

## CHAPTER 25

### FORESTRY

For further details on subjects dealt with in this chapter see the annual bulletins *Non-Rural Primary Industries* and (for sawmills, etc. operations) *Manufacturing Industry*.

#### Source of statistics

Statistics relating to forestry are, in general, provided by the various authorities concerned with forestry administration. Particulars of forest reservations contained in this chapter have been collected by the Statisticians of the various States, mainly from information provided by the State forestry authorities. Other information on forested areas, together with certain other data, has been provided by the Commonwealth Forestry and Timber Bureau. Statistics of timber and by-products have been compiled from the annual factory collections undertaken by the Statisticians in the several States; manufacturing industry statistics for 1968–69 are not yet available; see page 709. Figures of production of gums, resins and tanning barks have been provided by the State forestry authorities. Data of imports and exports of forest products and timber and timber products have been compiled in the Commonwealth Bureau of Census and Statistics as part of the statistics of overseas trade. The figures shown relate, in general, to years ended 30 June.

#### Forestry in Australia

##### Objects of forestry

The main object of forestry authorities is to manage the forests of the country in a manner that will provide the maximum benefits, both direct and indirect. Direct benefits include the provision of essential commercial commodities such as structural timber, pulpwood, plywood, veneers, firewood, bark products, tars, oil, and resins. Indirect benefits include protection of soil and stock from wind and exposure, regulation of stream flow, provision of recreational facilities, and aesthetic effects. Forestry also aims at improving existing forests and woodlands by properly controlled harvesting, by protection from such destructive agencies as fire and insect attack, and by inducing regeneration where it is desirable. The provision of a partial tree cover on denuded lands where this cover is necessary for protective purposes, and a complete cover when the land is better under forest than under any other land use, are further aims of forestry.

##### General account of forests and timbers

The area of land in Australia suitable for the production of commercial timber as a primary crop is very small in comparison with the size of the continent. Broadleaved forests (hardwoods) cover 97 per cent of the total forested area, and approximately 94 per cent of the broadleaved forest area is occupied by eucalypts.

*Eucalypts.* The genus *Eucalyptus* is remarkable in that it includes over 600 species, ranging in size from the mighty forest giants, mountain ash (*E. regnans*) of Victoria and Tasmania, and karri (*E. diversicolor*) of Western Australia, down to the small mallee species which inhabit vast areas of the inland. The habitats range from the dry inland areas to the high mountain areas in the Australian Alps, from areas with the annual rainfall as low as 10 inches to those where it is 150 inches. Of the 600 species, only about 100 are used for sawmilling, and not more than 40 of these are exploited extensively.

The better class of eucalypt forest is concentrated mainly in the higher rainfall areas such as the east coast, the highlands of southern New South Wales, Victoria and Tasmania, and the south-western corner of Western Australia. The more important species include blackbutt (*E. pilularis*), tallowwood (*E. microcorys*), flooded gum (*E. grandis*), and red mahogany (*E. resinifera*) of New South Wales and Queensland; alpine ash (*E. delegatensis*) of New South Wales, Victoria and Tasmania; mountain ash (*E. regnans*), messmate (*E. obliqua*) and blue gum (*E. bicostata*) of Victoria and Tasmania; and karri (*E. diversicolor*) of Western Australia. For height and grandeur, mountain ash and karri are unequalled among the broadleaved trees of the world and are excelled only by a few North American coniferous (softwood) species.

In the coastal regions with lower rainfall the eucalypt forests contain many durable species such as the ironbarks, grey gums and bloodwoods of the east coast, and jarrah (*E. marginata*) and tuart (*E. gomphocephala*) of Western Australia. The spotted gum (*E. maculata*) occurring in New South Wales and Queensland is another example.

Along most of the inland streams and adjacent flood-plains there are riverain forests consisting mainly of river red gum (*E. camaldulensis*), a very durable broadleaved tree which has supplied large quantities of sawn timber, railway sleepers and fence posts.

Eucalypts also occur in open forest and savannah woodland formations in areas receiving a reliable rainfall of about 10 to 20 inches per annum, as on the goldfields of Western Australia where salmon gum (*E. salomonophloia*), brown mallet (*E. astringens*) and wandoo (*E. wandoo*) occur. These forests are of considerable value for firewood, as mining timbers and for fencing. Minor forest products such as sandalwood, tan bark, essential oils, etc., also come from isolated areas in this type of country, and in the more arid areas.

In 1968-69 the volume of eucalypt sawn wood produced was 960 million super feet.

*Other broadleaved timbers (hardwoods).* Broadleaved genera other than *Eucalyptus* cover a comparatively small portion of the forested land in Australia; however, the areas concerned provide a great variety of timbers suitable for a multitude of uses. There are two basic types of forest containing supplies of broadleaved timbers other than eucalypts, namely, the tropical and sub-tropical rainforests of coastal New South Wales and Queensland and the temperate rainforests of southern Victoria and Tasmania, both of which yield species known collectively as rainforest or brushwood species. The total volume of brushwood species produced in 1968-69 was estimated at 85 million super feet, i.e. about 8.1 per cent of the total broadleaved timber cut in Australia.

The tropical and sub-tropical rainforest along the eastern coast of Australia contains a large number of different species. Tropical rainforest occurs in northern Queensland in the vicinity of Cairns and on the Atherton Tableland, providing such well-known cabinet woods as Queensland maple (*Flindersia brayleana*), Queensland walnut (*Endiandra palmerstonii*) and the silky oaks. The sub-tropical rainforest found in southern Queensland and northern New South Wales yields the tulip oak, crab apple (*Shizomeria ovata*) and white beech (*Gmelina leichhardtii*). Coachwood (*Ceratopetalum apetalum*) and sassafras (*Doryphora sassafras*) occur in regions to the south near Dorrigo and have yielded valuable timber for many years.

Turpentine (*Syncarpia glomulifera*), an excellent harbour pile timber resistant to marine borer attack, and brush box (*Tristania conferta*), a superior structural and decking timber, are found in association with some eucalypts in the wetter rainfall areas on the north coast of New South Wales and in southern Queensland.

Temperate rainforest which is to be seen in southern parts of Victoria and western Tasmania consists of myrtle beech (*Nothofagus cunninghamii*), but produces also southern sassafras (*Atherosperma moschata*) and blackwood (*Acacia melanoxylon*).

*Conifers (softwoods).* One of the most important species of native conifers is white cypress pine (*Callitris hugelii*). The main cypress pine forests of commercial value occur in New South Wales and southern Queensland west of the Great Dividing Range. The trees are comparatively small, but the timber has particular value owing to its durability and resistance to termites. It is suitable for use as scantlings, flooring, linings, weatherboards, poles, and posts. As much of the area originally covered by cypress pine has been cleared for wheat farming and grazing, the production from the remaining State forests is now strictly regulated to ensure a continuous supply. The volume of cypress pine cut in 1968-69 was approximately 60.4 million super feet.

Another important native conifer is hoop pine (*Araucaria cunninghamii*), which occurs naturally in the sub-tropical rainforest of southern Queensland and northern New South Wales associated with tulip oak, crab apple, white beech, coachwood, and sassafras. The greater part of the original hoop pine forests has been exploited, but considerable areas have been replanted to this species in Queensland and, to a lesser extent, in New South Wales.

Other native conifers which have played a useful but minor part in the Australian timber industry include bunya and kauri pines (*Araucaria bidwillii* and *Agathis palmerstonii*) of Queensland, and celery-top, Huon and King William pines (*Phyllocladus asplenifolius*, *Dacrydium franklinii* and *Athrotaxis selaginoides*) of Tasmania. Kauri pine is found in the tropical rainforest of northern Queensland in association with non-eucalypt broadleaved trees, while bunya pine occurs in the sub-tropical rainforests. In the temperate rainforests of Tasmania celery-top, Huon and King William pines are found in association with myrtle beech, southern sassafras and blackwood.

#### Extent of forested areas

Estimates prepared for the Ninth British Commonwealth Forestry Conference held in India in 1968 show the total area of forest in Australia as 599.7 million acres, or about 32 per cent of the total land area of the continent. In making these estimates the Food and Agriculture Organization definition of 'forest' (published in *World Forest Inventory*, 1958, page 123) was used. This definition includes areas of sparse or stunted tree growth, classified as 'woodland' in the following table, and in the case of Australia some four-fifths of the total forest area falls into this category. If 'woodland' is excluded from total forested area a more realistic assessment of real forest area of 87.7 million acres is obtained.

## CLASSIFICATION OF FOREST AREA(a): AUSTRALIA

(Source: Forestry and Timber Bureau)

('000 acres)

Type of forest	Area
LANDS	
Economically exploitable forest land—	
Productive forests—	
Coniferous (softwood)(b)	3,021
Other(c)	34,166
Total, productive forests	37,187
Non-productive areas—unstocked(d)	11,455
Not economically exploitable forest land	39,038
Woodlands(e)	512,010
Total, forested area	599,690
OWNERSHIP OF ACCESSIBLE FORESTS	
Publicly-owned forests—	
State forests	29,699
Other forests	22,472
Total, publicly-owned forests	52,171
Privately-owned forests	29,191
Ownership not yet determined	290,166
Total, accessible forests	371,528

(a) Date of inventory 30 June 1965. (b) Includes exotics, cypress, and other indigenous pines. (c) Includes broadleaved and mixed woods. (d) Areas enclosed or within or adjacent to forest land, but which are kept cleared of tree cover for management reasons or 'are temporarily free' of tree cover. (e) All lands dominated by trees which for ecological and botanical reasons are not now capable of producing economic forest products.

## Forest reserves

The distribution of forest reserves is shown by States in the following table. Detailed comparisons between States are not possible because of the lack of uniform definitions.

## FOREST RESERVES: STATES AND TERRITORIES

31 MARCH 1969

(Source: Forestry and Timber Bureau)

('000 acres)

	N.S.W.	Vic.	Qld	S.A.	W.A.(a)	Tas.	N.T. A.C.T.(b)	Aust
Production reserves(c)—								
Productive	8,407	4,174	8,927	245	4,069	2,631	11	29
Unproductive		1,379	..	27	..	1,906	..	..
Unstocked		116	..	..	706	..	..	..
Total, production reserves	8,407	5,669	8,927	272	4,775	4,537	11	29
Protection reserves(d)—								
Productive	20	..	..	2	33	233	1,478	13
Unproductive	..	499	2,343	19	55	..		97
Unstocked	..	..	..	..	28	1		..
Total, protection reserves	20	499	2,343	21	116	234	1,478	110
All other reserves, productive, unproductive and unstocked	1,038	151	..	..	..	..	(e)	1,189
Total area, all reserves	9,465	6,319	11,270	293	4,891	4,771	1,489	139

(a) South-west zone only. (b) Managed forests. (c) Land 'permanently' reserved by law for the production of timber for commercial purposes. (d) Land managed principally for the protection of natural resources (e.g. parks, scenic areas, water sheds, soil conservation areas). (e) Excluded are Aboriginal Reserves totalling 29,286,000 acres which are estimated to be 90 per cent forest.

### Categories of forest reserves

- (i) *Production reserves* consist of forest lands 'permanently' reserved—by law whether Federal, State or local—for the production of logs, pulpwood, pit props, poles, posts or fuelwood for commercial purposes.
- (ii) *Protection reserves* consist of reserved lands, the management of which is principally aimed at the protection of natural resources, of fauna and flora, or at other purposes not directly related to the production of wood (e.g., parks, watersheds, soil conservation areas, etc.). Industrial cutting may or may not be allowed in these Protection reserves. Industrial cutting includes the cutting of logs, pulpwood, pit props, poles, posts, fuelwood for commercial purposes. The production of logs for the production of sawnwood for local consumption is considered as industrial cutting; however, the cutting of poles and fuelwood for personal consumption on a casual or occasional basis is not considered as an industrial cutting.
- (iii) *All other reserves* consist of reserved forest lands not included above.

A considerable proportion of the permanently reserved areas is in inaccessible mountainous country, and many of the forests contain a mixture of species, only some of which are at present of commercial value. Much of the area consists of inferior forest, and a large proportion of the whole has been seriously degraded by recurrent fires.

### Plantations

The indigenous forest of Australia does not contain adequate supplies of coniferous timber, and Australia's requirements have had to be met largely by imports. As a result of the planned policy of the forest services and of several private commercial organisations, the area of coniferous plantations, mainly of exotic species, is steadily increasing. It was natural that this aspect of forestry should receive earliest attention in South Australia, as this is the State most poorly endowed with natural forest. South Australia now has a larger area of planted conifers than most other States in Australia, and for some years has been exploiting considerable quantities of timber from these plantations. Production is also increasing in the other States, and the thinnings from their plantations are already supplying a significant volume of timber.

The total production of roundwood from Australia's coniferous plantations is now more than 80 million cubic feet per annum and is expected to increase substantially during the next decade.

A special article prepared by the Forestry and Timber Bureau giving a detailed account of the history and development of coniferous plantations and of the characteristics of individual species is included in Year Book No. 44, page 975.

Broadleaved plantations (mainly *Eucalyptus spp.*) comprise a much smaller area, and the total acreage at 31 March 1969 was about 60,000 acres, about one-third of which was brown mallet (*E. astringens*). Plantations of this species have been established in Western Australia for tan bark production.

### AREA OF CONIFEROUS PLANTATIONS, BY TYPE OF PLANTATION

(Source: Forestry and Timber Bureau)

(Acres net)

State or Territory	Government			Private			Grand total
	<i>Pinus radiata</i>	Other species	Total	<i>Pinus radiata</i>	Other species	Total	
31 March 1969—							
New South Wales . . . . .	127,440	23,284	150,724	11,095	16,889	27,984	178,708
Victoria . . . . .	77,803	8,917	86,720	114,097	917	115,014	201,734
Queensland . . . . .	3,712	141,347	145,059	842	34,802	35,644	180,703
South Australia . . . . .	142,988	14,107	157,095	39,502	16	39,518	196,613
Western Australia(a) . . . . .	23,763	35,009	58,772	2,073	188	2,261	61,033
Tasmania . . . . .	35,338	424	35,762	14,764	3	14,767	50,529
Northern Territory . . . . .	..	2,965	2,965	..	50	50	3,015
Australian Capital Territory . . . . .	27,053	2,238	29,291	..	..	..	29,291
<b>Australia, 31 March 1969 . . . . .</b>	<b>438,097</b>	<b>228,291</b>	<b>666,388</b>	<b>182,373</b>	<b>52,865</b>	<b>235,238</b>	<b>901,626</b>
31 March—							
1968 . . . . .	395,215	207,176	602,391	161,326	47,224	208,550	810,941
1967 . . . . .	368,597	196,564	565,161	147,053	40,415	187,468	752,629
1966 . . . . .	342,135	184,143	526,278	139,071	36,328	175,399	701,677
1965 . . . . .	323,212	177,447	500,659	141,570	28,900	170,470	671,129

(a) South-west zone only.

### Forest administration and research

*Commonwealth Forestry and Timber Bureau.* The functions of the Commonwealth Forestry and Timber Bureau are laid down in the *Forestry and Timber Bureau Act 1930-1953* and include forestry research and education, the study of timber supply, and advice to the Government on forestry matters. The administrating department is the Department of National Development.

In 1961 the Commonwealth Government expanded its activities in forestry research in Australia. The existing Forestry and Timber Bureau Divisions of Silvicultural Research and Forest Management Research were combined to form the Forest Research Institute as a separate branch of the Bureau. The purpose of the Institute is to provide complete coverage in forestry research, ensuring that all problems of primary importance to the practice and development of forestry in Australia are investigated. In developing a programme with this objective, the Institute takes account of the research activities and potential of the State forest services and other organisations. The research work carried out by the existing sections of the Forest Research Institute covers a wide range of studies, including the following: factors affecting tree growth, tree breeding, introduction of exotic species, forest nutrition, forest botany, forest entomology and pathology, fire protection, watershed management, forest mensuration, forest management, and management economics, aerial inventory, biometrics, and tree seed. The Forest Research Institute maintains six regional establishments in the Commonwealth, two of which have an outstation in addition to the regional headquarters. These regional stations are run on a co-operative basis with State forest services and private forest companies or other government instrumentalities.

The Forestry and Timber Bureau also maintains a Timber Supply Economics Branch concerned with the compilation and analysis of statistics of production, consumption and trade in timber and other forest products. This Branch also carries out studies in forest economics and research into logging methods and machines. Advice on timber supply matters is currently made available to government departments and private enterprise. Research is also undertaken on matters associated with the marketing of timber products.

*Commonwealth Scientific and Industrial Research Organization, Division of Forest Products.* The Division of Forest Products was formed in 1928 to carry out investigations into Australian forest products, assist in the effective use of such products, reduce waste, reduce losses from decay and insect attack, and conduct research into the fundamental chemical, physical and mechanical properties of Australian timbers.

The research work of the Division is carried out by eight separate sections: wood and fibre structure, wood chemistry, timber physics, timber mechanics, timber preservation, timber seasoning, plywood and glueing, and timber utilisation. In addition, the Division provides assistance to individuals and local industry, administers courses of instruction on timber properties and usage, and maintains co-operative projects with several overseas authorities operating in the same field.

*Forestry in the Territories.* Forestry activities in the Territory of Papua and New Guinea are controlled by the Administration through its Department of Forests. The management of forests in the Australian Capital Territory is the responsibility of the Forestry Branch of the Department of the Interior.

The Forestry and Timber Bureau advises the Administrations of the Australian External Territories on the management of the forests in those Territories. Forests in the Northern Territory are under the control of the Forestry Branch of the Northern Territory Administration.

*Forestry activities of the States.* Forestry on State-owned lands in the various States is the responsibility of the respective State Governments, but they do not exercise any control over forestry activities on private property. The powers and functions of State forest authorities are laid down under forest Acts and Regulations. In each State there is a department or commission to control and manage State forests. Its functions include the introduction of proper measures for the control and management of forest land; the protection of forest land; the conversion, marketing and economic utilisation of forest products; the securing of an adequate and permanent reservation of State forests; and the establishment and maintenance of coniferous forests to remedy the existing deficiency of conifers in Australia. All State forest services are actively engaged on research programmes. Annual reports are issued by each State forest authority.

In addition to developing permanent forest reserves in each State, foresters are surveying all forested Crown lands with a view to obtaining dedications of new State forests to add to the permanent forest estate or to release for other uses areas unsuitable for forestry. State forest authorities control over 15 million acres of timber reserves, national parks, etc. They also usually control all timber on unoccupied Crown lands.

*Private forestry.* Privately owned lands contribute considerably to the total production from Australian forests. The most important areas of managed native forest in private ownership are the forests owned by pulp and paper companies. Schemes of financial assistance to individual land owners—designed primarily to encourage establishment and management of coniferous plantations—have been introduced by the Governments of New South Wales and Victoria.

The area of privately owned coniferous plantations is rapidly increasing, and here again the pulp and paper companies are very active. In step with the increase in afforestation programmes, the number of professional foresters employed in private forestry enterprise is increasing, while several are engaged on research.

The area of coniferous plantations established by private companies and individuals is included in the table on page 878.

#### Forestry education

The functions of the Australian Forestry School at Canberra, previously a division of the Forestry and Timber Bureau, were taken over by the Australian National University at the beginning of the 1965 academic year. The school was absorbed into the University's School of General Studies as the Department of Forestry. This department provides a full four-year training leading to the degree of B.Sc. in forestry. The University of Melbourne also maintains a School of Forestry which gives training leading to a B.Sc. degree in forestry. The Universities in all States provide facilities for post-graduate studies in forestry leading to higher degrees.

The Victorian Forests Commission maintains a Forestry School at Creswick where recruits are trained, mainly for employment in the Commission.

#### The Australian Forestry Council

The Australian Forestry Council comprises the Ministers responsible for forestry in the six State Governments and the Commonwealth Ministers for National Development, Interior, and External Territories.

The Council is intended to provide the means for the mutual exchange between the State and Commonwealth Governments of information and views on forestry. It co-ordinates research into problems affecting the establishment, development, management, and fire protection of all forests, and the utilisation of forest products. It assists in co-ordinating the work of State and Commonwealth Governments and also private enterprise in the development of Australian forestry.

The Council is supported by a Standing Committee, consisting of the Director-General of the Forestry and Timber Bureau, the heads of each of the six State Forest Services, the Chief of the Division of Forest Products, C.S.I.R.O., the Secretary of the Department of the Interior and the Secretary of the Department of External Territories.

#### Fire protection

The provision of adequate fire protection is one of the main problems facing forest and rural authorities. The commercial forest area is estimated at 37 million acres with a further 39 million acres of forest not at present exploitable. The forest services maintain a high degree of protection over a relatively accessible area of about 23 million acres, about 17 million acres in the more inaccessible area receive a lesser degree of protection, and about 8 million acres are at present not protected. The remaining area of 28 million acres is mainly vacant Crown Land or is privately owned or leased, and under some degree of fire protection from the rural volunteer fire-fighting organisations or Government-financed fire protection associations.

During the 1968-69 fire season a total of 1,744 fires were recorded over the area of 40 million acres of forest land afforded either intensive or extensive protection. An area of 1,885,000 acres was burnt by these fires, which represents 4.7 per cent of the area protected.

The number of forest fires and the forest area burnt over the last ten years is shown in the following table.

NUMBER OF FIRES AND FOREST AREA BURNT 1959-60 TO 1968-69

Year	Protected forest areas(a)		
	Number of fires	Forest area burnt '000 acres	Percentage of forest area burnt
1959-60	1,504	1,314	3.3
1960-61	2,667	1,294	3.5
1961-62	1,761	297	0.8
1962-63	1,299	275	0.7
1963-64	1,494	549	1.5
1964-65	2,307	1,626	4.1
1965-66	1,865	465	1.2
1966-67	1,422	388	1.0
1967-68	1,754	754	1.9
1968-69	1,744	1,885	4.7

(a) The area receiving protection has been taken as the 40 million acres for which State forest services provide protection.

Very intensive fire protection is afforded to the coniferous plantation area of Australia. This area is increasing rapidly and the annual planting programme is now between 60,000 and 70,000 acres. During the 1968-69 fire season a total of 2,247 acres were burnt, representing 0.29 per cent of the area of 781,000 acres for which fire statistics are available.

The area of coniferous plantations burnt during the past ten years is shown in the following table.

CONIFEROUS PLANTATIONS AREA BURNT AND  
TOTAL AREA, 1959-60 TO 1968-69

Year	Area burnt	Area of coniferous plantations	Percentage of coniferous area burnt
	acres	acres(a)	
1959-60 . . .	329	435,000	0.07
1960-61 . . .	507	452,000	0.11
1961-62 . . .	598	472,000	0.13
1962-63 . . .	475	492,000	0.10
1963-64 . . .	418	515,000	0.06
1964-65 . . .	3,130	556,000	0.56
1965-66 . . .	1,520	610,000	0.25
1966-67 . . .	461	660,835	0.07
1967-68 . . .	288	729,928	0.04
1968-69 . . .	2,247	781,000	0.29

(a) This area does not include certain privately owned coniferous forest (121,000 acres in 1968-69) for which fire statistics are not available.

Detailed information on fire protection is given in Year Book No. 55, 1969, pages 966-7.

#### Commonwealth loans to expand softwood plantations

In February 1965 the Australian Forestry Council recommended that the rate of expansion of softwood timber planting in Australia should be increased from their existing level of about 40,000 acres a year to 75,000 acres a year for the next thirty-five years. The recommendations envisaged a phased increase in the rate of Government plantings by the various State Governments up to a level of some 65,000 acres per annum, and an average of at least 10,000 acres per annum by private forest owners. This programme would make a major contribution towards meeting Australia's future requirements for softwood products.

In February 1966 the Commonwealth Government endorsed this recommendation and agreed, as a first step towards achieving the proposed annual target of 75,000 acres, to provide financial assistance to each State, over a five-year period commencing 1 July 1966, to enable them to accelerate their rate of softwood plantings. The assistance, which is provided to the States under section 96 of the Constitution, takes the form of long-term loans repayable over twenty-five years with repayments of principal and the payment of interest commencing ten years after the date of each advance. The *Softwood Forestry Agreements Act 1967* authorised the Commonwealth to enter into agreements with each of the States to provide financial assistance by way of loans during the financial years 1966-67 to 1970-71 inclusive. Payments under the Act by the Commonwealth to all States in 1966-67 amounted to \$291,000, in 1967-68 to \$3,456,000, in 1968-69 to \$3,872,000, and in 1969-70 to \$4,814,000. It is estimated that \$5,548,000 will be provided in 1970-71.

### Employment in forestry

#### Persons engaged in forestry activities, 1966 census

The number of persons whose industry statements were classified to 'forestry' (excluding saw-milling) at the 1966 population census was 13,492 out of a total of 512,994 in all primary industries and 4,856,455 in the total work force. For further information see the chapter Employment and Unemployment, also 1966 Census Bulletin No. 9.6, *Population: by Industry and Occupational Status, Australia*.

### Employment by Forestry Departments

In the table following details are shown of the number of persons employed by State forestry departments, the Northern Territory Administration, and by the Forestry and Timber Bureau in the Australian Capital Territory at 30 June 1969.

#### PERSONS EMPLOYED BY FORESTRY DEPARTMENTS STATES AND TERRITORIES, 30 JUNE 1969

Occupational group	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust
Professional staff . . . . .	307	246	168	103	66	47	8	10	955
Non-professional field staff . . . . .	290	202	101	3	253	106	23	2	980
Clerical staff . . . . .	291	302	230	110	50	97	18	8	1,106
Extraction of timber . . . . .	} (a) 1,635 {	} . . . . .	111		37	7	15	..	} 6,235
Milling of timber . . . . .			..	538	42	..	6	..	
Labour (forest workers, etc.) . . . . .			1,049	1,425	263	601	358	73	
<b>Total . . . . .</b>	<b>2,523</b>	<b>1,799</b>	<b>2,035</b>	<b>1,017</b>	<b>1,049</b>	<b>615</b>	<b>143</b>	<b>95</b>	<b>9,276</b>

(a) Excludes milling of timber.

### Employment in milling operations

Details of the average number of persons employed, including working proprietors, in sawmills during the year 1967-68 are shown in the next table. Further details regarding the operations of sawmills in 1967-68 are shown in the chapter Manufacturing Industry.

#### NUMBER OF SAWMILLS AND NUMBER OF PERSONS EMPLOYED STATES AND TERRITORIES, 1967-68(a)

	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Number of sawmills . . . . .	685	442	478	86	199	274	..	8	2,172
Average number of persons employed during year—									
Males . . . . .	7,713	5,645	5,055	(b)	3,201	2,745	..	(b)	26,498
Females . . . . .	392	293	302	(b)	191	56	..	(b)	1,415
<b>Persons . . . . .</b>	<b>8,105</b>	<b>5,938</b>	<b>5,357</b>	<b>(b)</b>	<b>3,392</b>	<b>2,801</b>	<b>..</b>	<b>(b)</b>	<b>27,913</b>

(a) Statistics for 1968-69 are not yet available, see page 709. (b) Not available for publication; included in Australian total.

## Forest production

### Forest products

#### FOREST PRODUCTION(a): STATES AND TERRITORIES, 1968-69

Product	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
<b>Logs for sawing, peeling, slicing, or pulping—</b>									
Forest broadleaved . . . . . '000 cu ft	55,147	75,158	22,260	680	43,188	57,914	19	..	254,366
Brushwoods and scrubwoods . . . . . "	4,186	..	9,085	..	..	..	1	..	13,272
<b>Coniferous—</b>									
Indigenous forest 'pines'—									
Cypress . . . . . "	5,628	..	5,688	..	..	..	58	..	11,374
Other . . . . . "	564	..	2,764	..	..	368	..	..	3,696
Plantation grown 'pines' . . . . . "	9,973	16,107	5,217	27,595	2,874	1,828	..	1,537	65,131
<b>Total logs . . . . .</b>	<b>75,498</b>	<b>91,264</b>	<b>45,014</b>	<b>28,275</b>	<b>46,062</b>	<b>60,110</b>	<b>79</b>	<b>1,537</b>	<b>347,838</b>
<b>Value of logs . . . . . \$'000</b>	<b>22,179</b>	<b>25,865</b>	<b>15,522</b>	<b>5,659</b>	<b>8,670</b>	<b>13,326</b>	<b>209</b>	<b>359</b>	<b>91,789</b>
<b>Hewn and other timber (not included above)—</b>									
Firewood(b) (weight) . . . . . '000 tons	178	268	52	430	551	367	1	..	1,847
Other(c) (value) . . . . . \$'000	10,696	2,231	2,312	275	(d)1,673	119	17	12	17,335
<b>Value of hewn and other timber . . . . .</b>	<b>11,868</b>	<b>3,944</b>	<b>2,616</b>	<b>2,798</b>	<b>(d)4,255</b>	<b>(e)2,559</b>	<b>29</b>	<b>12</b>	<b>28,081</b>
<b>Other forest products(f) (total value)</b>	<b>322</b>	<b>111</b>	<b>274</b>	<b>60</b>	<b>(g) 7</b>	<b>(h)</b>	<b>..</b>	<b>..</b>	<b>774</b>
<b>Total value of forest products . . . . .</b>	<b>34,369</b>	<b>29,920</b>	<b>18,411</b>	<b>8,518</b>	<b>(i)13,465</b>	<b>15,885</b>	<b>238</b>	<b>371</b>	<b>121,177</b>

(a) Excludes some production from private land, thought to be relatively small, details of which are not available. (b) Excludes mill waste used as firewood. (c) Includes sleepers, transoms, girders, bridge timbers, mining timber, poles, piles, etc. (d) Excludes timber used for tannin extract, details of which are not available for publication. (e) Includes value of "Other forest products". (f) Includes charcoal (forest production only), tanning bark, essential oils, eucalyptus leaves, crude rutin, etc. (g) Excludes value of sandalwood and substitutes, details of which are not available for publication. (h) Not available for publication. (i) Includes timber used for tannin extract and sandalwood and substitutes.



## FOREST PRODUCTION(a): AUSTRALIA, 1964-65 TO 1968-69

Product		1964-65	1965-66	1966-67	1967-68	1968-69
Logs for sawing, peeling, slicing, or pulping—						
Forest broadleaved . . . . .	'000 cu ft	251,753	252,587	249,985	253,723	254,366
Brushwoods and scrubwoods . . . . .	„	13,549	14,027	12,131	12,755	13,272
Coniferous—						
Indigenous forest 'pines'—						
Cypress . . . . .	„	13,795	12,487	11,402	12,179	11,374
Other . . . . .	„	3,766	3,706	3,568	3,475	3,696
Plantation grown 'pines' . . . . .	„	56,255	59,894	61,992	59,798	65,131
Total logs . . . . .	„	339,117	342,701	339,078	341,930	347,838
Value of logs . . . . .	\$'000	86,493	87,804	88,405	89,778	91,789
Hewn and other timber (not included above)—						
Firewood (b) (weight) . . . . .	'000 tons	2,322	2,301	2,143	1,914	1,847
Other (c) (value) . . . . .	\$'000	15,255	17,290	15,470	16,925	17,335
Value of hewn and other timber(d) . . . . .	„	28,537	31,177	28,106	27,712	(e)28,081
Other forest products(f) (total value) . . . . .	„	1,167	782	801	851	763
Total value of forest products(g) . . . . .	„	116,338	120,589	117,975	119,004	121,177

(a) Excludes some production from private land, thought to be relatively small, details of which are not available.  
 (b) See footnote (b) to previous table. (c) See footnotes (c) and (d) to previous table. (d) Incomplete; see footnote (d) to previous table. (e) Includes "other forest products" for Tasmania. (f) See footnotes (f) and (g) to previous table. (g) Includes timber used for tannin extract and sandalwood and substitutes in Western Australia.

## Value of production

While statistics of both the gross value (at principal markets) and local value (at place of production) of the forestry industry are available, particulars of the value of materials used in the process of production are not available for all States. For this reason values cannot be stated on a net basis, as has been done with most other industries. A more detailed reference to the value of production of forestry and other industries in Australia, as well as a brief explanation of the terms used, will be found in the chapter Miscellaneous.

GROSS AND LOCAL VALUE OF FORESTRY PRODUCTION: STATES AND TERRITORIES  
 1964-65 TO 1968-69  
 (\$'000)

Year	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
GROSS VALUE(a)									
1964-65	32,539	29,167	17,777	8,846	12,093	15,326	276	314	116,338
1965-66	33,663	29,691	18,043	9,729	12,731	15,990	358	384	120,589
1966-67	31,632	29,675	17,199	8,888	13,300	16,627	303	351	117,975
1967-68	35,140	27,845	17,683	8,128	14,077	15,488	278	365	119,004
1968-69	34,369	29,920	18,411	8,518	13,465	15,885	238	371	121,177
LOCAL VALUE(b)									
1964-65	31,586	28,358	13,482	8,801	11,334	13,270	276	314	107,421
1965-66	32,342	28,870	13,590	9,693	11,965	13,837	358	384	111,039
1966-67	30,967	29,036	12,631	8,853	12,473	14,332	303	351	108,946
1967-68	34,160	27,448	12,948	8,100	13,274	13,420	278	365	109,993
1968-69	33,649	29,577	13,472	8,489	12,591	13,418	238	371	111,794

(a) Gross production valued at principal markets. (b) Gross production valued at place of production.

### Timber and timber products

#### Mill production of timber

Particulars of logs treated and the production of sawn, peeled and sliced timber by sawmills and other woodworking establishments are shown in the following table. These figures have been compiled from annual factory collections, which cover virtually all sawmills. The only omissions are some small portable mills operated by itinerants, e.g. sleeper cutters.

#### OUTPUT OF AUSTRALIAN-GROWN TIMBER: ALL MILLS STATES 1967-68(a) (\*000 super ft)

	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	Total(b)
Logs treated (gross hoppus)(c)—							
Broadleaved . . . . .	689,357	499,225	327,363	6,800	467,028	352,122	2,341,895
Coniferous . . . . .	118,497	74,030	114,586	201,805	17,121	6,926	532,965
<i>Total, logs treated</i> . . . . .	<i>807,854</i>	<i>573,255</i>	<i>441,948</i>	<i>208,605</i>	<i>484,149</i>	<i>359,048</i>	<i>2,874,860</i>
Sawn, peeled or sliced timber produced from logs above—							
Broadleaved . . . . .	361,219	283,184	151,617	4,006	201,993	171,912	1,173,931
Coniferous . . . . .	69,934	36,718	64,050	124,085	9,643	3,254	307,684
<i>Total, timber produced</i> . . . . .	<i>431,153</i>	<i>319,903</i>	<i>215,666</i>	<i>128,091</i>	<i>211,637</i>	<i>175,165</i>	<i>1,481,615</i>

(a) Statistics for 1968-69 are not yet available, see page 709. (b) Excludes Australian Capital Territory and Northern Territory. (c) Gross hoppus measure is approximately 78.5 per cent of the true volume.

#### OUTPUT OF AUSTRALIAN-GROWN TIMBER, ALL MILLS: AUSTRALIA(a) 1963-64 TO 1967-68(b) (\*000 super ft)

	1963-64	1964-65	1965-66	1966-67	1967-68
Logs treated—					
Broadleaved . . . . .	2,681,691	2,767,843	(c)2,371,263	2,313,256	2,341,895
Coniferous . . . . .	696,831	728,691	(c)569,521	554,838	532,965
<i>Total, logs treated</i> . . . . .	<i>3,378,522</i>	<i>3,496,535</i>	<i>(c)2,940,784</i>	<i>2,868,093</i>	<i>2,874,860</i>
Sawn, peeled or sliced timber produced from logs above—					
Broadleaved . . . . .	1,157,175	1,203,705	1,185,831	1,151,369	1,173,931
Coniferous . . . . .	330,014	329,508	331,709	317,591	307,684
<i>Total, timber produced</i> . . . . .	<i>1,487,189</i>	<i>1,533,213</i>	<i>1,517,540</i>	<i>1,468,960</i>	<i>1,481,615</i>

(a) Excludes Australian Capital Territory and Northern Territory. (b) Statistics for 1968-69 are not yet available, see page 709. (c) Gross hoppus basis: not necessarily comparable with details for years prior to 1965-66, which are generally on a true volume basis.

In addition to the mill production of timber shown in the preceding tables, a large quantity of hewn and round timber, e.g. sleepers, piles, poles, fencing timber, timber used in mining and fuel, is obtained directly from forest and other areas. Complete information in respect of the volume of this output is not available.

#### Veneers, plywood, etc.

Cutting of timber for the manufacture of veneers, plywood, etc., has been carried out in most States for a number of years. In recent years this has been considerably extended, since plywood manufacture has allowed the use of some species unsuitable for sawing. Special attention has been paid to ensure that logs suitable for peeling are diverted to ply factories.

#### PLYWOOD PRODUCED: STATES, 1963-64 TO 1967-68(a) (\*000 square feet: $\frac{3}{16}$ -in basis)

State	1963-64	1964-65	1965-66	1966-67	1967-68
New South Wales . . . . .	58,880	59,045	54,201	58,791	63,909
Queensland . . . . .	97,252	94,766	80,761	81,313	93,185
Other States . . . . .	60,150	63,249	52,296	60,348	71,929
<i>Australia</i> . . . . .	<i>216,282</i>	<i>217,059</i>	<i>187,258</i>	<i>200,451</i>	<i>229,023</i>

(a) Statistics for 1968-69 are not yet available, see page 709.

Of the total plywood produced in 1967-68, 128,672,850 square feet ( $\frac{1}{16}$ -in basis) were classed as 'Commercial', 73,331,689 as 'Waterproof', 2,664,942 as 'Case', and 24,353,525 as 'Sliced fancy'.

During 1967-68, 828.8 million square feet ( $\frac{1}{16}$ -in basis) of veneers were produced by the rotary process for the manufacture of plywood, including 260.5 million square feet ( $\frac{1}{16}$ -in basis) sold or added to stock, the bulk of which would eventually be used in the production of plywood. In addition, 73.4 million square feet of sliced veneers were produced.

#### Manufactured boards

Particle board, resin or cement bonded of acoustic and other composition, amounted to 115,579,513 square feet surface measurement during 1967-68.

#### Wood pulp and paper

*Wood pulp.* During 1967-68 wood pulp production was 351,268 tons of chemical, mechanical and other pulp. During the previous year production was 357,665 tons.

Detailed information relating to the types and methods of production of wood pulp in the various States was published in Year Book No. 50, 1964, page 1110.

*Paper and paper board.* Paper and paper board are manufactured in all States but the greater part of the industry is in New South Wales, Victoria and Tasmania. During 1967-68 twenty-one paper mills were operating, nine in Victoria, three in New South Wales, four in Tasmania, two each in Queensland and South Australia, and one in Western Australia. A wide variety of paper and paper board is produced in Australian mills. The table below gives details of the production of some of the principal items.

#### PRODUCTION OF PAPER PRODUCTS: AUSTRALIA, 1965-66 TO 1967-68(a)

Type of paper	Quantity (tons)			Value (\$'000)		
	1965-66	1966-67	1967-68	1965-66	1966-67	1967-68
Newsprint . . . . .	93,211	97,255	92,648	12,106	13,365	12,688
Blotting . . . . .	601	508	569	161	149	161
Duplicating . . . . .	9,721	8,291	10,212	3,758	3,467	3,876
Printing and writing . . . . .	120,540	114,992	112,780	35,818	35,704	35,952
Wrapping—						
Kraft . . . . .	149,331	184,561	183,591	34,568	40,637	43,344
Other . . . . .	11,114	13,942				
Paper felts . . . . .	1,700	1,905	1,164	366	415	243
Paper boards . . . . .	317,553	329,496	334,660	51,465	53,726	57,093

(a) Statistics for 1968-69 are not yet available, see page 709.

### Overseas trade in forest products, timber and timber products

#### Imports

#### IMPORTS OF FOREST PRODUCTS, TIMBER AND TIMBER PRODUCTS AUSTRALIA, 1966-67 TO 1968-69

	Quantity			Value (\$'000 f.o.b.)		
	1966-67	1967-68	1968-69	1966-67	1967-68	1968-69
Wood in the rough or roughly squared . . . '000 sup ft	44,763	53,166	49,033	2,896	3,695	3,322
Wood shaped or simply worked—						
Timber sawn lengthwise, sliced or peeled, but not further prepared, of a thickness exceeding 5 mm—						
Conifer—						
Douglas fir . . . . .	177,183	171,316	195,132	16,366	16,104	21,785
Hemlock and balsam . . . . .	15,395	11,200	12,562	1,003	865	1,175
Radiata pine . . . . .	26,531	25,016	29,474	2,004	1,868	2,108
Redwood and western cedar . . . . .	22,414	28,905	30,065	2,728	3,851	4,455
Non-conifer . . . . .				6,981	11,278	10,707
Tanning extracts of vegetable origin . . . . . cwt	79,601	74,005	96,015	550	504	565
Wood and cork manufactures (except furniture)—						
Veneers, plywoods, 'improved' or reconstituted wood and other wood, worked, n.e.s. . . . .				6,355	7,777	8,580
Wood, worked, n.e.s. . . . .				2,725	3,722	4,417
Cork manufactures . . . . .				1,187	1,431	1,372

Imports of coniferous timbers, shaped or simply worked, came mainly from Canada and the United States of America in 1968-69. Malaysia was the source of by far the greater proportion of non-coniferous timber imports. Malaysia, Papua and New Guinea and the United Kingdom supplied most of Australia's imports of veneers, while plywood imports came mainly from Japan and Papua and New Guinea.

## Exports

EXPORTS OF AUSTRALIAN FOREST PRODUCTS, TIMBER AND TIMBER PRODUCTS(a)  
AUSTRALIA, 1966-67 TO 1968-69

	Quantity			Value (\$'000 f.o.b.)		
	1966-67	1967-68	1968-69	1966-67	1967-68	1968-69
Wood in the rough or roughly squared . . . . .	..	..	..	666	636	267
Wood, shaped or simply worked—						
Railway or tramway sleepers . . . . . '000 sup ft	26,023	5,621	3,312	3,280	863	522
Timber sawn lengthwise, sliced or peeled, but not further prepared, of a thickness exceeding 5 mm—						
Conifer . . . . . "	393	574	143	95	99	37
Non-conifer. . . . . "	11,541	9,864	13,004	1,790	1,634	2,292
Timber, planed or tongued—						
Conifer . . . . . "	830	808	540	233	228	146
Non-conifer. . . . . "	468	588	624	114	146	114
Cork, raw and waste . . . . . cwt	131	..	101	13	..	5
Plants used in dyeing and tanning . . . . . "	2,590	1,920	385	8	5	3
Natural gums, resins, etc. . . . . "	9,180	8,160	7,569	63	66	60
Eucalyptus oil . . . . . '000 lb	308	355	205	221	269	149
Veneer wood . . . . . '000 sq ft	3,207	3,584	3,604	133	151	162
Plywood, blockboards, etc. . . . . "	3,383	1,749	3,637	444	416	481
Improved wood . . . . . "	..	..	..	24	3	1
Reconstituted wood . . . . . '000 sq ft	1,153	1,106	1,262	151	147	191
Wooden beadings and mouldings . . . . . "	..	..	..	120	61	176
Wood simply shaped or worked, n.e.i. . . . . "	..	..	..	33	8	24
Wood manufactures, n.e.i. . . . . "	..	..	..	894	715	1,242
Cork manufactures . . . . . "	..	..	..	31	83	78

(a) Excludes re-exports.