



Australian Government

Department of Agriculture, Fisheries and Forestry
Bureau of Rural Sciences

Australia's forests at a glance 2010

Data to 2009



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The main sources of data for this booklet are *Australia's State of the Forests Report 2008*, *Australian Forest and Wood Products Statistics, November 2009* and provisional data from the *National Plantation Inventory 2010 update*. The final year is shown for data reported for financial years. Where data earlier than 2009 are presented, they are the latest available, or are used to indicate trends. Totals in some tables may not tally exactly because of rounding.

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More information on forest issues is available at
www.daff.gov.au/forestsaustralia

Cover images: (front) iStockphoto (back) Mark Parsons

Foreword



The Australian Government recognises Australia's forests play a vital role in supporting our timber industries, regional jobs, tourism and recreation and biodiversity conservation.

We are committed to encouraging sustainable investment in forestry and helping our forest industries prepare for future challenges. This includes providing grants to increase the competitiveness of our forest resources and investing to address major knowledge gaps about the impact of climate change on our forest systems and industries.

We also remain determined to restrict the importation of illegally logged timber, which undermines local jobs and hurts communities in developing nations.

As Australia's forests at a glance 2010 shows, the annual value of turnover of Australia's forestry and forest products industries is \$23 billion.

The Hon. Tony Burke MP
Minister for Agriculture, Fisheries and Forestry
March 2010

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%
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
New plantation area reported (five year average)	70 000 hectares/year
Total logs harvested (2008)	28.5 million m ³

Total imports of wood products (2009)	\$4.5 billion
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Total exports of wood products (2009)	\$2.3 billion
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Major wood product imports (value in 2009):

Paper and paperboard	\$2277 million
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Manufactured paper products	\$590 million
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Sawn timber	\$405 million
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Panels and veneers	\$271 million
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Major wood product exports (value in 2009):

Woodchips	\$997 million
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Paper and paperboard	\$605 million
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Sawn timber	\$125 million
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Panels and veneers	\$101 million
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Number of people employed in ABS categories forestry, logging and wood manufacturing (2009)	76 800
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Value of turnover in forest product industries (2008)	\$23.0 billion
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Forestry and forest products industries contribution to GDP (2008)	0.7%
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Image Science and Analysis Laboratory, NASA Johnson Space Centre

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Forest area

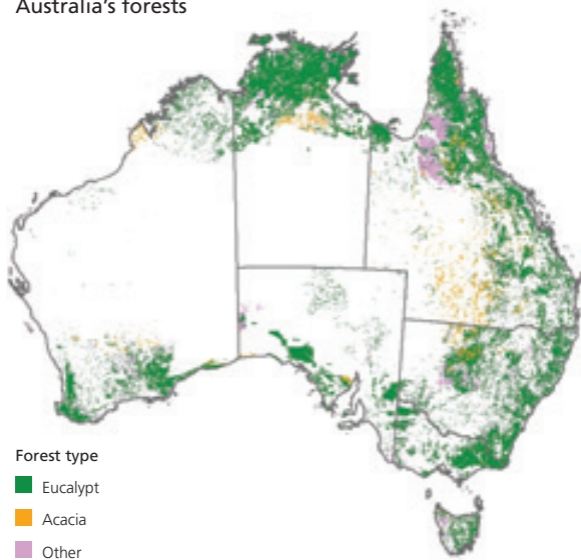
The information about Australia's native forests in this booklet is derived mainly from *Australia's State of the Forests Report 2008*. Copies of that report can be obtained from the Bureau of Rural Sciences (see inside back cover).

Forest is defined as:

'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%.' This definition 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% of the continent. Australia has about 4% of the world's forests on 5% of the world's land area.

Australia's forests



Development of crops and pastures has led to the removal of considerable areas of native vegetation, including forest, over the past two hundred years. The area of tall eucalypt forests where timber harvesting occurs is now estimated to be 86.6% of the original extent.

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

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 forests and woodlands	73.2
Eucalypt tall forests	86.6
Mallee woodlands and shrublands	70.2
Other shrublands	78.3
Rainforests and vine thickets	65.3
All groups	87.5

Source: Australian Vegetation Assessment 2010. Bureau of Rural Sciences (in press)

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%), followed by acacias (7%) and melaleucas (5%). In contrast, about half of Australia's plantations are exotic conifers (predominantly *Pinus radiata*). The other half is mostly native hardwood species.

The distribution of forest types and class is mainly determined by climate and soil properties. Other factors, especially fire frequency and intensity, are also important.

→ Did you know?

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

Forest area by types ('000 hectares)

Forest type	Area
Acacia	10 365
Callitris	2597
Casuarina	2229
Eucalypt	116 449
Mangrove	980
Melaleuca	7556
Rainforest	3280
Other forest	3942
Total native forest (2008)	147 397
Hardwood plantation	991
Softwood plantation	1020
Other plantation	9
Total plantation (2009)	2020
Total forest	149 417

Forest crown cover

Crown cover is the area of ground covered by tree canopies. A line around the outer edge defines the limits of an individual canopy. All the area within that line is counted as 'canopy', irrespective of gaps and overlaps. The National Forest Inventory uses three broad national forest crown cover classes.

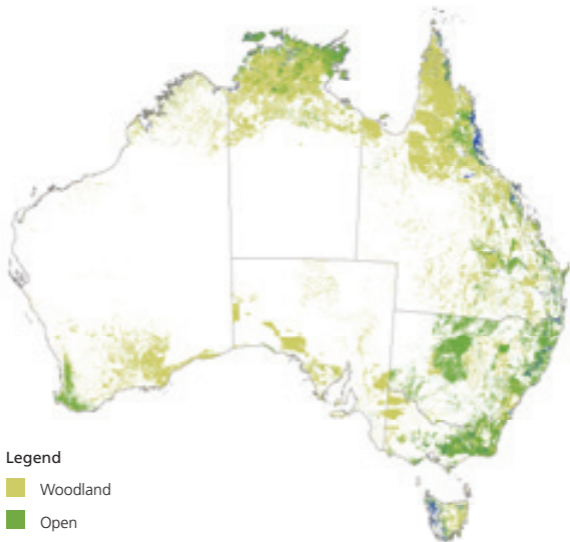
Native forest areas by crown cover class ('000 hectares)

Woodland forest (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



John Davidson

Native forest by crown cover class



Legend

- Woodland
- Open
- Closed

Forest height

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

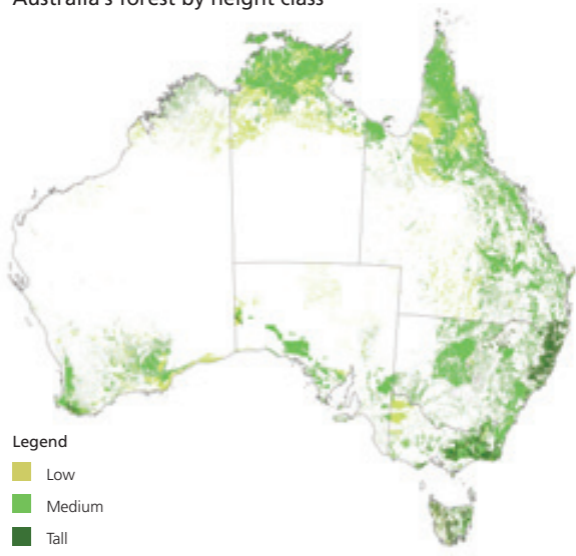
Native forest area by height class ('000 hectares)

Height class	Total
Low (height 2–10 metres)	35 846
Medium (height 10–30 metres)	104 024
Tall (height > 30 metres)	7329
Unknown	199
Total native forest	147 398



John Davidson

Australia's forest by height class



Native forest by crown cover and height class

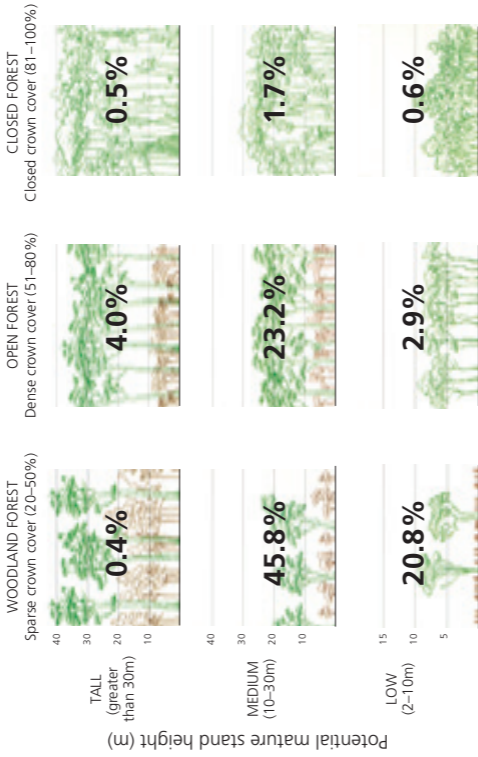
→ Did you know?

Nearly 46% of Australia's forest is medium height woodland forest and less than 1% is tall closed forest?



Mark Parsons

Proportion of Australia's forest extent in each class



Sources: Australian Land Information Group and JA Carnahan 1990, *Atlas of Australian Resources, Vegetation*, Australian Government Publishing Service, Canberra
 Note: Percentages from the NFI.

Old-growth forests

Old-growth forests are ecologically mature forests where the effects of past disturbances are now negligible.

Old-growth forests were surveyed in regions where assessments were conducted for Regional Forest Agreements (RFAs) a decade or more ago. There has been no comprehensive survey of old-growth forests across the rest of Australia. Old growth forests in Western Australia were remapped in 2007.

In RFA regions:

- more than five million hectares of forest, or 22%, were classified as old-growth
- 73% of these known old-growth forests are in conservation reserves. Some of the remainder are available for timber production.

→ Did you know?

79% of Tasmania's identified old-growth forests are in conservation reserves.

Area of old-growth forest in areas surveyed for RFAs ('000 hectares)

	Native forest in region	Area of old-growth identified	Area of old-growth in reserves ^a	Proportion in reserves %
NSW ^b	8989	2536	1742	69
Qld ^b	3230	270	196	73
Tas.	3116	1229	973	79
Vic. ^c	5774	673	460	68
WA ^d	1909	331	331	100
Total	23 018	5039	3702	73 ^e

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

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

Native forest tenure and ownership

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

Multiple-use public forest – public forests 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 that are formally reserved for environmental, conservation and recreational purposes.

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

Private forest – forest on privately owned land.

→ Did you know?

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

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

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

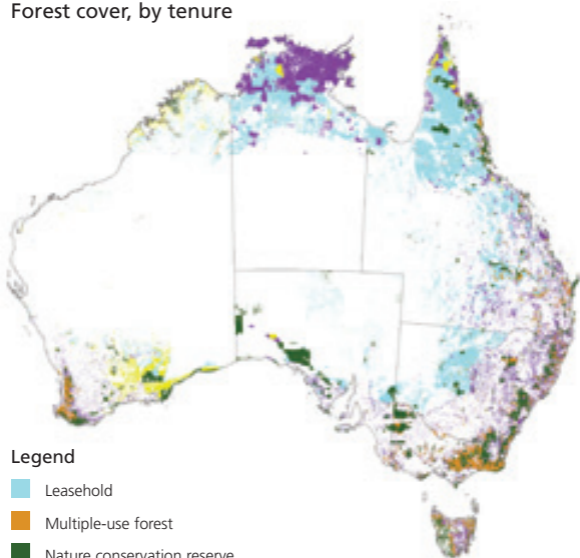
There are Indigenously managed native forests in each of the tenure categories described above with the exception of multiple-use forests. There is no formal tenure classification system to enable native forests managed by Indigenous people to be identified.

Native forest area by tenure category, 2008

Tenure	Area (‘000 hectares)	Proportion of total %
Multiple-use forest	9410	6
Nature conservation reserve ^a	22 371	15
Other Crown land	10 862	7
Private forest (including Indigenous)	38 099	26
Leasehold forest	65 132	44
Unresolved tenure	1524	1
Total native forest	147 397	100

Note: Data in this table are supplied by the states and territories. The 23 million hectares of formal nature conservation reserve (IUCN categories I–IV) mentioned on page 23 are derived from the Collaborative Australian Protected Area Database that includes additional reserved lands found in ‘Other Crown land’ and ‘Private land’ categories.

Forest cover, by tenure



Legend

- Leasehold
- Multiple-use forest
- Nature conservation reserve
- Unresolved
- Other Crown land
- Private

Forest in reserves

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

In 2008, 23.0 million hectares—16% of Australia's forests—were in dedicated formal conservation reserves (reserved in International Union for Conservation of Nature and Natural Resources 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% in 1998 to 16% in 2008.



Tim Clancy

Plantation forests

What is a plantation?

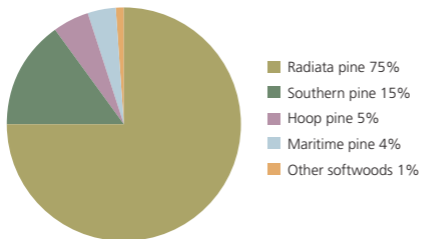
Plantations are intensively managed stands of trees, of native or exotic species, created by the regular placement of seedlings or seeds.

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.

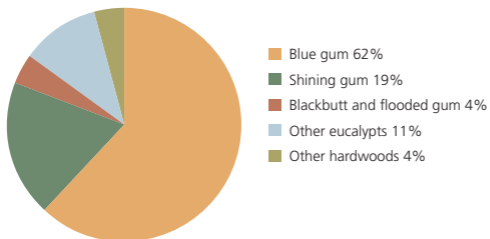
Plantation species fall into two groups:

- Softwood – mainly pine (*Pinus*) species.
- Hardwood – mainly eucalypts, including *Eucalyptus* and *Corymbia* species.

Softwoods



Hardwoods



Plantation establishment began in Australia in the 1870s. About 200 000 hectares had been established by 1960 and over 90% of that was introduced pines. From the 1960s to the 1980s, the area of pine plantations increased rapidly because of investment by governments.

The total area by 1990 was a little over one million hectares. After 1990, the area of hardwood plantations began to increase rapidly because of private investment, while the rate of establishment of new pine plantations slowed. In some regions the softwood area has declined in the past few years because harvested pine areas have been replanted with hardwood species or the land has been used for other purposes.

The emphasis since 1990 has been on 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.

Types of plantations by climate region

Type	Climate region	Main species	Main uses
Hardwood	Tropical: high rainfall	Mangium (an Acacia)	Paper products
	Sub-tropical: medium rainfall	Flooded gum, Dunns white gum	Paper products
	Temperate: medium to high rainfall	Blue gum, shining gum	Paper products
	Tropical: high rainfall	African mahogany, teak, some native species	Sawn timber for furniture, flooring and other high value uses
	Several regions	Various eucalypts	Sawn timber for building and furniture
Softwood	Temperate: medium rainfall	Radiata pine	Sawn timber for building, joinery, furniture, plywood, other high-value uses; posts and poles; residues used for paper, particleboard and other panels
	Tropical, sub-tropical: medium rainfall	Caribbean pine, slash pine and hybrids	
	Temperate: low to medium rainfall	Maritime pine	
	Tropical, subtropical: high rainfall	Hoop pine	

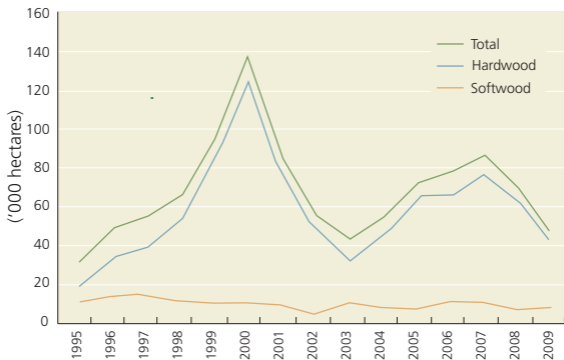
Plantation expansion

Australia's plantation area has been expanding steadily for several years. An average of 70 000 hectares of new plantations was established in each of the five years to 2009. The rate of expansion is expected to decrease in the next few years.

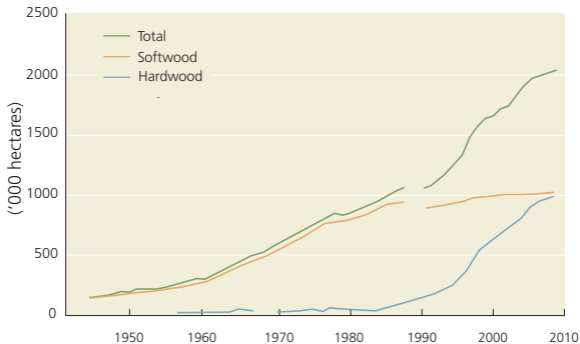


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New areas of plantation by species group



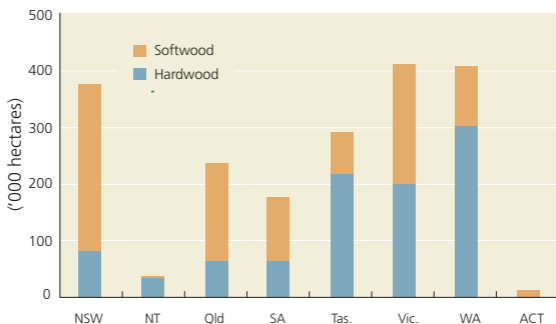
Cumulative plantation area by species group



Current area of plantations

There were 2.0 million hectares of plantations in Australia in 2009. Of this total, 49% were hardwood species and 51% were softwood species. Victoria and Western Australia are the states with the largest areas of plantations.

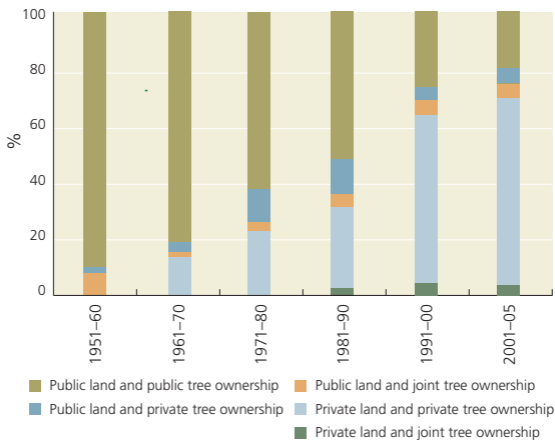
Plantation area by species group and jurisdiction 2009



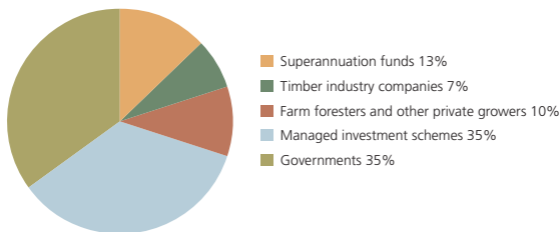
Plantation ownership

State governments were the major plantation owners in the early 1990s. Since then, most of the investment in new plantations has been in the private sector. The Victorian and Tasmanian governments have sold plantations to private investors. Private ownership of plantations has therefore increased from about 30% in 1990 to about 62% in 2009. The private plantations include an estimated 100 000 hectares of small scale farm forestry plantings. Public ownership is 33% and about 5% is jointly owned. Most of the expansion in private plantations has been funded by managed investment schemes.

Plantation land and tree ownership by planting years



Plantation ownership by owner type 2009



Wood supply from plantations

Plantations currently produce about two-thirds of the 27 million cubic metres logs harvested in Australia each year. The balance of the logs comes from native forests.

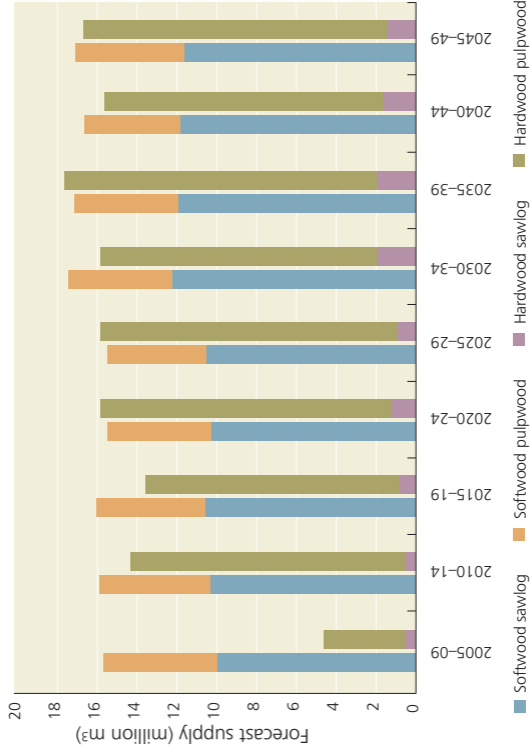
The potential supply of softwood plantation sawlogs and pulpwood is not expected to change significantly from now to 2050.

The potential log supply from hardwood plantations will rise rapidly because the large areas established from the mid-1990s are reaching rotation age. The vast majority of those plantations are managed to produce pulpwood for papermaking. Hardwood sawlog supply from plantations is estimated to rise slowly to 2030 then stabilise at a low level or decline to 2050.

→ Did you know?

Plantations provide 75% of the sawlogs produced in Australia, yet comprise only 1.3% of the forest area.

Future wood supplies from plantations



Forest certification and codes of practice

Forest and chain of custody certification assures buyers in Australia and around the world that the forest products they obtain originate from legally harvested and sustainably managed native forests and plantations.

Several private organisations conduct forest and chain of custody certification in Australia. They use standards set by either the Australian Forest Certification Scheme (AFCS) or the Forest Stewardship Council (FSC) scheme.

The AFCS uses the Australian Forestry Standard, which was developed via a nation-wide process involving representatives of the Australian community, industry and government. The FSC uses a standard that complies 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 rapidly to about 10.4 million hectares. This includes most of the native forests managed for timber production.

In addition to certification, multiple-use public forests and private forests are managed in accordance with codes of practice. Many forest managers use environmental management systems (EMS) that are certified independently to an ISO standard. Public forest management agencies with certified EMS in place include Forests NSW, Forestry SA, Queensland's Department of Natural Resources and Water (Forest Products), Forestry Plantations Queensland, Western Australia's Forest Products Commission, Victoria's Department of Sustainability and Environment, and Forestry Tasmania. Several large private forestry enterprises also have EMS.



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Forests, wood products and carbon

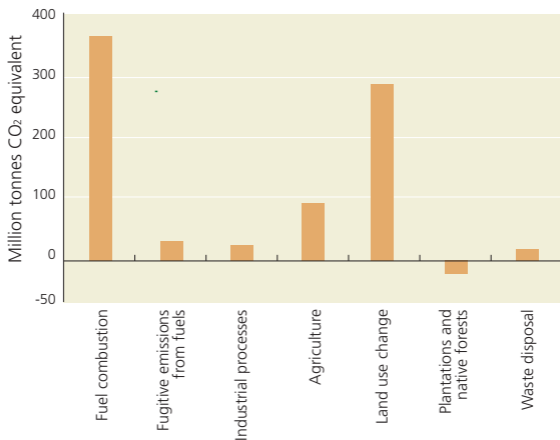
Trees take up carbon dioxide from the atmosphere during photosynthesis. The carbon dioxide is released during respiration, when trees are burned, die and decay and when wood products are burned or decay after use.

Australia's total greenhouse gas emissions from power generation, transport, agriculture and other sources was over 800 million tonnes in 2007. Plantations and native forests sequestered a net 18.9 million tonnes of carbon dioxide in that year. That amount reduced national emissions by 2.2%.



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Australia's greenhouse gas emissions by sector, 2007

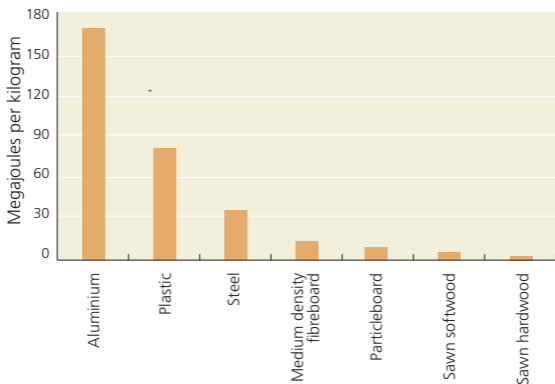


Note: Emissions from land use change were substantially higher in 2007 than in 2006 because of wildfires and drought that caused losses from all vegetation carbon pools.

Source: *National Greenhouse Gas Inventory*, Department of Climate Change, 2009.

The embodied energy of a product is all the energy used to obtain raw materials and to manufacture, package and transport the product. Energy use is closely associated with the amount of carbon dioxide emissions to the atmosphere. Different materials have widely different embodied energy. The embodied energy of timber products is much lower than that of many other materials.

Embodied energy in new materials



Source: Taylor, J and 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.

Note: The value for plastic is for PVC (polyvinylchloride). The values for timber are for kiln dried timber.

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. Those fires can cause losses of human life and can destroy assets such as trees, livestock, buildings, fences, bridges and power lines. Bushfires in southern Australia lead to soil erosion and degrade stream water quality. The resulting natural regrowth reduces water yields for decades.

Climate change could have serious implications for the frequency and severity of bushfires in Australia. There is some evidence that the observed warming trend has already contributed to increased drought severity through higher evaporation and water demand. Native forests in many locations may become more susceptible to fire.

Large fires in southern Australia

Year	Location	Area burnt* (‘000 hectares)
1926	Victoria	394
1939	Victoria	1400
1943–44	Victoria	1100
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 NSW	>800
1995	South-east Queensland	333
1997–98	Hunter, Blue Mountains, Shoalhaven, NSW	>500
2001–02	Greater Sydney, NSW	744
2002–03	Eastern Highlands, Victoria	1100
2002–03	Brindabella Ranges–Canberra, NSW–ACT	157
2002–03	East coast–greater Sydney, NSW	1460
2002–03	Arthur–Pieman, Tasmania	100

Continued...

Year	Location	Area burnt* ('000 hectares)
2005	Eyre Peninsula, South Australia	145
2006–07	Eastern Highlands, Victoria	1050
2009	Central–north-east Victoria	430

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

Sources:

Bartlett, T, Leonard, M and 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 and 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.



Adam Gerrand

Forest industries

The forestry and wood products industries contribute significantly to the economic and social well-being of rural and regional Australia. The wood products industries have an annual turnover of about \$23 billion. They contribute around 0.7% to Australia's gross domestic product and 5.8% of total manufacturing industry income.

The total number of people employed in the forestry and wood products industries has been estimated based on an industry survey to be about 120 000. The number of people employed in the Australian Bureau of Statistics industry classifications 'forestry', and 'wood, pulp and paper manufacturing' for 2009 was 76 800. Those industry classifications cover a narrower range of activities than the industry survey.

Estimated employment in forest-growing and wood product industry sector, 2006

Sector	No. of employees
Forest growing and management	7348
Timber harvesting and haulage	8973
Sawmilling and timber processing	19 081
Timber product manufacturing	37 800
Wood panel and board production	5635
Pulp and paper manufacturing	11 024
Timber merchandising	22 134
Support service internal to industry	5445
Support service external to industry	2745
Total	120 184

Source: based on ForestWorks Ltd data

Forest products

Australians consume around 23 million cubic metres (in log volume equivalent terms) of wood products each year. Most of the logs from which those products are made are grown in Australia. The volume of logs harvested has increased by about 35% in the past decade while consumption of wood products has increased by 21%. The increase in logs harvested is because plantations are reaching harvest age. Production of native forest logs has declined by 10% over the decade. The decrease is mainly because of transfer of forests to nature conservation reserves.



Logs harvested ('000 m³)

Source of logs	1998	2003	2008	10-year change %
Native forests				
Sawlogs and veneer logs	4151	3846	3176	-24
Pulpwood and other logs	6061	6772	5974	-1
Total	10 212	10 617	9150	-10
Hardwood plantations				
Sawlogs and veneer logs	7	153	186	large*
Pulpwood and other logs	199	1441	4421	large*
Total	206	1594	4607	large*
Softwood plantations				
Sawlogs and veneer logs	6265	8256	9227	47
Pulpwood and other logs	4475	5354	5477	22
Total	10 741	13 609	14 704	37
Total log harvest	21 159	25 820	28 461	35

* Large increase because of low base in 1998.

Source: Australian forest and wood products statistics, ABARE

Production and consumption of wood products

	1998	2003	2008	10-year change %
Paper products production (thousand tonnes)				
Newsprint	444	412	456	3
Printing and writing	424	564	706	67
Household and sanitary	191	194	186	-3
Packaging and industrial	1483	1892	1933	30
Total	2542	3062	3281	29
Paper products consumption (thousand tonnes)				
Newsprint	718	682	679	-5
Printing and writing	1146	1337	1822	59
Household and sanitary	208	206	231	11
Packaging and industrial	1394	1561	1606	15
Total	3466	3786	4338	25
Sawn timber production (thousand cubic metres)				
Softwood ¹	2338	3356	4263	82
Hardwood ²	1513	1312	1108	-27
Total	3851	4668	5371	39

Continued...

	1998	2003	2008	10-year change %
Sawn timber consumption (thousand cubic metres)				
Softwood ¹	2998	4009	4642	55
Hardwood ²	1598	1387	1164	-27
Total	4589	5378	5806	27

1 Mainly sawn from plantation pine logs.

2 Mainly sawn from native forest eucalypt logs.

Source: Australian forest and wood products statistics, ABARE



John Davidson

	1999	2004	2009	10-year change %
Veneer and panel production (thousand cubic metres) ¹				
Veneers	3	3	116	large ²
Plywood	169	146	118	-30
Particleboard	902	1048	911	1
Medium density fibreboard	495	795	632	28
Woodchip exports (bone dry tonnes)				
Softwood	1033	1099	964	-7
Hardwood	2852	4165	4291	50
Total	3885	5264	5255	35

- 1 Laminated veneer lumber and hardboard cannot be reported because of confidentiality restrictions.
- 2 The large increase is because structural veneer manufacturing commenced in Tasmania in 2008.

Source: Australian forest and wood products statistics, ABARE

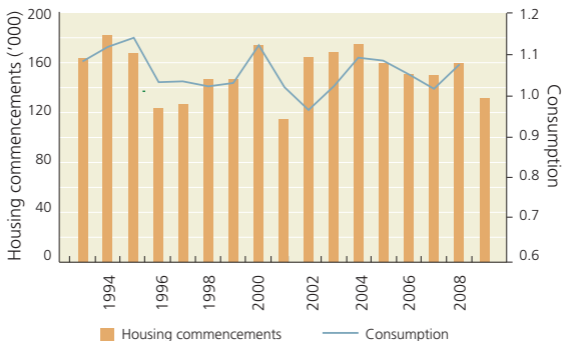
→ Did you know?

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.

Wood products consumption

Most of Australia's wood products are used in home building and other construction. From year to 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 increased in parallel with population growth for many years.

Housing commencements and wood consumption in Australia



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 25% in the ten years to 2009. The increase was mainly because of a 59% increase in consumption of printing and writing papers. Consumption of paper products far exceeds domestic production. The shortfall is made up by imports of about 1.8 million tonnes per year, 67% of which is printing and writing papers. Imported paper products cost nearly \$2.3 billion and were 51% of total timber products imports in 2009.

Most hardwood sawn timber is used for flooring, decking, joinery, furniture and similar uses where particular appearances or colours are required or for engineering and architectural applications that need particular strength, hardness and durability. The consumption of sawn hardwood declined by about 27% in the ten years to 2008 to 1.2 million cubic metres. About 10% of the sawn hardwood used is imported.

Softwood sawn timber is mainly used as a structural component of house frames and other buildings. The consumption of sawn softwood increased by about 55% in the ten years to 2008 to about 4.6 million cubic metres. Australian production increased by 82% to 4.3 million cubic metres in that period.

Medium-density fibreboard and particleboard are mainly used for flooring and joinery (e.g. kitchen benches and cupboards) and together comprise over 80% of the timber-based panels produced in Australia. As for sawn timber, trends in

domestic consumption of these products follow trends in the building industry, in particular the rate of house construction. Consumption of particleboard nearly equals Australian production. About one-third 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 soared since 2007 because of construction of two veneer mills in Tasmania. 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. The veneer is exported to plywood manufacturers in Malaysia.

Many products other than wood 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.



Department of Agriculture, Fisheries and Forestry

Recycling

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



John Davidson

Wood and paper products trade

The value of wood and paper products exports in 2009 was \$2.3 billion. The value of imports was \$4.4 billion, leaving a trade deficit of \$2.1 billion.

Wood product exports and imports (\$millions)

	1999	2004	2009	10-year change %
Exports				
Woodchips	586	794	997	70
Paper and paperboard ¹	314	635	605	93
Recovered paper	25	53	235	large ²
Sawn timber ³	43	74	125	190
Manufactured paper products	146	149	106	-27
Other products	233	335	274	18
Total wood product exports	1347	2040	2342	74

Continued...

→ Did you know?

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

	1999	2004	2009	10-year change %
Imports				
Paper and paperboard ⁴	1756	2137	2277	30
Manufactured paper products	348	341	590	70
Sawn timber ³	417	502	405	-3
Panels	143	190	271	90
Wood pulp	193	235	263	36
Other products	407	590	653	60
Total wood product imports	3264	3995	4459	37

- 1 Mainly packaging and industrial papers.
- 2 Reflects a large increase in recovered paper exports to China.
- 3 There is a wide range of species and grades of sawn timber. Different species and grades are exported and imported to meet particular consumer requirements.
- 4 Mainly printing and writing papers.

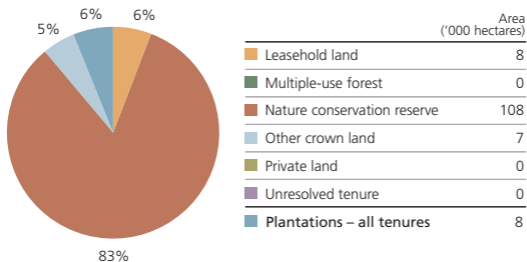
Source: Australian forest and wood products statistics, ABARE

State and territory summaries

Australian Capital Territory

	Area (‘000 hectares)	% Australian Capital Territory	% of national total
Land area	243	n.a.	0.03
Native forest	123	52	<1
Plantation forest	8	3	<1
Forest cover	131	56	<1

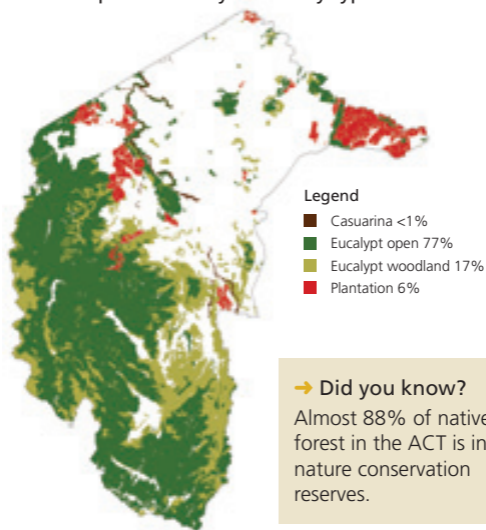
Australian Capital Territory forest area by tenure



ACT forestry and wood products industries

The ACT forest industries have contracted substantially since 2003, when bushfires destroyed two-thirds (10 500 hectares) of the territory's softwood plantations. About 1563 people are employed in wood product manufacturing and marketing in the ACT.

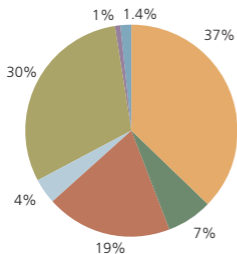
Australian Capital Territory forests by type



New South Wales

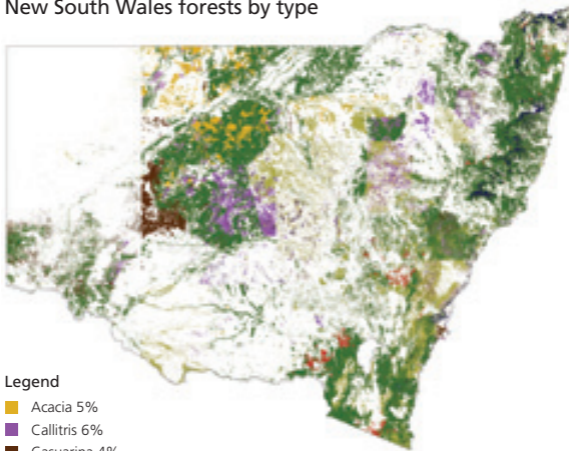
	Area (‘000 hectares)	% New South Wales	% of national total
Land area	80 064	n.a.	10
Native forest	26 208	33	18
Plantation forest	383	<1	19
Forest cover	26 591	33	18

New South Wales forest area by tenure



	Area (‘000 hectares)
Leasehold land	9891
Multiple-use forest	1980
Nature conservation reserve	5148
Other crown land	943
Private land	8076
Unresolved tenure	170
Plantations – all tenures	383

New South Wales forests by type



Legend

- Acacia 5%
- Callitris 6%
- Casuarina 4%
- Eucalypt mallee 1%
- Eucalypt woodland 18%
- Eucalypt open 61%
- Eucalypt closed <1%
- Mangrove <1%
- Melaleuca <1%
- Other 2%
- Rainforest 2%
- Plantation 1%

→ Did you know?

Forests NSW manages the largest plantation estate in Australia.

New South Wales forestry and wood products industries

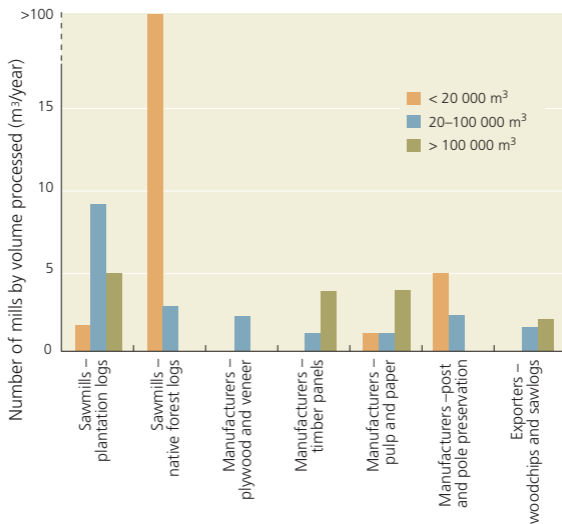
Census data for 2006 show a total employment of 23 792 people in the forestry and wood products manufacturing sectors in New South Wales. When all businesses that depend on growing and using timber are included, total employment is estimated at about 38 000 people.

The forestry and wood products industries are a major part of several regional communities in New South Wales.



Mark Parsons

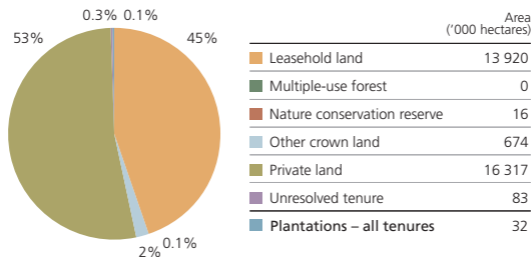
Type, number and size of the main timber processing industries in New South Wales



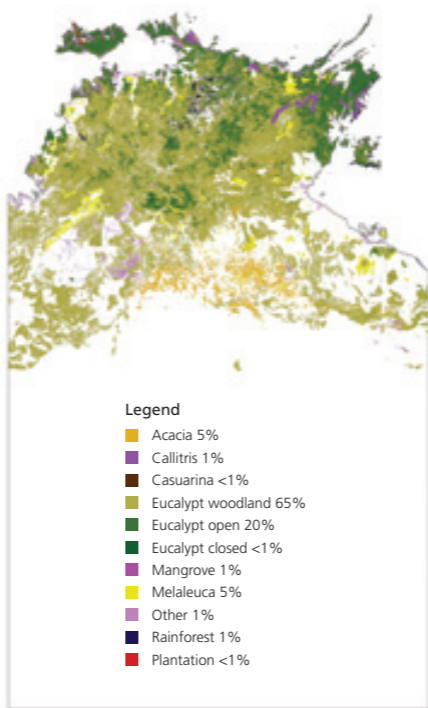
Northern Territory

	Area (‘000 hectares)	% Northern Territory	% Australia
Land area	134 913	n.a.	18
Native forest	31 010	23	21
Plantation forest	32	<1	2
Forest cover	31 042	23	21

Northern Territory forest area by tenure



Northern Territory forests by type



Northern Territory forestry and forest 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. A national survey identified 339 people employed in the timber industry in the Northern Territory. This is likely to be an underestimate because in Indigenous communities the art and crafts industry can amount to more than 40% of a community's cash income.

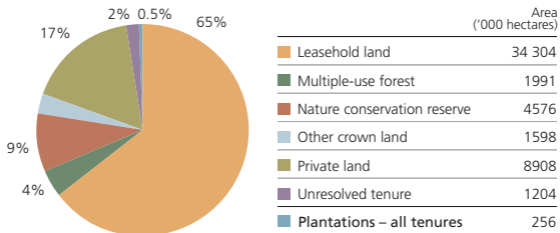
→ Did you know?

Kakadu National Park in the Northern Territory is the largest nature conservation reserve in Australia. At nearly 2 million hectares, it is almost a third the size of Tasmania.

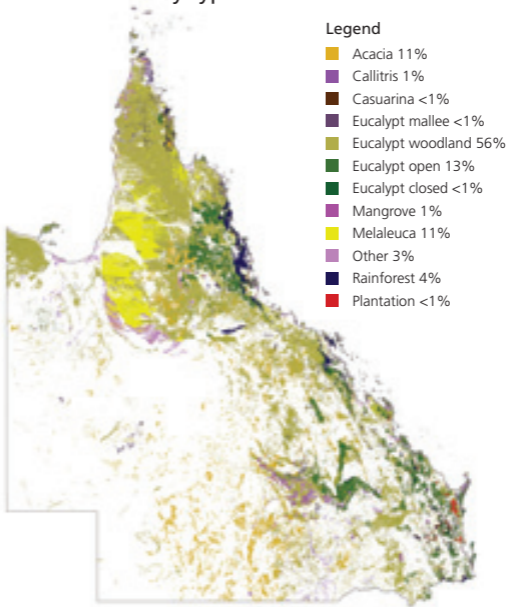
Queensland

	Area (‘000 hectares)	% Queensland	% Australia
Land area	173 065	n.a.	23
Native forest	52 582	30	36
Plantation forest	256	<1	13
Forest cover	52 838	31	35

Queensland forest area by tenure



Queensland forests by type



→ Did you know?

More than one third (42%) of Australia's eucalypt woodland forests are in Queensland.

Queensland forestry and forest products industries

Census data for 2006 show a total employment of 14 825 people in the forestry and wood products manufacturing sectors in Queensland. When all businesses that depend on growing and using timber are included, total employment is estimated at nearly 20 000 people. Some results from a survey of individual businesses that use logs from pine plantations are summarised below. No data about the hardwood plantation and native forest-based timber industries in Queensland are available.



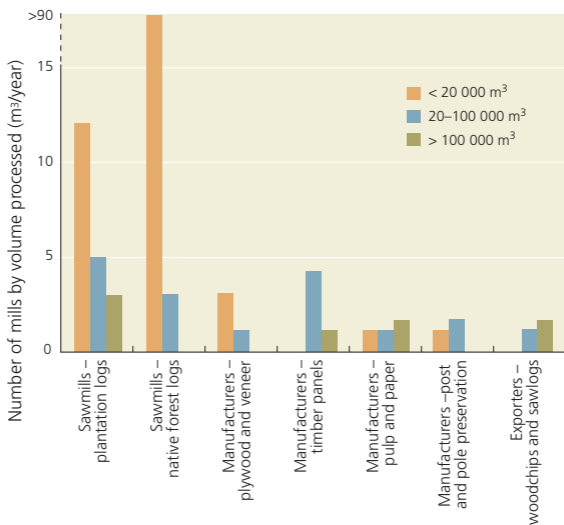
Mark Parsons

Socio-economic significance of Queensland's pine products industries

Socio-economic indicator	Sawmills	Panel manufacturers	Other businesses	Total
Number of employees	847	775	131	1754
Value of logs used (\$million/year)	115	39	25	179
Wages paid (\$million/year)	27	36	8	72
Contractor payments (\$million/year)	43	23	26	93
Value of sales (\$million/year)	245	231	97	573

Source: MBAC Consulting Pty. Ltd 2005, *A socio-economic assessment of the plantation processing sector in Queensland*, Timber Queensland, Brisbane.

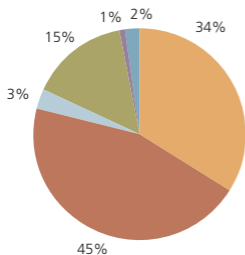
Type, number and size of the main timber processing industries in Queensland



South Australia

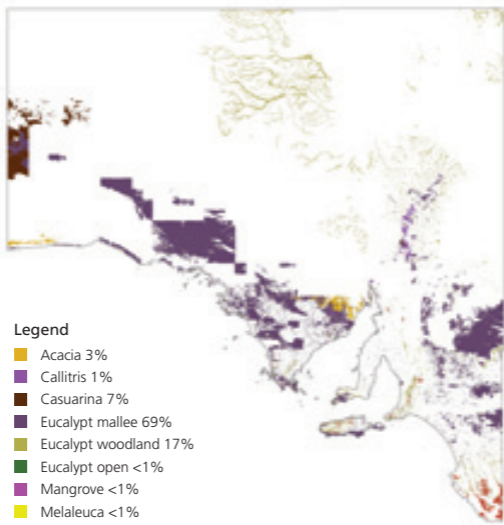
	Area (‘000 hectares)	% South Australia	% Australia
Land area	98 348	n.a.	13
Native forest	8855	9	6
Plantation forest	183	0.2	9
Forest cover	9038	9	6

South Australian forest area by tenure



	Area (‘000 hectares)
Leasehold land	3083
Multiple-use forest	0
Nature conservation reserve	4029
Other crown land	277
Private land	1399
Unresolved tenure	67
Plantations – all tenures	183

South Australian forests by type



Legend

- Acacia 3%
- Callitris 1%
- Casuarina 7%
- Eucalypt mallee 69%
- Eucalypt woodland 17%
- Eucalypt open <1%
- Mangrove <1%
- Melaleuca <1%
- Other <1%
- Plantation 2%

→ Did you know?

All timber production in South Australia is from plantations.

South Australian forestry and forest products industries

Census data for 2006 show a total employment of 7470 people in the forestry and wood products manufacturing sectors in South Australia. When all businesses that depend on growing and using timber are included, total employment is estimated at about 13 000 people.

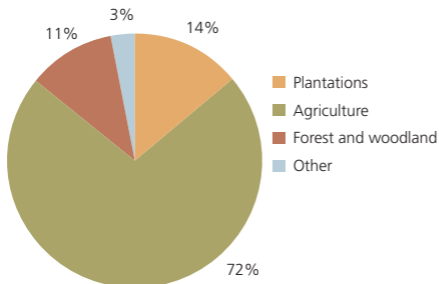
South Australia's forest industries are based solely on plantation timber growing and processing. Most of the plantations are located in the 'Green Triangle' region in the south-east of the state. Plantations in that region occupy about 14% of the region's land area compared with about 72% used for agriculture. Data on socio-economic impacts are summarised in the following table.

Socio-economic significance of forestry and wood products industries in the Green Triangle region, South Australia

Socio-economic indicator	Contribution to gross regional production (\$million)	Employment (number of jobs)
Socio-economic impact		
Direct effects:		
– Forestry	98	614
– Wood and paper products	368	3052
Flow-on effects	197	3416
Total	664	7082
Proportion of total primary industries	44%	35%
Proportion of total regional economy	27%	21%

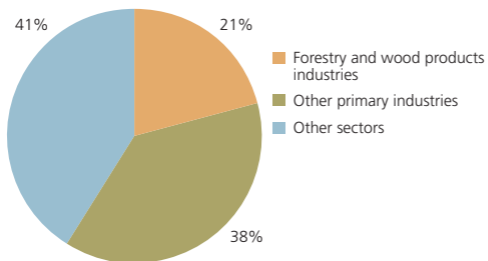
Source: EconSearch Pty Ltd 2005, *Economic impact of the timber industry in the Green Triangle region*, Green Triangle Regional Plantation Committee and ForestrySA, Mt Gambier.

Land use, south-eastern South Australia*

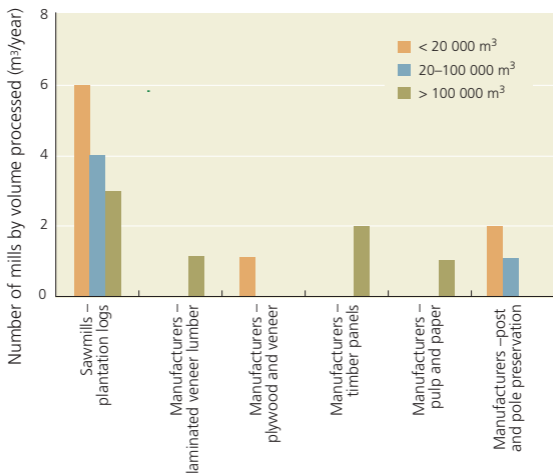


* For Millicent Coast catchment land area with above 600 mm average annual rainfall.

Employment, south-eastern South Australia



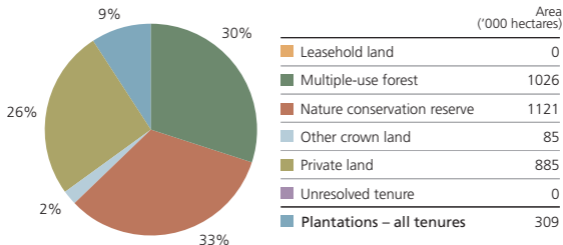
Type, number and size of the main timber processing industries in South Australia



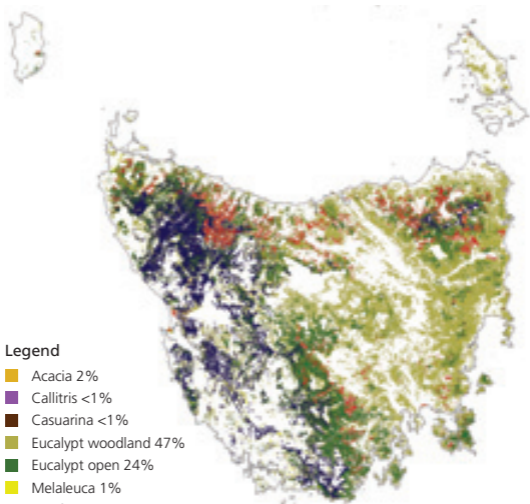
Tasmania

	Area (‘000 hectares)	% Tasmania	% Australia
Land area	6840	n.a.	1
Native forest	3116	46	2
Plantation forest	309	4	15
Forest cover	3425	50	2

Tasmanian forest area by tenure



Tasmanian forests by type



Legend

- Acacia 2%
- Callitris <1%
- Casuarina <1%
- Eucalypt woodland 47%
- Eucalypt open 24%
- Melaleuca 1%
- Rainforest 17%
- Plantation 9%

→ Did you know?

Forty-seven per cent of Tasmania's native forests are in conservation reserves.

Tasmanian forestry and forest products industries

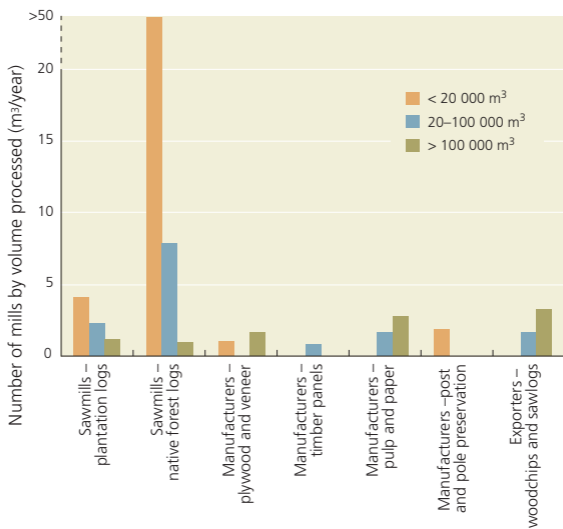
Tasmania's forestry and wood products industries employed an estimated total of 6300 people in 2006. After allowing for part-time employment, the total number of full-time equivalent jobs was 5870. This represented 3.08% of Tasmania's employed labour force in August 2006. Because most forestry and forest products industries employment is regionally-based, employment in these industries exceeded 5% of total employment in 11 of the 23 Tasmanian local government areas. The proportions employed in different industry sectors are shown below.

Employment by forestry industry sector	Proportion of total employment (%)
Forest growers	11.7
Combined forest growers and log processors	10.9
Log processors	38.7
Contractors, service providers and nurseries	38.7
Total	100.0

Employment by forest sector	Proportion of total employment (%)
Native forest	68.3
Eucalypt plantation	7.7
Pine plantation	24.0
Total	100.0

Source: J Schirmer 2008, *Forestry, jobs and spending: Forest industry employment and expenditure in Tasmania, 2005–2006*, Cooperative Research Centre for Forestry, Tasmania, 2008.

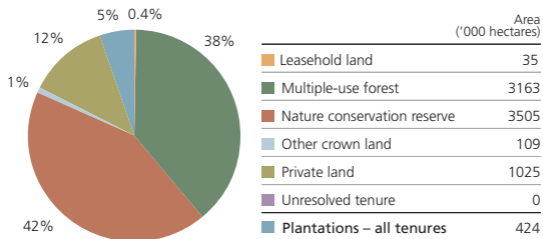
Type, number and size of the main timber processing industries in Tasmania



Victoria

	Area (‘000 hectares)	% Victoria	% Australia
Land area	22 742	n.a.	3
Native forest	7 837	34	5
Plantation forest	424	2	21
Forest cover	8261	36	6

Victorian forest area by tenure



Victorian forests by type



Legend

- Acacia <1%
- Callitris <1%
- Casuarina 2%
- Eucalypt mallee 18%
- Eucalypt woodland 13%
- Eucalypt open 54%
- Eucalypt closed 3%
- Mangrove <1%
- Melaleuca <1%
- Other 4%
- Rainforest <1%
- Plantation 5%

→ Did you know?

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

Victorian forestry and forest products industries

Census data for 2006 show a total employment of 21 941 people in the forestry and wood products manufacturing sectors in Victoria. When all businesses that depend on growing and using timber are included, total employment is estimated at about 32 000 people.

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. Data on socio-economic impacts in Gippsland are summarised below.



Mark Parsons

Socio-economic significance of Gippsland's wood products industries¹

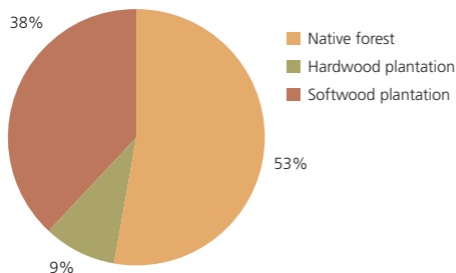
Socio-economic indicator	Hardwood sawmills	Softwood sawmills	Pulp and paper mills	Total ²
Value of logs used (\$million/year)	55.2	30.6	73.0	161.4
Wages paid (\$million/year)	41.4	15.2	92.6	151.3
Payments to local suppliers (\$million/year)	21.1	5.0	68.0	94.5
Other payments (\$million/year)	31.7	34.4	404.5	476.8
Total value of production (\$million/year)	149.4	85.3	638.1	884.0

¹ The values shown are for primary processing. The annual value of production of processing logs and chips exported from the region was estimated at an additional \$315 million.

² Totals include other wood products industries.

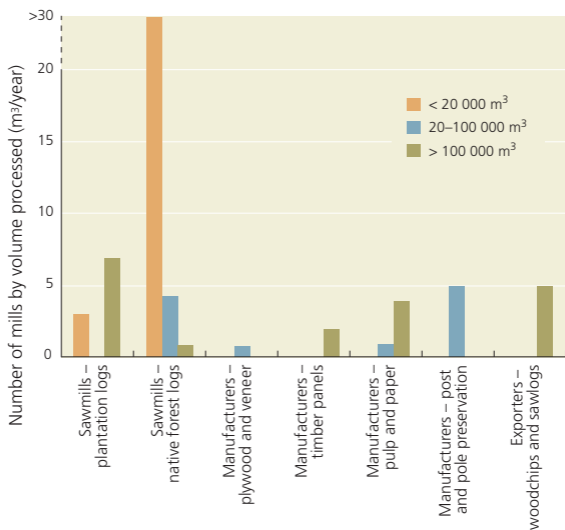
Employment in Gippsland's forestry and wood products industries was estimated to be 3124 people. The proportions employed in the native forest, hardwood plantation and softwood plantation sectors are shown below. Adding flow-on effects, total employment was estimated to be 6200 people.

Employment by forest sector



Source: Cameron, J, Gibbs, D, and Meynink, R 2004, *A socio-economic assessment of the timber industry in Gippsland, Victoria*, Gippsland Private Forestry Inc., Bairnsdale.

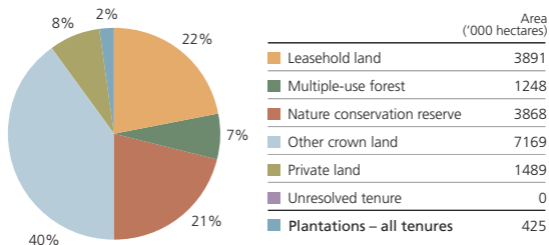
Type, number, and size of the main wood processing industries in Victoria



Western Australia

	Area (‘000 hectares)	% Western Australia	% Australia
Land area	252 988	n.a.	33
Native forest	17 664	7	12
Plantation forest	425	<1	21
Forest cover	18 089	7	12

Western Australian forest area by tenure



Western Australian forests by type

Legend

- Acacia 6%
- Callitris <1%
- Casuarina <1%
- Eucalypt mallee 7%
- Eucalypt woodland 62%
- Eucalypt open 13%
- Eucalypt closed <1%
- Mangrove 1%
- Melaleuca <1%
- Other 8%
- Rainforest <1%
- Plantation 2%



→ Did you know?

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

Western Australian forestry and forest products industries

Western Australia's forestry and wood products industries employed an estimated total of 5570 people in 2006. After allowing for part-time employment, the total number of full-time equivalent jobs was 5090. The industries are concentrated in the Perth, Bunbury, Albany, Manjimup and Dardanup areas. The proportions employed in different industry sectors are shown in the following tables.



Department of Agriculture, Fisheries and Forestry

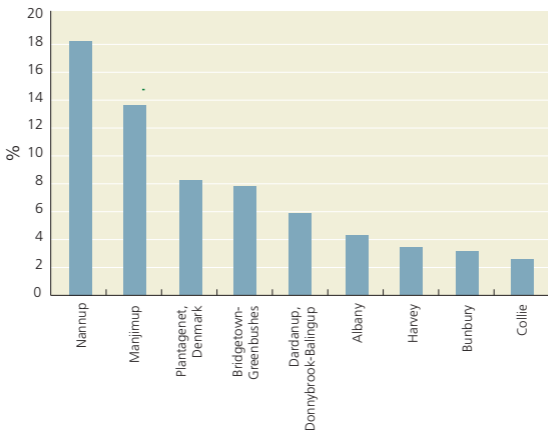
Employment by forestry industry sector	Proportion of total employment (%)
Forest growers	3.1
Combined forest growers and log processors	3.9
Log processors	62.7
Contractors, service providers and nurseries	30.3
Total	100.0

Employment by forest sector	Proportion of total employment (%)
Native forest	47–54
Eucalypt plantation	19–23
Pine plantation	24–28
Other plantation unspecified	1–3

Source: Schirmer, J 2008, *Forestry, jobs and spending: forest industry employment and expenditure in Western Australia, 2005–06*, Cooperative Research Centre for Forestry, Hobart.

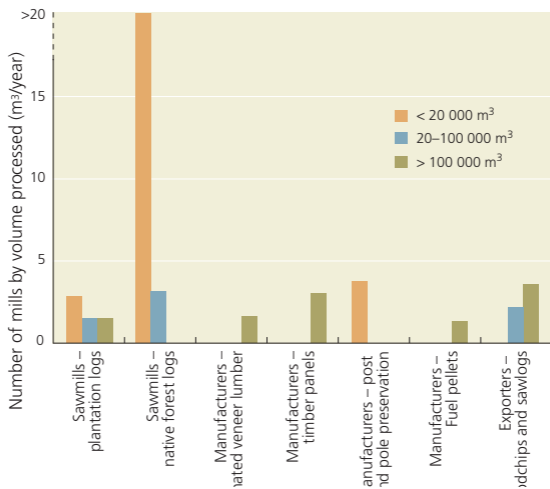
The local government areas where the largest proportions of the workforce are directly dependent on the forestry and wood products industries are shown on the following graph. Forest industry employment is less than 3% of total employment in all other local government areas in Western Australia.

Forest industries as a percentage of total local government area employment



Source: Schirmer, J 2008, *Forestry, jobs and spending: forest industry employment and expenditure in Western Australia, 2005–06*, Cooperative Research Centre for Forestry, Hobart.

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



Information sources

National Forest Inventory and National Plantation Inventory

Since 1990, the National Forest Inventory (NFI) has been collecting and communicating information on Australia's forests. Its mission is to be the authoritative source of information for national and regional monitoring and reporting and to support decision-making on all of Australia's forests.



State, territory and private forest owners and managers collect data that the NFI collates and translates into national datasets and maps, such as those used in Australia's state of the forests reports and in this booklet. Most inventory and monitoring activities in native forests have focused on areas managed for wood production. Large gaps in forest information remain in the cases of privately managed forests and in forest areas managed for non-wood goods and environmental services.

The National Plantation Inventory (NPI) has been collecting data and reporting on Australia's forestry plantations since 1993. Its objective is to document the contributions tree plantations make to communities, the economy, 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 (ABARE) compiles and publishes quarterly forest and wood products statistics derived from a range of sources. Production data are from ABARE and the Australian Bureau of Statistics (ABS) surveys and datasets, state forest services and industry organisations. Data on imports and exports are from the Australian Bureau of Statistics.

References and further reading

ABARE 2009, *Australian forest and wood products statistics*, March and June quarters 2009, Australian Bureau of Agricultural and Resource Economics, 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.


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

Davidson J, Davey S, Singh S, Parsons M, Stokes B and 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.

Gavran M and Parsons M, 2010, *National Plantation Inventory 2010 Update*, National Forest Inventory, Bureau of Rural Sciences, Canberra.

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

Russell-Smith J, Yates C, Whitehead P, Smith R, Craig R, Allan G, Thackway R, Frakes I, Cridland S, Meyer M and Gill A, 2007, 'Bushfires 'down under': patterns and implications of contemporary Australian landscape burning', in *International Journal of Wildland Fire* vol.16, p.361–377.

A scenic view of a forested mountain range. In the foreground, a tree branch with green leaves hangs down from the top right. The background shows rolling hills and mountains covered in dense green forest, with a blueish-grey sky above.

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