Forests Department. Western Australia

Annual Report
1 July 1984 to 21 March 1985

FORESTS DEPARTMENT COMO, W.A.

TO THE HON. BRIAN BURKE, M.L.A.
PREMIER AND MINISTER FOR FORESTS

IN ACCORDANCE WITH SECTION 42 OF THE FORESTS ACT, I PRESENT THE ANNUAL REPORT OF OPERATIONS OF THE DEPARTMENT FOR THE YEAR ENDED 1 MARCH 1985

P.J. McNAMARA,
Acting Conservator of Forests.

CONTENTS

1. Foreword

This report covers operations during the period 1 July 1984 to 21 March 1985.

The Forests Act 1918-1976 was repealed on 21 March 1985 by the proclamation of The Conservation and Land Management Act No. 126 of 1984, when the Forests Department was incorporated into the new Department of Conservation and Land Management (CALM).

At this stage, it is fitting to note the contribution made by the former Department and its officers towards establishment of a permanent forest estate and the development of the skills and systems needed for improved woodland management in Western Australia.

One of the highlights of the year was the amount of constructive public comment received on an outline plan for the management of the Shannon River Basin and the D'Entrecasteaux National Park which was produced in line with Government policies.

The activities of the Murray Valley Advisory Committee, with representatives from local government, the farming community, and the environmental movement were another major success in public input to management planning. On 4 December 1984, the Premier formally named this recreation and conservation reserve "The Lane-Poole Reserve", in honour of C.E. Lane-Poole, the first Conservator appointed under the Forests Act of 1918.

Sales of the Bibbulmun Bushwalking Track Guidebook have run at about 1 000 copies per year for the past 6 years, and show the degree of public interest in forest recreation. The introduction of a series of standard signs for recreation areas will help visitors to gain more enjoyment from their contact with the forest. Public education facilities were improved by upgrading the Perup Field Study Centre, and several courses were also conducted at the Mundaring and Jarrahdale Centres, in conjunction with the Education Department.

Turning to forest management, a series of harvesting trials has been set up in road and stream reserves in the southern region to explore public acceptability of this option to compensate for reduction of the timber resources from the Shannon Basin. The trials were set up in liaison with the Environmental Protection Authority and the Water Authority and are open for public inspection, although they will not be finished until later this year.

The Government's initiative in hardwood forest rehabilitation received substantial assistance from employees engaged under the C.E.P. scheme. The annual program remains at 2 000 ha, and detailed site surveys now show that some 60 000 ha of the jarrah forest is suitable for treatment. This approach to improving forest productivity was supplemented by the formal commissioning of the Wood Utilization Research Centre at Harvey by Mr H.D. Evans, Minister Assisting the Minister for Forests, in December 1984.

The continuing studies of timber drying techniques at the centre are giving favourable indications of the scope for improving the level of utilization and the quality of the product from the old growth and regrowth hardwoods. Detailed studies of milling immature hardwood logs are to be started shortly.

In November 1984, the W.A. Timber Utilization and Marketing Task Force which was commissioned in June 1983, reported to Government and its recommendations were subsequently accepted in principle . The Task Force provided a unique opportunity for constructive dialogue between timber growers, processors and users and whilst it was not possible to fully implement the terms of reference, or to reach accord on every topic, the views expressed will provide a constructive basis for developing cohesive policies for the

future of the forest based industry. The major recommendations covered the need for a comprehensive set of objectives for the timber industry, improved resource statements, development of improved hardwood seasoning techniques, markets for regrowth hardwoods, expansion of value added manufacture, establishment of a senior level research panel, and improved security of access to log resources.

Increased strength in the housing industry resulted in a reduction of stocks and return to operations at full permissible log intakes in the timber industry. Demand for pine timber was firm and the first modern pine sawmill with facilities for seasoning, planing, and reprocessing residues came into operation at Dardanup.

In examining the question of land availability, and alternative methods of financing the pine planting program, economic studies have confirmed that in some circumstances, radiata plantations compare favourably with conventional grazing as an assured source of income for landowners. A proposal envisaging leasing of suitable farmland by the Department for one growing period of 25-35 years, subject to an annuity payment of landowners' profits, and a share of the final crop, has reached the final drafting stages.

Several field demonstrations of the benefits of agroforestry were organised in conjunction with the Department of Agriculture and CSIRO. Increasing interest in agroforestry was also demonstrated by farmers' initiatives in organising their own field days and setting up their own trials. Some 750 ha of farmland were purchased for planting in the Manjimup Shire prior to agreement of a two year moratorium on further purchases. This will probably continue until additional Crown land is made available for agriculture in the Shire.

Despite these initiatives, availability of suitable land for an annual planting program of 3 000 ha required to supplement timber availability in the early decades of the next century remains a matter of concern.

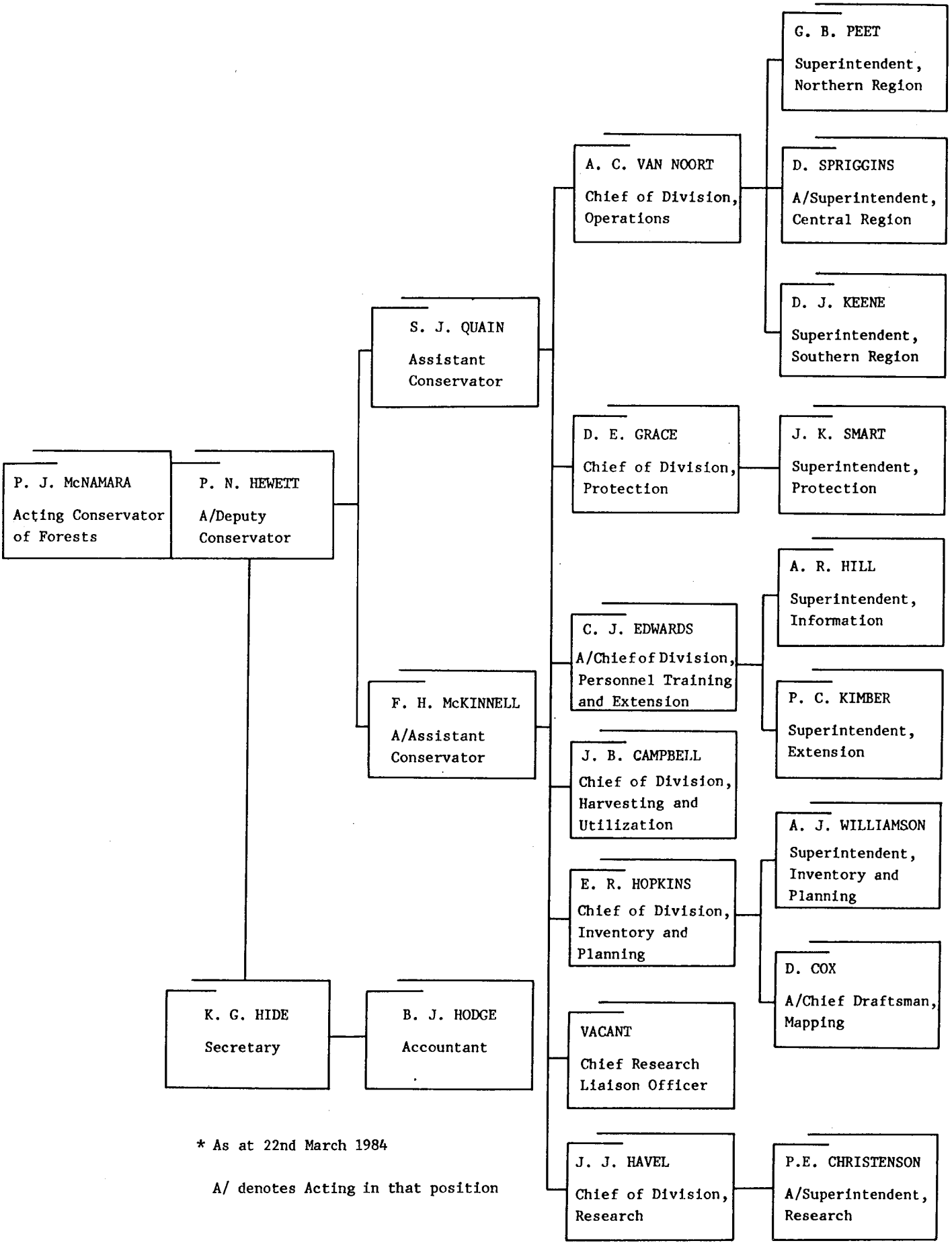
The additional workforce available under the Community Employment Program again made an invaluable contribution to general field projects, particularly hardwood rehabilitation, and to recreation projects in the Shannon Basin and the Lane-Poole Reserve. Increased funds were also available for intensifying weed eradication efforts in liaison with the Agricultural Protection Board. Performance in fire suppression, aided by the strategic fuel reduction program, was most creditable especially in view of the record spell of hot weather in February.

With the termination of activities of the Forest Department I would like to record my appreciation of the enthusiasm and support of all staff and employees especially during the somewhat uncertain times leading up to the formation of the new Department.

I would also like to extend my best wishes for their future success and for the success of the Department of Conservation and Land Management.

P. J. McNAMARA
ACTING CONSERVATOR OF FORESTS

2. Principal Officers*



* As at 22nd March 1984

A/ denotes Acting in that position

3. Objectives

Forest policy involves the following management objectives.

Water Supplies: To protect, control and rehabilitate, where necessary, those forest areas that contribute to the water supply requirements of the State.

Timber Production: To maintain the removal of produce from native forests at a level that can be sustained by the forest growth in the long term. To ensure sufficient supplies of softwood to guarantee Western Australia's long-term self-sufficiency in timber production.

Other Forest Produce: To manage State forest so that land use conflicts are minimized, and supplies of minor forest produce, such as honey, sandalwood, and wildflower seed are sustained undiminished.

Recreation and Tourism: To extend access to the forest wherever this is possible, and to provide additional facilities for people to enjoy the many aspects of forest recreation available to them.

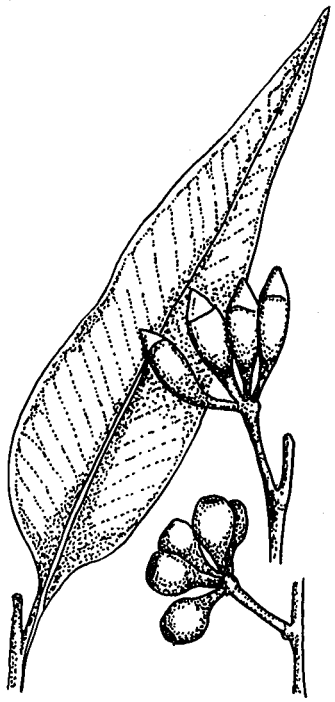
Flora and Fauna: To conserve the habitats of the many species of flora and fauna that exist in the forest of Western Australia.

Special Scientific Values: To set aside specific areas of forest for the purposes of education, reference, and scientific study.

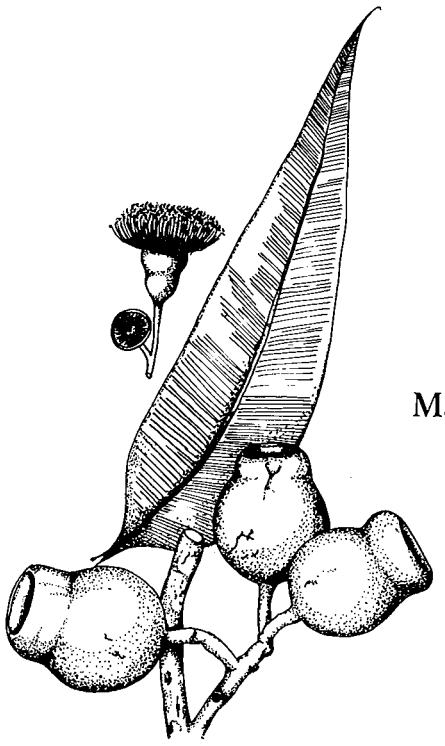
Mining: To stabilize and rehabilitate forest areas upon which the original vegetation has been disrupted or destroyed by mining operations.

Forest Protection: To maintain and add to the areas of permanently reserved forest; to protect these forests from fire, insects and other harmful agencies, and to maintain and improve the health and vigour of the forest.

Private Forestry: To encourage private investment in commercial forests, and to assist in their establishment and maintenance. To provide advice on tree planting for shelter and protection, particularly in rural areas.



Karri



Marri

4. Statistical Summary of Forestry Activities 1984/85**

THE FOREST ESTATE

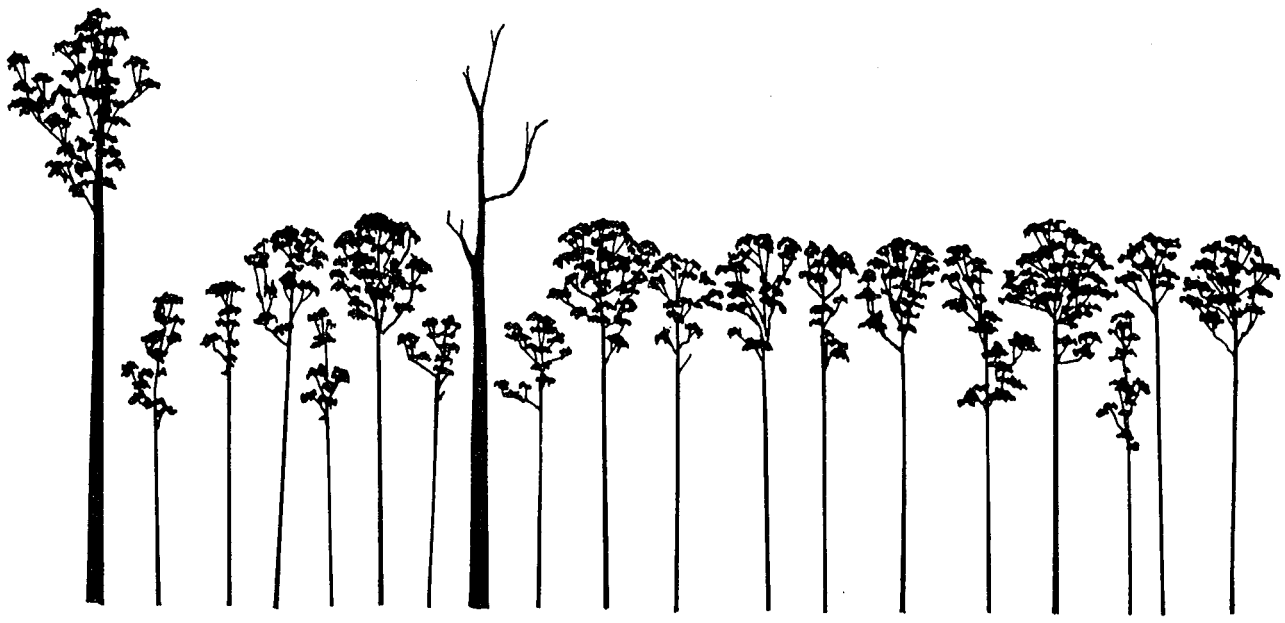
Total area of State forest	1 897 925 ha
Additions to State forest	28 101 ha
Excisions from State forest	118 ha
Timber reserves	119 116 ha
Freehold land held in the name of the Conservator of Forests	25 460 ha
Land purchased for pine planting	1 395 ha

HARDWOOD FOREST ESTABLISHMENT

Regeneration - karri	2 184 ha
- wandoo	177 ha
- tuart	70 ha
Reforestation of areas mined for - bauxite	324 ha
- coal	41 ha
- tin	11 ha
Reforestation of disease-killed forests Forest Improvement and Rehabilitation Scheme (FIRS)	2 590 ha
Reforestation of - sand pits, log landings	127 ha
- gravel pits	98 ha
- catchment areas	940 ha

PINE FOREST ESTABLISHMENT

Area planted with pines in 1984	2 534 ha
Radiata	1 996 ha
Pinaster and other species	538 ha
Total area of State pine forests	59 089 ha
Radiata	31 431 ha
Pinaster and other species	27 658 ha



NURSERY PRODUCTION

Eucalypt seedlings for Departmental use	
Hamel	246 000
Manjimup	2 362 000
Eucalypt seedlings for public sale	
Hamel	278 000
Manjimup	76 000
Narrogin	109 000
Pine seedlings for Departmental use	
Pinaster	560 000
Radiata	2 014 000
Pine seedlings for public sale	
Pinaster	513 000
Radiata	190 000
Other seedlings for Departmental use	
Broome	1 000
Karratha	1 000
Other seedlings for public sale	
Broome	36 000
Karratha	54 000
Carry over to 85/86	867 000
Total seedling production	7 307 000

FOREST PROTECTION

Area of prescribed burning	270 000 ha
Fire Outbreaks	
Number of fires	183
Area burnt	3 889 ha

** Period from 1 July 1984 to 22 March 1985 inclusive

5. Statistical Summary of Forest-Based Industries 1984/85**

SAWN WOOD PRODUCTION

Total production of sawn timber	214 927 m^2

LOG PRODUCTION	Crown Land (m^3)	Private Property (m^3)
Saw logs hardwood +	564 688	18 954
Saw logs softwood +	39 550	3 559
Other logs hardwood*	358 121	67 203
Other logs softwood*	116 857	8 916

HARDWOOD CHIP LOGS

Quantity produced	425 324 m^3

FIREWOOD PRODUCTION

Quantity produced	38 740 t

POLES AND PILES

Quantity produced	277 048 lin m (33 706 pieces)

SANDALWOOD

Quantity produced	1 360 t

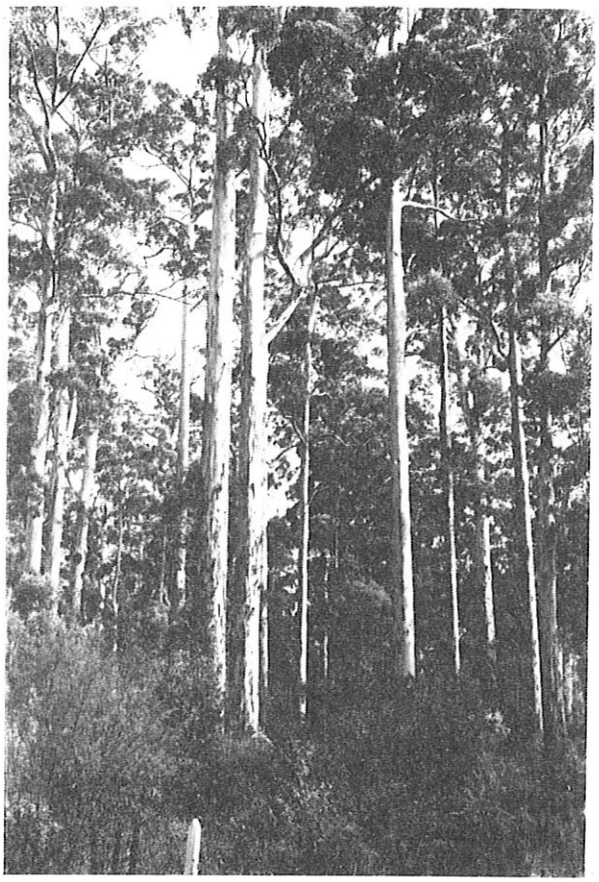
AVERAGE MONTHLY EMPLOYMENT

Timber mills, including bush workers	1 764
Other timber processing plants (est)	3 000
Firewood, mining timber and pole cutters	56
Sandalwood workers	74
Apiarists	177
Forestry (including contractors)	1 311

** Period from 1 July 1984 to 22 March 1985 inclusive

\+ includes logs used for production of plywood veneer
* includes chip logs and particleboard material.

6. The Forest Estate



AREA OF STATE FOREST AND TIMBER RESERVES

The area of land held as State forest at 22 March 1985 was 1 897 925 ha, which represents a net increase of 27 983 ha compared with the area at 30 June 1984. The area of land under timber reserves (Forests Act 1918-76) was also increased during the period of this report by 195 ha to 119 116 ha. Freehold land held in the name of the Conservator of Forests totalled 25 460 ha: an increase of 1395 ha since last year.

The increased area of State forest is largely due to the dedication of 28 011 ha of vacant Crown land in the Mitchell River area, near Denmark.

TYPE	AREA (ha)
Jarrah	1 461 000
Karri	153 000
Wandoo	106 000
Mallet	10 000
Tuart	3 000
Goldfields species	30 000
Radiata	31 000
Pinaster	28 000
Very open areas	221 000
	2 043 000

LAND ALIENATION AND LEASES

Land alienation is the process of moving land from Crown to private ownership. Eight applications for alienation were received, involving 1260 ha, and 29 applications for forest leases were received involving 2157 ha. The Department has agreed to the following:

(a) Alienations

	Number	Area (ha)
State forest	1	1
Crown land	2	80

(b) Leases

State forest	22	1977
Crown land	2	168

7. Land Management

The Department manages forest land for the complete spectrum of land use activities and land values. These range from flora and fauna conservation to the rehabilitation of land cleared by mining. Multiple-use, and the resolution of conflict are the key concepts behind the system of land management practiced by the Department.

LAND USE MANAGEMENT PLANS

The first phase of the Shannon Forest D'Entrecasteaux management plan was released by the interim planning group for public comment. A total of 5207 responses were received; 5003 as petition signatures and 204 as individually written submissions. These are currently being assessed by the planners with a view to incorporating some of the ideas into the next stage of the plan.

The interim planning group, comprising the Forests Department and the National Parks Authority, handed over responsibility for preparation of the plan to the new planning group within the Department of Conservation and Land Management.

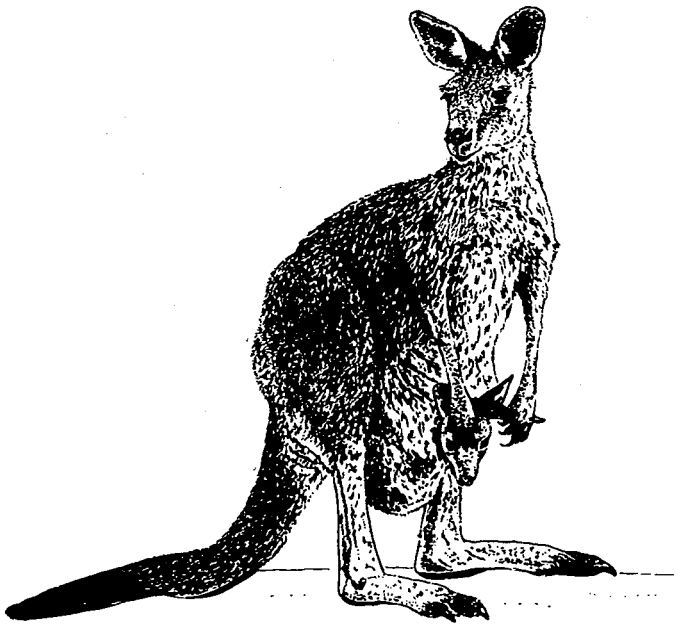
FLORA AND FAUNA

As the public custodians of a large section of comparatively undisturbed natural habitat the Department has a responsibility to conserve the forest ecosystem in its entirety, including all species of fauna and flora.

Since the early 1970s a considerable effort has gone into active conservation of flora and fauna in State forest areas. Management Priority Areas (MPAs) have been created for the protection of flora and fauna throughout the forest. Road, river and stream reserves have been set aside in areas where clear felling is taking place, biological surveys have been carried out and a program of research and education has been instituted. Many of these projects are ongoing, and the work continued during the year. Also during the past year a large section of Crown land, comprising some 28 011 ha on the Mitchell river to the east of the Hay river, was dedicated as State forest. This followed recommendations in a report on a biological survey carried out in the area by Departmental staff. The area has outstanding flora and fauna values and is a valuable addition to the forest estate.

The results of 15 years of biological survey work in the southern forest area were collated and written up during the year and is in press. This publication provides valuable base line data on the flora and fauna of these forests.

Routine monitoring of fauna populations continued in the Perup area to the east of Manjimup. It is pleasing to record that the number of species of medium-sized marsupials, such as the woylie, possum, numbat and others, continues to increase.



LANDSCAPE PLANNING

Landscape planning and design assistance was provided on a range of management activities, including harvesting, roading, softwood reforestation, mining rehabilitation and amenity planting. A pilot project was also commenced in consultation with Mapping Branch personnel to develop a computer-based landscape management system.

Site development plans were prepared for a number of forest recreation areas, several divisional offices and a field study centre. In addition, a conceptual site plan was also prepared for the Department's Garden Week display at Perry Lakes.

A paper on the use of seen area analysis in the forests of south western Australia was prepared and presented at the Australian Institute of Landscape Architect's 1984 conference held at Marcoola, Queensland.

RECREATION

During the year, Community Employment Program grants enabled further work to be undertaken in the Lane-Poole Reserve and the Shannon Forest. A range of developments including camping and day-use areas, walk tracks and visitor interpretation facilities are nearing completion in both areas. In addition, work on the general up-grading of recreation sites at a number of other locations throughout State forest continued.

A preliminary field assessment of the northern and central sections of the Bibbulmun Track commenced. This work is being carried out as a prelude to the eventual realignment of some sections of the Track and the corresponding revision of the existing guidebook.

The Department contributed to the formulation of draft recommendations and guidelines for recreational access to water catchments and reserves being developed by the Water Resources Council. In association with this work, divisional officers at Mundaring prepared a management program that provides for controlled public access and use of portions of the lower Helena catchment. Work on the implementation of this program has commenced in consultation with the Water Authority.

ESTABLISHMENT AND TENDING OF FORESTS

Jarrah Forest

Generally, the jarrah forest regenerates naturally from lignotuberous seedlings present on the forest floor following logging.

The Forest Improvement and Rehabilitation Scheme (FIRS) aims at rehabilitation of areas where regeneration has been adversely affected by dieback caused by the cinnamon fungus. The scheme is financed by ALCOA. During the period of this report 2590 ha were treated under the scheme.

In accordance with Government policy a Hardwood Stand Improvement program aimed at improving the productivity of the hardwood forests is being undertaken. The work includes thinning of regrowth stands and removal of overmature, unsaleable, old growth trees to make way for regeneration. During this period some 1190 ha of forest were treated.

Karri Forest

During the winter of 1984, 2184 ha of cut-over karri forest were regenerated. Of this, 493 ha were regenerated naturally from seed trees, 215 ha were sown with karri seed and 1476 ha were regenerated by planting with nursery-raised karri seedlings.

Rehabilitation of log landings and snig tracks continued with the co-operation of the timber industry. Karri seedlings were planted on 411 landings and associated snig tracks.

Wandoo Forest
177 ha of wandoo forest were regenerated on seedbeds created by heaping and burning debris.

Mallet Forest
118 ha of the mallet plantation in the Narrogin District were thinned commercially for production of tool handles and fence posts.

Tuart Forest
At Ludlow, 70 ha of tuart forest were prepared and regenerated during winter of 1984.

Pine Forest
State owned pine forests now cover some 59 089 ha.

PINE FOREST ESTABLISHMENT

Area planted with pines in 1984	2 534 ha
Radiata	1 996 ha
Pinaster and other species	538 ha
Total area of pine forests established at 31.12.84	59 089 ha
Radiata	31 431 ha
Pinaster and other species	27 658 ha

1984 PLANTING (ha)

Division	Radiata	Pinaster and other species	Total
Wanneroo	-	528	528
Mundaring	56	* 8	64
Busselton	1 333	1	1 334
Nannup	387	-	387
Manjimup	80	-	80
Pemberton	139	-	139
	1 996	537	2 534

* second rotation

Pine Tending

The following pine forest tending was carried out during the period.

Scrub control	4582 ha
Refertilizing	4765 ha
Low pruning	1916 ha
High pruning	1381 ha
Non-commercial thinning	492 ha

Private Forests

Private forest managers and consultants informed the Department that 428 ha of pine were planted in 1984. This brings the total area of privately owned pine forest to 12 845 ha.

The W.A. Chip and Pulp Co. Ltd. planted 211 ha of hardwood (mainly Tasmanian blue gum) as a future chipwood resource. This brings the total area of private eucalypt plantation to 596 ha.

Most of the pine was planted in the northern forest region and most hardwood in the southern region.

A Departmental representative attended council meetings of the W.A. Chapter of the Australian Forest Development Institute, which assists with liaison between Government and private growers and managers.

INLAND FORESTS

Goldfields

A high level of mining and exploration activity resulted in a large number of requests for rehabilitation advice, and increased the need to monitor these activities on timber reserves.

The Department continued to be represented on the Goldfields Dust Abatement Committee, and carried out tree planting projects on behalf of the Committee. Direct seeding was attempted for the first time on an operational scale.

Kalgoorlie staff collected 18 kilograms of eucalypt and Pittosporum seed for the central seed store, and a substantial quantity of sandalwood seed for use in planting trials near Kalgoorlie.

Overcrowded stands of regrowth in the pioneer area, south of Kalgoorlie, was thinned to produce timber for mining, and production rose 11 per cent above the 1983/84 level. These stands were regenerated after mine timber and firewood cutting in the late 19th century.

Pilbara

The range of arid-area native plant species raised at Karratha Nursery was substantially increased, following improvements to techniques used to raise plants from cuttings. Research at the nursery continued into methods of propagating local species.

Information from the Karratha advisory service continued to be in heavy demand from the public, local authorities and mining companies. Advice was given on selecting species, the design and development of low-water gardens, landscaping, and revegetation of disturbed areas.

Projects involving the conservation of water were expanded. The first Israeli type water-harvesting structure, constructed two years previously, proved successful in the establishment of a small grove of trees. An additional, much larger structure, was planned and construction started during the year.

The small irrigated plantation of river red-gums, date palms and mangoes was extended to include more dry-area fruit trees, and some tropical tree species with a potential to produce timber.

Kimberley

Plant production at Broome Nursery remained steady. The range of species raised in the nursery was increased to include more native species which have a low water demand when planted in gardens.

Advice was provided both at Broome and Kununurra on species selection, landscaping and rehabilitation.

A research project was initiated in Kununurra Arboretum to test a range of exotic tropical timber species suited to the relatively dry, monsoonal climate of this region. Parallel trials were also started to test very high value species grown under irrigation. Indian sandalwood is the major species to be tested under irrigation.

Kununurra staff liaised with Aboriginal communities, local authorities and pastoralists to promote and help with tree planting projects.

HARDWOOD FOREST REHABILITATION

Bauxite Mining

The dispersed pattern of clearing required for bauxite mining radically alters the composition of the forest. After rehabilitation, there are small areas of healthy, natural forest; patches of forest infected with the cinnamomi fungus; mine sites that have been revegetated using a variety of techniques and species; rehabilitated dieback areas; rehabilitated transport and service corridors; and access roads.

This year 324 ha of pits, access roads and other clearings associated with mining were reforested by planting or seeding with eucalypt species.

Preparation includes backfilling, bank battering, landscaping, returning top soil, drainage and deep ripping.

Tin Mining
A total of 11 ha mined by Greenbushes Tin has been planted with three eucalypt species. Preparation included backfilling, landscaping and drainage and was carried out by the Company.

Coal Mining
The Department continues to liaise with coal mining companies on matters which affect State forests. Western Collieries have rehabilitated 41 ha of mined areas by direct seeding with 55 species of native shrub and 12 species of eucalypt.

Gravel Pit
A total of 98 ha of disused gravel pits in State Forest and timber reserves has been rehabilitated.

Miscellaneous
Rehabilitation of other areas including sand pit workings, log landings, and exploration clearing totalled 127 ha.

CATCHMENT REHABILITATION

The Department has planted 940 ha of former farmland in the Wellington and Helena catchment areas on behalf of the Water Authority of W.A. and the State Energy Commission, using 17 species.

In catchments within the Jarrahdale and Dwellingup divisions 21 ha of dieback degraded areas have been rehabilitated.

PROTECTING THE FOREST

Fire
The 1984/85 fire season was longer than normal due to an extension of dry autumn conditions until late May 1985. The northern forest regions were required to maintain their fire alert from early October to late May, a period of 8 months. A record run of very high temperatures occurred in February.

During the fire season to 21 March 183 wildfires, covering an area of 3 889 ha, were attended by forestry crews in or near State forest.

Prescribed Burning
Sixty-nine prescribed aerial burns covering approximately 217 000 ha of State Forest were carried out prior to 22 March. In addition about 53 000 ha were burnt by ground crews. These areas were burnt for a variety of purposes including fuel reduction for fire protection; habitat management; disposal of logging debris; and site preparation for hardwood regeneration and pine plantation establishment. The total area also includes 4 720 ha burnt for fuel reduction in departmental plantations of *Pinus radiata* and *P. pinaster*.

The first of a series of helicopter ignition trials was conducted in two

SUMMARY OF WILDFIRES ATTENDED (to 21/3/85)

Land Category	1984/85		Annual average past 5 years	
	number of fires	area burnt (ha)	number of fires	area burnt (ha)
State Forest Hardwood	109	1 600	114	5 800
State Forest Softwood	20	24	17	44
Adjacent Private Property and Crown Land	54	2 265	91	6 690
TOTAL	183	3 889	222	12 534

areas of *P. pinaster* plantation at Gnangara, immediately north of Perth.

The trial revealed the effectiveness and efficiency of the helicopter as a means of igniting small or difficult areas, and proved more economical than a three-man ground crew in areas over 230 ha.

Detection

The Department's fleet of nine Piper Super Cub aircraft was flown for approximately 5 600 hours to provide aerial surveillance of State forest and nearby Crown lands and private property.

Four lookout towers were used to maintain a continuous watch on important pine plantations, whilst another 20 towers were maintained as a back-up to spotter aircraft.

Disease

Implementation of the Government's 'Dieback Policy 1982' continued. All operations proposed within proclaimed Disease Risk Areas were evaluated. These included logging, roading, maintenance of aerial-burn boundaries and installation of SEC lines.

The area of State Forest and timber reserves proclaimed as Disease Risk Areas remained at 719 561 ha. Access to Disease Risk Areas is restricted and is controlled by permits and enforced by patrols. To 21 March 1985 - 220 permits were issued and 185 patrols were carried out to assist enforcement of regulations.

Environmental Protection

Training schools were conducted on a variety of topics for Forests Department staff, and for other Government authorities.

Aerial surveys were made of forests damaged by the insects gum leaf skeletoniser and jarrah leaf miner. Aerial photographs were taken to be evaluated as a survey method.

The health of all State forest blocks was monitored by divisions, with results collated by the Environmental Protection Branch. This information was depicted in a crown condition map at a scale of 1:500 000.

Weed control continued in line with the Forests Department weed control policy. Progress in weed control programs was monitored in liaison with the Agriculture Protection Board (APB).

The Forests Department and the APB co-operated in a research program near Dwellingup into the movement of feral pig and techniques for their control.

8. Resource Management

SEED SUPPLY

It is essential to have a reliable source of seed for regeneration, rehabilitation and conservation work.

Seed collected in 1984/85 totalled 1 125 kg, of which 610 kg were from pine species and 500 kg were from other native species, mainly eucalypts, legumes and sandalwood.

Seed Store

Seed store records and transactions were computerised during the year. As a result of this, accurate and up-to-date data on all species are immediately available. Data for the system are gathered during field collections.

Transactions included 411 issues of seed, totalling 205 kg to the public and overseas organisations. Departmental nurseries and users of seed in forest areas received 229 issues, amounting to 555 kg.

At the end of the year stocks totalled 3 580 kg.

Returns from the sale of seeds during the period 1 July 1984 to 21 March 1985 amounted to $11 925.

Seed Orchards

Plantings were made at the Dryandra (Narrogin) seed orchard in 1985 and at Hamel in 1984. New plants included *Pinus sabiniana* (edible seed), evergreen walnut or Ecuadorian walnut *(Juglans neotropica)* and carob bean *(Ceratonia siliqua)* provenance material.

Plantings at Esperance are planned for 1985 and 1986.

Further plantings at Dryandra in 1986 will include rare species of eucalypts which are now difficult and costly to collect.

TREE NURSERIES

The Department operates seven nurseries, which produce tree seedlings both for sale to the public, and Departmental planting programs.

The north-west nurseries at Karratha and Broome mainly produced species suitable for arid areas. These species are better suited to the climate than the tropical species with a high water requirement previously favoured in north-west gardens and townsites. Both nurseries continued their training function and two horticultural apprentices graduated during the year.

Hamel and Narrogin produced trees mainly for farm planting and other rural tree planting programs, while Gnangara, Nannup and Manjimup nurseries produced pine and eucalypt seedlings for Departmental planting.

Nursery production for 1984 is shown in the table following.

WOOD PRODUCTION

Management of timber harvesting is a vital part of the Department's activities. It is a very complex function involving control of logging activities to meet environmental protection and disease management requirements and to achieve the most efficient use of the timber resource. At the same time, the timber harvest must be controlled and located to work towards a proper sequence of tree age classes in the forest, which is essential for the Department's long term goal of maximum sustained yield.

Once the forest has been restructured in this way its sustained yield will be considerably higher than the current yield. In the meantime, the level of hardwood sawlog cut (the allowable cut) is being progressively reduced as new pine forests reach maturity.

DEPARTMENTAL NURSERY PRODUCTION

Nursery	For Sale to the Public		For Departmental Use		Carry Over to 85/86	Total
	Potted Stock	Open Rooted Stock	Potted Stock	Open Rooted Stock		
Commercial Nurseries:						
Narrogin	109,000					109,000
Hamel	278,000		246,000			524,000
Hardwood Nurseries:						
Manjimup	76,000		1,079,000	1,283,000		2,438,000
Pine Nurseries:						
Gnangara		513,000		560,000	679,000	1,752,000
Nannup		190,000		2,014,000	155,000	2,359,000
Other Nurseries:						
Broome	36,000		1,000		8,000	45,000
Karratha	54,000		1,000		25,000	80,000
TOTAL	553,000	703,000	1,327,000	3,857,000	867,000	7,307,000

The allowable cut is set according to long term plans which take into account the State's present timber requirements, the rate of growth of pine forests and the need to provide a smooth transition from one type of timber to another.

The allowable cut refers only to the volume of hardwood sawlogs used by general purpose sawmills which hold permits or licences issued from the Department's Head Office. It does not include other logs which cannot be used by these mills because the logs are too small or too defective. Any such logs produced in harvesting operations are made available to smaller mills and are called salvage logs. They are sold on local licences issued by field officers.

Areas Cut Over

Three types of harvesting take place in the forest according to the management system used for a particular area. Areas of forest are either clearfelled, selection felled or thinned.

Clearfelling involves the removal and subsequent regeneration of a complete stand of timber. A two-stage process of harvesting is often practised in which trees are left to provide seed for regeneration. Subsequently they are removed, once seed shed has taken place. Alternatively if the area is to be regenerated by planting the stand is harvested in one operation.

Selection felling involves removing groups of trees, or single trees. The openings in the forest created by this operation are regenerated from the surrounding trees or from seedling regrowth already on the forest floor.

Thinning is the practice of removing excess trees from overcrowded areas, particularly in immature or regrowth hardwood or softwood forests.

This practice enhances the growth of the retained trees and maintains the vigour of the forest. A forest may be thinned several times before it reaches maturity.

During the period of this report, the commercial thinning of regrowth karri forest continued. Some 337 ha were thinned during the period bringing to 1 357 ha the total area treated in this way to date. Veneer logs, sawlogs and chipwood, are being recovered from logs removed during thinning.

The area cut over each year fluctuates depending on the quality of the forest involved and the timber volume prescribed for extraction under silvicultural plans.

There was a significant increase in the area of pine forest thinned. This reflects the increasing importance of pine, which together with regrowth hardwood, is replacing the resource previously obtained from the mature hardwood forests.

Log Production
Hardwood log production from State forest increased compared with the previous period almost to the level of the allowable cut, as buoyant market conditions continued.

The new softwood sawmill at Dardanup commenced production during the period.

Production of Hardwood Sawlog Timber from Crown Land
The allowable cut of hardwood sawlogs for this year is 762 866 m^3. UP to 21 March 1985 the cut was 523 784 m^3, which was well below the progressive allowable cut for that proportion of the year. The cut of salvage logs was proportionately decreased slightly in the same period.
While working towards this goal the level of hardwood sawlog cut (the allowable cut) takes into account the State's present timber requirements, the inadequacy of mature hardwood forests to meet these requirements in the future, the increasing availability of pine logs and the need to provide a smooth transition in the industry from one type of timber to the other.

The allowable cut refers only to the volume of hardwood sawlogs used by general purpose sawmills and is controlled by permits or licences issued by the Forests Department. It does not include other sawlogs which because of size or defect cannot be used by these mills. These sawlogs are termed salvage logs capable of being processed by smaller mills. The sale of these salvage logs is covered by licences issued by the Divisional offices.

The volume of salvage logs declined during the period.

Veneer Log Production
High quality karri and pine logs for production of veneer continued to be supplied. The volume of pine supplied returned to the normal level after last years unusually high yield following the salvage of timber affected by wildfires.

A steady increase in demand for karri veneer logs continued. It is encouraging to note the market acceptance of peeler logs from regrowth karri forests.

Hardwood Woodchip Production
Marri and karri chiplogs were supplied to WA Chip and Pulp Co Pty Ltd. Of the 358 121 m^3 of chiplogs produced, 81 per cent was marri and 19 per cent was karri. The company also obtained 67 203 m^3 of chiplogs from private property and 57 860 tonnes of chips prepared from sawmill residue.
Production of Softwood Log Timber
The production of pine logs continued to increase, largely due to a greater demand for logs for particleboard production, and a new sawmill.

Sandalwood
Sandalwood is obtained from the Goldfields and Murchison areas and exported mainly to Asia.

Exports totalled 1 313 tonnes for the period compared with 1 221 tonnes in the comparable period 1983/84.

Licences to obtain sandalwood were issued to 29 contractors while 75 people were registered as employed in the industry.

Firewood Production and Consumption
Firewood is obtained as a by-product of sawmilling, from forest residues and dead trees.

The increasing popularity of using wood for home heating has seen a large increase in wood gathering by the public. Areas of forest near the metropolitan area have been allocated

to supply firewood for this purpose.

The figures for firewood consumption do not include this material.

Other Forest Produce
A similar demand for piles and poles occurred compared with the corresponding period last year. It is becoming increasingly difficult to meet the demand due to limitations on the areas of suitable forest.

Market Surveys
Technical Paper No. 11 "A Survey of Timber Used in Timber Manufacturing Western Australia" was published in December 1984. In a preface to this report the Premier and Minister for Forests, Mr Burke, stated "The survey of timber use has established the specific needs of timber product manufacturers. This is a vital step in planning for the continuing timber requirements of an expanding industry".

Timber Utilization
The activities of the WA Timber Utilization and Marketing Task Force highlighted the need for immediate research into processing hardwood regrowth thinnings.

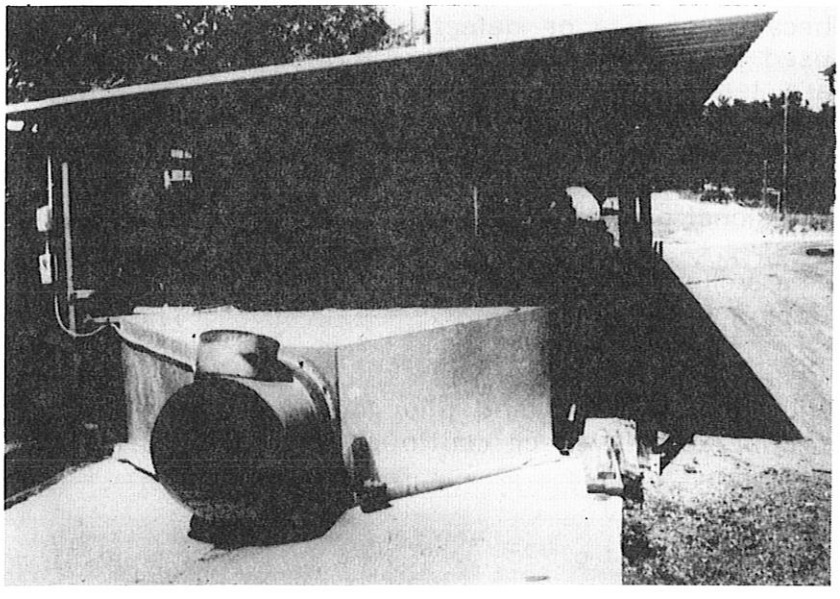
The Harvey Wood Utilization Research Centre (WURC) was officially opened by the Hon Dave Evans, Minister Assisting the Minister for Forests, in November 1984.

During early 1984 a start was made on developing a research complex at the Forests Department's Harvey sawmill.

Restructuring the Harvey mill has provided the facilities to handle small regrowth hardwood logs as well as pine logs. An experimental tunnel kiln was built and contruction of a laboratory scale high temperature kiln was completed.

Research has been conducted in the areas of log stockpiling, sawmill conversion of small regrowth eucalypt logs, progressive tunnel kilns, high temperature seasoning, timber strength testing, residue utilization and various aspects of marketing and product development.

Timber Inspection
The demand for sawn timber inspection stretched the resources of the Department's inspection service. In addition, the inspection of round timber, a service introduced the previous year, also expanded as more poles requiring timber preservative treatment were inspected for the State Energy Commission. More timber for bridge building was also inspected.



The tunnel kiln

Log Pricing

In July 1984 and January 1985 softwood log prices were increased in line with movement in the Perth Consumer Price Index. This resulted in an increase of 6 per cent in July 1984 for prices not indexed for 23 months, and 4.1 per cent for other stumpage rates.

In January 1985 softwood log prices were raised 1.6 per cent.

Hardwood log royalties were indexed to reflect increases which occurred in the Price Index of Western Australian Produced Hardwoods. This index is collected by the Australian Bureau of Statistics for the purpose of reflecting relative timber price changes. Royalties are now adjusted annually by reference to changes that occurred in this index in the previous twelve months.

An increase of 7 per cent was applied to major hardwood log royalties from 1 October 1984.

WATER

The main water catchments for the southern portion of the State fall within forest managed by the Department, and there is close liaison and co-operation with the Water Authority on their management. The objective is to maintain, or where possible, to enhance the quantity and quality of water yield from both natural forest and disturbed areas. Various measures to achieve this objective are being introduced.

A program to thin dense jarrah regrowth forest is underway. It aims to improve timber production but may also have important benefits in water yield. The size of these benefits is being determined from current research. Another water management problem concerns the control of surface water drainage during and after bauxite mining. On the one hand it is desirable to encourage rapid surface drainage, which prevents waterlogging and disfavours the dieback fungus. On the other hand it is necessary to prevent turbid water entering forest streams. The conflict between these two objectives will be resolved by a range of techniques now under development.

FOREST AREAS CUT OVER		1984/85* ha.	1983/84 ha.
Jarrah	Selection felled	23 940	21 537
	Clear felled	89	-
Karri	Clear felled	2 016	1 487
	Removal of Seed Trees	762	488
	Thinned	337	264
Marri	Selection felled	-	-
Wandoo	Selection felled	589	579
Sheoak	Selection felled	213	-
Mallet	Thinned	118	157
Pine	Clear felled	143	161
	Thinned	2 302	1 526

* up to 21 March 1985

HARDWOOD SAWLOG PRODUCTION FROM CROWN LAND

	1984/85* m^3	1983/84 m^3
Head Office licences	523 784	625 785
Local licences	40 904	63 957

SAWN TIMBER PRODUCTION FROM CROWN LAND AND PRIVATE PROPERTY

	1984/85* m^3	1983/84 m^3
Sawn Timber Production		
Crown land	189 101	223 037
Private property	6 457	22 532
Sawn Sleeper Production		
Crown land	17 508	18 521
Private property	1 861	3 243
Total	214 927	273 333

VENEER LOG PRODUCTION

	1984/85* m^3	1983/84 m^3
Karri	2 341	1 753
Jarrah	68	-
Pine	2 875	6 926

* Period from July 1984 to 22nd March 1985.

SANDALWOOD

	1984/85 t	1983/84 t
From Crown land		
Green sandalwood	1 359	905
Dead sandalwood	-	665
From private property	1	2
Total	1 360	1 572

FIREWOOD PRODUCTION AND CONSUMPTION*

		1984/85 t	1983/84 t
Crown land	for sale	27 590	33 024
Sawmills	for own use	800	1 457
Firewood	local firewood permit	1 670	2 112
Contractors	forest produce licence	8 680	6 619
Industrial use		N/A	N/A
Total		38 740	43 212

* These figures do not take into account the private collection of firewood in the forest.

OTHER FOREST PRODUCE

South-west division agricultural areas.

		1984/85	1983/84
Mining (m^3)	Crown land	2 502	3 431
	private property	N/A*	N/A
Piles, poles and bridge timber (m)	Crown land	257 071	361 580
	private property	19 977	N/A
Fence posts and rails (no.)	Crown land	140 731	143 508
	private property	2 048	N/A
Strainer post (No.)	Crown land	19 032	20 035
	private property	-	N/A
Goldfields area	Crown land		
Mining timber (m)		138 986	153 477
Fence posts and rails (No.)		7 780	11 740
Strainer posts (No.)		980	310

* N/A - Not Available

9. Support Services

RESEARCH

Research by the Department is carried out from five separate stations - Wanneroo, Como, Dwellingup, Busselton and Manjimup. The stations largely service the forest regions in which they are located but each also has wider responsibilities. Certain areas of research may encompass most or all of the forest areas and sometimes areas outside as well. An example is agroforestry research, based at Busselton, which services areas as far away as Esperance.

The Department's research is most easily divided into two major areas: production and protection research. Protection research covers adverse factors which affect forests and includes also the effects which production forestry may have on other forest values.

PRODUCTION RESEARCH - HARDWOOD PRODUCTION

Karri
The program of establishing karri seed orchards and seed production areas on a range of sites continued. A five hectare orchard containing 50 families, and a progeny trial containing the same families, was established this year. Approximately 50 hectares of seed production areas have been established over a range of sites during the last two years.

A thinning and fertilizer trial was established in high quality 12 year old regeneration. Initial treatments and measurements indicate the potential for heavy thinnings in high quality stands of this age. In the most heavily thinned plots approximately 100 m^3 of chippable material was removed. The commercial viability of such thinnings has yet to be demonstrated in practice.

Jarrah
Site classification work continued in the southern forests. Field work is now complete and data are being analysed.

Analysis of the results of establishment trials gave good results from the sowing of seeds in the shelter of plastic cups. Jarrah seedlings performed best on laterite and gravelly soils and performance was poorest on loams and sandy soils, particularly on wetter sites.

Thinning trials in saplings and pole-sized regrowth stands have shown that heavy thinning does not reduce total stand growth but doubles the growth rate of the crop trees. The greatest response to thinning is shown by the most vigorous trees: thinning does not benefit trees with poor crowns.

Other species
An officer at Narrogin has been appointed to work on the problems of establishment and growth of eucalypts on farms in the wheatbelt area. Another officer at Dwellingup has been appointed to work on eucalyptus breeding.

Softwood production

P. radiata
Further searches were conducted to find the best trees for inclusion in the breeding program.

Glasshouse screening tests show that a higher proportion of families within the South African *Radiata* pine population is tolerant to the cinnamon fungus than South Australian breeding stock. After four years in a dieback field test, tolerant radiata families averaged 2 per cent mortality

compared with 21 per cent for susceptible families. Sub-lethal infections in susceptible families have reduced height growth by 8 per cent compared with tolerant families, but this difference is increasing. The establishment of a seed orchard of families tolerant to cinnamon fungus is proceeding.

Trials using fertilizer on *Pinus radiata* in the Donnybrook Sunkland indicated that growth rate increases in proportion to the amount of phosphorus and nitrogen applied. There appears to be a marked seasonal pattern of nutrient uptake in young *P. radiata*, which suggests that fertilizer is most effective if applied in autumn.

Two new agroforestry demonstration areas were established at Manjimup.

Pinus pinaster
Tree breeding research and grafting to establish clone banks of the best tree breeding stock continued.

Studies of second rotation were initiated on the Swan coastal plain to monitor the survival of *P. pinaster* seedlings as well as long-term productivity. Results indicate that the problem of seedling losses after planting can be overcome. However, long-term productivity on the coastal sands is still being investigated.

PROTECTION RESEARCH

Fire
Research into fire behaviour in karri regrowth continued. Results indicate that the size and age of the young karri has a major bearing on fuel conditions and hence fire behaviour. Basal area has proved a useful index for describing fuel variation both within and between stands, independent of scrub type. The amount of fuel can now be interpreted from aerial photographs, using crown size and stand density as a guide.

Trials indicate that litter under regrowth has a similar drying pattern to litter under mature karri.

Experimental prescribed burns, carried out in regrowth karri stands demonstrated that fuel reduction burning can be carried out within a narrow range of conditions.

Data from project Aquarius on the behaviour of large scale, massed fires in jarrah forests continues to be analysed. Much of the year was spent developing appropriate methods of analysis using industry advanced computer graphic techniques.

Dieback
Work predicting the impact of cinnamon fungus on different types of site within the jarrah forest is progressing. Over 300 sites have now been surveyed in the northern and central jarrah forest and marked differences have been found in disease impact levels. Some vegetation types are associated with high impact, and their occurrence can be used to predict potential impact. However, on two thirds of the high impact sites no outstanding individual plant indicators are yet apparent.

Techniques have been developed for excavating tree roots and measuring root damage in live jarrah growing on infected moderate impact sites. Cinnamon fungus has been recovered from fine jarrah roots in half of the sites assessed.

Rehabilitation
One of the major problems is to find trees which can be used for rehabilitation on sites affected by cinnamon fungus or saline ground water.

Measurements have been made on five different sites of the growth rates of five and six-year-old trees belonging to 70 eucalypt species. Measuring the water consumption of some species is proceeding. This work is providing the basis on which species may be matched to site.

Catchment management
Two years after a heavy thinning a catchment in jarrah forest to a basal area of 11 m^2/ha, there has been a rise of nearly 1 m per year in the ground water, but no significant change in water quality. There was no increase in streamflow in the first year; however, in the second the streamflow doubled.

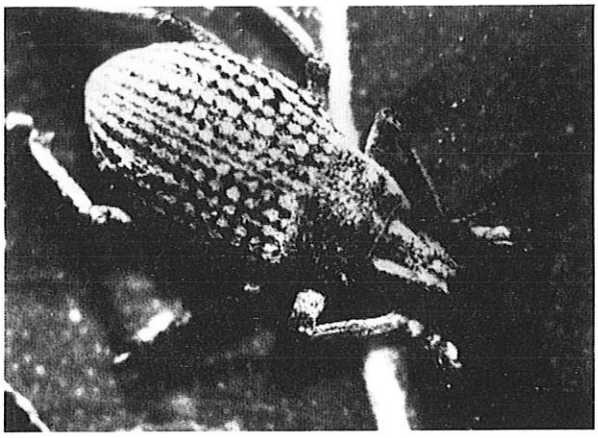
A small dieback-affected catchment has been rehabilitated and is being monitored to determine the effects of reforestation on streamflow, ground water quality and quantity.

Ecology
Work continues on the effects of karri forest management techniques on the bird community. Data have now been collected over three seasons in forest prior to felling and burning. Logging operations were completed in summer 1985 and the regeneration burn was carried out during autumn. Much valuable information on karri forest bird communities and the methods of recording bird data has been collected. Data collection will continue for a long time into the future to monitor the effects of these operations.

Work continued in monitoring of woylie populations in areas where new colonies have been released in recent years. The northern Perup colony is thriving, the colony at Collie is maintaining itself and perhaps increasing slowly, whilst the colony at St John's brook west of Nannup appears to have died out altogether.

Routine monitoring of mammal populations continued in the Perup MPA. Work on termite activity and occurrence in relation to numbat feeding has been completed and is being analysed. Studies on the tammar wallaby and the relationship between heartleaf thickets and fire continues in the Perup.

Entomology
The Department commenced a new research program on forest entomology with the appointment of a research officer. A comprehensive review of all past work and information on forest entomology in W.A. has been prepared for publication. Work started on projects designed to obtain basic information on leaf eating insects in the jarrah forest. Some further work was also initiated on jarrah leaf miner, and an insectary has been started in Como.



A common leaf-eating weevil (*Catasarcus* sp.) on jarrah.

Information retrieval

A start has been made on the computerization of research data. All research projects for the past 30 years are being included. A later phase of the project will include summaries of results of the many trials involved in these projects. This system will allow easy access to research data by managers.

DATA PROCESSING

The Department continued to use its Perkin-Elmer computer and the Cyber computer at the W.A. Regional Computing Centre in order to meet its data processing needs.

The Perkin-Elmer was expanded by the addition of central memory, disc space, 15 terminals and remote printers.

An Intergraph Computer mapping workstation was installed and connected to the Vax computer at the Land Information System Support Centre.

Work continued on a computer system to monitor hardwood logging. Several small computer systems were completed including a seed store system to monitor the availability of the various seed types in the store. An index system was also introduced to keep details about experimental pole, pile and sleeper timbers. A system to collect and monitor the costs of items of plant equipment was transferred to the computer from accounting machines. This will allow closer regulation of the cost of the Department's vehicle fleet.

INVENTORY AND PLANNING

The Inventory and Planning Section is responsible for the collection of natural resource data and the processing of the data to provide management information on which policies, strategic plans and management plans are based.

Detailed inventory was carried out on 1640 ha to provide estimates of sawlog resource on 50 300 ha of hardwood forest. An additional 222 ha were assessed to provide an estimate of the SEC pole resource on 4 500 ha in the central region.

Staff from the section took part in the sandalwood survey on the Goldfields. A map system for the recording of sandalwood resource information was developed.

In the southern forest region 14 permanent plots were established to monitor the growth of wandoo and *Eucalyptus muelleriana* stands. Thirty eight existing plots were remeasured to provide growth information on regrowth karri and marri and mature jarrah forest.

During the period of this report, 411 permanent and 70 temporary plots were measured throughout softwood forests in the northern and central regions. A project established by Research branch in 1953 was taken over by the Inventory section. The project is to document the performance of *Pinus pinaster* at Gnangara under "free growth" conditions. Established fixed area plots were remeasured for final analysis. Other work associated with pine forest management included the mapping of site quality on 1000 ha in the central region, and the measurement of 100 sample trees for detailed utilization studies.

Large scale, shadowless, aerial photography for mapping dieback was obtained over 23 000 ha of forest. Other aerial photography produced included 3 300 ha for research into dieback impact, hydrology and crown development. Also, the Department's spotter aircraft were used to obtain supplementary photography for the purpose of monitoring hardwood logging operations.

Interpreters based in the three forest regions analysed 70 mm aerial film of 32 650 ha of forest land. The interpretation, together with field checking, provided the basis for the production of several maps used to assist forest management. Among the maps produced are dieback free, hygiene, current and predicted impact, landform, vegetation, karri occurrence and *Armillaria* distribution.

A four-year integrated logging plan plus detailed one-year logging and regeneration plans were produced for the southern region. A resource statement for the 20 year period 1985-2004 was produced for pine forests in Wanneroo division. A draft management plan for the Dryandra State forest was prepared.

Economic analyses included preparation of a report of the economic potential of agroforestry in the Manjimup region. The study was carried out in conjunction with the Department of Agriculture and the CSIRO. Other work included a financial analysis of Government softwood forests and rates applied as compensation for timber values forgone as a result of forest clearance for industrial purposes.

Considerable staff time was spent supervising dieback hygiene aspects of road construction associated with the Bunbury-Muja powerline. In the southern region the section assisted with logging details for a trial of the computerized hardwood logging system. Also in the southern region the section assessed and reported on 15 proposed land exchanges. Assistance was provided to divisions for dieback demarcation and vegetation assessment.

There was continual update, refinement and extension of the Forest Management Information System (FMIS) data base. The system is now recognized as a valuable management tool both within and outside the Department. The facility to interrogate the system at regional offices has been provided.

A study was conducted in Dwellingup division which looked at factors affecting the form of jarrah regrowth. Insufficient evidence was gathered to support the theory that larger cutover areas produce regrowth of poorer form than smaller areas.

MAPPING BRANCH

Four of the Department's lithographs: Boranup, Margaret, McLarty and Collie, were revised and published as second editions. In addition the Busselton sheet was reprinted without amendments.

The topographical section produced twelve new 1:25 000 scale topographical maps and revised a further six. This section is also responsible for the preparation and maintenance of the special surveillance maps used by the spotter aircraft pilots.

Forty new tenure plans were prepared for head office and field use and a further ninety-three were revised by the drafting section. Twenty-nine aerial burning plans, five tower and two co-ordination boards were supplied to the divisional offices for fire control.

The photogrammetric section compiled dieback maps for five areas and hygiene maps for seven. Three impact maps were completed. This section also mapped from aerial photos, clearing for bauxite mining and new planting on clear felled areas in pine forests.

An intergraph work station was installed in the branch during October, and staff training in computer aided mapping was commenced.

EDUCATION

The number of requests from community groups for talks and tours remained at a high level reflecting public interest in forests and forest management.

Two workshops dealing with environmental education and awareness were sponsored by the Department and conducted by Professor Steve Van Matre of the George Williams College, Illinois. Eighty people from the Department and from other organisations attended the workshops.

Facilities at the Perup field study centre were upgraded and courses in basic ecology run for Departmental staff, school teachers and National Park rangers. Other courses and workshops for teachers were run at Jarrahdale and Mundaring field study centres in co-operation with the Education Department.

The 'Forest Pack' of information on trees and forests for use in primary schools was distributed during the year and proved enormously popular. Requests for the packs have been received from organisations throughout Australia and a reprint is underway.

ADVISORY SERVICES

Tree advisory services continued to be well patronised by the public.

Rural advisory officers participated in tree planting workshops and seminars, and conducted field days with the Department of Agriculture officers on subjects ranging from agroforestry and shelterbelts to conservation plantings on farms.

Further demonstrations were established in co-operation with farmers covering the subjects of direct drilling tree seed, the use of tagasaste as a fodder crop, the establishment of shelterbelts, and replanting salt affected areas.

Large numbers of domestic enquiries were handled in the metropolitan area, and a similar service was provided by officers in Esperance, Bunbury, Narrogin, Karratha, Broome and Kununurra.

The level of enquiries about commercial tree plantations remained at just under 100 during the year. The majority of these were to do with

pines, and many involved inspections to determine the suitability of sites for planting.

ARBORETA

Signposting and tree labelling was completed in the more comprehensive arboreta in the wheatbelt and eastern goldfields. A new arboretum was established at Tenindewa on private land, filling a gap in the coverage of the wheatbelt system of arboreta.

At Karratha, trials of trees irrigated with sewage effluent were extended to include date palms and ornamental and shade species.

Other departmental arboreta at Broome and Kununurra were expanded during the year, and an irrigation system was installed at Kununurra.

GREENING AUSTRALIA

Departmental support for the Greening Australia (W.A.) Committee was increased during the year. A State Government grant of $45 000 to the organisation was administered by the Department. Greening Australia used $28 000 of the grant to match a similar funding from Federal Government, and the $56 000 total was awarded as grants for tree planting projects.

A further $10 000 was allocated to the inaugural John Tonkin Tree Awards, for outstanding tree planting and tree conservation projects throughout the State.

Departmental officers provided significant support for Greening Australia by supervision and help with Commonwealth Employment Program projects. The Department took over the total organisation of one such project at Collie involving the employment of 20 people for 12 months.

PUBLICATIONS

The Department produces general information, scientific, technical and educational publications for local, national and world-wide distribution.

Research publications, intended for the scientific community and professional organizations, included five technical papers, covering such diverse topics as the economics of agroforestry near Manjimup, and the prediction of blow-up fires in the jarrah forest.

The final issue of Forest Focus, the departmental colour magazine, went to press in July 1984, with an update on the dieback situation in the jarrah forest written by leading researchers in the field.

In addition to Bush Telegraph, the fortnightly in-house news sheet, publications section also produced INDAT, a newsletter for the Department of Conservation and Land Management prior to the amalgamation of Forests, Wildlife and National Parks.

Editors in the section were extensively involved in planning committees for the amalgamation of the three departmental publishing programs, and the rationalization of distribution systems.

A much needed program on the Department's Perkin-Elmer computer was designed and installed to cope with the increasing pressure of distributing the range of publications produced. Features of the new system include the ability to obtain select label print-outs according to reader interest, type, geographic location, or other categories.

Writing and editing services were provided for other branches of the Department, and successes included

features appearing in National magazines, and an extended local and State media coverage of Departmental activities.

Appendix 6 provides a complete list of publications produced this year, as well as those articles prepared by Departmental Officers for publication in professional journals.

LIBRARY

The library aimed to serve the information needs of members of the Department by circulating books, pamphlets and periodicals, acquiring selected new titles and obtaining, on request, material on inter-library loan from other libraries.

Members of the public used the library for reference.

An audit of publications on semi-permanent loan to readers was commenced.

Lists of recent accessions were issued every month, until February. Early in March the library was relocated to the Wildlife Research Centre at Woodvale.

ENGINEERING

This Branch provides vehicle fleet management and engineering services appropriate to Departmental needs.

Regional workshops are located at Manjimup, Collie and Mundaring, where major plant repair, development and fabrication of special equipment is carried out for forest operations.

To support regional workshops, ten maintenance workshops are located at Yanchep, Walpole, Nannup, Pemberton, Harvey, Jarrahdale, Grimwade, Dwellingup, Margaret River and Ludlow.

RADIO COMMUNICATIONS

This Branch services the Department's extensive radio communications network, including the establishment and maintenance of repeater stations, fixed radio stations and mobile radios in aircraft and vehicles.

The repeater station at Carlotta was upgraded to improve radio communications in the Nannup division. The new fire lookout at Gnangara was wired for radio communications and three other repeater stations were provided with upgraded antennae and solar power systems.

The new offices at Wanneroo and Kelmscott were equipped with V.H.F. radio for communication with lookout towers, aircraft, and mobiles in the field.

As part of the improvement in mobile radio communications, new radios were installed at Busselton, Nannup and Mundaring districts. These radios increase the flexibility in fire control management by being able to select repeater or vehicle-to-vehicle mode and also have shire and bush fire brigade frequencies.

A total of 511 vehicle radio installations were checked and serviced in the field and 125 vehicles were wired for radio. The nine Piper Cub fire spotting aircraft, and the two twin-engine aircraft used for aerial prescribed burning and dieback photography, had their radio and intercom systems overhauled and checked.

Two first year apprentices commenced their training, one at Manjimup and the second at Como.

10. Administration

FINANCE

Total Finance for period
1 July 1984 to
21 March 1985 $38 299 794

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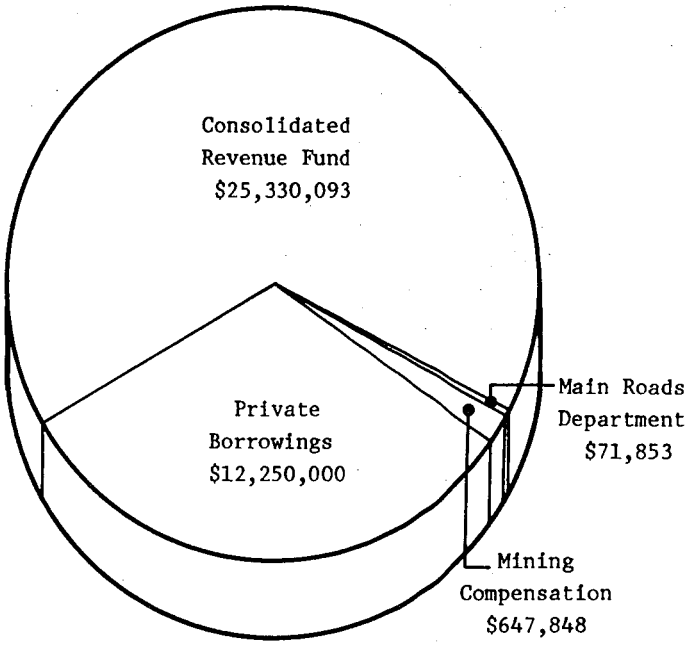
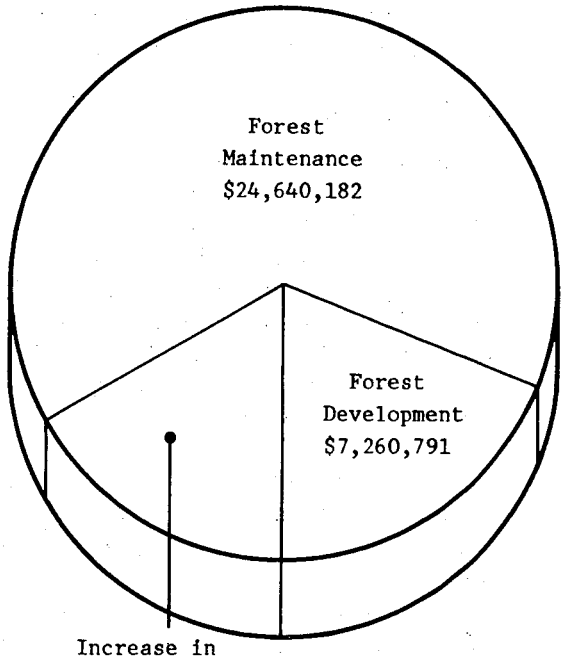


APPLICATION



* Note -
Application of Funds figures for Forest Maintenance and Forest Development have been proportionally adjusted to account for a credit of $186 962 in Plant Hire Recoveries to 21 March 1985 which is carried forward as part of the closing balance transferred to the Conservation and Land Management Trust Fund.

All Territorial and Departmental revenue is paid into the Consolidated Revenue Fund. Allocations are made from this fund for forest maintenance activities. Forest development and other capital works programs are financed from loan borrowings and other internal funds and balances.

DEPARMENTAL STAFF

Public Service Act

Mr TOWERS R G and Mr VEAR K R
Reclassified as Senior Divisional Forest Officers

Mr LONERAGAN O W
Senior Silviculturist Retired

Mr CAMPBELL F J
Acting Deputy Conservator
Promoted to position of Commissioner in the Public Service Board

Mr WELLS E J
Reclassified as Senior District Inspector

Mr SHEDLEY P N
Reclassified as Inspector

Mr BOWEN P J
Reclassified as Senior Draftsman (Special)

Forests Act

Mr SPELDEWINDE D P E Retired

Mr HUTCHINSON G
Reclassified as Regional Forester (Communications)

Mr VINCE F H
Reclassified as Senior Forester

Mr GORTON S C
Reclassified as District Forester

Mr KESNERS A
Reclassified as Regional Forester (Safety)

Mr FREMLIN R R A and Mr SMITH M D
Promoted to District Forester (Tech)

Training

Policy and Organisation

A Departmental training policy was finalised in January 1985. Policy insists on a systematic approach to needs-based training, with full emphasis on post-training evaluation.

Field Cadets

Twelve cadets commenced the first year of their training at the College of the South West, Bunbury, in February 1985. They will be the first group of field cadets to be taught, from July 1985 onwards, the revised syllabus for field officers of the Department of Conservation and Land Management.

The 11 cadets who successfully completed their first training year in November 1984, commenced their second year at Dwellingup in January 1985. The group was increased to 12 by the addition of a mature aged cadet of satisfactory academic status who had substantial experience as a forest workman.

Professional Cadets

Two students were granted cadetships during the year; they are Carol Dymond and Andrew Hill.

Currently eight cadets are studying at the Australian National University and one at Melbourne University.

Conferences, Study Tours and Awards

During the period of the report, seventeen officers visited the Eastern States to attend various research working group meetings, seminars, conferences, study tours and training sessions, covering a wide range of forestry related interests.

Employment in Forestry and Forest-Based Industries

The number of salary and wage earners employed in forestry, or in forest-based industries was estimated 6 442 people, made up as follows:

Forestry		
Administration	:	3
Professional Officers	:	103
General Field Staff	:	375
Clerical & Mapping	:	107
Professional Cadets	:	9
Field Cadets	:	24
Full time Wages Employees	:	540
* Contract Personnel (est)	:	150
		1 311
Forest-Based Industries		
** Sawmilling employees including bushworkers	:	1 824
++ Other wood reprocessing industries (est.)	:	3 000
Firewood, mining, timber and pole cutters working under licence (est.)	:	56
Sandalwood workers	:	74
Apiarists est (2 174 sites registered)	:	177
		5 131
TOTAL		6 442

* Contractors are employed periodically for clearing, road building, pine logging and hardwood logging. The figure given here is an estimate of average employment over the report period.

** Includes employees of registered sawmills only, and excludes persons employed in associated yards in metropolitan and country areas.

++ Includes employees "working in wood" as defined under the Factories and Shops Act (1963).

HOUSING AND BUILDING

Major capital improvements on housing for staff were provided at Manjimup, Narrogin and Nannup. Offices at Wanneroo, Dwellingup and Collie were extended.

Minor improvements to staff housing were undertaken at Dwellingup and Nannup.

FOREST OFFENCES

Eleven breaches of the Forest Disease Regulations under the Forest Act were reported. In seven cases offenders were prosecuted and fines amounting to $760.00 were imposed.

There were fifteen cases of illegal removal of forest produce for which royalty amounting to $9 493.05 was recovered.

Also, seven other breaches of the Forest Acts and Regulations were reported. No prosecutions were made.

Warnings were issued to all offenders not prosecuted.

TIMBER INDUSTRY REGULATION ACT 1926-1969

A total of 131 mills was registered under the provisions of the Act at 31 December 1984: 58 mills on Crown land and 73 mills on private property.

The District and Workmen's Inspectors made 811 mill inspections and 651 bush inspections.

There were 96 notifiable accidents during the period. None of these were fatal. A notifiable accident under Section 14 of the Timber Industry Regulation Act is comparable with a Lost Time Accident as defined by the Australian standard.

The number of accidents per 100 persons employed was 5.26. This is equivalent to a frequency rate of approximately 38. (The frequency rate is calculated as the number of lost time accidents per 1 000 000 man hours worked.)

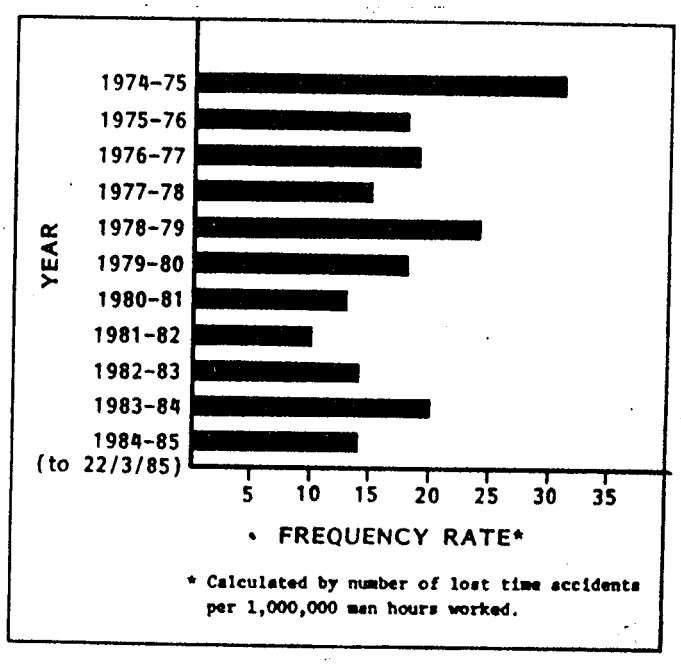
The cost of administering the Timber Industry Regulation Act for the year was as follows:

Salaries	$ 53 718
Travel allowances, plant costs and sundries	14 299
TOTAL	$ 68 017

OCCUPATIONAL HEALTH, SAFETY AND WELFARE

The Forest Department's safety program has been one of the most successful accident prevention efforts in Western Australia for nearly 19 years.

Between July 1984 and March 1985 twenty-one lost time injury accidents occurred with a corresponding frequency rate of 14. This is an improvement on last year's performance, and compares favourably with the record during the previous ten years:



A quarter of these 21 accidents happened during planting operations in winter 1984. Thirty-three per cent of injuries were strains and sprains.

Safety training was orientated towards prevention of accidents and included manual handling instruction, chainsaw operation, hearing conservation, shotfiring, the safe use of chemicals, and first aid.

The personnel of the Narrogin, Jarrahdale, Mundaring and Kirup divisions, together with Bunbury and Kimberley regional staff, achieved twelve months accident-free.

In 1966, when a sustained accident prevention program commenced, one in every six employees suffered a lost time accident each year. During the last year of Departmental operations only one in every 52 employees sustained such an accident.

As this is the last report on the Forests Department's safety program, it is fitting to record some of the highlights of the program over the last 19 years.

1966 Mr Jack Marshall appointed first full-time Safety Officer of the Department when the frequency rate was 114. A safety policy is adopted.

1977 On his retirement, the frequency rate had dropped to 19. Mr Marshall's work was recognised with the award of the Imperial Service Order to him.

1978 The Forests Department is awarded the prestigeous CML Safety Award for the State of Western Australia and subsequently for Australia.

1981 The Walpole Division achieves ten years without incurring a lost time accident. The then Premier, Sir Charles Court, goes to Walpole to present the award, supported by Hon. David Evans, acting leader of the Opposition at that time.

1982 The Forests Department peaks its accident performance by lowering the accident frequency rate for the year 1981/82 to 9.9.

1983 The Department's Safety Officer, Mr Arthur Kesners, is awarded the Premier's Safety Award.

Over the years the Forests Department's safety program has resulted in considerable savings in both human resources and finance. The Department of Conservation and Land Management will benefit from this experience.

11. Appendices

APPENDIX 1(a)

STATEMENT OF REVENUE PAID INTO CONSOLIDATED REVENUE FUND FOR THE PERIOD 1st JULY 1984 TO 21st MARCH 1985.

	1984-85 $
ROYALTIES	
Logs	7 022 615
Chip Logs	1 165 966
Sleepers	-
Poles and Piles	404 032
Mining Timber	20 080
Firewood	9 095
Posts	43 324
Sandalwood (Royalty only)	65 153
Miscellaneous	65 625
	8 795 890
PINE CONVERSION	
Pine Logs	2 581 775
Sawn Pine	45 488
	2 627 263
HARDWOOD CONVERSION	
Logs	598 088
	598 088
OTHER SALES AND FEES	
Seeds and Trees	190 779
Inspection Fees	78 199
Rents and Leases	82 703
Miscellaneous	1 269 095
	1 620 776
RECOUPABLE PROJECTS	
Miscellaneous	597 836
	597 836
COMMONWEALTH RECOUPS	
Aboriginal Advancement Programme	-
Special Employment Reflief Programme	-
Community Employment Programme	388 183
	388 183
	14 628 036

APPENDIX 1(b)

FORESTRY FUND FOR THE PERIOD 1st JULY 1984 TO 21st MARCH 1985

		1984-85
		$
EXPENDITURE		
Hardwood Forests - Establishment & Tending		1 584 063
Softwood Forests - Establishment & Tending		3 542 372
Access Road Construction		217 037
Land Purchase		1 120 247
Plant and Equipment		349 000
Housing and Buildings		490 625
Sawmilling and Seasoning Plant		-
Plant Workshop		- 186 962
Forest Protection		2 881 953
Access Roads Maintenance		544 289
Research & Other Services		2 022 779
Commercial Operations		2 222 792
Trade Operations		269 924
Recoupable Projects		1 331 463
Salaries	10 713 175	
Less Charged to Development	-1 015 900	9 697 275
Administration Expenses	7 039 518	
Less Charged to Development	- 679 900	6 359 618
Cash Order Balance		- 545 502
		31 900 973
SOURCE OF REVENUE		
Balance Brought Forward		1 037 003
Main Roads Department Grant		71 853
Mining Compensation		647 848
C.R.F. Contribution		25 330 093
General Loan Fund		-
Private Borrowings		12 250 000
Sundry Revenue		-
		39 336 797
Less Balance Carried Forward/Transferred to Conservation & Land Management Trust Fund		7 435 824
		31 900 973

APPENDIX 2(a)

EXPORTS FROM WESTERN AUSTRALIA OF TIMBER, TIMBER PRODUCTS AND ESSENTIAL OILS FOR THE YEAR ENDED 30 JUNE 1984

OVERSEAS

ITEM AND DESTINATION	Unit of Quantity	Quantity	Value $
1. Wood in the rough or roughly squared	m^3		
Christmas Island		–	–
Japan		200	28 877
Total		200	28 877
2. Sleepers	m^3		
Belgium-Luxembourg		13	4 654
Hong Kong		1 810	122 843
United Kingdom		8 811	2 464 647
United States of America		260	93 777
Total		10 894	2 685 912
3. Wood, planed, tongued, grooved, rebated, chamfered, V-jointed, centre V-jointed, headed, centre-headed or the like, but not further manufactured	m^3		
Conifer			
Christmas Island		61	14 550
Cook Islands		21	15 785
United Kingdom		16	5 826
Total		98	36 161
Non-conifer			
Christmas Island		2	889
United Kingdom		7	4 535
Total		9	5 424
4. Wood, sawn lengthwise, sliced or peeled, but not further prepared, of a thickness exceeding 5mm	m^3		
Conifer			
Christmas Island		90	7 375
Total		90	7 375

ITEM AND DESCRIPTION	Unit of Quantity	Quantity	Value $
Non-Conifer			
Jarrah	m^3		
Bahrain		4	2 090
Canada		3	1 348
Christmas Island		7	1 276
Cocos Islands		43	22 915
Germany, Federal Republic of		109	40 212
Jordan		1 048	352 038
New Zealand		19	10 485
South Africa, Republic of		59	29 475
United Kingdom		2 747	790 147
United States of America		166	81 775
Total		4 205	1 331 759
Karri	m^3		
Canada		67	35 771
Germany, Federal Republic of		151	50 830
Namibia		17	5 578
New Zealand		258	88 115
South Africa, Republic of		452	147 158
Tanzania		7	5 146
United Kingdom		2 609	741 182
United States of America		256	114 770
Total		3 817	1 188 550
Other	m^3		
Italy		5	600
Total		5	600
5. Wood, sawn lengthwise, sliced or peeled but not further prepared, of a thickness not exceeding 5mm; veneer sheets and sheets for plywood, of a thickness not exceeding 5mm		-	-
6. Plywood consisting solely of sheets of wood	m^2		
Christmas Island		692	3 428
Cocos Islands		991	12 918
Ships Stores		304	5 199
Total		1 9878	21 545
7. 'Improved' wood, in sheets, blocks or the like	-		
Christmas Island		-	1 802
Ships Stores		-	8 685
Total		-	10 487

ITEM AND DESCRIPTION	Unit of Quantity	Quantity	Value $
8. Wood-based panels, n.e.i.			
Blockboard, laminboard, battenboard and similar laminated wood products (including veneered panels and sheets)		-	-
Cellular wood panels, whether or not faced with base metal	m^2		
Christmas Island		3 037	9 609
Total		3 037	9 609
9. Wood, simply shaped, n.e.i.			
Hopwood, split poles; piles; pickets and stakes of wood, pointed but not sawn lengthwise; chipwood; drawn wood; wood shavings of a kind suitable for use in the manufacture of vinegar or for the clarification of liquids; wooden sticks, roughly trimmed but not turned, bent nor otherwise worked, suitable for the manufacture of walking sticks, umbrella handles, tool handles or the like	-		
Christmas Island		-	450
Total		-	450
Wooden beadings and mouldings (including moulded skirting and other moulded boards)	-		
Christmas Island		-	946
United Kingdom		-	2 400
Total		-	3 346
10. Wood manufactures, n.e.i.			
Casks, barrels, vats, tubs, buckets and other cooper's products and parts thereof, of wood (including staves)		-	-
Builders' carpentry and joinery (including prefabricated and sectional buildings and assembled parquet flooring panels)			
Prefabricated buildings and fittings forming part thereof	-		
Christmas Island		-	2 856
Total		-	2 856

ITEM AND DESCRIPTION	Unit of Quantity	Quantity	Value $
Doors	No.		
Christmas Island		50	3 073
Singapore, Republic of		20	303
Total		70	3 376
Other	-		
Christmas Island		-	9 415
Total		-	9 415
Manufactured of wood for domestic or decorative use (excluding furniture)	-		
Canada		-	2 548
Christmas Island		-	4 426
Japan		-	250
Singapore, Republic of		-	9 300
United Kingdom		-	1 057
United States of America		-	2 000
Total		-	19 581
Manufactured articles of wood, n.e.i.	-		
Christmas Island		-	3 650
Singapore, Republic of		-	1 887
South Africa, Republic of		-	31 250
Ships Stores		-	2 340
Total		-	39 127
11. Wood furniture, not elsewhere specified	-		
Bahrain		-	35 596
Christmas Island		-	14 549
Hong Kong		-	744
Japan		-	16 455
New Zealand		-	130 524
Papua New Guinea		-	18 307
Saudi Arabia		-	2 010
Singapore, Republic of		-	113 679
United Arab Emirates		-	4 000
United States of America		-	250
Ships Stores		-	1 787
Total		-	337 901
12. Matches, wood, in boxes (excluding Bengal matches)	thousands		
Christmas Island		8 740	3 578
Ships Stores		642	837
Total		9 382	4 415

ITEM AND DESCRIPTION	Unit of Quantity	Quantity	Value $
13. Essential oils (terpeneless or not), concretes and absolutes; resinoids	kg		
Christmas Island		357	2 187
Ships Stores		160	951
Total		517	3 138

INTERSTATE

DESCRIPTION OF ITEMS	QUANTITY m^3	VALUE $
Jarrah timber, sawn lengthwise, sliced or peeled, but not further prepared, of a thickness exceeding 5mm	N/A	N/A
Karri timber, sawn lengthwise, sliced or peeled, but not further prepared, of a thickness exceeding 5mm	N/A	N/A
Other non-conifer timber, sawn lengthwise, sliced or peeled, but not further prepared, of a thickness exceeding 5mm	N/A	N/A
Cork and wood, n.e.i.	7 864	9 448 501

n.e.i. - not elsewhere included

N/A = Please note that because of confidentiality restrictions, the above information is not available for Interstate exports for 1983/84.

APPENDIX 2(b)

IMPORTS INTO WESTERN AUSTRALIA OF TIMBER, TIMBER PRODUCTS, TANNING SUBSTANCES AND ESSENTIAL OILS FOR THE YEAR ENDED 30 JUNE 1984

OVERSEAS

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
1. Wood in the rough or roughly squared			
Sawlogs and veneer logs in the rough, whether or not stripped of their bark or merely roughed down			
- of non-coniferous species	m^3	-	-
Sawlogs and veneer logs, roughly squared or half squared, but not further manufactured - of non-coniferous species	m^3	-	-
Pitprops, poles, piling posts and other wood in the rough, n.e.s.			
- non-coniferous species	m^3		
Malaysia		3	1 084
Total		3	1 084
2. Wood of conferous species, sawn lengthwise, sliced or peeled, but not further prepared, of a thickness exceeding 5mm			
Douglas fir	m^3		
United States of America		559	144 661
Total		559	144 661
Radiata pine	m^3		
New Zealand		47	10 282
Total		47	10 282
Western red cedar	m^3		
Canada		33	12 845
Total		33	12 845
Other	m^3		
Canada		41	17 002
Netherlands		11	8 936
United States of America		197	111 304
Total		249	137 242

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
3. Wood of coniferous species (including blocks, strips and friezes for parquet or wood block flooring, not assembled), planed, tongued, grooved, rebated, chamfered, V-jointed, centre V-jointed, beaded, centre-beaded or the like, but not further manufactured			
Radiata pine	m^3		
Sweden		-	30
Total		-	30
Douglas fir	m^3		
United States of America		412	74 260
Total		412	74 260
Other	m^3		
Germany, Federal Republic of		-	655
United States of America		264	60 626
Total		264	61 281
4. Wood of non-coniferous species, sawn lengthwise, sliced or peeled, but not further prepared, of a thickness exceeding 5mm			
Cut to size for making staves; dunnage			
Meranti	m^3		
Malaysia		1 492	375 059
Total		1 492	375 059
Rammin	m^3		
Indonesia		153	51 798
Malaysia		1 012	292 084
Singapore, Republic of		281	92 450
Total		1 446	436 332
Teak	m^3		
Burma, Socialist Republic of the Union of		54	72 843
Singapore, Republic of		35	43 726
Total		89	116 569
Kapur	m^3		
Malaysia		1 502	322 061
Singapore, Republic of		13	3 034
Total		1 515	325 095

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
Keruing	m^3		
Malaysia		725	98 542
Total		725	98 542
Merbau	m^3		
Malaysia		16	5 983
Total		16	5 983
Nyatoh	m^3		
Malaysia		4 189	899 760
Singapore, Republic of		225	49 858
Total		4 414	949 618
Other	m^3		
India		2	551
Malaysia		1 595	288 974
Singapore, Republic of		42	11 151
United States of America		211	131 824
Australia - Re-imported		4	475
Total		1 854	432 975
5. Wood of non-coniferous species (including blocks, strips and friezes for parquet or wood block flooring, not assembled) planed, tongued, grooved, rebated, chamfered, V-jointed, centre V-jointed, beaded, centre-beaded or the like, but not further manufactured			
Meranti	m^3		
Malaysia		1 015	329 304
Singapore, Republic of		32	9 990
Total		1 047	339 294
Other	m^3		
Canada		25	17 618
China - Taiwan Province only		-	188
Equador		26	7 440
Germany, Federal Republic of		-	30
Italy		-	76
Malaysia		99	30 202
New Zealand		1	629
Singapore, Republic of		67	21 885
United States of America		-	618
Total		218	78 686

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
6. Veneers, plywood, 'improved' or reconstituted wood, and other wood, worked n.e.s.			
Wood sawn lengthwise, sliced or peeled but not further prepared, of a thickness not exceeding 5mm; veneer sheets and sheets for plywood of a thickness not exceeding 5mm			
Veneer			
Rotary, exceeding 1mm in thickness	m^2		
United Kingdom		5 946	6 337
Total		5 946	6 337
Sliced	m^2		
Italy		21 580	29 370
Japan		40	335
Malaysia		39 025	35 493
Singapore, Republic of		150 400	211 101
South Africa, Republic of		93 507	111 257
United Kingdom		10	33
Total		304 562	387 589
Other than veneer	m^2		
Total		-	-
Plywood consisting solely of sheets of wood, not exceeding 23mm in thickness			
Door skins not exceeding 4mm (including grooved and/or prefinished), interior glueline			
Rotary	m^2		
China - Taiwan Province only		327 650	198 390
Papua New Guinea		105 610	62 220
Singapore, Republic of		210 630	73 488
Total		643 890	334 098
Sliced	m^2		
China - Taiwan Province only		215 140	126 086
Indonesia		121 920	38 269
Singapore, Republic of		163 810	68 317
Total		500 870	232 672
Grooved, interior glueline	m^2		
China - Taiwan Province only		821 820	415 934
Singapore, Republic of		44 340	20 131
Total		5866 160	436 065

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
Other, interior glueline			
Sliced	m^2		
China - Taiwan Province only		133 520	63 036
Indonesia		30 280	6 823
Malaysia		21 550	6 030
Papua New Guinea		39 000	23 720
Singapore, Republic of		196 240	59 860
United States of America		1 243	965
Total		421 833	160 434
Other	m^2		
China - excl Taiwan Province		5 350	3 147
China - Taiwan Province only		628 545	300 683
Indonesia		143 850	43 792
Malaysia		38 010	11 479
Papua New Guinea		49 910	29 992
Singapore, Republic of		1 157 710	376 191
United States of America		19 480	7 150
Total		2 042 855	772 434
Exterior glueline	m^2		
Indonesia		22 000	6 069
New Zealand		247 000	127 045
Singapore, Republic of		262 647	82 032
United States of America		11 558	3 347
Total		543 205	218 493
Exceeding 23mm in thickness		-	-
7. Blockboard, laminboard, battenboard and similar laminated wood products (including veneered panels and sheets)	m^2		
China - Taiwan Province only		6 713	45 170
Finland		87	1 718
Singapore, Republic of		22	110
Total		6 822	46 998

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
8. Hopwood; split poles, piles, pickets and stakes of wood, painted but not sawn lengthwise; chipwood; sawn wood; wood shavings of a kind suitable for use in the manufacture of vinegar or for the clarification of liquids; wooden sticks, roughly trimmed but not turned, bent or otherwise worked, suitable for the manufacture of walking-sticks, umbrella handles, tool handles orthe like.	-		
New Zealand		-	2 434
United States of America		-	1 970
Total		-	4 404
9. Wooden beadings and mouldings	-		
Canada		-	2 846
China - Taiwan Province only		-	42 956
France		-	1 216
Japan		-	3 002
Malaysia		-	26 684
New Zealand		-	1 102
South Africa, Republic of		-	1 737
United Kingdom		-	17 791
United States of America		-	749
Total		-	98 083
10. Wood wool and wood flour	kg		
United Kingdom		340	33
Total		340	33
11. Wooden packing cases, boxes, crates, drums and similar packings, complete	-		
Belgium-Luxembourg		-	480
France		-	1 890
Germany, Federal Republic of		-	177
Total		-	2 547
12. Casks, barrels, vats, tubs, buckets and other cooper's products and parts thereof, of wood	-		
Canada		-	224
Finalnd		-	297
France		-	119 801
New Zealand		-	308
United Kingdom		-	956
Total		-	121 586

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
13. Doors, not incorporating locks, hinges or similar fittings	No.		
China - Taiwan Province only		1 453	65 697
Malaysia		1	10
Phillipines		3	6
Singapore, Republic of		10 111	71 609
Total		11 568	137 322
14. Assembled parguet flooring panels	No.	-	-
15. Builder's carpentry and joinery, not elsewhere included	-		
China - Taiwan Province only		-	26 391
Japan		-	3 418
Philippines		-	88
Singapore, Republic of		-	3 256
United States of America		-	6 893
Total		-	40 046
16. Wooden picture frames, photograph frames, mirror frames and the like	-		
China - excl Taiwan Province		-	178
China - Taiwan Province only		-	9 248
Denmark		-	52
Hong Kong		-	329
Indonesia		-	880
Italy		-	2 349
Japan		-	4 430
Malaysia		-	2 878
Philippines		-	1 440
Singapore, Republic of		-	2 459
Thailand		-	3 272
United Kingdom		-	10 009
United States of America		-	281
Total		-	37 805
17. Household utensils of wood	-		
China - excl Taiwan Province		-	25 644
China - Taiwan Province only		-	60 116
Denmark		-	3 750
Finland		-	137
France		-	166
Hong Kong		-	435
Indonesia		-	71
Ireland		-	30
Italy		-	2 071

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
Japan		-	51 058
Malaysia		-	43 245
New Zealand		-	165
Philippines		-	1 036
Portugal		-	1 344
Singapore, Republic of		-	4 734
Spain		-	6 465
Swaziland		-	82
Switzerland		-	19
Thailand		-	12 643
United Kingdom		-	584
Total		-	213 795
18. Wooden figures of the type ordinarily used as ornaments in the household	-		
Burma, Socialist Republic of the Union of		-	99
China - excl Taiwan Province		-	3 711
China - Taiwan Province only		-	3 261
Finland		-	159
Germany, Federal Republic of		-	98
Hong Kong		-	617
India		-	743
Indonesia		-	3 146
Ireland		-	27
Italy		-	622
Japan		-	471
Mauritius		-	1 433
Philippines		-	4 506
Singapore, Republic of		-	414
Swaziland		-	765
Sweden		-	553
Thailand		-	4 513
United States of America		-	117
Total		-	25 255
19. Boxes, cases, caskets and similar containers, cases and similar receptacles for violins and other musical instruments; pen or pencil cases, of wood	-		
Burma, Socialist Republic of the Union of		-	86
China - excl Taiwan Province		-	1 051
China - Taiwan Province only		-	73 653
Denmark		-	95
Germany, Federal Republic of		-	799
Hong Kong		-	550

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
India		-	565
Indonesia		-	131
Japan		-	4 255
New Zealand		-	18
Singapore, Republic of		-	154
Thailand		-	66
United Kingdom		-	650
United States of America		-	46
Total		-	82 119
20. Standard lamps, table lamps and other light fittings of wood	-		
China - Taiwan Province only		-	12 251
Finland		-	92
Germany, Federal Republic of		-	22 699
Hong Kong		-	577
Indonesia		-	138
Italy		-	2 131
Japan		-	75
New Zealand		-	26 251
Philippines		-	739
Sweden		-	47
Thailand		-	471
United Kingdom		-	270
United States of America		-	110
Total		-	65 851
21. Wooden trays, bowls	No.		
Burma, Socialist Republic of the Union of		32	160
China - excl Taiwan Province		105	410
China - Taiwan Province only		3 983	6 510
India		2 171	811
Indonesia		334	419
Ireland		1	3
Italy		123	972
Japan		18 625	86 486
Malaysia		6	98
Philippines		2 298	1 065
Portugal		32	94
Spain		60	645
Swaziland		4	37
Sweden		5 100	17 137
Thailand		1 880	4 746
United Kingdom		11	111
Total		34 765	119 704

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
22. Wooden tools	-		
China - Taiwan Province only		-	1 480
Indonesia		-	1
Japan		-	462
Singapore, Republic of		-	79
Spain		-	67
Sweden		-	62
United Kingdom		-	1 178
United States of America		-	337
Total		-	3 666
23. Wooden handles	No.		
China - Taiwan Province only		247 700	89 507
Germany, Federal Republic of		112	163
Indonesia		38 025	12 497
Malaysia		27 000	7 403
Singapore, Republic of		2 136	7 403
Sweden		50	987
Thailand		828	688
United Kingdom		66	44
United States of America		341	575
Total		316 258	111 954
24. Broom and brush bodies and boot and shoe lasts and trees of wood	-		
Philippines		-	7
Total		-	7
25. Spools, caps, bobbins, sewing thread reels and the like of turned wood	-		
New Zealand		-	20
Total		-	20
26. Match splints; wooden pegs or pins for footware		-	-
27. Spring rollers for blinds, including parts of wood	No.		
Canada		970	5 721
Japan		150	747
United Kingdom		7	14
Total		1 127	6 482

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
28. Articles of wood, not elsewhere included	-		
Austria		-	21
Belgium-Luxembourg		-	112
Burma, Socialist Republic of the Union of		-	309
Canada		-	20 056
China - excl Taiwan Province		-	8 600
China - Taiwan Province only		-	236 610
Denmark		-	221
Finland		-	344
France		-	144
Germany, Federal Republic of		-	2 127
Hong Kong		-	6 987
India		-	391
Indonesia		-	1 294
Ireland		-	83
Italy		-	6 220
Japan		-	31 595
Korea, Republic of		-	3 483
Malaysia		-	31 301
Mexico		-	167
Netherlands		-	61
New Zealand		-	9 099
Philippines		-	5 814
Singapore, Republic of		-	6 254
Spain		-	1 030
Swaziland		-	570
Sweden		-	327
Switzerland		-	1 157
Thailand		-	3 246
Turkey		-	310
United Kingdom		-	11 547
United States of America		-	175 787
Total		-	565 267
29. Wood or wooden-framed chairs and other seats with seats or backs of any material	No.		
Brazil		479	113 388
China - excl Taiwan Province		770	3 840
China - Taiwan Province only		7 832	210 658
Denmark		163	6 033
Germany, Federal Republic of		8	3 463
Hong Kong		38	3 235
Indonesia		408	16 349
Italy		6 784	445 663
Japan		30	1 365
Malaysia		4 333	61 060
Netherlands		330	25 645
New Zealand		1 086	17 649

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
Philippines		270	1 607
Singapore, Republic of		23 652	427 114
South Africa, Republic of		2 679	30 085
Sweden		454	52 393
Thailand		8	1 054
United Kingdom		812	42 249
United States of America		27	3 602
Yugoslavia		12	922
Total		50 175	1 467 374
30. Furniture of wood, not elsewhere specified			
Tables, domestic	No.		
Brazil		192	13 558
China - Taiwan Province only		17 637	322 079
Denmark		38	3 517
Hong Kong		43	4 397
India		73	1 532
Indonesia		80	4 855
Ireland		1	10
Italy		1 222	155 365
Japan		6	1 803
Korea, Republic of		36	739
Malaysia		366	9 600
Netherlands		86	2 529
New Zealand		102	4 917
Pakistan, Islamic Republic of		60	1 389
Philippines		66	610
Singapore, Republic of		5 515	274 692
South Africa, Republic of		505	23 261
Thailand		79	3 258
United Kingdom		596	40 864
United States of America		71	12 328
Yugoslavia		27	773
Total		26 801	882 076
Chests and boxes, carved	No.		
China - excl Taiwan Province		60	9 884
China - Taiwan Province only		179	10 929
Hong Kong		291	23 911
Indonesia		1	24
Italy		2	455
Netherlands		1	51
United Kingdom		16	2 182
Total		550	47 436

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
Wooden office furniture	No.		
China - Taiwan Province only		1	76
Hong Kong		3	1 131
Indonesia		1	247
Italy		55	2 223
Sweden		80	3 806
United States of America		12	616
Total		152	8 099
Other wooden furniture	No.		
Belgium-Luxembourg		348	14 730
Brazil		2	190
Burma, Socialist Republic of the Union of		1	314
Canada		3	42
China - Taiwan Province only		18 593	328 180
Denmark		3 571	58 980
France		1	53
Germany, Federal Republic of		69 988	89 796
Hong Kong		51	11 133
Indonesia		22	2 398
Ireland		6	22
Italy		1 350	330 631
Japan		48	2 981
Korea, Republic of		48	1 515
Malaysia		265	6 553
Netherlands		565	24 688
New Zealand		63	10 758
Singapore, Republic of		3 193	139 095
Sweden		1 088	26 438
Switzerland		6	4 022
Thailand		15	3 336
Turkey		6	84
United Kingdom		1 021	106 474
United States of America		286	24 638
Yugoslavia		618	31 597
Total		101 158	1 218 648
31. Miscellaneous manufactured articles of wood			
Matches	Gross Boxes		
China - Taiwan Province only		45	1 600
Japan		786	4 083
Singapore, Republic of		146	484
Total		977	6 167

ITEM AND ORIGIN	Unit of Quantity	Quantity	Value $
Wooden smoking pipes	No.		
United Kingdom		304	2 944
Total		304	2 944
32. Tanning extracts of vegetable origin			
Wattle bark extract	kg		
South Africa, Republic of		602 170	449 647
Total		602 170	449 647
Other	kg		
Belgium-Luxembourg		4 000	27 739
Italy		5 000	4 134
Total		9 000	31 873
33. Tannins, including water extracted fall-nut tannin, and their salts, ethers, esthers and other derivatives	kg		
Belgium-Luxembourg		8 760	60 373
Total		8 760	60 373
34. Synthetic organic tanning substances and inorganic tanning substances; tanning preparations, whether or not containing natural tanning materials; engymatic preparations for pre-tanning	kg		
Germany, Federal Republic of		54 540	36 538
New Zealand		19 560	18 302
United Kingdom		25 040	13 892
Total		99 140	68 732
35. Essential oils, concretes and absolutes			
France		-	5 426
India		-	188
Italy		-	205
Singapore, Republic of		-	53
Thailand		-	385
Total		-	6 257

DESCRIPTION OF ITEM	INTERSTATE QUANTITY	INTERSTATE VALUE $
Cork and Wood	14 444 m^3	5 030 959
Plywood consisting solely of Sheets of Wood (incl core)	-	591 461
Reconstituted and 'Improved' Wood (eg particle board, chipboard, etc.) in sheets, blocks or the like	1 194 018 m^2	4 448 182
Other Wood worked, n.e.i. (including wood-based panels, veneers, wood wool, wood flour, wooden beading and mouldings, etc)	-	1 771 534
Wooden doors, whether or not incorporating locks, hinges or similar fittings	-	904 049
Other Wood manufactured, n.e.i. (including tool handles, brush and broom handles and the like, assembled parquet, flooring panels, boxes, picture frames, travel goods, clothes pegs, match splints, etc, excluding furniture)	-	2 270 616

n.e.i. = not elsewhere included

APPENDIX 3

SUMMARY OF EXPORTS OF FOREST PRODUCE — SINCE 1968

Year	Timber		Wood Manufacture Value $	Essential Oils and Tanning Material* $
	m^3	Value $		
Brought forward	13 081 830	177 786 912	8 536 935	17 386 964
1968	84 569	4 947 595	3 016 850	280 806
1969	86 455	4 984 098	3 802 927	267 565
1970	96 275	5 661 547	3 906 699	317 553
1971	79 362	4 803 842	2 110 802	343 512
1972	101 191	6 439 732	2 369 541	348 762
1973	111 547	7 036 637	2 604 116	337 736
1974	98 200	7 366 709	3 769 461	433 627
1975	100 127	9 080 092	132 278	479 019
1976	94 136	9 823 037	993 199	214 918
1977	77 352	10 150 025	205 173	45 767
1978	58 833	8 809 324	4 625 089	41 422
1979	66 420	10 560 052	8 122 584	61 525
1980	71 955	12 265 737	591 670	255
1981	65 109	12 331 467	1 414 745	2 361
1982	48 448	9 599 222	1 671 328	Nil
1983	41 789	8 295 949	1 634 839	300
1984	19 318	5 284 658	N/A	3 138

* Tanning materials not recorded separately since 1967.

APPENDIX 4

SUMMARY OF IMPORTS OF FOREST PRODUCE — SINCE 1968

Year	Timber Woodware $	Tanning Materials $	Essential Oils $
Brought forward	63 937 163	1 344 397	4 600 226
1968	13 081 830	177 786 912	8 536 935
1969	8 731 114	109 905	206 309
1970	10 968 170	153 169	293 845
1971	6 761 806	103 857	175 331
1972	5 578 819	144 219	227 530
1973	8 326 939	225 463	366 786
1974	11 738 861	420 010	271 713
1975	14 053 751	465 884	641 859
1976	19 960 421	373 331	131 515
1977	24 857 792	603 819	39 143
1978	24 039 952	912 669	620
1979	18 200 508	614 628	48
1980	26 801 716	641 927	1 118
1981	28 691 997	512 128	126
1982	26 068 548	571 183	1 446
1983	23 738 070	341 138	1 138
1984	26 480 449	610 625	6 257

APPENDIX 5 (a)
SUMMARY OF LOG PRODUCTION - SINCE 1970

Year	Crown Land m^3	Private Property m^3	Total m^3
Brought forward	6 821 873	15 844 520	81 469 989 *
1970	1 121 396	175 686	1 297 082
1971	1 145 161	161 990	1 307 151
1972	1 096 236	106 993	1 203 229
1973	1 060 359	102 992	1 163 351
1974	1 084 463	91 884	1 176 347
1975	1 096 356	87 957	1 184 313
1976	1 194 667	111 761	1 306 428
1977	1 429 493	106 848	1 536 341
1978	1 445 465	119 706	1 565 171
1979	1 489 515	129 665	1 619 180
1980	1 582 018	165 076	1 747 094
1981	1 593 512	161 966	1 755 478
1982	1 392 227	127 825	1 520 052
1983	1 225 798	102 942	1 328 740
1984	1 333 037	134 922	1 467 959
1985	1 515 956	187 975	1 703 931

* Includes 18 783 746 m^3 estimated cut prior to 1917.

Note - as in previous years this total includes log material used for reconstituted wood and chipwood. The increase since 1976 is due to the use of karri and marri by W.A. Chip and Pulp Company.

5(b)
TREND IN PINE LOG OUTPUT IN RECENT YEARS
(Including Particleboard Logs)

	Crown Land m^3	Private Property m^3	Total m^3
1970	81 283	1 514	82 797
1971	86 246	1 594	87 840
1972	90 161	1 306	92 067
1973	100 419	1 015	101 434
1974	123 393	1 167	124 560
1975	129 086	63	129 149
1976	105 567	-	105 567
1977	120 859	335	121 194
1978	125 548	1 677	127 225
1979	176 944	6 127	183 071
1980	191 363	4 827	196 190
1981	201 552	2 988	204 540
1982	173 474	14 834	188 308
1983	176 618	5 468	182 086
1984	198 281	3 559	201 840
1985	225 945	18 042	243 787

5(c)

TRENDS IN THE PRODUCTION AND USE OF SAWN WESTERN AUSTRALIAN TIMBER

Year Ended 30 June	Sawn Production (m^3)				
	Hardwood	Softwood	Total	Export	Local Use
1970	425 295	16 893	442 188	96 275	345 914
1971	420 777	21 595	442 372	79 437	362 935
1972	379 006	21 733	400 739	101 191	299 548
1973	375 135	23 283	398 418	111 547	286 871
1974	374 899	26 534	410 433	98 200	303 233
1975	368 844	27 086	395 930	100 127	295 803
1976	383 010	16 258	399 268	94 136	305 132
1977	369 151	16 685	385 836	77 352	308 484
1978	347 111	18 669	365 780	58 833	306 947
1979	331 135	18 145	349 280	66 420	282 860
1980	331 411	21 400	352 811	71 955	280 856
1981	330 863	22 954	353 817	65 109	288 708
1982	320 915	22 190	343 105	48 448	294 657
1983	252 124	13 216	265 340	41 789	223 551
1984	258 861	14 723	273 333	N/A	N/A
1985	291 683	21 632	313 315	N/A	N/A

APPENDIX 6

FORESTS DEPARTMENT PUBLICATIONS PRODUCED TO 21 MARCH 1985

ANNUAL REPORT 1984

FOREST FOCUS 31 - A new perspective on Jarrah Dieback
King Jarrah
Beauty and Versatility
Original Names

BUSH TELEGRAPH - Bi monthly staff newsletter.

INDAT - Newsletter for the formation of the Department of Conservation and Land Management.

RESEARCH PUBLICATIONS:

TECHNICAL PAPER NO. 9 - Describing forest fires in Western Australia - a guide for fire managers by N.D. Burrows.

TECHNICAL PAPER NO. 10 - An Economic Study of Agroforestry in the Manjimup region, Western Australia by G. Malajczuk, D. Morrison, J. Havel, G. Anderson and R. Moore.

TECHNICAL PAPER NO. 11 - A survey of timber used in timber manufacturing, Western Australia (1983) by J. Glass and P. Shedley.

TECHNICAL PAPER NO. 12 - Predicting blow-up fires in the Jarrah Forest, by N.D. Burrows.

TECHNICAL PAPER NO. 13 - Forest and Woodland Fauna research in South-Western Australia, compiled by the Forest Fauna Research Working Group.

TECHNICAL PAPER NO. 14 - Growth and Potential of Coniferous species in the South-West of Western Australia. A report on the progress of three arboreta by R.R.A. Fremlin, J.W. Kruger and R.A. Hingston.

RESEARCH PAPER NO. 80 - Invertebrate studies in disturbed and pristine habits of Dryandra State Forest by J.D. Majer.

EXTERNAL JOURNAL ARTICLES (FORESTRY)

Ecological Features of an Outlying Stand of Jarrah (*Eucalyptus marginata*) at Jilakin Rock, Western Australia by I. Abbott. Journal of the Royal Society of Western Australia, 66, 107-110 (1984).

Emergence, Early Survival, and Growth of Seedlings of six tree species in Mediterranean Forest of Western Australia by I. Abbott. Forest Ecology and Management, 9, 51-66 (1984).

Growth Rate and Long-term Population Dynamics of Jarrah (*Eucalyptus marginata* Donn Ex. Sm.) Regeneration in Western Australian Forest by I. Abbott and O. Loneragan. Australian Journal of Botany, 32, 353-362 (1984).

Response of Jarrah (*Eucalyptus marginata*) Regrowth to Thinning by I. Abbott and O. Loneragan. Australian Forest Research, 13, 217-229 (1983) (Actual year of publication - 1984).

The Movement of Zinc Through Excized stems of Seedlings of *Pinus radiata*, D Don. by J.F. McGrath and A.D. Robson. Annals of Botany 54, 231-242, 1984.

Comparisons of Spatial Pattern, Structure and Tree Composition between Virgin and Cut-over Jarrah Forest in W.A. by Dr I. Abbott. Forest Ecology and Management, 9 (1984) 101-126.

The Influence of Zinc Supply to Seedlings of *Pinus radiata* D Don. on the Internal Transport of Recently Absorbed Zinc by J.F. McGrath and A.D. Robson. Aust. Journal of Plant Physiology, 1984, 11, 165-178.

Changes in the Abundance and Activity of Certain soil and Litter Fauna in the Jarrah Forest of Western Australia after a Moderate Intensity Fire by Dr I. Abbott. Aust. Journal of Soil Research, 1984, 22, 463-469.

Reproductive Ecology of *Banksia Grandis* (Proteaceae) by Dr I. Abbott. New Phytol. (1985) 99, 129-148.

LAND MANAGEMENT PLANS

1. The Shannon Forest and D'Entrecasteaux National Park - a Strategy for Management Planning.

2. Kemerton Area - a Conceptual Land Management Plan.

INTERNAL MANUALS

1. Safety in Forest Fire Control - The Blue Book.

2. Chemical Users Manual - Amendments.

3. Foresters Manual Part 2 - Amendments Part 16, 16.016-16.024.

DIRECTORIES & PRICE LISTS

1. Nursery Price Lists 1984-85
   Hamel, Narrogin, Wanneroo, Nannup and Broome.

PUBLICITY & ADVISORY MATERIAL

. Information sheet No. 47 - Managing Jarrah Forest for Wood Production.

. Education Forest Packs - for use in primary schools at levels K-2, 3-4, and 5-7.

- Fauna Series - The Quokkas in the Southern Forests.

- Tree Care Series - Pines for Farms (Manjimup)
  - Farm Wind Breaks.

- Recreation Guides - Camping in State Forests.

- Posters - Mangroves of the North West Coast
  - Karri Forest and Boranup
  - Gimlet near Trayning
  - Jarrah and Karri at Nannup
  - Boabs

SPECIAL REPORTS

- Farmers Attitudes towards a Pine Afforestation Scheme in the Southern Region of Western Australia - by the Centre for Applied Business Research.

- The Western Australian Timber Utilization and Marketing Task Force Report to Government.

APPENDIX 7

THE DEPARTMENT'S SAFETY RECORD OVER THE LAST 19 YEARS

Year	M H W	L T A	M T A	Total Accidents	Frequency Rate L T A	Frequency Rate M T A	L T A M T A	Man Days Lost	Duration Rate (days)
1966-67	-	185	-	-	100+	-	100+	2 896	-
1967-68	1 895 600	124	312	436	65	164	230	1 701	14
1968-69	2 019 568	96	155	251	48	76	124	1 738	18
1969-70	1 901 020	70	129	199	37	67	104	721	10
1970-71	1 808 406	48	158	206	27	76	110	458	9
1971-72	1 759 888	40	128	168	23	72	95	275	6
1972-73	1 728 577	45	112	157	26	64	90	414	9
1973-74	1 651 621	45	119	164	27	72	99	359	8
1974-75	1 748 219	55	127	182	31	72	104	634	11
1975-76	1 762 693	31	113	144	17.5	64	82	383	12
1976-77	1 707 635	32	157	189	19	92	111	620	19
1977-78	1 764 519	26	151	177	15	86	100	731	28
1978-79	1 835 917	44	143	187	24	76	100	810	18
1979-80	1 826 452	32	125	157	17.5	68	86	938	14
1980-81	1 897 463	24	135	159	13	71	84	490	15
1981-82	1 915 184	19	141	160	10	74	84	459	18
1982-83	1 931 192	27	134	161	14	69	83	849	22
1983-84	2 144 995	43	198	241	20	92	112	819	14
* 1984-85	2 093 453	30	189	219	14	90	104	**1 206	#26

M.H.W. - Man Hours Worked
L.T.A. - Lost Time Accidents
M.T.A. - Medical Treatment Accidents
* Period from 1st July 1984 to 30th June 1985 inclusive.
** Of 1206 days lost 430 were carried over from seven accidents sustained during the previous year.
# The Duration Rate for the 30 L.T.A. this year is 26 days. If the 430 days lost from the 7 carry over accidents are taken into account, the Duration Rate is 33 days.

APPENDIX 8

Common and Scientific Names of Plants and Animals mentioned in this report

PLANTS

Common Name	Scientific Name
Blackbutt	*Eucalyptus patens*
Brown Mallet	*Eucalyptus astringens*
Bull banksia	*Banksia grandis*
Bullich	*Eucalyptus megacarpa*
Cleland's blackbutt	*Eucalyptus clelandii*
Dundas mahogany	*Eucalyptus brockwayi*
Flooded gum	*Eucalyptus rudis*
Gimlet	*Eucalyptus salubris*
Goldfields blackbutt	*Eucalyptus le souefii*
Jarrah	*Eucalyptus marginata*
Jam	*Acacia acuminata*
Karri	*Eucalyptus diversicolor*
Mallet	*Eucalyptus astringens*
Marri	*Eucalyptus calophylla*
Millstream palm	*Livistona alfredii*
Pinaster pine	*Pinus pinaster*
Powderbark wandoo	*Eucalyptus accedens*
Radiata pine	*Pinus radiata*
Red Mahogany	*Eucalyptus resinifera*
River redgum	*Eucalyptus camaldulensis*
Salmon gum	*Eucalyptus salmonophloia*
Sandalwood	*Santalum spicatum*
Sheoak	*Casuarina fraserana*
Spotted gum	*Eucalyptus maculata*
Swamp mahogany	*Eucalyptus robusta*
Sydney blue gum	*Eucalyptus saligna*
Tasmanian blue gum	*Eucalyptus globulus*
Tingle, rate's	*Eucalyptus brevistylis*
yellow	*Eucalyptus guifoylei*
red	*Eucalyptus jacksonii*
Tuart	*Eucalyptus gomphocephala*
Walnut (tropical species)	*Juglans neotrapica*
Wandoo	*Eucalyptus wandoo*
Yellow stringy-bark	*Eucalyptus muellerana*

FUNGI

Common Name	Scientific Name
The cinnamon fungus	*Phytophthora cinnamomi* *Armillaria spp.*

INSECTS

Gum leaf skeletonizer	*Uraba lugens*
Leaf miner	*Perthida glyphopa*

ANIMALS

Mardo	*Antechinus flavipes*
Numbat	*Myrmecobius fasciatus*
Red-tailed wambenger	*Phascogale calura*
Woylie	*Bettongia penicillata*