

1939

WESTERN AUSTRALIA

REPORT

on the operations of

The Forests Department

for the

YEAR ENDED 30th JUNE, 1939

BY

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CONSERVATOR OF FORESTS.

PERTH:

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1939.

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LIST OF BOTANICAL NAMES OF LOCAL SPECIES REFERRED TO IN THIS REPORT.

Jarrah (*Eucalyptus marginata*).

Karri (*Eucalyptus diversicolor*).

Wandoo (*Eucalyptus redunca*, var. *elata*).

Tuart (*Eucalyptus gomphocephala*).

Marri (*Eucalyptus calophylla*).

Blackbutt (*Eucalyptus patens*).

Sandalwood (*Santalum spicatum*).

Sheoak (*Casuarina Fraseriana*).

Bullich (*Eucalyptus megacarpa*).

Banksia (*Banksia verticillata*).

Brown Mallet (*Eucalyptus astringens*).

Blackboy (*Xanthorrhoea Preissii*).

KEY TO DIVISIONS AND DISTRICTS.

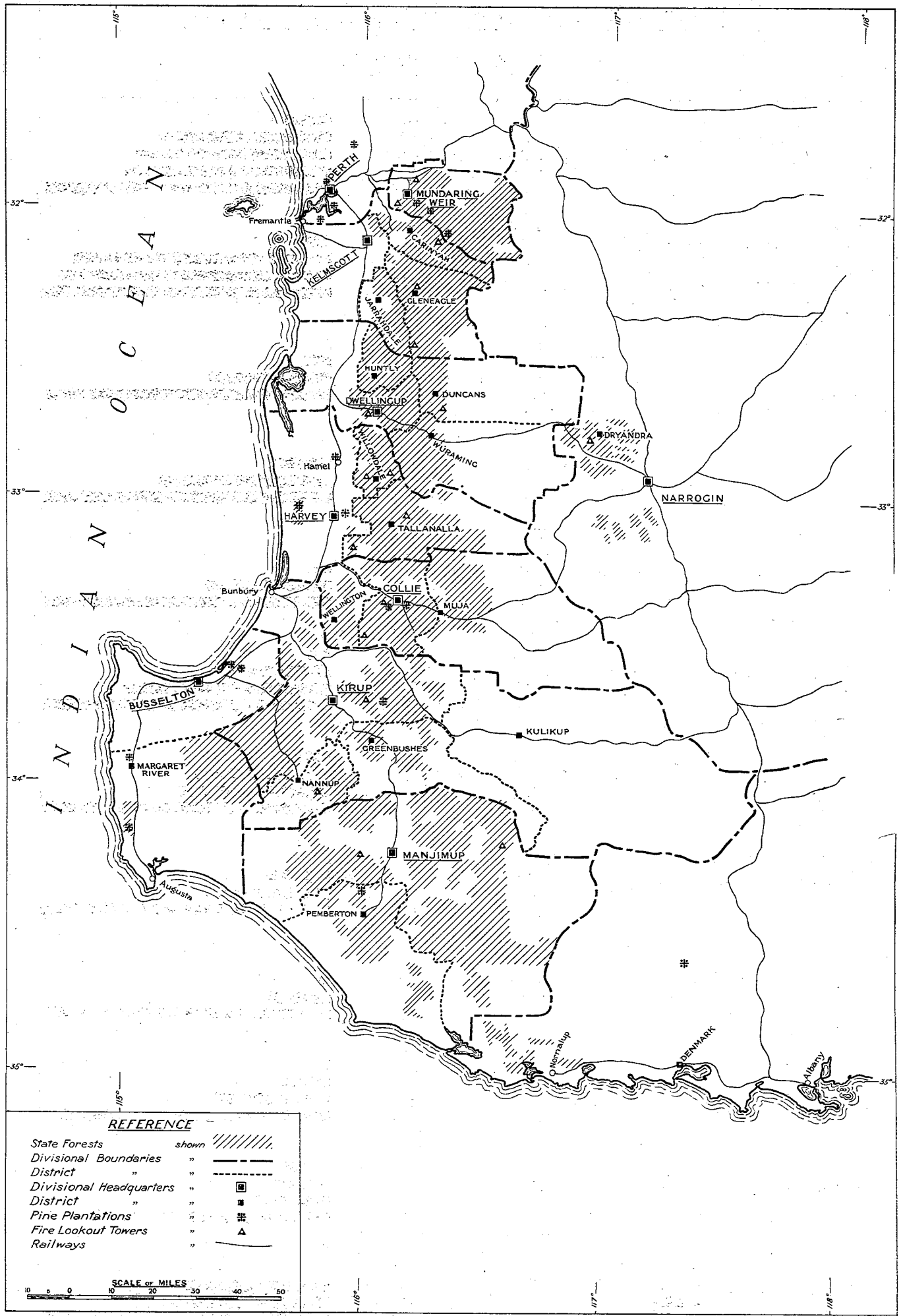
Division.	Headquarters.	Districts.
I.	Busselton	Busselton Margaret River
II.	Mundaring Weir	Mundaring Weir
III.	Dwellingup	Dwellingup Huntly Wuraming Duncan's
IV.	Collie	Collie Muja Wellington
V.	Kirup	Kirup Kulikup Greenbushes Nannup
VI.	Manjimup	Manjimup Pemberton
VII.	Narrogin	Narrogin Dryandra
VIII.	Kelmscott	Kelmscott Jarrahdale Gleneagle Carinyah
IX.	Perth	Metropolitan Denmark
X.	Harvey	Harvey Willowdale Tallanalla

(See map on next page.)

PROGRESS of OPERATIONS

1919 - 1939

Area classified and assessed	1919	1,388,000 ac.		
	1924	4,001,832 ac.		
	1929	4,781,682 ac.		
	1934	4,845,000 ac.		
	1939	6,846,000 ac.		
Area of Topographical and Subdivisional survey	1919	Nil.		
	1924	200,000 ac.		
	1929	1,501,450 ac.		
	1934	1,602,000 ac.		
	1939	1,704,960 ac.		
Area regenerated.	JARRAH.	1919	Nil.	
		1924	6,003 ac.	
		1929	45,278 ac.	
		1934	169,891 ac.	
		1939	408,855 ac.	
	KARRI.	1919	Nil.	
		1924	Nil.	
		1929	4,673 ac.	
		1934	12,479 ac.	
		1939	21,650 ac.	
Areas sown.	MALLET.	1919	Nil.	
		1924	Nil.	
		1929	760 ac.	
		1934	5,407 ac.	
		1939	11,873 ac.	
Area Planted	PINES	1919	400 ac.	
		1924	1,040 ac.	
		1929	4,000 ac.	
		1934	8,257 ac.	
		1939	11,705 ac.	
Under intensive control	1919	Nil.		
	1924	227,000 ac.		
	1929	817,000 ac.		
	1934	864,700 ac.		
	1939	1,863,000 ac.		
Forest Roads.	1919	Nil.		
	1924	21 miles		
	1929	603 miles		
	1934	1,225 miles		
	1939	2,651 miles		
Firelines	1919	Nil.		
	1924	Nil.		
	1929	490 miles.		
	1934	1,470 miles.		
	1939	6,330 miles.		
Telephone lines	1919	Nil.		
	1924	51 miles		
	1929	187 miles.		
	1934	441 miles.		
	1939	1,066 miles.		
Fire lookout Towers	1919	Nil.		
	1924	3.		
	1929	4.		
	1934	5.		
	1939	20.		
Houses for Field Staff	1919	2.		
	1924	8.		
	1929	36.		
	1934	123.		
	1939	175.		



Annual Report of the Operations of the Forests Department for the Year Ended 30th June, 1939.

INTRODUCTORY REMARKS.

The total production of timber in the State during the year ended 30th June, 1939, was 12,422,000 cubic feet, valued at £1,677,000. These figures are approximately 13% below corresponding figures for the previous year. The value of timber exported dropped from £932,420 to £722,310, due principally to fluctuations in sleeper orders from overseas countries.

The gross revenue showed a corresponding decrease, and amounted to only £145,724 for the year. A contributory factor was the continued restriction of sandalwood sales in China owing to widespread war conditions in that country.

Despite difficult trading conditions, the overseas demand for classes of timber other than railway sleepers was well maintained, and sawn Jarrah and Karri timber to the value of £474,070 was sent out of the State. Following the outbreak of war in Europe, it is difficult to forecast the immediate effect on the timber industry, but it is evident that certain markets will be closed. If production and employment are to be maintained, it will require close co-operation by all interests to meet changing trade conditions and to take advantage of openings created by possible shortage of supplies in markets which have not been available to Western Australian hardwoods in the past. Looking further ahead, it would appear that post-war developments will create new and extended markets for our timbers, and with this position in view it is very desirable that the reorganization and transfer of certain sawmilling units now pending should proceed without interruption.

Attention is drawn to the graphical summary printed on the opposite page illustrating the progress made in a number of important features of the Department's activities since its inception following the passing of the Forests Act, 1918. In the ensuing twenty years the commercial timber lands of the State have been permanently dedicated and brought under protection and management which has resulted in their conversion from a rapidly depreciating asset to tended forests capable of supporting a regulated timber industry in perpetuity.

This is a record of which the Forest Service is justifiably proud. At the same time, it is realized that much remains to be done to consolidate the work of this period of rapid development during which cut-over areas have been re-stocked by natural and artificial means, plantations have been established to provide essential timber requirements which cannot be met from indigenous forests, a fire control organization has been developed to protect regenerated and virgin forests, and an extensive programme of research and investigational work has been initiated to develop new and improved methods of handling our forests and timbers.

During the past year the first periodic revision of the General Working Plan for the Jarrah forests of the State was prepared and received the approval of the Lieutenant-Governor in Executive Council. The original Working Plan was drawn up and approved in 1929. Its main object was to regulate the Jarrah sawmilling industry on a basis of sustained annual yield, and it provided, *inter alia*, that, within the first ten-year period, the total intake of Jarrah sawmills operating on State Forests should be reduced to an intake capacity of 23,000,000 cubic feet per annum, and that the progress of reforestation work should keep pace at least with logging operations. With the co-operation of the sawmilling industry, the first essential provision has been carried into effect and, as a result of generous grants from Commonwealth and State Governments from Unemployment Relief Funds, the requirements of the Plan with regard to areas to be regenerated have been greatly exceeded. Owing, however, to a serious deficiency in middle-age classes in the growing stock of the forest, no increase in permissible cut is proposed for the current period of the Plan, and it is expected that, before the next revision is due, much more detailed information will be available concerning growing stock, on various site qualities and rates of growth to be anticipated on each site which will enable a more accurate determination of yield to be made.

Consequent upon the imminent exhaustion of supplies of mature log timber on permit areas being worked by several old-established sawmills, it has been necessary to advertise sawmilling rights over three areas of virgin forest in the Manjimup district, and the companies who have secured the new permit areas are proceeding with plans for the early erection of new plants. To provide essential access for tramlines to the new mill sites, it will be necessary to resume strips of land through a number of privately-owned locations, and Parliamentary approval to these resummptions will be sought, as provided under Section 22 of the Forests Act, 1918.

Major operations carried out during the year were as follows :—

Area of Jarrah forest regenerated	....	....	26,166 acres.
Area of Karri forest regenerated	....	....	1,575 "
Area of Mallet sown	....	....	705 "
Area of Pines planted	....	....	460 "
New roads established	....	....	393 miles.
Length of forest roads maintained	....	....	2,258 "

New firelines established	550 miles
Length of firelines maintained	5,780 "
Telephone lines constructed	199 "
Area under intensive fire control	1,863,000 acres.
Top disposal carried out	38,957 "
Fire towers manned throughout the summer	20

The fire season extended from December to the middle of April and was characterised by a number of long dry spells. Peak conditions occurred late in the summer and this resulted in settlers' fires lit after the end of the prohibited burning period assuming serious proportions in a number of districts, demonstrating again the serious dangers associated with the lighting of clearing and scrub fires on set dates fixed months in advance by *Gazette* notice without due regard to conditions of high hazard which may occur in March and early April. There is urgent need for better organisation and control of burning operations on private property in all road board districts in the South-West. The Department was fortunate that the vigilance and strenuous efforts of its employees were successful in preventing these private property fires from encroaching on to State Forest, and the total area of regenerated and planted forest damaged by fire during the past summer amounted to only 896 acres in all, which was 0.13% of the area under "complete protection."

Research work dealing with numerous problems of reforestation, afforestation and utilisation was continued. Progress results have been published in papers contributed by members of the staff to technical journals and, during the year, two bulletins were printed. These were "Pine Nutrition," being an account of investigations and experiments in connection with the growth of exotic conifers in Western Australian plantations, and "Grading Rules for Jarrah and Karri," with notes on allowable working stresses for these timbers. The latter bulletin was published in conjunction with the Standards Association of Australia, who have adopted the grading rules prepared by the Utilisation Branch of the Department as Australian Standards.

CHAPTER I.

THE FOREST AREA.

(1) State Forests (*Forests Act, 1918*).

During the year one new State Forest, comprising 171,750 acres in the vicinity of Lake Muir was dedicated, and a number of minor additions and adjustments to existing State Forests increased the area by 925 acres. With the approval of Parliament, 2,419 acres were excised from State Forests and reverted to the Lands Department for settlement. The net increase during the year to the area dedicated for the protection of timber was 170,258 acres.

	June, 1938.	June, 1939.	Increase or Decrease.
	acres.	acres.	acres.
Jarrah	2,577,379	2,710,562	+ 133,183
Karri	151,782	151,763	- 19
Jarrah and Karri (Mixed)	370,071	407,577	+ 37,506
Tuart	5,939	5,939	...
Tingle Tingle	10,774	10,774	...
Karri and Tingle (Mixed)	13,895	13,895	...
Sandalwood	1,930	1,930	...
Pine Planting	6,592	6,592	...
Mallet	58,637	58,225	- 412
Total	3,196,999	3,367,257	+ 170,258

(2) Timber Reserves (*Forests Act, 1918*).

Two additional reserves comprising 1,780 acres were declared during the year, and an area of 145 acres was excised from a reserve at Reedy. The present position of Reserves is shown in the following table:—

	June, 1938.	June, 1939.	Increase or Decrease.
	acres.	acres.	acres.
Jarrah	37,816	39,596	+ 1,780
Wandoo	9,669	9,669	...
Sandalwood	27,105	27,105	...
Pine Planting	25,951	25,951	...
Mallet	677	677	...
Mining Timber, Firewood, etc.	1,670,687	1,670,542	- 145
Total	1,771,905	1,773,540	+ 1,635

CHAPTER II.

REVENUE.

The gross revenue of the Department for the financial year ended 30th June, 1939, amounted to £145,724, as compared with £176,201 for the previous year.

A large proportion of the fall in revenue was due to decreased sales of sandalwood. Owing to unsettled conditions in China, revenue from this source amounted to £1,812 only as compared with £24,051 for the previous year.

The rebate of 16 per cent. on royalties payable on log timber was continued until 31st December, 1938, and was then reduced to 12 per cent.

The rebate of 25 per cent. on inspection fees on all sawn timber including sleepers, and on hewn sleepers for export was continued.

The amounts so rebated were as follows :—

		£
On Log Timber		14,819
On Inspection Fees		2,216
Total		£17,035

Log royalty for the year amounted to £106,436, a reduction of £3,566 on the previous year's figures.

PRINCIPAL SOURCES OF REVENUE FOR PAST TWO YEARS.

Year.	Royalties.		Inspection Fees.	Sandalwood.	Firewood, Piles and Poles, etc.	Miscellaneous.	Goldfields Revenue.	Total.
	Logs for Sawmilling.	Hewn Timber.						
1937-38	£ 110,002	£ 8,480	£ 8,116	£ 24,051	£ 4,974	£ 8,648	£ 11,930	£ 176,201
1938-39	106,436	5,391	5,962	1,812	5,393	8,887	11,843	145,724

TIMBER PRODUCTION.

PRODUCTION OF TIMBER FOR YEAR ENDED 30TH JUNE, 1939 (EXCLUSIVE OF MINING TIMBER, FIREWOOD AND PILES AND POLES).

Forest Division No.		MILL LOGS.					HEWN TIMBER.				Grand Total.	
		Jarrah.	Karri.	Other.	Total.		Jarrah.	Other.	Total.		In Log.	In Square.
					In log.	Recovery of Sawn Timber.			In Square.	In Square.			In Log.	In Square.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		
1	Crown Lands	cub. ft. 795,749	cub. ft. 1,729	cub. ft. 4,737	cub. ft. 802,215	cub. ft. 280,637	cub. ft. 100,434	cub. ft. 502,170	cub. ft. 100,434	cub. ft. 1,304,385	cub. ft. 381,071	
	Private Property	147,560	26,899	133	174,592	58,955	40,431	202,155	40,431	376,747	99,386	
2	Crown Lands	52,855	.....	24,057	76,912	26,919	1,744	11,790	2,358	88,702	29,277
	Private Property	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	Crown Lands	5,007,290	.....	64,108	5,071,398	1,774,989	41,043	207,060	41,412	5,278,458	1,816,401
	Private Property	792,528	.....	203,334	996,362	348,727	107,572	561,570	112,314	1,557,932	461,041
4	Crown Lands	3,165,162	.....	160,898	3,326,060	1,164,121	37,609	198,195	39,639	3,524,255	1,203,760
	Private Property	728,034	.....	171,462	899,496	314,324	51,795	314,480	62,896	1,213,976	377,720
5	Crown Lands	3,524,842	391,031	9,661	3,925,534	1,342,655	109,107	547,965	109,593	4,473,499	1,452,248	
	Private Property	527,083	.....	37,522	564,605	197,612	432,432	15,959	2,241,955	2,306,560	646,003
6	Crown Lands	2,465,187	5,178,666	640	7,644,493	2,261,279	60,759	303,795	60,759	7,948,288	2,322,038	
	Private Property	143,591	59,568	213	203,372	66,415	308,686	262	1,544,740	308,948	1,748,112	
7	Crown Lands	.....	.....	33,628	33,628	11,770	18	45,375	9,075	79,003	20,845
	Private Property	.....	.....	57,646	57,646	20,176	8,653	84,210	16,842	141,856	37,018
8	Crown Lands	1,914,136	.....	28,942	1,943,078	680,077	156	780	156	1,943,858	680,233
	Private Property	79,053	.....	294	79,352	27,773	1,769	8,845	1,769	88,197	29,542
9	Crown Lands	117,592	78	28,476	146,146	51,145	55,941	357,290	71,458	508,436	122,603	
	Private Property	1,456,615	47,932	204,130	1,708,677	594,202	153,201	1,019,600	203,920	2,728,277	798,122	
10	Crown Lands	3,987,722	.....	116,039	4,103,761	1,436,316	.....	.....	.....	4,103,761	1,436,316
	Private Property	308,597	.....	10,375	318,972	111,640	21,076	105,380	21,076	424,352	132,716
Totals	Crown Lands	21,030,535	5,571,504	471,186	27,073,225	9,029,908	406,811	28,073	2,174,420	434,884	29,247,645	
	Private Property	4,133,086	134,399	685,609	5,003,074	1,740,324	1,130,615	85,972	6,082,935	1,216,587	9,464,792	
Grand Totals	.....	25,213,601	5,705,903	*1,156,795	32,076,299	10,770,232	1,537,426	†114,045	8,257,355	1,651,471	40,333,654
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,956,911

Figures in columns (1), (2), (3), (4), (8) and (10) are in the round based on full volume measure. Figures in columns (5), (6), (7), (9) and (11) are the volumes of sawn or hewn timber measured in the square.

* Comprises 669,729 cubic feet Wandoo; 192,315 cubic feet Shoak; 123,118 cubic feet Blackbutt; 107,297 cubic feet Tuart; 54,475 cubic feet Pine; 3,200 cubic feet Marri; 340 cubic feet River Banksia; 561 cubic feet Ted Bingle Tingle; 260 cubic feet Bullich.

† Comprises 113,972 cubic feet Wandoo; 73 cubic feet Blackbutt.

SAWMILLING AND HEWING.

The total production of sawn and hewn timber for the past year was 12,422,000 cubic feet, valued at £1,677,000, and was 1,872,000 cubic feet, or 13%, below the production for the previous year. This reduction in output is due principally to a shortage of overseas orders for railway sleepers. An examination of the figures for the past two years shows that the sleeper production last year dropped by 29%. Every assistance has been rendered by the Government to secure orders, and in June last arrangements were made for the Conservator of Forests to visit Ceylon with a view to assisting the local timber firms in their efforts to secure the order for sleepers then under consideration by the Ceylon Government. On this occasion Western Australia was successful in securing an order for 150,000 9ft. x 10in. x 5in. sleepers for delivery in November and December of this year.

Sixty-seven sawmills were operating during the year on Crown lands and a similar number, mostly sleeper and case mills, were working on private property. The total log intake of these mills amounted to 32,076,000 cubic feet, from which 10,770,000 cubic feet of sawn timber were produced. Sawn railway sleepers accounted for 15% of the sawn timber.

The first periodic revision of the Working Plan relating to the jarrah forests of the South-West Division of the State, first approved by the Governor-in-Council in March, 1929, was carried out during the year and received the approval of the Governor-in-Council on 9th March, 1939. Pending the results of a general stocktaking of the jarrah forests and growth studies now in progress this revision was confined to Section 9 prescribing the permissible cut on the various sawmilling areas for the ensuing period of the Plan. Provision has been made for the permissible annual cut of jarrah logs for sawmilling purposes to remain at 23,000,000 cubic feet, measured in the round.

During the last four or five years there has been a marked increase in the use of Wandoo, which continues to gain in favour as a sleeper and bridge timber. Sheoak logs, which are used principally in the production of barrel staves are also being milled in increasing quantities. Since 1934, when the log intake of Sheoak was 24,908 cubic feet, there has been a steady increase annually, and for last year the quantity of logs totalled 192,315 cubic feet. Similar improvement has been shown in the quantities of Blackbutt and Tuart timbers used.

Royalty received by the Department on mill logs obtained from Crown lands averaged 3s. 11d. per load of 50 cubic feet.

Throughout the year an average of 3,200 men were employed in the sawmills of the South-West.

The quantity of hewn timber produced fell from 2,573,500 cubic feet in 1937-38 to 1,651,500 cubic feet in 1938-39, and of the latter quantity 74% was obtained from private property.

The average royalty received by the Department on hewn timber from Crown lands was 12s. 5d. per load of 50 cubic feet, measured in the square.

Five hundred and fifty men were employed in the hewing industry during the year.

The respective quantities of sawn and hewn timber, measured in the square, produced from Crown lands and private property for the past two years, are given in the following statement.

Year.	From Crown Lands.			From Private Property.			Estimated Value of Timber obtained.
	Sawn Timber other than Sleepers.	Sawn Sleepers.	Hewn Timber.	Sawn Timber other than Sleepers.	Sawn Sleepers.	Hewn Timber.	
1937-38 ...	cub. ft. 8,590,815	cub. ft. 1,046,327	cub. ft. 600,633	cub. ft. 1,088,493	cub. ft. 995,017	cub. ft. 1,972,907	£ 1,900,000
1938-39 ...	7,937,242 <i>sc</i>	1,092,666	434,884	1,202,958	537,366	1,216,587	1,677,000

TIMBER EXPORTS.

The volume of timber exported amounted to 5,704,250 cubic feet, valued at £722,310, including 2,051,735 cubic feet of railway sleepers, valued at £246,300. During the previous year the value of the export trade in timber was £932,420, and included sleepers to the value of £460,293. Although during recent years there has been a steady increase in the export of timber other than sleepers, the State is still dependent to a very large extent on the overseas sleeper trade for maintaining regular employment throughout the industry. The falling off in the export of sleepers last year accounted for 96% of the reduced output of sawn and hewn timber.

As a result of war conditions in China, no timber was purchased by the Chinese Government during the past year. For some years prior to 1938-39 this market had shown steady improvement, and during the previous 4 years has purchased timber from this State of an average annual value of £76,000.

The timber exported last year represented 46% of the total production. The figures quoted above do not take into account the timber used in the fruit export trade, the cases for which, during last season, were valued at £60,000. The value of other wood manufactures exported was £43,518.

The principal markets during the past three years, and the value of the timber exported to each, are set out hereunder :—

	Year ended	Year ended	Year ended
	30th June, 1937.	30th June, 1938.	30th June, 1939.
	£	£	£
Eastern States of Commonwealth	222,602	210,502	215,690
United Kingdom	147,878	176,774	125,981
South African Union	89,350	124,058	116,354
New Zealand	24,192	26,850	101,990
Ceylon	35,272	43,392	58,482
Egypt	25,672	83,761	49,151
Belgium	7,117	24,228	19,347
Mauritius	7,535	16,063	10,736
Iraq	27,791	141,034	3,436
China	95,236	71,878	...

Further details of timber exports are contained in Appendix 2a.

TIMBER IMPORTS.

The import trade in timber showed a slight decrease. The total value of timber (including wood manufactures) imported was £254,315, or approximately 6% less than the previous year. Wood manufactures accounted for £159,272, of which 33% was for plywood and veneers, and 23% for furniture. Of the total wood manufactures 87% has been declared as being of Eastern States origin.

Dressed and undressed timber amounted to £95,043, the principal countries of origin being Eastern States of Australia (£43,723), Canada (£27,751), United States of America (£11,554), and Sweden (£7,224).

A detailed statement of imports is given in Appendix 2b.

TIMBER INSPECTION

The quantity of sawn and hewn timber inspected by officers of the Department during the year totalled 3,749,000 cubic feet, representing a decrease of 24 per cent. on the previous year's figures. This decrease is due to a large extent to the lack of overseas sleeper orders. Of the timber submitted for inspection, 3,198,000 cubic feet, were railway sleepers. In addition to sawn and hewn timber 1,291 poles and piles, containing 35,914 lineal feet, required for Government works within the State were also inspected.

The revenue received from timber inspection amounted to £5,962.

SANDALWOOD.

The sandalwood trade has been seriously affected by the war conditions in China. The present outlook for the industry, which a few months ago gave slight indications of improvement, is now anything but hopeful. Although every effort has been made to effect sales, during the past twelve months only 800 tons of Western Australian sandalwood were delivered from the "go-downs" in China.

As a result of the temporary improvement early in the year, orders were placed on the Goldfields in March last for 564 tons of wood from Crown lands, and fourteen licenses for the pulling of 50 tons of sandalwood from 28 private property locations were also issued. Most of this wood has now been delivered at Fremantle, but unfortunately conditions in China do not justify the placing of further orders at the present time.

The quantity of sandalwood exported for the year was 1,106 tons, valued at £34,571.

The following statement shows the quantity of sandalwood obtained from all sources during the year :—

Locality.	For Oil Distillation within the State.	For Export.
	tons.	tons.
From Crown Lands South of the 26th parallel of South Latitude	51	279
From Crown Lands North of the 26th parallel of South Latitude	1	...
From Private Property	...	16
Total	52	295

Sandalwood for Oil Distillation.

Local distillers continued to purchase all roots and butts sawn from export logs, but as they were holding fairly large stocks of oil only a very small quantity was distilled.

The quantity of oil exported amounted to 16,346 lbs. or 35 per cent. less than the quantity exported for the previous year.

OTHER FOREST PRODUCE.

Firewood and Mining Timber.

The control of timber cutting for firewood and mining timber throughout the Goldfields is now on a satisfactory basis. All cutting is carried out under permits or licenses issued over defined areas, and royalty is paid on the quantity of timber obtained. During the year ended 30th June, 1939, 510,600 tons of firewood and 20,600 tons of mining timber were consumed on the Goldfields and 12,100 tons of mining timber in the Coal Mines at Collie.

The classification of vegetation types with a view to locating belts of timber, suitable for mining timber, firewood or charcoal has been continued and plans have now been prepared covering areas in the vicinity of most of the principal gold mining centres. Areas of country timbered mainly with overmature blackbutt and salmon gum trees have been selected in close proximity to Kalgoorlie on which ring-barking is being carried out to provide dry firewood for domestic requirements. Under these operations a suitable number of seed trees is left and areas of sparsely timbered country avoided.

Sixty-six thousand tons of firewood for the Metropolitan area, apart from sawn blocks obtained from mill waste, were obtained from Crown lands. The bulk of this wood is cut from areas South of Armadale along the Albany and Bunbury Roads, where the Department has developed roads providing for the systematic expansion of the industry which apart from giving employment to a large number of men particularly during winter months is doing good work in cleaning up the forest floor.

The revenue received by the Department from mining timber and firewood during the year amounted to £14,760.

Piles and Poles.

The difficulty now being experienced in obtaining long length piles and poles on private property has resulted in increased cutting on Crown lands. Piles and Poles obtained from this source during the year numbered 8,429 and totalled 154,995 lineal feet. A quantity of 162,356 lineal feet was reported to the Department as having been obtained from private property, but these figures are incomplete as returns are not received for all private property cutting.

Tanning Barks and Extracts.

Thirty thousand tons of Wandoo timber, most of which comes from private property were used in the manufacture of a tanning extract at factories established at Belmont and Boddington.

Mallet bark stripped during the year on Crown lands and private property amounted to 2,184 tons. Of this quantity 1,856 tons, valued at £17,842, were exported, principally to the Eastern States of Australia.

Particulars are given in the following statement of minor forest produce obtained during the year:—

FOREST PRODUCE NOT ELSEWHERE INCLUDED IN PRODUCTION TABLES; OBTAINED DURING
YEAR ENDED 30TH JUNE, 1939, AND REPORTED TO THE DEPARTMENT.

Description of Forest Produce.	SOUTH-WEST DIVISION AND AGRICULTURAL AREAS.										Northern, Central and Eastern Goldfields.	Total.
	Forest Division No.											
	1	2	3	4	5	6	7	8	9	10		
Mining Timber* .....	.....	.....	.....	12,088	9	.....	.....	.....	69	.....	20,600	32,766 tons
Sleepers for Goldfields Wood Lines .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	26,425	26,425 cub. ft.
Firewood, including Charcoal Mining Firewood, including Charcoal	548	15,908	.....	43	166	123	.....	60,613	6,063	1,557	73,782	158,803 tons
Piles and Poles*	6,412	7,271	52,467	12,040	81,432	8,823	26,698	37,684	41,728	42,796	436,850	438,005 "
Fencing Posts and Rails	1,781	1,060	3,050	173	5,064	300	.....	6,053	2,845	300	.....	20,626 No.
Blackboy .....	.....	.....	.....	.....	.....	.....	.....	.....	286	.....	.....	286 tons
Mallet Bark* .....	.....	.....	.....	.....	.....	.....	2,184	.....	.....	.....	.....	2,184 "
Wattle Bark † .....	.....	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	3 "
Kingia Fibre .....	.....	.....	.....	.....	.....	.....	.....	4	.....	.....	.....	4 "
Stone .....	.....	36	.....	.....	.....	.....	.....	5,981	.....	.....	.....	6,017 cub. yds.
Boronia Megastigma* .....	.....	.....	.....	.....	.....	.....	.....	.....	1,876	.....	.....	1,876 lbs.
Wandoo Timber for Tanning Extract* .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29,988 tons

* From Crown lands and private property.

† From private property.

NOTE.—Except where otherwise stated, this statement includes only forest produce obtained from Crown lands under permit or license.

FOREST OFFENCES.

During the year forest officers reported to the Department 82 offences against the Forests and Bush Fires Acts. In 18 cases proceedings were taken against the offenders, resulting in 17 convictions being recorded and fines, costs and damages amounting to £103 being imposed. One case was dismissed by the Magistrate without costs against the Department. Of the 18 prosecutions, four were taken under the Bush Fires Act for illegally lighting fires during the prohibited period.

Warnings were issued in a number of cases, and others were dealt with by the collection of royalty, damages or the confiscation, and sale of the forest produce illegally obtained. The amount collected by the Department in this way was £36.

CHAPTER III.

(1)—EXPENDITURE.

The Consolidated Revenue Fund expenditure on general administration, which includes both office and field work arising out of the enforcement of the Forests Act and Regulations, and such direct revenue producing activities of the Department as timber inspection, amounted to £28,474, as compared with £27,105 for the previous year.

An amount of £56,256 was also expended during the year on the provision of "A" class relief works carried out as unemployment relief measures, and of this amount £12,000 was received from the Federal Aid Roads Grant.

In addition to this an amount of £29,852 was made available for the employment in the forests for "C" class men whose disabilities prevented them from engaging in heavy manual labour.

The provision of these amounts enabled the Department to maintain an average number of 400 wages men, inclusive of relief workers, in employment throughout the year.

Three-fifths of the net revenue of the Department, exclusive of revenue derived from Sandalwood, amounted to £46,964 for the year, and this amount was credited to the Reforestation Fund in accordance with the provisions of Section 41 of the Forests Act, 1918.

The following tables set out the position of the Reforestation Fund as at 30th June, 1939:—

	£	s.	d.	£	s.	d.	£	s.	d.
Revenue for Year 1938-39	145,723	18	0
Less Sandalwood	1,812	14	9
							143,911	3	3
Consolidated Revenue Fund Expenditure	28,474	0	1			
Less Sandalwood Expenditure	1,617	4	4			
„ Timber Industry Regulations—Salaries	691	8	4			
„ Timber Industry Regulations—Incidentals	391	14	3			
				2,700	6	11			
				25,773	13	2			
Adjustment previous Year's Expenditure				28	11	3
Interest on Loans	36,612	15	2			
Sinking Fund	1,830	12	9			
Special Acts	1,270	0	0			
Audit Fees	123	0	0			
							65,638	12	4
Net Revenue				£78,272	10	11
Reforestation Fund—									
Balance at 30th June, 1938				85,493	2	9
Three-fifths Revenue transferred	46,963	10	6			
Direct Credits	2,890	1	9			
							49,853	12	3
							135,346	15	0
Expenditure for Year 1938-1939				49,761	18	11
Balance as at 1st July, 1939				£85,584	16	1

(2)—REFORESTATION OPERATIONS.

(A)—FOREST MANAGEMENT.

SUMMARY OF PERMANENT ESTABLISHMENT AND NEW WORKS CARRIED OUT DURING THE YEAR.

No.	DIVISION. Headquarters.	District.	ROADS.		FIRELINES.		TELEPHONE LINES.		HOUSES.		
			Cleared 1938- 1939.	Total miles cleared & main- tained.	Miles cleared, 1938- 1939.	Total miles cleared & main- tained.	Miles erected, 1938- 1939	Total mileage erected.	Built, 1938- 1939.	Total No. built.	Topo- graphi- cal Survey.
1	Busselton	Busselton	5	15	...	18	9	32	No.	No.	miles.
2	Mundaring Weir	Mundaring	29	159	22	173	2	47	...	10	...
3	Dwellingup	Dwellingup	6	118	20	268	...	...	...	15	58
		Wuraming	8	94	24	304	...	...	...	16	...
		Duncan's	13	98	18	262	...	95	...	7	43
		Huntly	7	101	3	186	...	...	...	7	...
4	Collie	Collie	3	114	72	692	...	105	...	11	...
		Wellington	...	75	36	310	...	...	...	5	...
5	Kirup	Kirup	27	327	42	968	...	...	...	20	...
		Nannup	27	97	24	197	44	206	...	5	102
		Greenbushes	...	5	...	74	...	...	...	...	...
6	Manjimup	Manjimup	227	406	78	331	125	259	...	7	263
		Pemberton	5	73	...	149	...	...	...	5	...
7	Narrogin	Narrogin	13	156	21	431	...	62	...	10	...
8	Kelmscott	Carinyah	1	121	23	317	...	...	...	9	...
		Gleneagle	...	198	59	566	...	125	...	8	100
		Jarrahdale	...	125	36	414	...	...	...	4	...
9	Perth	Metropolitan	...	...	...	...	...	8	...	4	...
		Albany	...	...	...	...	...	...	...	1	...
10	Harvey	Harvey	...	...	...	...	...	...	...	10	...
		Willowdale	22	125	2	233	18	127	...	9	240
		Tallanalla	...	244	65	437	1	...	...	8	...
		Totals	393	2,651	550	6,330	199	1,066	...	175	806

FOREST SURVEY.

Survey work was carried out as required by the various Divisional staffs. The Forester's Compass and 5 chain band were used and surveys of compartment boundaries, baselines, firelines, forest roads and general topographical features necessitated the running of 806 miles of traverse.

PERMANENT ESTABLISHMENT.

With the extension of fire control organisation to embrace larger areas of forest country, the importance of an effective system of arterial roads and subsidiary means of access to all parts of the forest is becoming more and more apparent, and during the past year considerable activity has been centred on an extensive programme of forest road and fireline construction which will bring large areas of mixed Jarrah and Karri forest, in the vicinity of Manjimup, under intensive management and fire control. In the course of this project, together with other works associated with the greater intensity of management of established Divisions, 393 miles of forest roads and 550 miles of graded or ploughed firelines were constructed during the past year.

The continuance of this work has been greatly facilitated by assistance from the Commonwealth in the form of an allocation of £12,000 under the Federal Road Grant.

The system of forest roads and firelines which traverse and subdivide the main forest areas now includes 2,651 miles of graded forest roads and 6,330 miles of graded or ploughed firelines.

To provide adequate communication between Divisional and District offices, lookout towers, resident staff and employees, the Departmental telephone system was extended by the construction of a further 199 miles of line during the year. The system now embraces 1,066 miles of lines and approximately 500 telephones are in daily use. A feature of recent developments has been the construction of lines from Departmental offices and houses to the homes of settlers living in the vicinity of State Forest, and who have shown a willingness to co-operate with the Department in general fire control organisation.

One additional fire lookout tower, 125 feet in height, was constructed during the year in the East Manjimup District. To date 18 major lookout towers have been constructed, in addition to which a number of subsidiary lookouts has been established.

ASSESSMENT SURVEYS.

In connection with soil and site quality assessment of marginal areas of the jarrah forest, further surveys have been carried out in the Kirup Division. Broad surveys based on 15 chain strip assessment were carried out at Hester, Greenbushes, Argyle, Boyanup and Glen Lynn. In these surveys both soil and vegetative types were mapped and a total area of 36,100 acres was covered during the year.

At Witchcliffe, in the Margaret River District, a detailed soil profile survey of 340 acres of jarrah forest was carried out on the basis of 5 chain strips.

In the Collie District an area of 730 acres at Lowden was covered by a detailed soil survey to determine the suitability of the area for the establishment of a pine plantation. In the Keenan Plantation at Margaret River, an area of 426 acres which had not been previously surveyed, was covered by a detailed soil profile survey.

Following recent improvements in the technique of soil profile surveys, approximately 200 acres at Keenan and Ludlow Plantations were resurveyed under more intensive methods.

The total area covered by soil surveys during recent years and up to June, 1939, includes:—

Detailed Soil Profile surveys—		acres.
Pine Plantation areas	....	15,896
Forest Settlement areas	....	16,950
Jarrah Forest	....	11,470
Assessment surveys—		
Jarrah Forest	....	143,250

(B)—SILVICULTURE.

(a) Jarrah.

SUMMARY OF OPERATIONS FOR THE YEAR AND TOTAL AREA REGENERATED.

No.	Division.		Area regenerated. 1938-1939.	Total area regenerated at 30th June, 1939.	Thinning. 1938-1939.	Coppice Thinning. 1938-1939.	Tree-marking.		Top Disposal.
	Head-quarters.	District.					Saw-milling.	Hewing.	
2	Mundaring		acres.	acres.	acres.	acres.	acres.	acres.	acres.
	Weir ...	Mundaring ...	1,458	5,811	317	...	225	...	263
3	Dwellingup								
	Dwellingup...	Dwellingup...	3,475	40,024	11	170	2,042	...	...
	Wuraming ...	Wuraming ...	7,181	39,537	...	1,282	3,425	...	1,244
	Duncan's ...	Duncan's ...	3,096	32,602	...	1,118	2,421	3,491	3,010
	Huntly ...	Huntly ...	122	22,078	...	...	1,923	...	682
4	Collie ...								
	Collie ...	Collie ...	3,223	43,168	...	...	5,105	749	3,924
	Wellington ...	Wellington ...	1,374	14,446	...	150	4,348	...	3,395
	Muja ...	Muja ...	...	...	...	...	...	1,065	...
5	Kirup ...								
	Kirup ...	Kirup ...	1,528	45,477	...	...	2,566	...	3,854
	Nannup ...	Nannup ...	...	7,895	...	...	1,827	...	1,438
	Greenbushes ...	Greenbushes ...	...	3,674	...	...	...	...	...
6	Manjimup...								
	Manjimup ...	Manjimup ...	1,141	8,341	...	...	2,649	...	4,128
	Pemberton ...	Pemberton ...	...	...	...	...	...	...	...
8	Kelmscott...								
	Carinyah ...	Carinyah ...	758	18,908	...	...	6,220	...	3,830
	Gleneagle ...	Gleneagle ...	1,363	40,955	...	903	7,115	...	5,065
	Jarrahdale ...	Jarrahdale ...	545	33,574	44	948	...	...	...
10	Harvey ...								
	Willowdale ...	Willowdale ...	902	30,034	96	...	5,553	...	3,856
	Tallanalla ...	Tallanalla ...	...	22,331	57	...	3,599	...	4,266
	Totals ...	Totals ...	26,166	408,855	525	4,571	49,018	5,305	38,957

JARRAH.

During the past year regeneration operations were carried out over an area of 26,166 acres of cut-over Jarrah forest.

The total area of cut-over Jarrah forest which has been silviculturally treated for regeneration amounts to 408,855 acres, and considerable attention is now being directed to the silvicultural requirements of the young stands of Jarrah developing on these areas. In particular, the thinning requirements of second growth Jarrah are being studied and, pending the results of these investigations, thinning operations are only being carried out on a small scale. During the past year thinning operations were carried out over 4,571 acres of small sapling stands.

The permissible cut of mill logs from Crown lands and State Forests was fixed in the Jarrah Working Plan at 23,000,000 cubic feet per year, and the annual cut has been maintained at approximately this figure. For the past year the figure of 21,030,535 cubic feet was slightly below the allowable cut.

This volume was obtained from a total area of 79,328 acres, which included :—

	Virgin Bush.	Cut-over Bush.	Total.
	acres.	acres.	acres.
Area cut over under Treemarking control	26,847	22,171	49,018
Area cut over under minimum girth restrictions	14,980	15,330	30,310
Total area cut over	41,827	37,501	79,328

In addition, 2,255 acres of virgin forest of mixed Jarrah and Karri were cut over under minimum girth restrictions.

KARRI.

During the year 1,575 acres of cut over Karri forest in the Manjimup Division were treated for natural regeneration. This area had been recently cut over for sawmilling and regeneration treatment consisted principally of the disposal and burning of the lops and tops resulting from logging operations. The total area of Karri forest which, following trade cutting, has been reforested and brought under intensive fire control measures now amounts to 21,650 acres.

In the vicinity of Manjimup an extensive programme of work is in operation, whereby areas of mixed Jarrah and Karri forest are being subdivided, provided with roads of access and firelines and brought under intensive management. In the course of this project 232 miles of forest roads and 78 miles of trafficable firelines have been constructed and 125 miles of telephone lines have been erected during the past twelve months.

During the year 5,571,504 cubic feet of Karri mill logs were removed from Crown lands and State Forests, and an additional 134,399 cubic feet were milled from private property.

MALLET.

In the Narrogin Division unproductive lands of poor quality, carrying an open stand of Wandoo, and infested with poison plants of the genera *Gastrolobium* and *Oxylobium*, are being converted to plantations of Brown Mallet (*Eucalyptus astringens*).

Following the removal of all merchantable timber from areas selected for conversion, the remaining timber is clear felled, and the resulting debris burnt in the early autumn following felling. With the first rains immediately following the burn, the Mallet seed is spot sown, at a spacing distance of 6ft. by 6ft.

In order to investigate the practicability of arranging a better distribution of work in Mallet areas, tests are being carried out on the burning of areas for sowing, at the beginning instead of at the end of the prohibited burning season. To bring this test into operation only portion of the area felled was sown last March, the remainder being held over till November, when it will be burnt and sowing operations carried out between the following December and March.

During the past year, therefore, only 705 acres were sown with Mallet, bringing the total area of established plantation up to 11,873 acres, all of which is located within a 30 mile radius of Narrogin.

For the management and protection of these plantations 13 miles of forest roads and 21 miles of firelines were constructed during the year.

The first Mallet plantations established were sown in 1926, and many of these earlier plantations have now reached the stage when a first thinning is desirable. During the year thinning operations embracing the thinning out of denser groups only were carried out over 3,247 acres.

In the younger areas of established plantations, cleaning operations, embracing the liberation of young Mallet from competition with Wandoo suckers, were carried out over 2,063 acres.

To provide for future sowing, in the establishment of new acres of plantation, 837 lbs. of Mallet seed were collected from vigorous trees of good form.

(3)—AFFORESTATION.

AREAS OF CONIFERS PLANTED 1938, AND TOTAL AREA ESTABLISHED.

Division.	Plantation.	Area established, 1938.				Total Area established.			
		<i>Pinus radiata.</i>	<i>Pinus pinaster.</i>	Other conifers.	Total.	<i>Pinus radiata.</i>	<i>Pinus pinaster.</i>	Other conifers.	Grand Total.
No. 1— Busselton ...	Coolilup ...	...	...	...	...	28.5	773	13	814.5
	Stirling ...	...	55	...	55	112	739.5	7	858.5
	Keenan ...	79.5	...	4.5	84	531	173.5	12	716.5
	Boranup ...	...	6	...	6	39	75	...	114
No. 2— Mundaring ...	Helena ...	...	...	...	...	496.5	210.5	38	745
	Greystones ...	...	...	...	...	396	176.5	46.5	619
	Beraking ...	...	...	...	...	147	57	91	295
	Mudros ...	10	1.5	...	11.5	178.5	121.5	16	316
	Darkin ...	...	...	...	...	108	157	3	268
No. 4— Collie ...	Proprietary ...	...	2	...	2	...	362	2	364
	Mungalup ...	...	...	...	...	52	12	2.5	66.5
	Bowelling ...	...	...	...	...	9.5	28.5	28	66
No. 5— Kirup ...	East Kirup ...	25	...	...	25	362.5	120.5	4	487
	Nannup ...	...	...	...	...	14	31.5	21.5	67
No. 6— Manjimup ...	Big Brook...	...	...	...	...	267	2	41	310
No. 9— Metropolitan ...	Applecross ...	...	125	2	127	...	1,236.5	2	1,238.5
	Gnangara ...	...	62.5	...	62.5	...	1,376	7	1,383
	Collier ...	...	...	...	...	...	884.5	...	884.5
	Scaddan ...	...	...	...	...	...	210	...	210
Albany ...	Pardelup ...	...	...	...	...	279.5	215	1.5	496
	Albany ...	...	...	...	...	1	4.5	9	14.5
No. 10— Harvey ...	Myalup ...	...	16	...	16	9	758	23.5	790.5
	Harvey Weir ...	70.5	...	...	70.5	416	86	15	517
	Hamel ...	...	...	...	...	12.5	46.5	5	64
Totals ...	...	185	268	6.5	459.5	3,459.5	7,857	388.5	11,705

Up to the year 1935 the pine planting programme was maintained at approximately 1,000 acres per year. During recent years, however, pending the results of experimental work, detailed soil profile surveys of established plantations and the correlation of crop quality with soil type, this programme has been considerably reduced to approximately 500 acres per annum.

During the winter months of 1938, pine planting was carried out over an area of 459.5 acres and the total area of established pine plantations now amounts to 11,705 acres.

Apart from small experimental areas, *Pinus pinaster* and *Pinus radiata* are the only species planted and the total area of established plantation embraces 7,857 acres of *Pinus pinaster* and 3,460 acres of *Pinus radiata*.

The total volume of pine logs sold from Departmental plantations during the past year amounted to 25,489 cubic feet. The bulk of this timber, 24,057 cubic feet, was produced in the Mundaring Division where a small mill utilises the thinnings from the surrounding plantations. The balance was made up of 512 cubic feet from the Busselton Division and 920 cubic feet from Harvey.

In addition, 28,986 cubic feet of pine logs obtained from private property in the Collie, Kirup, Metropolitan and Harvey Divisions were milled in country sawmills and city case factories.

(4)—FIRE CONTROL.

The Fire Season.

Moderate weather conditions were experienced during the greater part of the recent fire season, but a prolonged dry period in March and early April rendered dangerous the usual protective and clearing burns. Extreme hazards of Severe Summer and Dangerous were recorded on only nine occasions, but the average hazard of 6.06—higher than that for the previous summer—although associated with comparatively low temperatures provided conditions suitable for the spread and development of fires over a lengthy period. Heavy rains in various parts of the State during early February were restricted to small isolated sections of the forest area, and hazards of severe summer were again generally recorded within 3 days of these sporadic

and poorly distributed falls. Unfortunately little or no rain occurred before the opening of the burning season, and a great number of settlers' fires quickly assumed unmanageable proportions. Frequent North-East to North-West winds, while not of marked velocity, were sufficiently strong to cause many private property fires to spread quickly over the slopes of the Darling Range to the boundaries of State Forests.

The Area Protected.

Division.	Zone A.	Zone B.	Zone C.
	acres.	acres.	acres.
Busselton	11,100	....	....
Mundaring	31,000	9,500	200,000
Dwellingup	230,000	100,000	20,000
Collie	82,000	135,000	300,000
Kirup	113,000	109,000	50,000
Manjimup	34,000	360,000	....
Narrogin	12,000	60,000	....
Kelmscott	240,000	140,000	60,000
Metropolitan	5,000	....	....
Harvey	104,000	116,000	60,000
Denmark	7,000	....	....
Totals	869,100	993,500	690,000

Although no very large tracts of additional country have recently been brought within the scope of Fire Protection, developments in organisation for fire control have permitted the inclusion into Zone B of considerable areas of country previously classified as Zone C. The figures quoted for Zone C are still somewhat approximate as the limits of this zone are difficult to define.

Fire Losses.

Fires attended in Zone A alone during the past season totalled 157, and the areas of managed forest suffering damage in varying degree from uncontrolled bush fires totalled 1,278 acres. Of this area 4 fires covered 930 acres, and of these only 2 caused damage to regenerated areas, the remaining country carrying mature and immature mill logs with a very small proportion of sapling growth. Regenerated areas suffering fire damage in this zone totalled 896 acres or 0.13 per cent. of the area afforded complete protection.

In the open burning season during the latter part of the summer, several fires extending over large areas occurred in Zones B and C, and a number of these occurring during mild autumn weather were attended and developed to serve as useful controlled burns for future prevention measures.

Causes of Fires.

Despite the comparatively mild conditions, the total number of fires attended by Departmental employees shows a slight increase on numbers for other recent years. As further areas are included within Fire Protection organisations, particularly those adjacent to large tracts of private property, the number of fires suppressed each year on State Forests becomes gradually larger. Four hundred and eight fires were attended during the season under review.

Comparisons of the agencies responsible for fires in this and other summers reveal a substantial reduction in the number of fires attributed to travellers, bush workers, campers, picnickers and forest users generally. This may be attributed to a greater appreciation by the forest using public of the necessity for adequate fire control, and their co-operation in measures designed for the prevention and suppression of fires. Fires from Government locomotives were fewer in number and indicative of the support and co-operation of the Commissioner of Railways, whose officers frequently withdrew for inspection any locomotive about which a complaint was made. Twenty-eight per cent. of the fires attended arose from the burning operations of private property owners. This represents a substantial increase on the number arising from this source last summer, and may be attributed, to a large extent, to the unusually dry and unfavourable conditions during the early part of the open burning season. Settlers engaged in burning operations in early March were invariably in difficulties, and in many instances the departmental organisation was severely taxed to render assistance to nearby settlers. Co-operation with farmers in this essential operation is being successfully developed, and nuclei of fire-fighting forces have been organised among settlers near the boundaries of State Forests. Although temperatures were not high during the burning off period the prolonged dry season and low relative humidities had rendered the country more inflammable than was generally realised. A closer appreciation of the Fire Hazard Forecasts broadcast each morning through the National Stations might have avoided much of this unnecessary burning, and farmers in their own interests and in those of their neighbours, are urged to pay particular attention to these forecasts during the usual burning off seasons.

Fires attributed to hunters have increased tremendously in recent years, and it is desired that action be taken to exercise more adequate control of people hunting game in State Forests during the summer months.

Causes of Fires, 1938-39.

Cause.	No. of Fires.
W.A.G.R. locomotives	16
Bush locomotives	91
Bush workers	12
Navvies	8
Mill employees	5
Hunters and Fishers	47
Travellers	24
Private Property (closed season)	50
Private Property (open season—escapes)	66
Burning rubbish	2
Deliberately lit	14
Children	3
Departmental employees	17
Mill management	4
Other Government employees	4
Picnickers (fishermen)	4
Leaseholders (stock)	2
Lightning	6
Other known	5
Unknown	28
Total	408

Prevention Measures.

In order to minimise the possibility of fires starting, and to check the spread and development of those which do occur, extensive precautionary measures were carried out prior to the commencement of the fire season. The removal of dangerous hazards is one of the most important and lengthy of the periodic preventive operations. Controlled burning of firebreaks varying from 5 to 10 chains in width around individual compartments and groups of compartments was systematically completed, in addition to the burning of thousands of acres of dangerous hazards existing in large open flats and extensive areas of submarginal forest land. Burning of most breaks is necessary every two or three years, and the safe completion of extensive burning programmes was facilitated by the provision of ploughed and graded firelines and forest roads. 6,330 miles of trafficable firelines and 2,651 miles of roads have now been prepared, and these are regularly maintained for vehicular traffic.

Large areas of submarginal forest in Zones B and C are burned under safe conditions whenever possible, and large tracts of virgin bush are submitted to light fires during the early spring or on warm days in late winter. The eastern and western boundaries of the main forest belt, together with sections adjoining alienated land, are recognised as being particularly vulnerable, and these are protected by periodical burning of suitable firebreak belts.

Debris resulting from sawmilling and hewing operations is carefully cleared and drawn back from the base of any potential mill log, or utilisable tree, and then burnt up. The operation is known as Top Disposal, and is carried out over some 40,000 acres each year.

Locomotives operating on forest areas were fitted with ashpans and spark arresters from the beginning of the summer and maintained in a satisfactory condition. Despite this precaution, and periodical inspection of the apparatus, together with the burning of grass and leaf litter along railway lines, locomotives are still responsible for a considerable number of fires.

Fire Weather Research.

Fire Weather Research Stations have been established at Dwellingup, in the central Jarrah forest region, and at Manjimup in the Karri forest region, with a subsidiary station at Duncans, some 15 miles East of Dwellingup, on the fringe of the main Jarrah belt. During the summer months readings are taken of temperature, relative humidity, evaporation, wind direction and velocity, barometric pressure, rainfall and cloud density and formation. Difficulty was at first experienced in finding some reliable measure of current fire danger, but the important part played by moisture in the degree of inflammability of forest fuels gave the necessary lead. It has not been possible to take satisfactory moisture content measurements of the actual leaf litter in the Jarrah forest, and after exhaustive tests the moisture content of $\frac{1}{2}$ inch cylinders of locally grown *Pinus radiata* has given a satisfactory measure of the degree of fire danger at any particular time. Observations of the various weather elements and their association with actual hazards existing in the forest have been continued over a number of years, and variations in fire danger have been arbitrarily classified, and seven broad divisions recognised, ranging from Nil, when a fire will not run in two year old leaf litter, to Dangerous, representing the worst conditions which have been experienced. The scale of hazards developed for the Jarrah region has been found to apply equally well for the more southerly areas, although milder weather is generally experienced as a result of their geographic position.

The number of days of the various degrees of hazard for the past five summers, as recorded at Dwellingup, and for the past two seasons at Manjimup, appear hereunder :—

DISTRIBUTION OF HAZARD.

Station.	Fire Season.	Nil.	Low.	Moderate.	Average Summer.	High Summer.	Severe.	Dangerous.	Average Hazard.	No. of Days.	Days above Moderate.
Dwellingup ...	1934-35	5	26	47	20	...	6	9	5.07	113	% 31.0
Do. ...	1935-36	2	20	43	40	...	18	4	5.95	127	48.8
Do. ...	1936-37	2	11	40	47	...	29	7	6.45	136	61.0
Do. ...	1937-38	10	15	35	33	33	12	2	5.87	140	57.2
Do. ...	1938-39	5	8	51	36	29	8	1	6.06	138	53.6
Manjimup ...	1937-38	8	29	41	22	9	3	0	4.68	112	30.3
Do. ...	1938-39	12	23	36	12	6	1	0	4.30	90	20.0

Despite the fact that temperatures were not high, that December and January were comparatively mild, and that 80 points of rain were recorded in February, the cumulative drying of forest fuels was responsible for a daily hazard slightly higher than most other years. 53.6 per cent. of the days were "Average Summer" or worse.

The valuable co-operation of the Divisional Meteorologist was again secured in the preparation of daily forecasts based on meteorological readings from various weather stations throughout the State, and from the Departmental Research Stations. Variations in local weather were carefully recorded at the Fire Weather Stations, and alterations to forecasts conveyed by telephone to Divisional offices. Throughout the summer forecasts of anticipated fire weather were broadcast daily through the courtesy of the Australian Broadcasting Commission.

Facilities for the recording of temperature and relative humidity were provided at Divisional offices to serve as a check on variations in hazard throughout the day.

Based on the 8 a.m. readings of temperature, relative humidity and wood cylinder moisture content, a method was devised for calculating the anticipated hazard for any period of the day, and satisfactory tests were carried out during the latter part of the summer.

Suppression Measures.

Auxiliary fire fighting units of local settlers or mill and bush workers rendered valuable assistance in the suppression of fires in the more remote areas. The main fire fighting forces consist of Departmental employees, working in gangs of five or six, on silvicultural or other works in different parts of the forest. Accommodation and schooling facilities are provided for them in forest settlements, in close proximity to sawmilling centres, from which they travel to work each day on Departmental fire trucks. Working parties are in constant telephonic communication with the district officers and lookout stations. No time is lost in the despatch of fire fighters to the scene of an outbreak, and in the majority of cases suppression measures are commenced while the fires are sufficiently small to make direct attack a successful venture.

This is only made possible by the provision of a well planned system of main arterial roads and subsidiary means of access to all parts of the forest, and modifications and improvements to the roading systems are being constantly made in order that the period elapsing between the time of discovery of the fire and commencement of suppression may be reduced to a minimum. Firelines around compartments and subdivisional tracks are graded and maintained in a trafficable condition, and large areas of Zone C are accessible by good summer roads and tracks. The average time required to place a gang at fires in Zones A and B is now less than 40 minutes, and the size of fire suppressed in these areas averages less than two acres.

There are 29 Departmental vehicles equipped as fire trucks, and used solely for this work during the summer months. In addition a number of privately owned vehicles are available for fire control purposes whenever required. Standard fire trucks travelled 15,000 miles on fire control work alone last summer, and privately owned and hired vehicles over 2,000 miles.

Methods adopted in the suppression of fires are governed to a large extent by local conditions, and it frequently happens that a combination of both direct and indirect methods are employed to confine the fire to the smallest possible area. Water is brought into use whenever possible, and limited quantities are transported on the trucks and sprayed on the flames, with knapsack spray pumps, the use of which has replaced the more strenuous and less effective beating methods previously employed. Where abundant water supplies are available, power pumping outfits specially designed for bush fire fighting are used to pump large quantities of water at high pressure through long lengths of canvas hose. Intermediate units, comprising a power-driven centrifugal pump attached to a 400-gallon tank of water, and a high speed piston pump attached to a power take-off on a truck gear box, have been used as experimental measures.

(5)—RESEARCH AND INVESTIGATION.

(a) *Management and Silviculture.*

The major projects at present in the course of investigation include the following :—

Reforestation.

Further studies of the composition of the Jarrah forest were carried out and local and regional characteristics defined. Investigations in this field embrace the following studies :—

1. The composition of the forest. Considerable data has been obtained regarding size, classes and stem distribution, basal areas and height variance, and log length and volumes for the principal crop and associated species.
2. The range and distribution of quality classes. Extensive soil and site quality surveys have been carried out in an endeavour to correlate soil type with crop quality and ground vegetation types.
3. Crown development and relation to breast high diameter. Studies of crown area and spacing are being continued with reference to the regulation of the cut.
4. Jarrah volume tables and taper curves. Various areas have been sampled and data obtained for the preparation of new taper and volume tables to provide estimates of under bark volumes for standing trees.
5. Thinning requirements of second growth Jarrah. In 1935 replicated thinning experiments were laid down in which areas of Jarrah coppice were subjected to various thinning treatments. These experimental plots have been maintained, and annual measurements are providing interesting and valuable information regarding the growth, development and silvicultural requirements of second growth Jarrah.

Afforestation.

Problems which have arisen in connection with the establishment of pine plantations may be associated with nursery practice, establishment problems and growth or nutritional problems.

Early investigations of nursery practice showed the need for the inoculation of nursery soils with the necessary symbiotic fungus, and further experiments are now being continued regarding the use of mineral and organic manures, composts and animal manures. No outstanding results have so far been achieved from animal manures and composts. Trials are also being conducted to determine the most effective spacing within and between rows.

During the past seven years establishment problems relating to the successful transplanting of the nursery stock into the field have been the subject of special study. In addition to actual planting technique, these studies have embraced investigations of the optimum planting season, methods of preparation of the site, and the lifting, handling and transport of the pines from the nursery. The results of this work will shortly be published in bulletin form.

In common with all plantations of exotic conifers in Australia, certain areas of irregular and abnormal growth have developed in established plantations of *Pinus radiata* and *pinaster*. To discover possible remedial measures and to avoid further pine planting on sites unlikely to give satisfactory results, a detailed study has been made of the factors affecting the growth of pines in plantation. These investigations have shown that *Pinus radiata* requires a soil containing a considerably higher percentage of essential plant nutrients than is needed for the successful growth of *Pinus pinaster*. The most important remedial measures to restore to normal growth areas of young pines affected by various disorders were shown to be cultivation, applications of superphosphate, and spraying very young pines with a solution of zinc salts. A full account of this work appears in "Pine Nutrition," Bulletin No. 50, 1938.

(b) *Utilisation.*

The publication by the Standards Association of Australia and this Department, of Australian Standard Grading Rules for Jarrah and Karri, represents the culmination of extensive work over a number of years on the preparation of suitable grading rules for the two most important Western Australian timbers. The availability of these specifications is an important step forward in a fundamental aspect of timber utilisation, and it is generally recognised that in this regard Western Australia has given a desirable lead to other States of the Commonwealth. Rules are available either as W.A. Forests Department, Bulletin 51, "Grading Rules for Jarrah and Karri," or as Technical Standards, Nos. 0·10, 11 and 14 to 43, 1938, of the Standards Association.

Mill studies have been continued, the most important being a comprehensive study recently completed at Pemberton, at the request of the General Manager of State Saw Mills.

Close contact has been maintained at all times with the trade generally, and considerable assistance has been given with regard to problems of seasoning and general utilisation, particularly with regard to overseas sleeper orders.

Increasing attention is being paid to possible avenues for the chemical utilisation of wood, and the Department has taken an active interest in research work being undertaken in charcoal production for producer gas plants and the manufacture of charcoal iron. Possibilities of the production of paper, paper pulp and other cellulose products in this State have been investigated.

Co-operation has been maintained with the Division of Forest Products, Council for Scientific and Industrial Research, Melbourne.

(6)—ARBORICULTURE.

The distributing season which closed on 31st August, 1938, was a busy one and the number of trees sold from the Departmental Nursery at Hamel, represented an increase of 2,500 over the figures for the previous year.

Eucalyptus cladocalyx (Sugar Gum) was strongly demanded and the sales of 10,028 are the highest on record. Other popular species were *Pinus pinaster* (Maritime Pine), *Pinus radiata* (Monterey Pine), *Tristania conferta* (Brush Box), *Leptospermum laevigatum* (Victorian Ti Tree), *Schinus molle* (Pepper Tree), *Sterculia diversifolia* (Kurrajong), and *Eucalyptus Lehmanni* (Bald Island Marlock).

In all 167,600 trees were distributed, of which 53,649 were sold, 2,960 were supplied free to public bodies and charitable institutions, and 110,991 were supplied to Departmental plantations and arboreta.

Features of recent years, which were again evident in the season under review, were the steadily increasing demand for such native trees as *Eucalyptus salmonophloia* (Salmon Gum), *Eucalyptus salubris* (Gimlet), *Eucalyptus gomphocephala* (Tuart), and *Eucalyptus Lehmanni* (Bald Island Marlock), and the decreasing demand for *Cupressus macrocarpa* (Monterey Cypress), *Cupressus lusitanica* (Busaco Cedar), and *Pittosporum undulatum* (Cheesewood). A few years ago sales of the last three species ran into thousands per year, but now the annual sales barely reach the hundred mark. These trees were used largely for hedge planting and their place appears to have been taken to a large extent by *Leptospermum laevigatum*.

During recent years an attempt has been made to raise varieties of native trees and shrubs. Despite the difficulty experienced in propagating many of the dry climate species in the comparatively wet climate of the South-West, about fifty varieties have been established. The majority are eucalypts and many of them are of considerable interest on account of their remarkable flowers and their ornamental appearance.

CHAPTER IV.

(1)—LEGISLATION.

Native Flora Protection Act, 1938.

An Act to amend the Native Flora Protection Act, 1935, was assented to on 31st January, 1939. The purpose of the Amending Act is to facilitate the enforcement of the protection of wild flowers provided for in the original Act. It includes provision for the appointment of Honorary Inspectors to assist in administering the Act and prohibits the taking of native flora from private property except with the written consent of the owner.

Timber Industry Regulations.

Regulations made under the provisions of the Timber Industry Regulation Act Amendment Act, 1937, were gazetted in January last, and provided for the annual registration of all sawmills.

(2)—ADMINISTRATION.

The only staff changes during the year were as follows:—

(a) *Professional Division.*

Mr. H. L. Gloe, Assistant Divisional Forest Officer, was killed in an airliner smash on the 25th October, 1938.

Mr. W. G. Sharpe, B.Sc., Dip.For., was appointed Assistant Divisional Forest Officer on the 13th April, 1939.

Mr. J. E. Lloyd, Draftsman, was transferred to the Mines Department.

(b) *General Division.*

Mr. Henry McCoy, "B" Grade Forester, died on the 16th November, 1938.

One "D" Grade Assistant Forester resigned, the status of two others was changed to Overseer, and three new appointments were made.

One Forest Assistant was appointed.

(c) *Clerical Division.*

A few minor adjustments were made which did not, however, affect the total number of officers employed in this Division.

I desire to express my appreciation of the loyalty and enthusiasm which have been displayed by all officers of the Department, as a result of which satisfactory progress has been maintained in all branches of the Department's activities.

S. L. KESSELL,

Conservator of Forests.

Perth, 20th September, 1939.

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APPENDIX 1a.

CONSOLIDATED REVENUE FUND.

General Statement of Revenue and Expenditure for the Year ended 30th June, 1939.

DR.				CR.	
	£	s. d.		£	s. d.
To Log Royalty	106,436	6 2	By Salaries	23,732	17 7
„ Hewn Timber Royalty	5,390	15 6	„ Add Cash Orders outstanding		
„ Sandalwood Royalty	1,812	14 9	1st July, 1938	18	12 6
„ Miscellaneous Royalties	10,766	8 6		23,751	10 1
„ Goldfields Revenue	11,842	10 2	„ Less Cash Orders outstanding		
„ Rents	1,147	0 8	30th June, 1939	29	18 9
„ Inspection Fees	5,961	14 7		23,721	11 4
„ Sales	1,086	0 2	„ Postage and Telephones	184	9 4
„ Miscellaneous Revenue	1,280	1 6	„ Stationery and Printing	218	1 7
			„ Travelling allowances	316	3 5
			„ Freights and Fares	67	6 0
			„ Material	93	12 11
			„ Mileage allowances	1,757	7 10
			„ Miscellaneous	304	17 5
			„ Sandalwood Expenditure	426	11 3
			„ Maintaining State Nursery	98	0 9
			„ Workers' Compensation Pre-		
			miums	85	12 1
			„ Refunds from Revenue	125	5 6
			„ Purchase of Tents	362	6 1
				4,039	14 2
			„ Timber Industry Regulations		391 14 3
			„ Pine Conversion Costs		321 0 4
			„ Total Expenditure		28,474 0 1
			„ Excess Revenue over Expendi-		
			ture		117,249 17 11
	£145,723	18 0			£145,723 18 0

APPENDIX 1b.

Statement of Afforestation and Reforestation Expenditure for the Year ended 30th June, 1939.

DR.			CR.			
	£	s. d.	£	s. d.	£	s. d.
To Division No. 1—					By Cash Orders unallocated, 1st July, 1938 ...	1,862 15 11
Administration ...	350	12 5			„ General Loan Fund ...	44,256 6 4
Ludlow ...	1,365	1 7			„ Grant—Federal Aid Roads Fund ...	12,000 0 0
Boranup ...	401	10 9			„ Reforestation Fund ...	49,761 18 11
Keenan ...	1,845	13 7	3,962	18 4	„ Motor Vehicle Depreciation Account ...	1,528 19 9
„ Division No. 2—					„ Pine Conversion Costs ...	59 7 7
Administration ...	1,331	13 4				
Mundaring Weir ...	2,210	3 4	3,541	16 8		
„ Division No. 3—						
Administration ...	2,079	9 7				
Dwellingup, Huntly, Wuraming, and Duncan's ...	10,615	2 9	12,694	12 4		
„ Division No. 4—						
Administration ...	826	9 0				
Collie and Collie Outer ...	8,884	6 5	9,710	15 5		
„ Division No. 5—						
Administration ...	1,045	1 2				
Kirup, Nannup, Greenbushes ...	10,304	10 2	11,349	11 4		
„ Division No. 6—						
Administration ...	1,473	16 4				
Manjimup ...	16,048	10 5	17,522	6 9		
„ Division No. 7—						
Administration ...	964	18 3				
Narrogin ...	6,119	7 10	7,084	6 1		
„ Division No. 8—						
Administration ...	2,199	9 1				
Jarrahdale-Kelmscott ...	11,204	4 9	13,403	13 10		
„ Division No. 9—						
Administration ...	742	0 5				
Applecross ...	744	7 5				
Collier ...	292	8 10				
Gnangara ...	1,712	19 8				
Scaddan ...	78	15 3				
Pardelup ...	91	17 10	3,662	9 5		
„ Division No. 10—						
Administration ...	859	6 6				
Yarloop-Mornington ...	8,229	2 6				
Hamel ...	17	14 2				
Harvey Weir and Myalup ...	1,063	7 0	10,169	10 2		
Total, Divisional Expenditure ...			£93,102	0 4		
„ Training of Staff ...	90	18 9				
„ Research and Investigation ...	3,144	18 1				
„ Preparation of Working Plans and Topographical Surveys ...	2,145	6 6				
„ Salaries and Allowances ...	6,032	12 1				
„ General Equipment and Incidentals ...	2,313	4 0				
„ Depreciation on Motor Vehicles ...	1,144	8 10				
„ Purchase of Motor Vehicles ...	1,528	19 9	16,400	8 0		
			£109,502	8 4		
Less Cash Orders not cleared as at 30th June, 1939 ...			32	19 10		
			£109,469	8 6	£109,469	8 6

APPENDIX 2a.

Exports of Timber, Tanning Barks, Sandalwood and Essential Oils for the Year ended 30th June, 1939.

Item and Country of Destination.	Quantity.	Value.	Item and Country of Origin.	Quantity.	Value.
TIMBER—	cub. ft.	£	WOOD MANUFACTURES—contd.	cub. ft.	£
<i>Dressed, N.E.I. :</i>			<i>Other :</i>		
Commonwealth of Australia...	2,223	491	Commonwealth of Australia ...	...	10,367
United Kingdom	12,823	1,351	United Kingdom ... ..	...	51
Malaya, British	313	97	Malaya, British ... ..	...	2
	15,359	1,939		...	10,420
<i>Undressed, Railway Sleepers :</i>			Total, Wood Manufactures	...	43,518
Commonwealth of Australia...	179,836	21,002	Total, Timber and Wood		
United Kingdom	114,803	13,776	Manufactures ... ..	...	765,828
Ceylon	444,485	53,339			
Mauritius	46,875	6,216	SANDALWOOD—	cwt.	
New Zealand	460,003	55,201	Malaya, British	1,940	3,149
Pacific Islands—Nauru	5,500	693	Burma	20	33
South African Union	411,762	49,412	Ceylon	280	462
Egypt	349,724	41,967	Hong Kong	7,947	11,796
Iran	22,586	2,707	India	510	842
Iraq	13,731	1,696	China	11,072	17,715
Portuguese East Africa	2,430	291	Japan	108	178
	2,051,735	246,300	Netherlands East Indies	240	396
				22,117	34,571
<i>Undressed, N.E.I. :</i>			TANNING BARK—		
*Commonwealth of Australia...	1,468,791	194,197	Commonwealth of Australia ...	26,511	13,109
United Kingdom	888,234	110,854	Ceylon	40	27
British West Africa	3,282	534	China	311	159
Ceylon	42,855	5,143	Germany	8,251	3,582
Cyprus	2,756	331	Netherlands	1,998	965
Malaya, British	2,061	247		37,111	17,842
Mauritius	29,488	4,520	ESSENTIAL OILS—		
New Zealand	388,974	46,789	<i>Non-Spirituous, N.E.I. :</i>		
South African Union	529,171	66,942	Commonwealth of Australia ...	...	7,525
Egypt	59,867	7,184	United Kingdom ... ..	...	14,634
Portuguese East Africa	25,623	3,076	Burma ... ..	...	102
Belgium	107,170	19,347	Ceylon ... ..	...	48
Germany	53,843	9,932	Hong Kong ... ..	...	139
Iran	2,134	257	Malaya, British ... ..	...	119
Iraq	12,729	1,770	South African Union ... ..	...	105
Netherlands	16,673	2,426	Brazil ... ..	...	319
United States of America	3,505	522	China ... ..	...	1,060
	3,637,156	474,071	Egypt ... ..	...	84
Total, Timber Exports	5,704,250	722,310	Mexico ... ..	...	19
			Netherlands East Indies ... ..	...	1,094
WOOD MANUFACTURES—			Philippine Islands ... ..	...	45
<i>Casks and Shooks :</i>				...	25,293
†Commonwealth of Australia	...	31,224	<i>Eucalyptus :</i>		
United Kingdom ... ..	...	438	Burma ... ..	...	45
	...	31,662	Malaya, British ... ..	...	21
<i>Furniture :</i>			Brazil ... ..	...	16
Commonwealth of Australia ...	...	1,384	China ... ..	...	58
United Kingdom ... ..	...	17	Mexico ... ..	...	5
Malaya, British ... ..	...	35	Philippine Islands ... ..	...	112
	...	1,436		...	257
			Total, All Exports ... ..	...	843,791

*Value includes £4,300 of staves for which no quantity is shown.

†Principally empty returns.

APPENDIX 2b.

Imports of Timber, Tanning Substances and Essential Oils for the Year ended 30th June, 1939.

Item and Country of Origin.	Quantity.	Value.	Item and Country of Destination.	Quantity.	Value.
TIMBER—	cub. ft.	£	WOOD MANUFACTURES—contd.	cub. ft.	£
<i>Timber, Dressed :</i>			<i>Furniture—continued.</i>		
<i>Architraves, Mouldings, etc. :</i>			Italy ... ..	...	3
Commonwealth of Australia ...	...	1,299	Japan ... ..	...	139
Czechoslovakia ... ..	...	11	Netherlands East Indies ...	...	2
	...	1,310	Poland ... ..	...	125
<i>Tongued and Grooved :</i>			Sweden ... ..	...	124
Canada	481	39	Switzerland ... ..	...	6
Malaya, British	14	2	United States of America ...	...	849
Norway	818	82		...	37,106
Sweden	2,439	256	<i>Plywood and Veneers :</i>		
	3,752	379	Commonwealth of Australia ...	...	50,718
<i>*Timber, Dressed, N.E.I. :</i>			United Kingdom ... ..	...	311
Commonwealth of Australia ...	830	210	Canada ... ..	...	64
Czechoslovakia	10	11	France ... ..	...	442
Germany ... ..	...	32	Italy ... ..	...	14
Sweden	523	138	Japan ... ..	...	229
United States of America ...	1	4	Norway ... ..	...	60
	1,364	395	Philippine Islands ... ..	...	131
<i>†Timber, Undressed and Dressed :</i>			United States of America ...	...	107
<i>Timber for making Boxes :</i>			Yugoslavia ... ..	...	29
Commonwealth of Australia ...	...	12,641		...	52,105
Canada	127,303	6,926	<i>Spokes, Rims and Felloes :</i>	No.	
Malaya, British	10,259	811	Commonwealth of Australia ...	2,313	109
New Zealand ... ..	...	129	<i>Tool Handles (including Axe) :</i>		
Finland	8,974	1,003	Commonwealth of Australia ...	...	3,088
Netherlands	145	142	United Kingdom ... ..	...	61
Sweden	39,462	5,389	Canada ... ..	...	695
	186,143	27,041	United States of America ...	...	2,429
<i>Timber, Undressed, N.E.I. :</i>				...	6,273
Commonwealth of Australia ...	165,300	29,643	<i>Wood Manufactures, N.E.I. :</i>		
Borneo, British	2,309	279	Commonwealth of Australia ...	...	22,031
Canada	177,714	20,786	United Kingdom ... ..	...	2,783
Malaya, British	808	88	Canada ... ..	...	273
New Zealand	812	249	India ... ..	...	54
Czechoslovakia	3,513	259	New Zealand ... ..	...	21
Finland	2,020	158	Belgium ... ..	...	7
Japan	51	32	China ... ..	...	6
Philippine Islands	10,528	1,155	Finland ... ..	...	191
Norway	351	49	France ... ..	...	10
Peru	6	4	Germany ... ..	...	196
Siam	45	24	Hungary ... ..	...	11
Sweden	17,439	1,441	Japan ... ..	...	146
United States of America ...	69,480	11,550	Latvia ... ..	...	2,100
Rumania	4,306	201	Lithuania ... ..	...	552
	454,682	65,918	Sweden ... ..	...	3,684
WOOD MANUFACTURES—			United States of America ...	...	921
<i>Barrels and Casks :</i>				...	32,986
Commonwealth of Australia ...	...	27,578	Total, Timber Imports ...	...	254,315
United Kingdom ... ..	...	8	TANNING BARK—	cwt.	
Greece ... ..	...	2	Commonwealth of Australia ...	4,213	2,531
	...	27,588	South African Union ...	1,016	488
<i>Clothes Pegs :</i>				5,229	3,019
Commonwealth of Australia ...	...	3,105	TANNING EXTRACTS—		
<i>Furniture :</i>			Commonwealth of Australia ...	...	371
Commonwealth of Australia ...	...	32,683	United Kingdom ... ..	...	74
United Kingdom ... ..	...	2,403	Borneo, British ... ..	...	30
Canada ... ..	...	500	Malaya, British ... ..	...	8
Hong Kong ... ..	...	29	South African Union ... ..	...	253
India ... ..	...	2	Italy ... ..	...	14
Malaya, British ... ..	...	46	Turkey ... ..	...	41
Pacific Islands—Nauru ... ..	...	4	Yugoslavia ... ..	...	164
China ... ..	...	68		...	955
Czechoslovakia ... ..	...	16			
Estonia ... ..	...	53			
France ... ..	...	2			
Germany ... ..	...	52			

* Value includes £34 for which no quantity is shown.

† Value includes £12,791 for timber imported via Commonwealth States, and for which no quantity is shown.

APPENDIX 2b—continued.

Imports of Timber, Tanning Substances and Essential Oils, etc.—continued.

Item and Country of Origin.	Quantity.	Value.	Item and Country of Origin.	Quantity.	Value.
ESSENTIAL OILS—			ESSENTIAL OILS—continued.		
Commonwealth of Australia	£ 5,311	Netherlands ...	...	£ 333
United Kingdom	76	Netherlands East Indies ...	...	36
Ceylon	147	United States of America ...	...	669
France	26			
Guiana, French	114			7,014
Italy	298			
Japan	4	Total, All Imports ...	...	265,303

APPENDIX 2c.

Summary of Exports of Forest Produce since 1836.

Year.	Timber.		Sandalwood.		Year.	Timber.		Wood	Sandalwood.		Tanning	Essential
	Cub. ft.	Value.	Tons.	Value.		Manu- factures.	Cub. ft.	Value.	Value.	Tons.	Value.	Bark.	Oils.*
		£		£			£	£		£	£	£
1836a	10,000	2,500			1888	525,750	42,060	...	4,470	38,525	...	£
1837					1889	788,500	63,080	...	6,385	57,465	...	
1838					1890	1,172,200	82,052	...	5,136	51,355	...	
1839												
1840					1891	1,273,950	89,179	...	3,760	37,600	...	
1841					1892	1,082,650	78,419	...	5,716	42,870	...	
1842					1893	512,950	33,888	...	3,893	32,160	...	
1843					1894	1,063,700	74,804	...	2,784	23,430	...	
1844	b	163			1895	1,255,250	88,146	...	3,851	30,383	...	
1845					1896	1,545,600	116,420	...	6,848	65,800	...	
1846	2,550	255	4	40	1897	2,393,300	192,451	...	5,852	49,480	...	
1847	12,200	1,120	320	320	1898	4,086,150	326,195	...	4,349	31,812	...	
1848	3,350	333	370	4,444	1899	6,913,550	553,198	...	4,084	29,719	...	
1849			1,335	13,353	1900	5,725,400	458,461	...	5,095	39,038	...	
1850	10,500	1,048			1901	7,150,600	572,354	...	8,864	73,931	...	
1851	1,250	268	219	1,593	1902	6,256,750	500,533	...	7,995	61,771	...	
1852	7,050	806			1903	7,748,450	619,705	...	4,406	37,913	850	
1853	52,200	5,220			1904	8,072,300	654,949	...	4,510	25,417	32,876	
1854	58,500	7,023			1905	8,709,500	689,943	...	5,521	38,817	154,087	
1855	76,900	12,076			1906	8,830,700c	708,993	...	8,848	70,958	140,720	
1856	70,500	9,671			1907	6,409,550c	511,923	...	9,212	65,999	98,773	
1857	69,200	9,449	280	2,524	1908	9,869,500c	813,591	...	9,564	76,668	79,934	
1858	29,250	2,340	745	7,455	1909	10,830,450c	867,419	...	4,805	37,456	59,633	
1859	67,250	6,051	1,278	17,259	1910	12,074,100c	972,698	...	8,228	70,775	93,733	
1860	54,800	4,932	1,687	16,360	1911	12,449,500c	986,341	...	6,907	65,506	83,470	
1861	27,750	2,497	2,558	24,945	1912	11,297,100c	903,396	...	3,154	27,533	49,094	
1862	68,800	7,151	2,393	21,541	1913	13,619,850c	1,089,481	...	6,260	47,589	47,377	
1863	32,900	2,963	2,807	25,265	1914d	6,279,750c	502,153	...	4,702	39,800	18,197	
1864	58,300	5,508	2,724	24,520	1915e	9,968,500c	808,392	...	8,375	78,926	6,127	381
1865	183,950	15,693	1,636	13,400	1916e	5,432,100	441,991	...	6,271	61,381	10,208	1,102
1866	85,650	6,849	2,965	23,722	1917e	3,890,650	310,893	...	7,230	72,669	18,959	2,060
1867	56,750	4,541	2,305	18,442	1918e	3,436,250	274,141	...	6,504	81,834	16,886	3,995
1868	8,000	638	3,256	26,045	1919e	4,135,750	332,584	11,535	8,998	117,072	18,875	3,987
1869	179,900	14,273	4,124	32,998	1920e	5,065,300	465,731	21,935	14,355	240,579	22,121	3,704
1870	157,200	17,551	6,112	48,890	1921c	9,816,250	1,137,819	24,916	10,839	181,801	23,073	10,107
1871	218,500	15,304	3,366	26,926	1922e	8,309,750	1,041,047	22,428	3,990	54,769	13,328	6,878
1872	37,000	2,590	3,942	31,536	1923e	7,911,310	997,454	12,377	7,623	102,912	21,161	20,075
1873	68,150	4,771	6,292	62,916	1924e	11,126,861	1,367,517	11,505	14,081	348,713	29,606	39,877
1874	345,600	24,192	7,057	70,572	1925e	11,844,303	1,477,997	13,928	6,243	186,775	40,136	42,057
1875	342,350	23,965	6,646	66,465	1926e	12,001,384	1,522,958	10,072	7,771	238,203	15,056	47,819
1876	219,050	23,743	6,577	65,772	1927e	12,580,262	1,651,149	8,727	6,821	199,754	15,818	26,454
1877	336,150	36,979	4,247	31,851	1928e	10,384,784	1,265,383	7,783	4,829	147,426	27,662	39,131
1878	580,900	68,902	4,675	35,064	1929e	7,635,237	960,435	6,603	7,582	225,208	35,850	63,307
1879	627,250	69,742	4,667	35,001	1930e	6,579,743	807,425	4,687	943	22,228	40,628	77,510
1880	662,550	66,252	5,197	51,970	1931e	4,127,856	507,382	26,615	1,606	43,790	25,333	56,170
1881	792,750	79,277	7,716	77,165	1932e	3,062,673	361,700	85,488	1,386	40,546	42,016	59,301
1882	936,500	93,650	9,605	96,050	1933e	2,235,540	262,617	80,332	3,068	88,846	33,352	26,331
1883	997,000	79,760	7,031	56,250	1934e	4,060,830	487,248	76,107	2,508	75,424	20,904	26,720
1884	861,700	68,936	2,920	20,960	1935e	5,326,117	636,466	65,494	2,223	66,474	15,284	35,363
1885	848,150	67,850	4,527	36,216	1936e	5,598,180	679,522	50,665	1,592	44,916	12,237	27,526
1886	626,150	50,092	3,481	27,450	1937e	5,673,903	699,684	52,338	2,513	75,670	14,491	38,185
1887	354,800	28,384	4,317	34,593	1938e	7,545,744	932,420	47,934	747	22,884	13,865	35,128
					1939e	5,704,250	722,310	43,518	1,106	34,571	17,842	25,550
Total						341,629,827	33,684,405	684,987	423,196	5,268,524	1,419,571	718,723

a The exports up to the year 1834 consisted only of supplies to shipping, of which no record is kept.

b Not available. c Approximate figures only. d Six months ended 30th June.

e Year ended 30th June. * Principally Sandalwood Oil

APPENDIX 3.

TIMBER INDUSTRY REGULATION ACT, 1926.

Annual Report for the Year ended 31st December, 1938.

An Act to amend the Timber Industry Regulation Act, 1926, was assented to on 18th January, 1938, and provided for the incorporation in this Act of the provision previously existing under the Factories and Shops Act for the registration of all sawmills. Regulations giving effect to these provisions have been gazetted, and there are now 134 mills registered with the Department.

The average number of men (exclusive of sleeper hewers) engaged on timber holdings during the year was 3,188. One hundred and sixty-eight inspections of Timber Holdings were carried out by the District and Workmen's Inspectors, and it was found with a few exceptions that the provisions of the Act were being generally observed. Minor defects or dangers on being brought under the notice of managers were usually rectified promptly, and on only seven occasions was it necessary to serve requisitions for immediate attention to defects.

Accidents reported during the year and investigated by the Inspectors numbered 576. Of the accidents reported two proved fatal, one of which was caused by a falling limb striking an employee engaged in falling operations, and the other was the result of a whim tipping backwards, the pole or chain attached to the pole striking the driver of a tractor a severe blow on the head, from which he died a few days later.

The number of accidents that occurred to every 100 persons employed fell from 19.3 in 1937 to 18 last year. The total period of incapacity as a result of accidents was 14,147 days, or an average of 24.6 days per injured person, which is slightly higher than for the previous year.

Returns as listed hereunder have been prepared, but owing to the cost of printing have not been included in this report:—

1. Number of notifiable accidents reported in accordance with Section 14 of the Timber Industry Regulation Act, according to months, and indicating the nationality and age of the person injured, the period of incapacity, the number of occasions on which the first-aid outfit was used and the monthly fatigue symbol during the year ended 31st December, 1938.
2. The number of notifiable accidents reported during the year 1938, according to months and days of the week on which the accidents happened.
3. By months, the time at which the notifiable accidents occurred.
4. The number of hours worked on the day and up to the time of sustaining the accident by persons injured.
5. The number of accidents reported during the year 1938, classified according to the cause of accident and location of injury.
6. The number of accidents reported during the year 1938, classified according to the cause of accident and nature of injury.
7. The number of accidents reported during the year 1938, classified according to the location and nature of injury.
8. The personal cause of the accidents reported during the year ended 31st December, 1938, as determined by the District Inspector.

Perth, 20th September, 1939

S. L. KESSELL,
Controlling Officer.