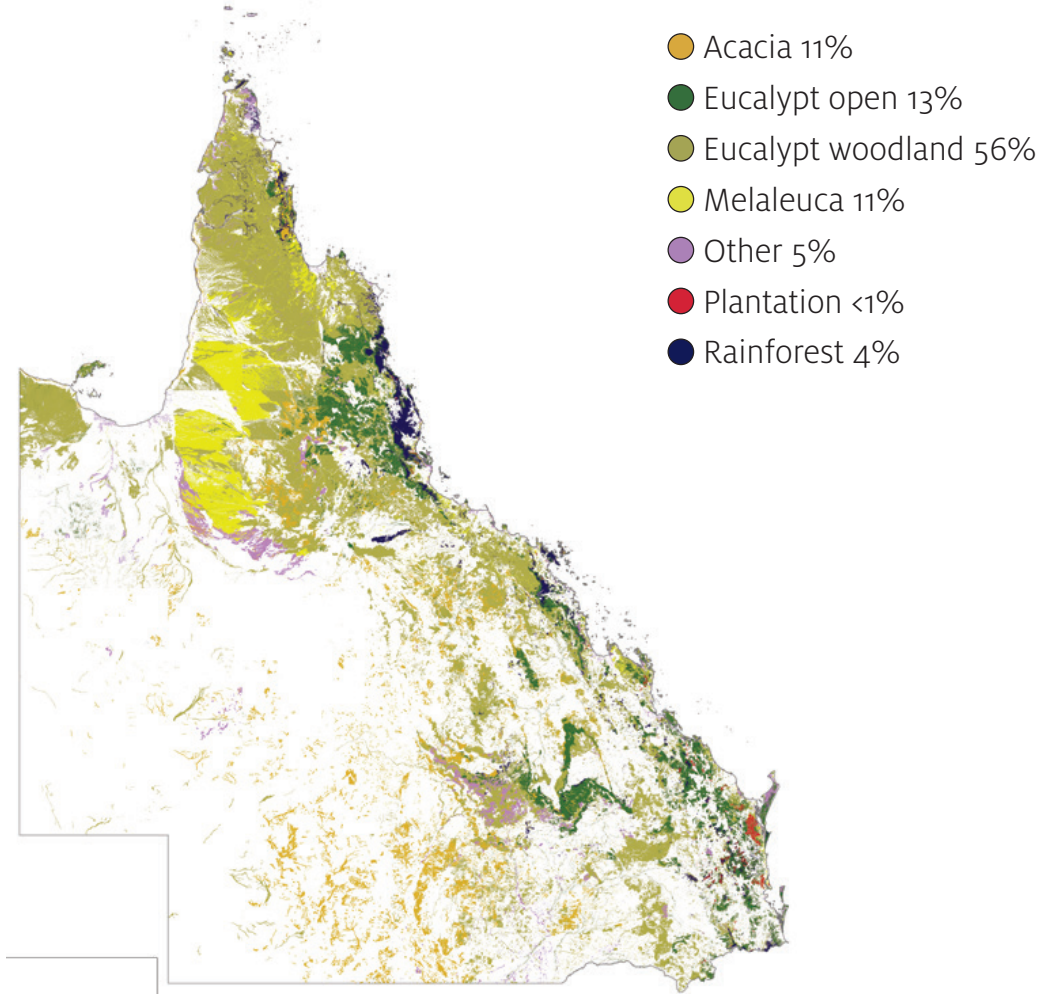


	Area ('000 ha)
Leasehold land	**34 304**
Multiple-use forests	**1 991**
Nature conservation reserves	**4 576**
Other Crown land	**1 598**
Private land	**8 908**
Unresolved tenure	**1 204**
Plantations – all tenures	**232**

Did you know?

63 per cent of Australia's World Heritage rainforest is in Queensland.

Queensland forests, by type

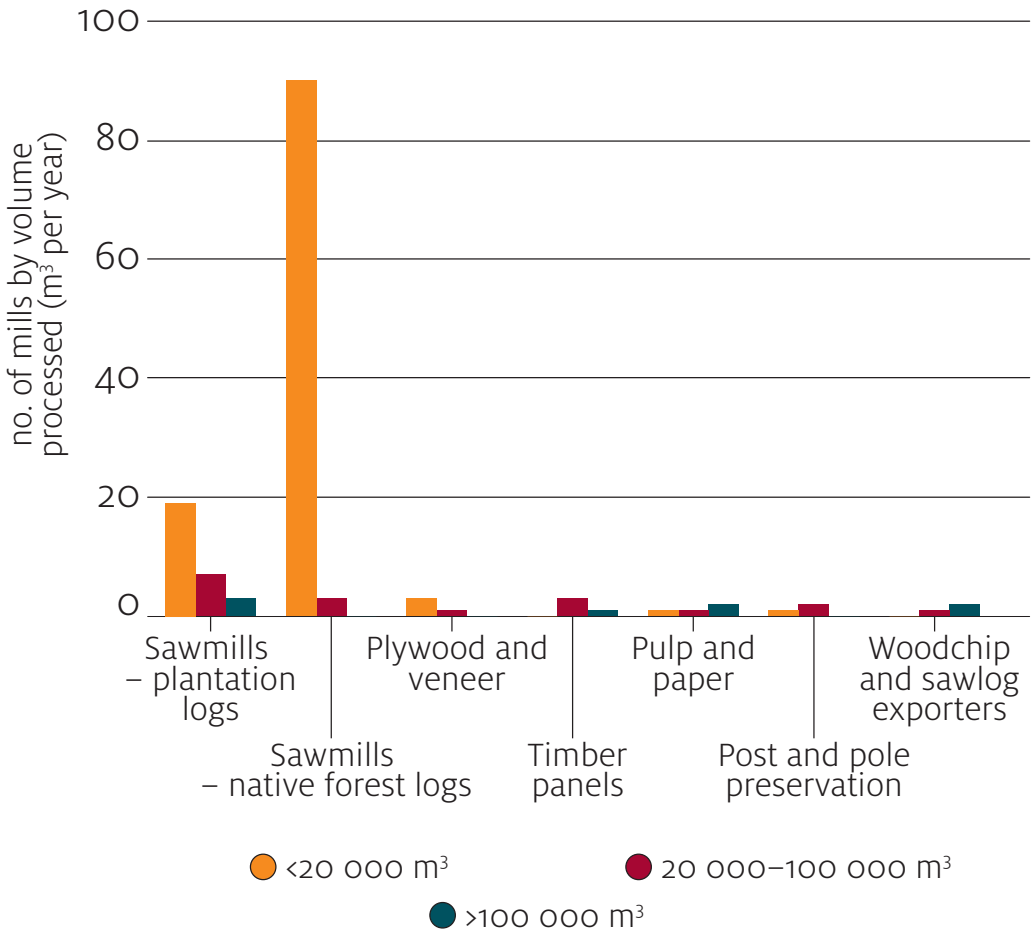


Note: Numbers following forest type represent proportion of total forest estate.

Queensland forestry and wood products industries

ABS labour force data for 2010–11 show employment of 9750 people in the forestry and wood products manufacturing sectors in Queensland. Fourteen local government areas directly employ more than 3 per cent of their labour force in these industries.

Type, number and size of main timber processing industries in Queensland, 2009

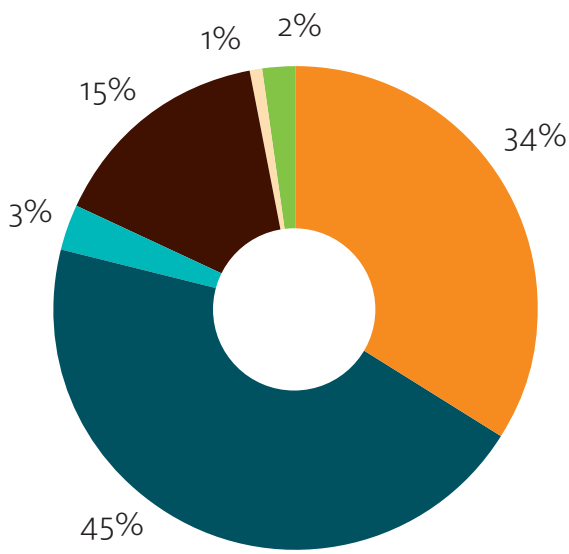


Note: More than 90 sawmills use native forest logs across all classes.

South Australia

	Area ('000 ha)	% of state	% of national total
Land area	98 348	100	13
Native forest	8 855	9	6
Plantation forest	188	<1	9
Total forest	9 043	9	6

South Australia forest area, by tenure

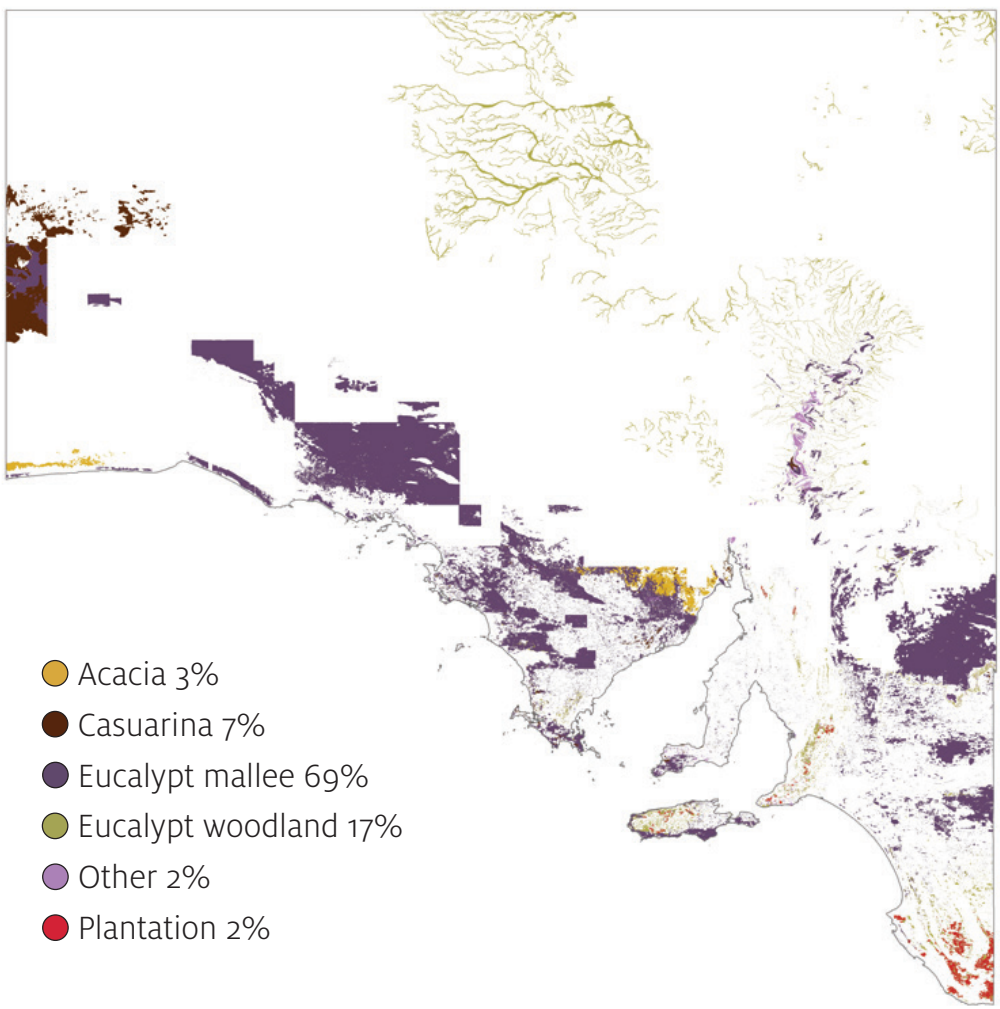


	Area ('000 ha)
Leasehold land	3 083
Multiple-use forests	0
Nature conservation reserves	4 029
Other Crown land	277
Private land	1 399
Unresolved tenure	67
Plantations – all tenures	188

Did you know?

All timber production in South Australia is from plantations.

South Australia forests, by type



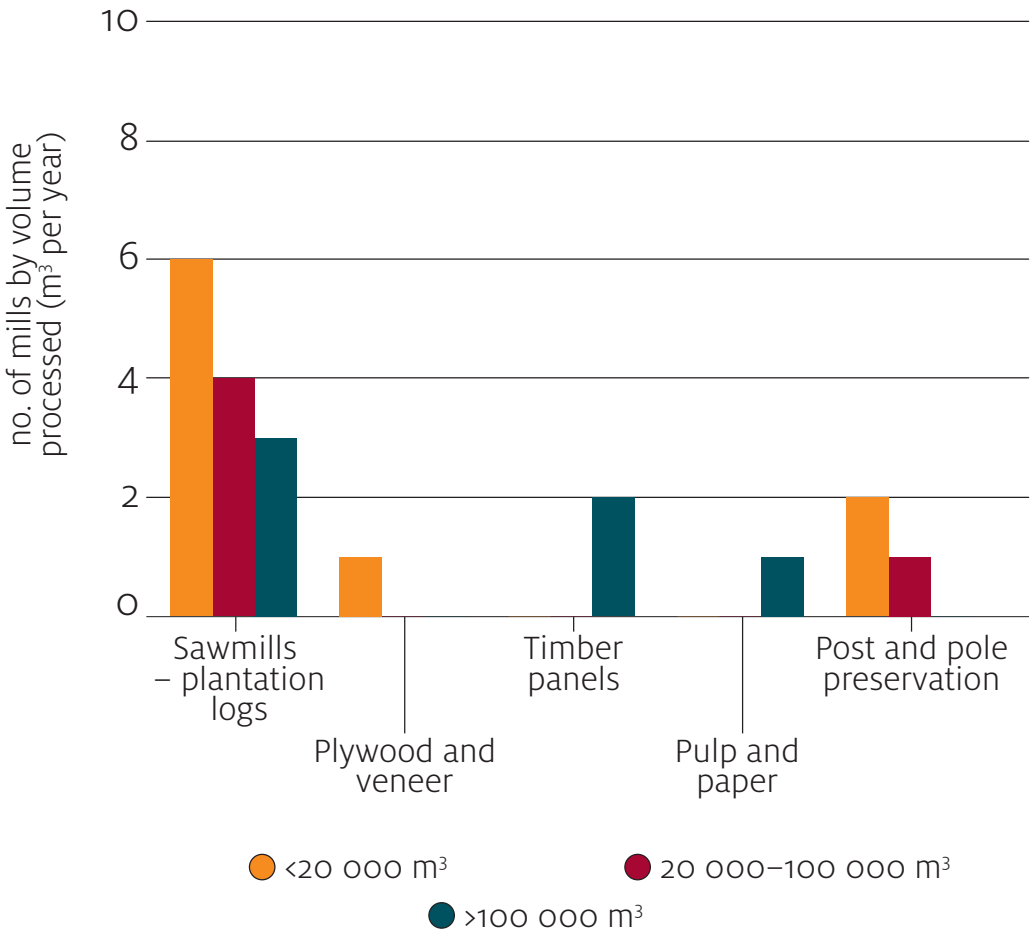
Note: Numbers following forest type represent proportion of total forest estate.

South Australia forestry and wood products industries

ABS labour force data for 2010–11 show employment of 3750 people in the forestry and wood products manufacturing sectors in South Australia.

South Australia's forest industries are based solely on plantation timber growing and processing. Most of the plantations are located in the Green Triangle region in the southeast of the state. Plantations in that region occupy about 14 per cent of the region's land area, compared with about 72 per cent used for agriculture.

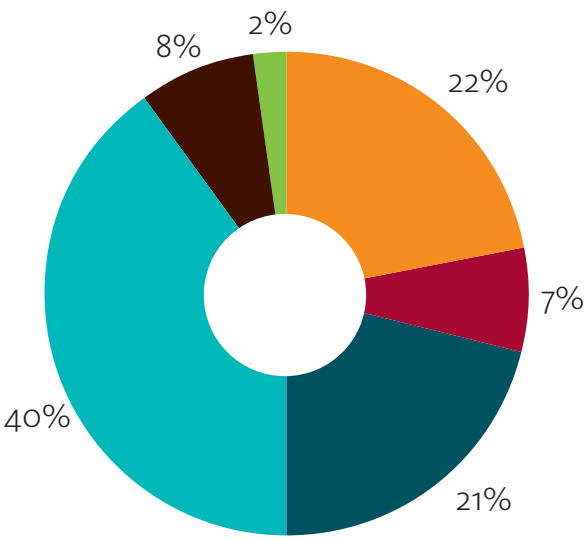
Type, number and size of main timber processing industries in South Australia, 2009



Western Australia

	Area ('000 ha)	% of state	% of national total
Land area	252 988	100	33
Native forest	17 665	7	12
Plantation forest	413	<1	20
Total forest	18 078	7	12

Western Australia forest area, by tenure

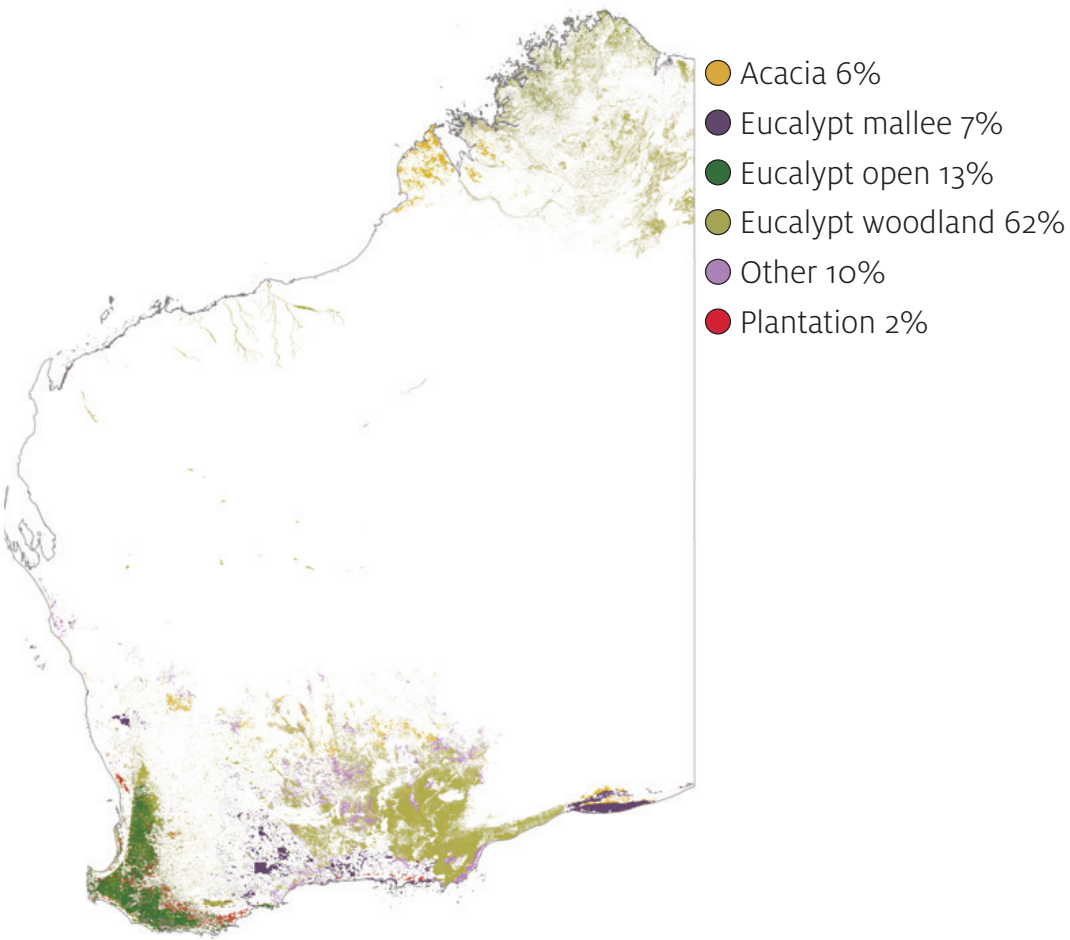


	Area ('000 ha)
Leasehold land	3 891
Multiple-use forests	1 248
Nature conservation reserves	3 868
Other Crown land	7 169
Private land	1 489
Unresolved tenure	0
Plantations – all tenures	413

Did you know?

All of Western Australia's old-growth forests are in nature conservation reserves.

Western Australia forests, by type

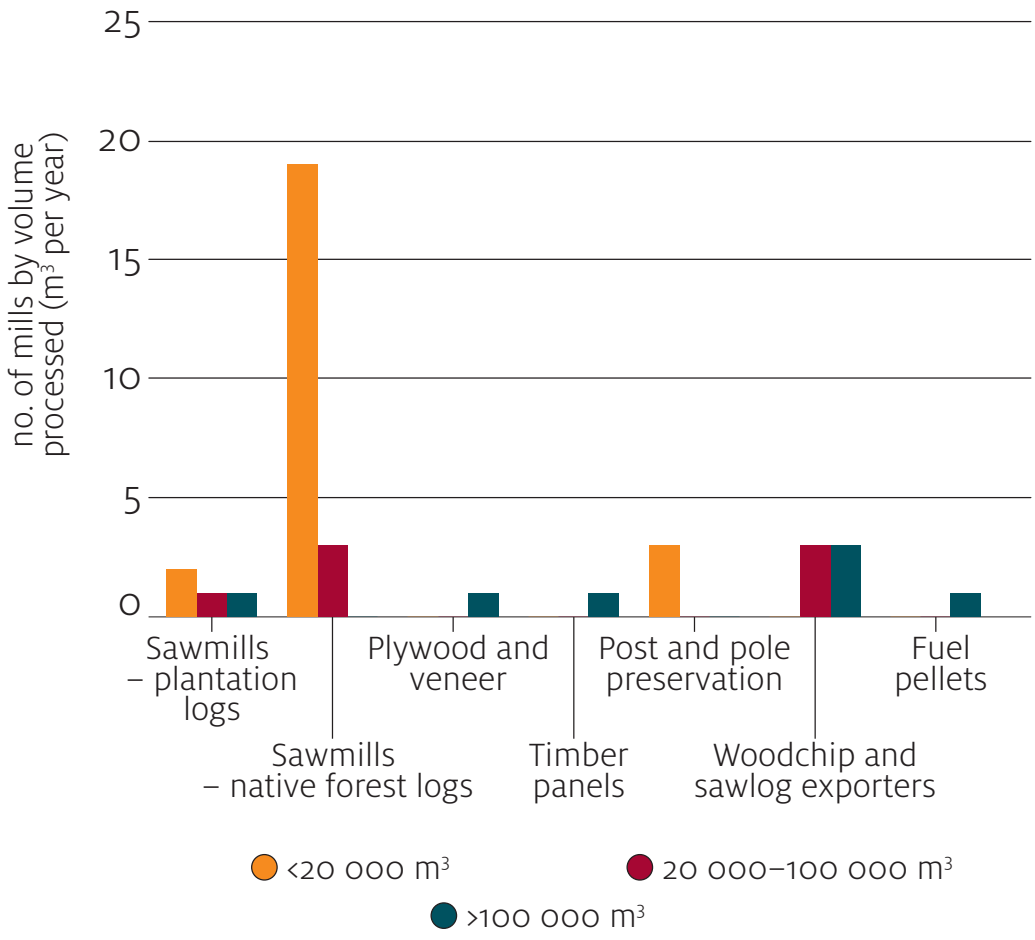


Note: Numbers following forest type represent proportion of total forest estate.

Western Australia forestry and wood products industries

ABS labour force data for 2010–11 show employment of 4750 people in the forestry and wood products manufacturing industries in Western Australia. The industries are concentrated in the Perth, Bunbury, Albany, Manjimup and Dardanup areas.

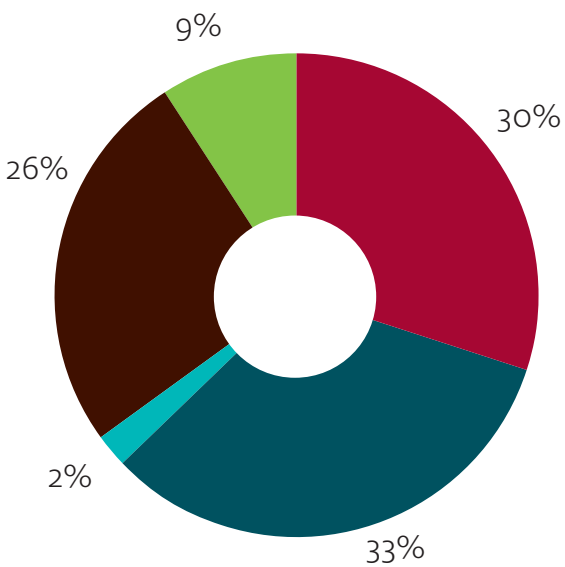
Type, number and size of main timber processing industries in Western Australia, 2009



Tasmania

	Area ('000 ha)	% of state	% of national total
Land area	6 840	100	1
Native forest	3 116	46	2
Plantation forest	311	5	15
Total forest	3 427	50	2

Tasmania forest area, by tenure

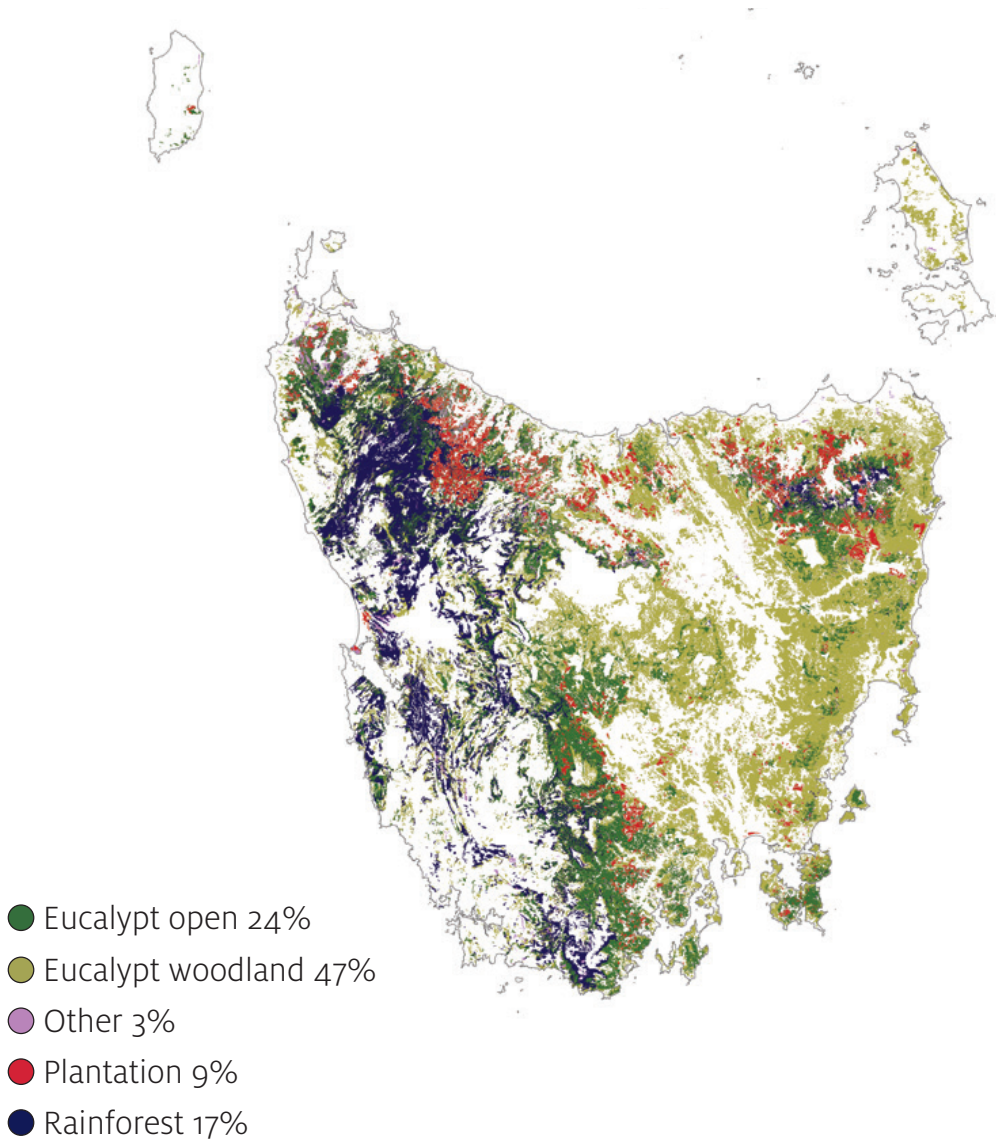


	Area ('000 ha)
Leasehold land	0
Multiple-use forests	1 026
Nature conservation reserves	1 121
Other Crown land	85
Private land	885
Unresolved tenure	0
Plantations – all tenures	311

Did you know?

Tasmania's plantations contributed 153 million dollars to the local economy in 2010–11.

Tasmania forests, by type

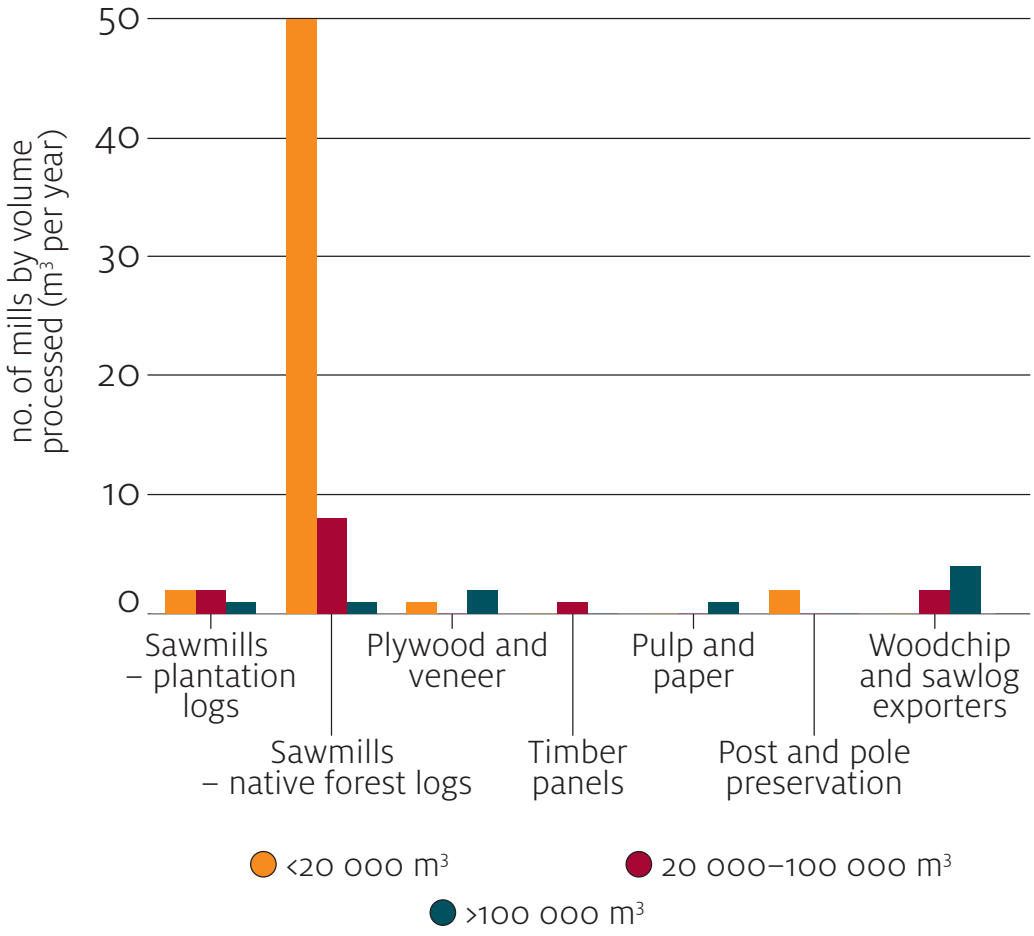


Note: Numbers following forest type represent proportion of total forest estate.

Tasmania forestry and wood products industries

Employment in Tasmania's forestry and wood products industries grew by 7 per cent between 2006 and 2008, from 6510 to 6960 people (Schirmer 2008). Between 2008 and 2010 a significant downturn in the industry caused employment to fall by 33.3 per cent. By September 2010, the number of people working in the forestry and wood products industry had fallen to 4650 (Schirmer 2010). The 2010–11 ABS labour force data show employment of about 3300 people in the forestry and wood products manufacturing sectors in Tasmania.

Type, number and size of main timber processing industries in Tasmania, 2009

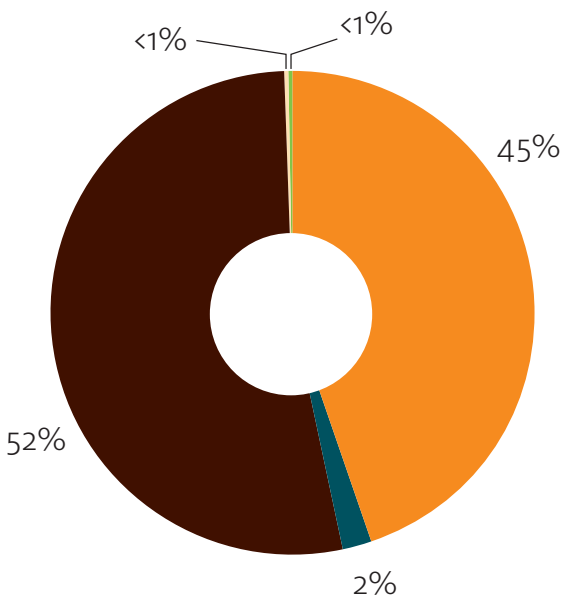


Note: More than 50 sawmills use native forest logs across all classes.

Northern Territory

	Area ('000 ha)	% of territory	% of national total
Land area	134 913	100	18
Native forest	31 010	23	21
Plantation forest	40	<1	2
Total forest	31 050	23	21

Northern Territory forest area, by tenure

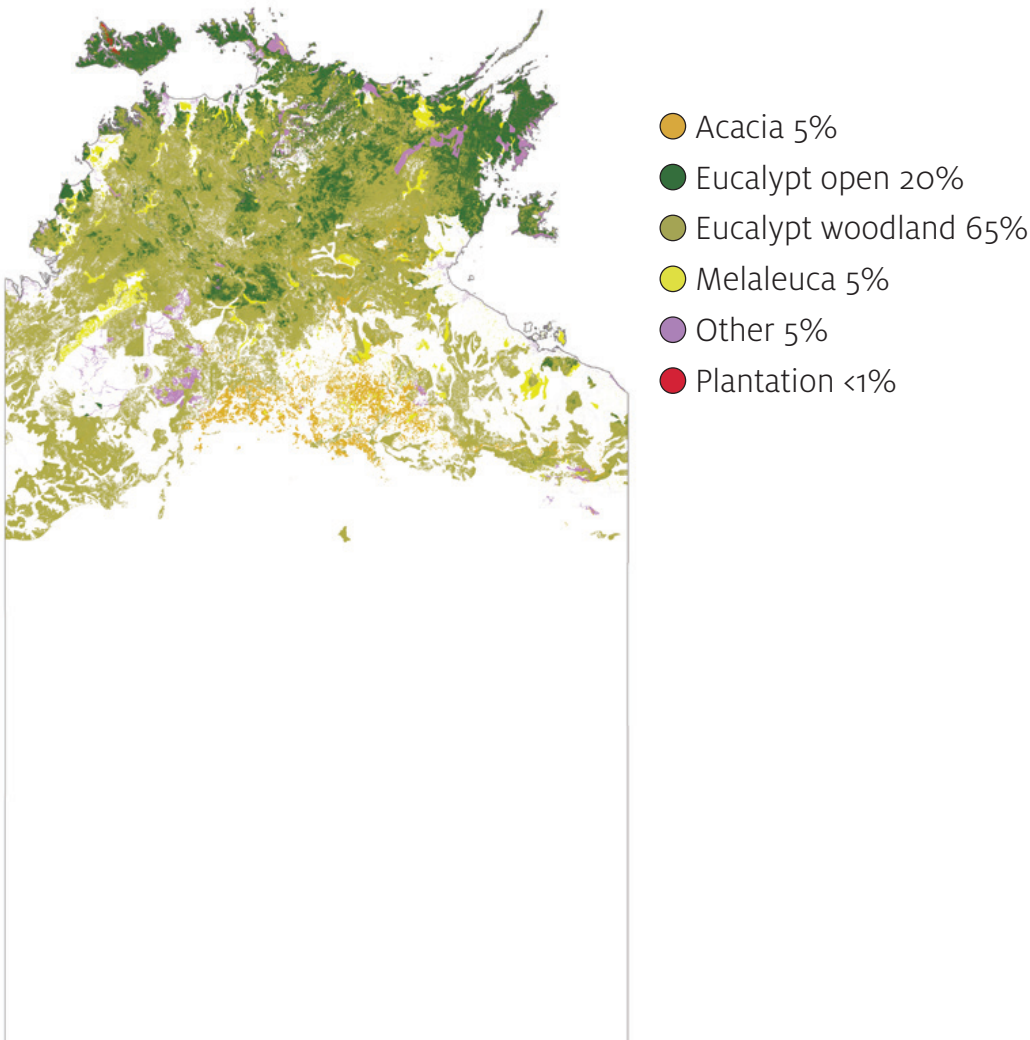


	Area ('000 ha)
Leasehold land	13 920
Multiple-use forests	0
Nature conservation reserves	16
Other Crown land	674
Private land	16 317
Unresolved tenure	83
Plantations – all tenures	40

Did you know?

Kakadu National Park in the Northern Territory is classified as private land and leased to the Australian Government for nature conservation. At nearly 2 million hectares, it is almost one-third the size of Tasmania.

Northern Territory forests, by type



Note: Numbers following forest type represent proportion of total forest estate.

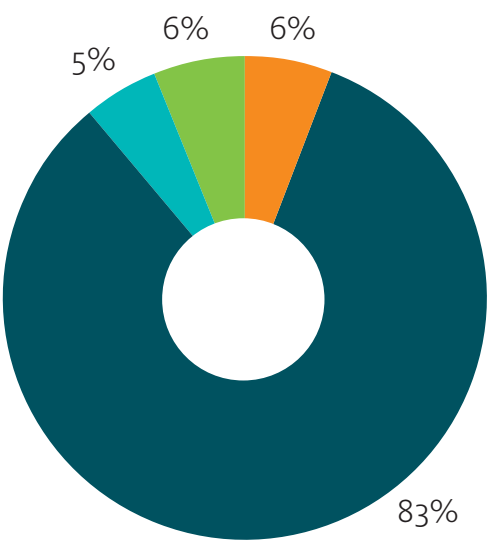
Northern Territory forestry and wood products industries

The Northern Territory forest industry is largely based on hardwood plantations, and the Indigenous arts and crafts industry which uses material from forests. The Northern Territory forest industries employ less than 1000 people in wood product manufacturing and marketing.

Australian Capital Territory

	Area ('000 ha)	% of territory	% of national total
Land area	243	100	<1
Native forest	123	51	<1
Plantation forest	8	3	<1
Total forest	131	54	<1

Australian Capital Territory forest area, by tenure

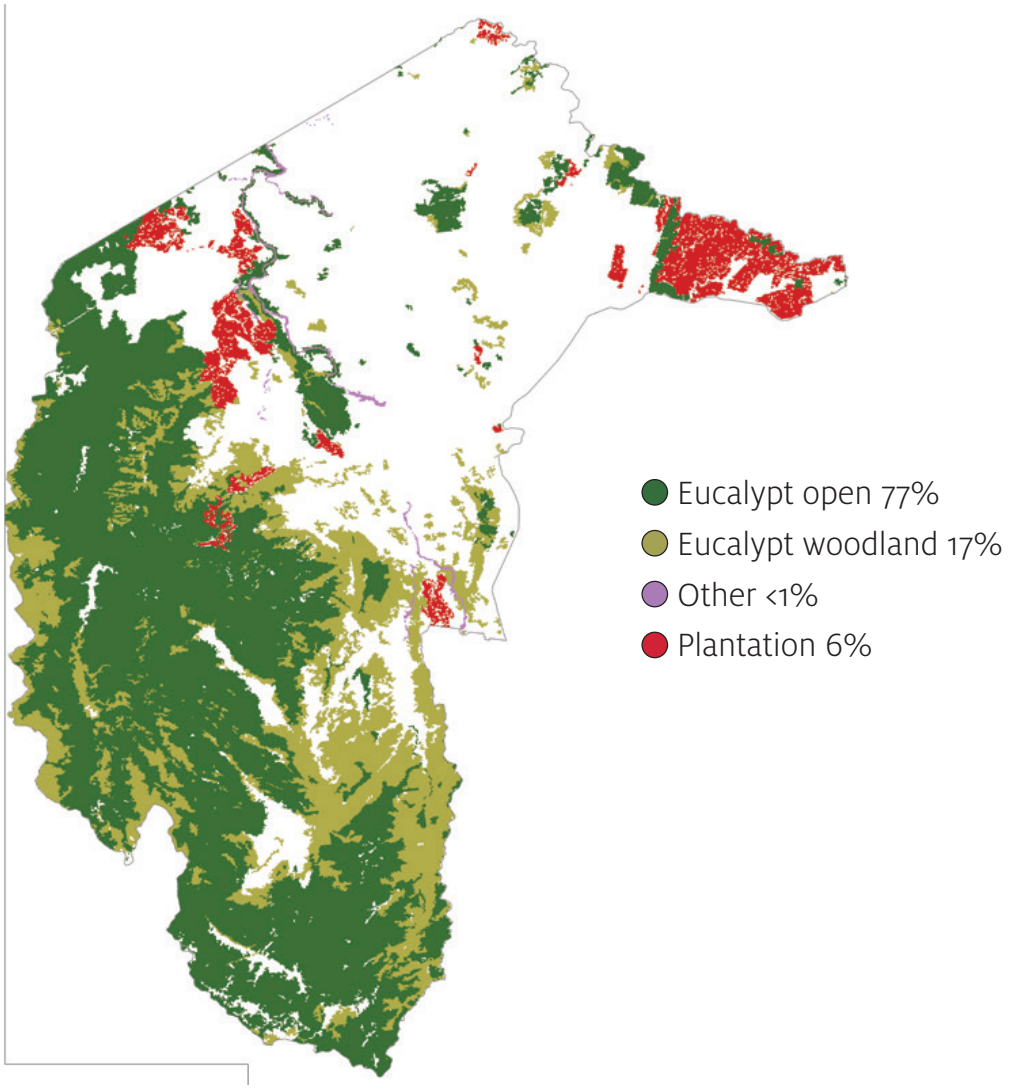


	Area ('000 ha)
Leasehold land	8
Multiple-use forests	0
Nature conservation reserves	108
Other Crown land	7
Private land	0
Unresolved tenure	0
Plantations – all tenures	8

Did you know?

Almost 88 per cent of native forest (excluding plantations) in the Australian Capital Territory is in nature conservation reserves.

Australian Capital Territory forests, by type



Note: Numbers following forest type represent proportion of total forest estate.

Australian Capital Territory forestry and wood products industries

The territory's forest industries have contracted substantially since 2003, when bushfires destroyed two-thirds (10 500 hectares) of its softwood plantations. The territory's forest industries employ fewer than 1000 people in wood product manufacturing and marketing.

References and further reading

ABARES 2011, *Potential effects of climate change on forests and forestry in Australia*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

ABARES 2012, *Australian forest and wood products statistics, September and December quarters 2011*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

Australian Land Information Group & Carnahan, JA 1990, *Atlas of Australian Resources: Vegetation*, Australian Government Publishing Service, Canberra.

BRS 2008, *Australian forest profiles*, information sheets series of eight titles: Acacia, Callitris, Casuarina, Eucalypts, Mangroves, Melaleuca, Rainforest and Plantations; Plus a poster: Australia's forests, Bureau of Rural Sciences, Canberra.

BRS 2008, *State of Australia's forests*, fact sheet series of eight titles: Type and Extent, Carbon, Certification, Conservation, Employment, Fire, Sustainable yield and Water, Bureau of Rural Sciences, Canberra.

Davidson, J, Davey, S, Singh, S, Parsons, M, Stokes, B & Gerrand, A 2008, *The Changing Face of Australia's Forests – A summary of major changes in Australia's forests since 1992*, Bureau of Rural Sciences, Canberra.

DCCEE 2011, *National Greenhouse Gas Inventory*, Department of Climate Change and Energy Efficiency, Canberra, available at climatechange.gov.au/climate-change/emissions.aspx.

Gavran, M & Parsons, M 2011, *Australian plantation statistics 2011*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

Gavran, M 2012, *Australian plantation statistics 2012 update*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

Gavran, M, Frakes, I, Davey, S & Mahendrarajah, S 2012, *Australia's Plantation Log Supply 2010–2054*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

Montreal Process Implementation Group for Australia 2008, *Australia's State of the Forests Report 2008*, Bureau of Rural Sciences, Canberra.

Schirmer, J, 2008, *Forestry, jobs and spending: Forest industry employment and expenditure in Tasmania, 2005–06*, CRC for Forestry, Hobart, June.

—2010, *Tasmania's forest industry – Trends in Forest Industry Employment and Turnover 2006 to 2010*, CRC Forestry.

Taylor, J & Van Langenberg, K 2004*, Review of the environmental impact of wood compared with alternative products used in the production of furniture*, Forest and Wood Products Research and Development Corporation.