1934.

WESTERN AUSTRALIA.

# REPORT

ON THE OPERATIONS OF

# The Forests Department

FOR THE

YEAR ENDED 30th JUNE, 1934.

PERTH:
BY AUTHORITY: FRED. WM. SIMPSON, GOVERNMENT PRINTER.

1934.

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# CONTENTS.



## 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*).

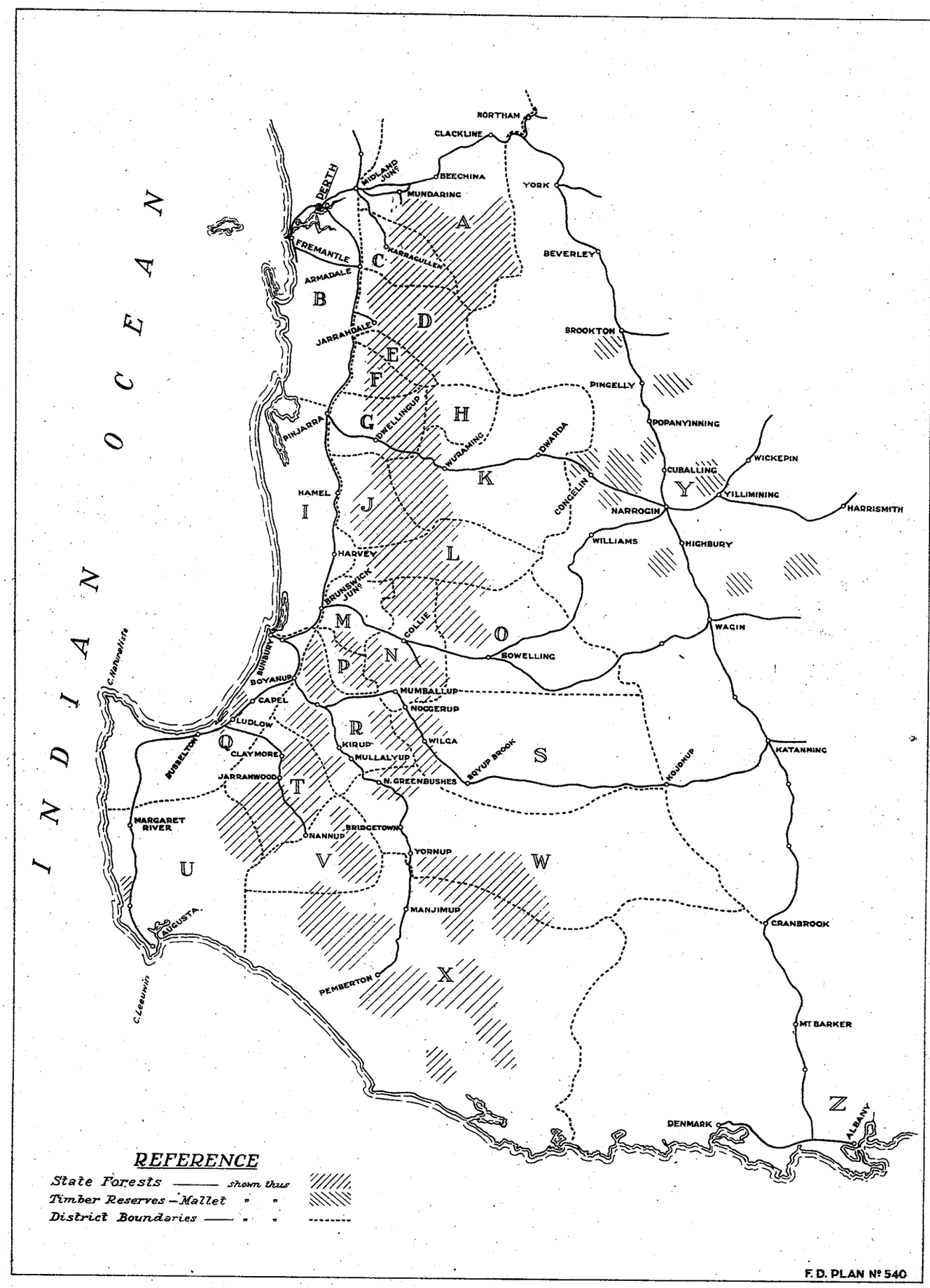
Brown Mallet (*Eucalyptus astringens*).

Blackboy (*Xanthorrhoea Preissii*).

## KEY TO DISTRICTS AND SUB-DISTRICTS.

| Division. | District or Sub-district. | |
|---|---|---|
| I. ... ... ... | Q | Busselton. |
| | U | Margaret River. |
| II. ... ... ... | A | Mundaring. |
| III. ... ... ... | G | Dwellingup. |
| | F | Huntly. |
| | K | Wuraming. |
| | H | Duncan's. |
| IV. ... ... ... | N | Collie. |
| | M | Worsley. |
| | O | Muja. |
| | P | Wellington. |
| V. ... ... ... | R | Kirup. |
| | S | Noggerup. |
| | W | Bridgetown. |
| | V | Nannup. |
| | T | Jarrahwood. |
| VI. ... ... ... | X | Manjimup. |
| VII. ... ... ... | Y | Narrogin and balance of Crown Lands in Agricultural Area. |
| VIII. ... ... ... | D | Jarrahdale. |
| | C | Karragullen. |
| | E | Solus. |
| IX. ... ... ... | B | Metropolitan. |
| | Z | Albany. |
| X. ... ... ... | J | Willowdale. |
| | I | Hamel. |
| | L | Mornington. |

(See map on opposite page.)



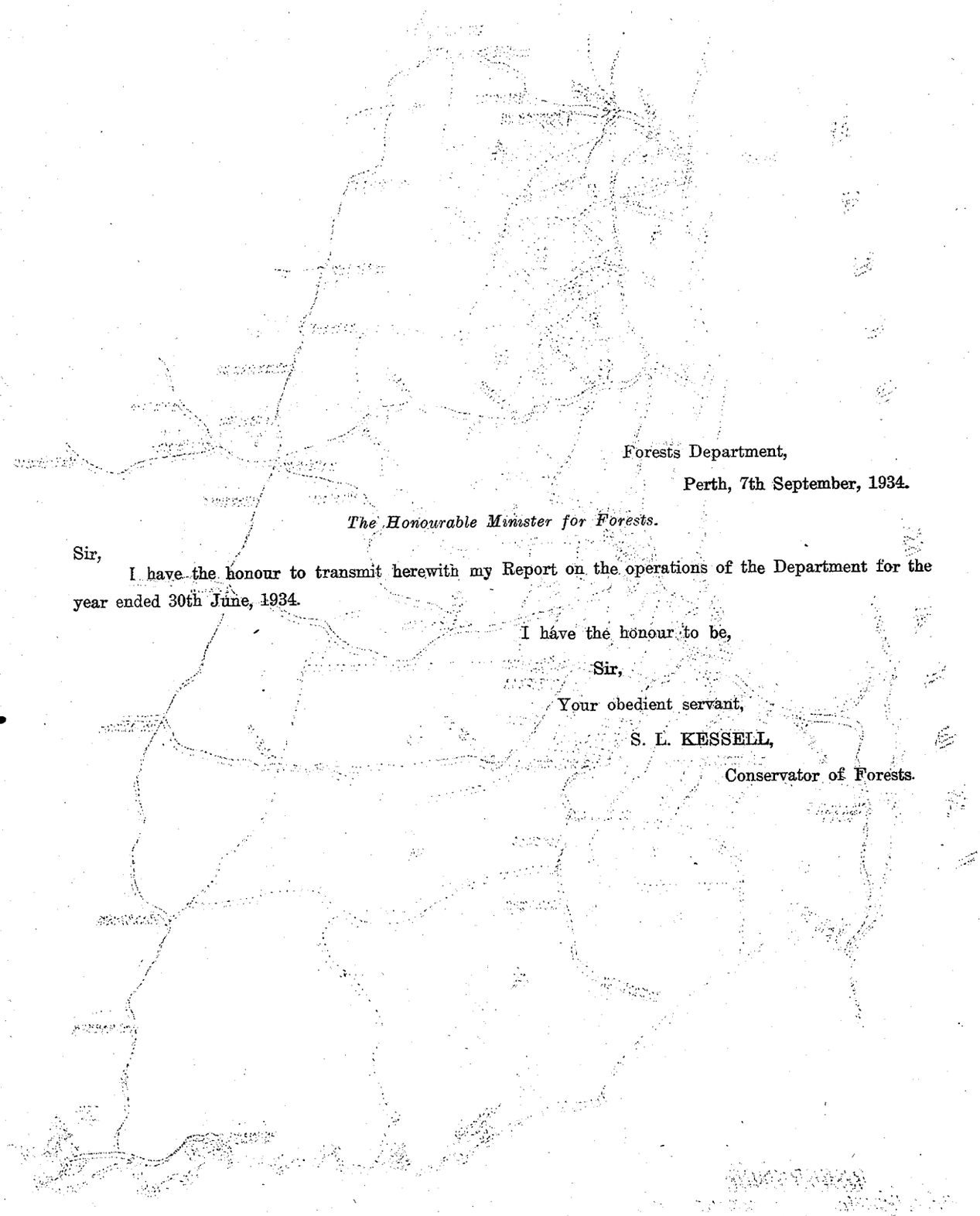

## REFERENCE

State Forests ——— shown thus

Timber Reserves – Mallet " "

District Boundaries —— " " ·····

F. D. PLAN Nº 540



Forests Department,

Perth, 7th September, 1934.

*The Honourable Minister for Forests.*

Sir,

I have the honour to transmit herewith my Report on the operations of the Department for the year ended 30th June, 1934.

I have the honour to be,

Sir,

Your obedient servant,

S. L. KESSELL,

Conservator of Forests.

# Annual Report on the Operations of the Forests Department for the Year ended 30th June, 1934.

## INTRODUCTORY REMARKS.

A very substantial improvement in the position of the timber industry has taken place during the year under review. The volume of milling timber produced has shown an increase of 37 per cent. over the previous year, and the production of hewn timber increased by 273 per cent. The increase in employment in both branches of the industry is greater than indicated by these figures, as monthly production figures have shown further increases towards the end of the financial year. This revival in the demand for Jarrah, particularly in the form of railway sleepers, from many parts of the world, directs attention again to the problem of future timber supplies. Practically the whole of the output of sawn timber is obtained from State Forests, and the life of several of the largest mills operating on virgin forest is less than ten years. Although a considerable volume of timber remains on certain areas of cut-over forest, the log supplies from this source will only be sufficient to support mills of much smaller size for limited periods, and there is a serious deficiency in trees nearing maturity in all the more accessible forest districts, owing to an extensive trade in poles, piles, and squared beams in past years. The remaining virgin forests which have not been tapped for sawmilling are few in number, poorer in quality, and at a considerably greater distance from port of shipment. During the past five years the cut of sawmill logs from all State Forests has been regulated by Working Plans which aim at a sustained yield of milling timber, and the additional information obtained during this period serves to emphasise the immediate practical importance of careful regulation of cut associated with a vigorous programme of reforestation and fire protection.

The outlook for the hewing industry is still more serious. It is evident that private property supplies are rapidly diminishing. In fulfilling large export orders during the years 1923 to 1929, over 85 per cent. of the hewn timber exported came from private property, while, at the present time, only 50 per cent. is derived from this source, and much of this timber is being obtained by working up odd trees remaining on properties which have been cut through several times during the past ten years. Following an assessment of the volume of hewing timber remaining on State Forests, timber reserves, and other Crown lands, an addendum to the General Working Plan for Jarrah, to regulate the output of hewn timber from these sources, was approved by the Governor in Council in November, 1933. This Working Plan aims to provide continuity of employment for 250 hewers for a term of five years, but in certain districts difficulty is being experienced already in finding suitable forest, and, if exploitation is continued at the present rate, within two years the question of sleeper supplies for local and Commonwealth Railways is likely to become a matter of serious concern. The seriousness of this position does not appear to be appreciated, even by those engaged in the industry, and the economy of selling sleepers of the present high standard to overseas countries at the low rates which are operating throughout the industry to-day is a matter deserving careful consideration.

As mentioned in previous reports, the retention of the term "royalty," to denote the sale value of standing timber in the open market, has done much to perpetuate the misconception that the royalty is an arbitrary tax on timber. In the sawmilling industry it is evident that sawmillers with plant lying idle and stocks deteriorating have suffered losses during the depression period, and, while it is questionable whether rebates of royalty have brought any considerable extra volume of business to the State, they may be held to be justified as a temporary measure to assist in the general rehabilitation of the industry. In the hewing industry the position is somewhat different, and there is reason to believe that competition between local suppliers for overseas business has played some part in bringing and holding prices at their present unreasonably low level. Prosperous conditions in the industry cannot be brought about by low stumpage values, and all associated with the business are entitled to look for a better return from this fast-diminishing export commodity. The present average royalty for hewn Jarrah sleepers

is considerably lower than the royalty on the recognised durable sleeper timbers in the Eastern States and is comparable only to the royalties charged in New South Wales on second class hardwoods which have been used to supply China and New Zealand contracts during recent years. The futility of suggesting that Jarrah should try to compete with these less durable hardwoods growing in proximity to harhour facilities on the East coast of Australia is indicated by the fact that sleepers are being delivered on wharves in certain New South Wales ports, after the payment of all charges, at a total cost which is below the bare cost of cutting and carting Jarrah sleepers to railway sidings.

Owing principally to assistance from Unemployment Relief Funds, the area of indigenous forest which has been treated for regeneration under various silvicultural systems has been increased by over 40,000 acres, and measures for the protection of this new crop from fire damage have been considerably extended. The area of cut-over Jarrah forest on which intensive natural regeneration operations were carried out last year amounted to 29,400 acres, and 9,680 acres treated for regeneration within the past ten years received a first thinning. In addition, some 5,190 acres of natural regrowth in the sapling stage were thinned and fire breaked. In the Karri forests a good seed year occurred and some 3,780 acres were restocked by natural regeneration from seed trees, and 428 acres were spot sown. The area of mallet artificially regenerated was increased by sowing an additional 1,430 acres, bringing the total area of plantations of this species up to 5,470 acres.

There is still a considerable area of Jarrah forest awaiting regeneration treatment before the leeway resulting from neglect of reforestation measures in pre-war years is overtaken. During the past five years 108,500 acres of Jarrah have been cut over for sawmilling, while regeneration operations have been carried out over 188,200 acres. In addition, very considerable developmental work in the construction of forest roads, telephone lines, lookouts, etc., has been undertaken during the same period, and the necessary organisation is now in existence to bring the whole of the better quality forests back into a reasonably productive state within the next few years, if sufficient funds can be made available.

The use of unskilled labour on a part-time basis, associated with the greater outlay necessary to carry out regeneration work on forests which have been afforded no protection from fire for a number of decades following logging operations, has greatly increased the cost of this work, and it must be realised that current forest revenue cannot be expected to carry full interest and sinking fund charges on this expenditure if a sufficient margin is to be retained in the Reforestation Fund for the necessary tending and protective work in future years. This is a matter in connection with which adjustments have been promised by the Treasury, and it is hoped that a reasonable basis will be agreed upon at an early date, so that future operations are not hampered by inroads being made upon the Reforestation Fund to meet claims of this nature. The matter is of particular importance to the Department at a time when the Government is asking for assistance in placing "B" class men in healthy and remunerative work in the forests, as it is inevitable that the volume of work to be expected from such men will be considerably below that which would be accomplished by skilled axemen on similar work.

Research and investigation work has been extended considerably on the silvicultural and forest protection side. Regeneration methods adopted in connection with the main indigenous forest species have been very successful in securing a full stocking of vigorous regrowth, but, as this develops, new problems, such as the correct tending and thinning practice for each forest type, to secure a maximum volume production of merchantable timber, are becoming of increasing importance, and detailed studies are being initiated.

To date our fire control measures have been remarkably successful, owing largely to the keenness and efficiency of all employees, who have taken a personal interest in the protection of the young forest which they see developing as a result of their own work. This is borne out by the figures, which show that the area of regenerated forest damaged by fire amounted to only 190 acres in 237,500 acres, and in pine plantations to 6 acres in 8,260 acres. With the very considerable extension of regenerated and planted areas, it is necessary that every effort be made to increase the efficiency of fire control measures, particularly in connection with the protection of young forests during the seedling and young sapling stage, when even the lightest of ground fires may cause serious damage. A Fire Hazard Research Station has been established with a view to obtaining more definite information concerning factors affecting the intensity of fires and the forecasting of bad fire weather, and an extensive trial is being made of the economy and efficiency of specially-trained fire-fighting gangs equipped with motor transport and using water rather than direct beating or counter-firing.

During the 1933 planting season 1,490 acres of pines were planted. Although, as a whole, the plantations are showing very satisfactory growth and, in some instances, phenomenally rapid development has been recorded, the results on certain soil types have been disappointing. With the object of obtaining reliable data as a guide to future practice, soil surveys have been made according to the whole soil profile associated with mechanical and chemical analyses of a number of samples. Intensive work on these lines has been carried out over large areas of established plantation at Mundaring, Harvey Weir, Pardelup and Myalup, to a degree usually applied in soil surveys of irrigation settlements. The methods adopted conform closely to those employed by the Soils Division of the Commonwealth Council for Scientific and Industrial Research. The work has shown a great variation in soil types within small areas and has indicated that the land available for pine planting in this State is, with few exceptions, very low in recognised plant nutrients. Although, in most instances, the correlation of growth with soil type has been possible, a number of years must elapse before the suitability of Pinus radiata for a particular site under plantation conditions can be established, and until more definite information is forthcoming on a number of points which at present are obscure, a reduced pine planting programme is proposed.

## CHAPTER I.

### THE FOREST AREA.

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

No new State Forests were dedicated during the year but State Forests already dedicated were amended by the addition of 733 acres and by the excision, with the approval of Parliament, of 2,696 acres for land settlement. The total area of State Forests, therefore, shows a decrease of 1,963 acres compared with the area as at 30-6-1933.

| —— | June, 1933. | June, 1934. | Increase or Decrease. |
|---|---|---|---|
| | acres. | acres. | acres. |
| Jarrah ... ... ... ... ... ... ... ... | 2,537,838 | 2,535,587 | — 2,251 |
| Karri ... ... ... ... ... ... ... ... | 151,814 | 151,794 | — 20 |
| Jarrah and Karri (Mixed) ... ... ... ... | 368,655 | 368,936 | + 281 |
| Tuart ... ... ... ... ... ... ... ... | 5,932 | 5,939 | + 7 |
| Tingle Tingle ... ... ... ... ... ... ... | 10,774 | 10,774 | ... |
| Karri and Tingle (Mixed) ... ... ... ... ... | 13,875 | 13,895 | + 20 |
| Sandalwood ... ... ... ... ... ... ... | 1,930 | 1,930 | ... |
| Pine Planting ... ... ... ... ... ... ... | 4,842 | 4,842 | ... |
| Total ... ... ... | 3,095,660 | 3,093,697 | — 1,963 |

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

During the year ten additional reserves were declared resulting in the increase of area as shown in the following table:—

| —— | June, 1933: | June, 1934. | Increase or Decrease. |
|---|---|---|---|
| | acres. | acres. | acres. |
| Jarrah ... ... ... ... ... ... ... | 35,916 | 36,956 | + 1,040 |
| Other species— | | | |
| Sandalwood ... ... ... ... ... ... | 27,105 | 27,105 | ... |
| Pine Planting ... ... ... ... ... ... | 5,521 | 5,521 | ... |
| Mallet ... ... ... ... ... ... ... | ... | 677 | + 677 |
| Mining Timber, Firewood, etc. ... ... | 1,361,431 | 1,361,822 | + 391 |
| Total ... ... | 1,429,973 | 1,432,081 | + 2,108 |

## CHAPTER II.

### REVENUE.

The Revenue of the Department amounted to £89,895, compared with £65,875 for the previous year, an increase of £24,020.

The rebate of 20 per cent. on log royalty approved by Cabinet in 1931 was continued, the amount involved being £9,710. Rebates on inspection fees of 50 per cent. on hewn sleepers from private property, 25 per cent. on hewn sleepers from Crown Lands, and 25 per cent. on sawn timber were also allowed throughout the year and amounted to £2,232.

Log royalty amounted to £52,468, representing an increase of approximately 38 per cent. on the receipts from this source during the year 1932-33. Inspection fees increased from £2,292 to £4,325, and Sandalwood revenue showed a slight increase. Renewed activity in the export trade was mainly responsible for the increase in hewn timber royalty from £1,424 to £8,066.

PRINCIPAL SOURCES OF REVENUE FOR THE PAST TWO YEARS.

| Year. | Royalties. | | Inspection Fees. | Sandal-wood. | Firewood and Fence Posts. | Miscel-laneous. | Total. |
|---|---|---|---|---|---|---|---|
| | Logs for Sawmilling. | Hewn Timber. | | | | | |
| | £ | £ | £ | £ | £ | £ | £ |
| 1932–33 ... ... | 38,103 | 1,424 | 2,292 | 13,576 | 3,178 | 7,302 | 65,875 |
| 1933–34 ... ... | 52,468 | 8,066 | 4,325 | 13,918 | 2,319 | 8,799 | 89,895 |

## TIMBER PRODUCTION.

PRODUCTION OF TIMBER FOR YEAR ENDED 30TH JUNE, 1934 (EXCLUSIVE OF MINING TIMBER, FIREWOOD AND PILES AND POLES).

| No. of Division. | — | Mill Logs. | | | | | Hewn Timber. | | | | Grand Total. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Jarrah. | Karri. | Other. | Total. | | Jarrah. | Wandoo. | Total. | | | |
| | | | | | In Log. | Recovery of Sawn Timber. | In Square. | In Square. | In Log. | In Square. | In Log. | In Square. |
| | | cub. ft. | cub. ft. | cub. ft. | cub. ft. | cub. ft. | cub. ft. | cub. ft. | cub. ft. | cub. ft. | cub. ft. | cub. ft. |
| 1 | Crown Lands ... | 383,591 | 3,323 | 2,640 | 389,554 | 136,078 | 94,698 | ... | 473,490 | 94,698 | 863,044 | 230,776 |
| | Private Property | 54,496 | ... | 129,843 | 184,339 | 64,519 | 120,445 | ... | 602,225 | 120,445 | 786,564 | 184,964 |
| 2 | Crown Lands ... | 17,932 | ... | 753 | 18,685 | 6,540 | 8,733 | ... | 43,665 | 8,733 | 62,350 | 15,273 |
| | Private Property | 21,000 | ... | ... | 21,000 | 7,350 | 5,727 | 55 | 28,910 | 5,782 | 49,910 | 13,132 |
| 3 | Crown Lands ... | 3,872,524 | ... | 233 | 3,872,757 | 1,355,465 | 76,246 | ... | 381,230 | 76,246 | 4,253,987 | 1,431,711 |
| | Private Property | ... | ... | ... | ... | ... | 40,667 | 11,214 | 259,405 | 51,881 | 259,405 | 51,881 |
| 4 | Crown Lands ... | 1,031,860 | ... | 22,652 | 1,054,512 | 369,079 | 192,267 | ... | 961,335 | 192,267 | 2,015,847 | 561,346 |
| | Private Property | 693,857 | ... | 2,938 | 696,795 | 243,878 | 119,661 | 1,026 | 603,435 | 120,687 | 1,300,230 | 364,565 |
| 5 | Crown Lands ... | 870,071 | ... | 588 | 870,659 | 304,731 | 299,120 | ... | 1,495,600 | 299,120 | 2,366,259 | 603,851 |
| | Private Property | 85,468 | ... | 27,816 | 113,284 | 39,649 | 314,816 | 5,494 | 1,601,550 | 320,310 | 1,714,834 | 359,959 |
| 6 | Crown Lands ... | 1,820,787 | 4,097,356 | ... | 5,918,143 | 1,743,561 | 17,943 | ... | 89,715 | 17,943 | 6,007,858 | 1,761,504 |
| | Private Property | 629 | 108,095 | ... | 108,724 | 29,406 | 164,497 | ... | 822,485 | 164,497 | 931,209 | 193,903 |
| 7 | Crown Lands ... | ... | ... | 318 | 318 | 111 | ... | 15,366 | 76,830 | 15,366 | 77,148 | 15,477 |
| | Private Property | ... | ... | ... | ... | ... | 10,630 | 23,271 | 169,505 | 33,901 | 169,505 | 33,901 |
| 8 | Crown Lands ... | 943,244 | ... | 4,591 | 947,835 | 331,742 | 88,670 | ... | 443,350 | 88,670 | 1,391,185 | 420,412 |
| | Private Property | ... | ... | ... | ... | ... | 20,842 | ... | 104,210 | 20,842 | 104,210 | 20,842 |
| 9 | Crown Lands ... | 28,171 | 938 | 873 | 29,982 | 10,418 | 3,766 | ... | 18,830 | 3,766 | 48,812 | 14,184 |
| | Private Property | 134,770 | 3,756 | 14,249 | 152,775 | 53,171 | 33,363 | 31,793 | 325,780 | 65,156 | 478,555 | 118,327 |
| 10 | Crown Lands ... | 3,376,930 | ... | 25,920 | 3,402,850 | 1,190,997 | 154,758 | ... | 773,790 | 154,758 | 4,176,640 | 1,345,755 |
| | Private Property | 4,375 | ... | ... | 4,375 | 1,531 | 106,319 | ... | 531,595 | 106,319 | 535,970 | 107,850 |
| Totals | Crown Lands ... | 12,345,110 | 4,101,617 | 58,568 | 16,505,295 | 5,448,722 | 936,201 | 15,366 | 4,757,835 | 951,567 | 21,263,130 | 6,400,289 |
| | Private Property | 994,595 | 111,851 | 174,846 | 1,281,292 | 439,504 | 936,967 | 72,853 | 5,049,100 | 1,009,820 | 6,330,392 | 1,449,324 |
| Grand Totals ... ... | | 13,339,705 | 4,213,468 | *233,414 | 17,786,587 | 5,888,226 | 1,873,168 | 88,219 | 9,806,935 | 1,961,387 | 27,593,522 | 7,849,613 |

* Includes 123,055 cub. ft. Tuart; 33,618 cub. ft. Pine; 28,438 cub. ft. Wandoo; 24,908 cub. ft. Sheoak; 21,664 cub. ft. Blackbutt; 1,498 cub. ft. Marri; and 233 cub. ft. Bullich.

(Factors for conversion of round to squared: Sawn Karri, 27 per cent.; Other Sawn 35 per cent.; Hewn, 20 per cent.)

## SAWMILLING AND HEWING.

The total sawn and hewn timber cut from Crown lands and private property during the year amounted to 7,849,000 cubic feet, which is estimated to have a value of £1,014,000. Compared with the operations for the previous year the volume of timber produced showed an increase of 63 per cent.

The quantity of log timber necessary to produce the sawn and hewn timber referred to above was approximately 27,593,000 cubic feet.

The respective quantities of sawn and hewn timber obtained from Crown lands and private property for the past two years are set out 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 including sleepers. | Hewn timber. | |
| | cub. ft. | cub. ft. | cub. ft. | cub. ft. | cub. ft. | £ |
| 1932–33 ... ... | 3,884,460 | 136,779 | 195,320 | 270,449 | 330,370 | 578,000 |
| 1933–34 ... ... | 5,178,582 | 270,140 | 951,567 | 439,504 | 1,009,820 | 1,014,000 |

For some years past the hewn timber has been obtained principally from privately owned land, but it will be seen from the statement above that the quantity of hewn timber obtained from Crown land during the past year, viz., 952,000 cubic feet, is almost equal to the quantity from private property. From the past year's operations it is evident that supplies of timber on private property are becoming depleted, and contractors are looking more towards Crown lands for hewn sleepers. In view of this, steps have been taken by the Department to make it clear that the quantity of timber suitable for hewing into the class of sleepers required to-day is limited if proper regard is to be paid to the permanence of the sawmilling industry and supplies of timber for our own requirements.

The position with regard to land under the control of the Department was carefully examined and a definite plan of management formulated so that all interested in the hewing industry may know where they stand before becoming involved in big commitments for overseas or local supplies. In March, 1929, a General Working Plan for the jarrah forests of the State was approved by the Governor in Council, but as this dealt only with the regulation of the cut of sawmill logs it was necessary to prepare an addendum to bring hewing operations under the scope of this Working Plan for the balance of the period, which expires in March, 1939. This addendum, which received the approval of the Governor in Council in November last, provides for a maximum output of 1,000,000 cubic feet of hewn Jarrah sleepers per annum from State Forests, Timber Reserves, and other Crown lands under the control of the Department, and sets out the various districts from which supplies are to be drawn. Consideration has been given to the possibility of making timber available for hewing in districts in which hewers have established their homes, but it must be recognised that in many of the old established milling and hewing centres supplies of mature timber are practically exhausted, and it will be necessary in future to go further afield for supplies.

A number of overseas sleeper orders were obtained during the year, and these, together with Commonwealth and local orders, have given employment to between 700 and 800 hewers, and it is anticipated that orders at present in hand will keep these hewers employed until well into the next year.

Increased activity has also been shown in the sawmilling industry, and during the past year a number of large mills which had been closed for a considerable time were reopened. There are now 26 mills operating on Crown lands exclusive of fruit case mills.

In order to assist in the re-establishment of the sawmilling industry, the Government recently decided to allow a further rebate of 5s. per load in the square on all sawn timber from Crown lands exported to countries beyond Australia during a period of twelve months commencing from the 1st July, 1934.

TIMBER EXPORTS.

During the year under review, 4,061,000 cubic feet of timber valued at £487,248, together with wood manufactures to the value of £76,107, were exported from the State. The value of the timber and wood manufactures exported for the year shows an increase on the previous year's operations of £220,400. The railway sleeper trade is largely responsible for this increase, and shows an improvement of £154,000 on the figures for the previous year.

The principal buyers of our timber were again the Eastern States of Australia, who purchased timber to the value of £182,290; United Kingdom £74,522; South African Union £60,770; Ceylon £55,564; Persia £29,217; Hong Kong £27,847; Portuguese East Africa £23,637; and New Zealand £12,163.

Full details of the timber exported and the countries of destination are given in Appendix 2A.

TIMBER IMPORTS.

The value of timber (including wood manufactures) imported during the year amounted to £183,944. From an examination of the detailed statement of imports which appears as Appendix 2B to this report, it will be seen that the value of wood manufactures totals £128,953, or 70 per cent. of the total timber imports. Timber to the value of £120,945 is listed as having been of Eastern States origin, and is made up principally of wood manufactures which include barrels and casks, £47,750; plywood and veneers, £19,782; furniture, £11,596; axe and other tool handles, £7,118; and other wood manufactures, £22,924. The value of dressed and undressed timber imported was only £54,991, of which 42 per cent. was for timber stated to be of Eastern States origin; 18 per cent. from the United States of America; 18 per cent. from Canada; 9 per cent. from Sweden; and 6 per cent. from New Zealand.

## TIMBER INSPECTION.

With the increased cutting of sleepers for overseas orders, there has been a considerable increase in the volume of timber submitted to the Department for inspection. The quantity of sawn and hewn timber inspected for the year totalled 2,818,390 cubic feet, which represents an increase of 172 per cent. on this branch of the previous year's work.

Piles and poles totalling 84,761 lineal feet were also inspected.

In order to deal with the increased volume of timber inspection, it was found necessary to increase the number of officers engaged on this branch of the work.

The revenue received from timber inspection fees amounted to £4,325.

## SANDALWOOD.

Considerable improvement has been shown in the position of the sandalwood industry since the introduction, in July, 1932, of single unit control over the export of all sandalwood from Western Australia and South Australia. Excess stocks of West Australian wood, which two years ago amounted to approximately 7,000 tons, have now been reduced to 3,500 tons, and, in addition to the liquidation of stocks, it has been possible to place orders regularly for new wood. Under the agreement with South Australia, the export of sandalwood from the two States is regulated by actual sales in China, and of the total quantity shipped, two-thirds is from this State, one-half of which goes in reduction of accumulated stocks and one-half is placed for new pulling.

Although the total exports during the last four or five years have been much lower than in the years immediately following the war, this is believed to be attributable to loss of purchasing power of the masses in the interior of China following civil wars, abnormal floods and the fall in the value of export commodities.

The practice followed during previous years of submitting all applications for sandalwood orders to an advisory board, on which the prospectors and sandalwood getters are represented, has been continued. Two hundred and eighteen orders for 1,420 tons of export wood were placed during the year on the Goldfields areas, and thirteen orders for 125 tons of sandalwood for distillation were issued in the Carnarvon and North-West districts. Assistance was also given to the holders of a number of Conditional Purchase Leases, on which the sandalwood had been reserved to the Crown, by placing orders with them for sandalwood pulled during the process of clearing operations.

The quantity of sandalwood supplied from all sources during the year ended 30th June, 1934, is set out in the following table:—

| Locality. | Distillers. | Export. |
|---|---|---|
| | tons. | tons. |
| From Crown Lands, South of 26th Parallel ... ... ... ... | 272 | 996 |
| From Crown Lands, North of 26th Parallel ... ... ... ... | 39 | ... |
| From Private Property ... ... | ... | 74 |
| Totals ... ... ... | 311 | 1,070 |

The Department was asked to inspect and assess the value of 384 tons of the wood supplied, which was considered to be below fair average quality, and reductions in the price to be paid for this wood, ranging from 2s. 6d. to 90s. per ton, were authorised. After taking these reductions into account, the average price paid to the getter for sandalwood logs was £15 12s. 10d. per ton f.o.r. Fremantle.

### *Sandalwood from Private Property.*

The quantity of sandalwood to be obtained from private property is limited under the "Sandalwood Act, 1929," to 10 per cent. of the total quantity to be pulled annually for export. During the year twenty-nine licenses were issued for the pulling and removal of 112 tons of wood.

### *Sandalwood for Oil Distillation.*

Owing to the general trade depression and the accumulation of large stocks, the distillation works were closed for the greater part of the year and only 311 tons of sandalwood were purchased for distillation purposes.

*Sandalwood Exports.*

Two thousand five hundred and eight tons of sandalwood, valued at £75,424, were exported during the year.

The quantity of sandalwood oil exported amounted to 17,700 lbs., being 2,500 lbs. less than for the previous year.

## OTHER FOREST PRODUCE.

*Mining Timber and Firewood.*

The system of control for mining timber and firewood cutting operations, introduced during the previous year throughout the Eastern, Central and Murchison Goldfields, has been extended.

The present activities in the gold mining industry have resulted in an increased demand for mining timber and firewood and, as supplies are obtained almost exclusively from pastoral areas, action to protect the interests of pastoral lessees has been necessary. Areas of timber have been excluded from cutters' operations and reserved for pastoral requirements, and the cutting of timber within 20 chains of all wells, windmills, waterholes, rivers, homesteads and shearing sheds has been prohibited. The mining companies have rendered every assistance to the Department in its effort to control the cutting and maintain regular supplies.

The quantity of mining timber and firewood consumed during the year on the Goldfields amounted to 12,900 tons and 390,000 tons respectively.

*Mallet Bark.*

Mallet bark obtained during the year from Crown lands and private property totalled 3,154 tons. This quantity is 1,220 tons less than for the previous year. Two thousand and ninety-five tons of bark valued at £20,900 were exported. Of this quantity 1,355 tons went to the Eastern States of Australia, 528 tons to the Netherlands, 160 tons to Germany and 52 tons to Belgium.

*Piles and Poles.*

With a view to utilising a number of piles from country that was being cleared at East Kirup for pine planting and from country along Bussell's Brook that is to be made available for settlement, the Department arranged with the Public Works Department to supply 1,040 piles for the Esperance Jetty and Bunbury Harbour Extension Works. Six hundred and twenty-five of these were obtained from the localities referred to above and the balance are now being cut in the Manjimup district. Although a large number of poles are still being obtained annually from private property, the supply of long length piles from this source appears to be very limited, and contractors are now looking to Crown lands for their requirements, and even here good piles of 50 feet and over are becoming increasingly difficult to obtain.

Piles and poles amounting to approximately 210,300 lineal feet were reported to the Department as having been obtained during the year.

FOREST PRODUCE NOT ELSEWHERE INCLUDED IN PRODUCTION TABLES OBTAINED DURING YEAR ENDED 30TH JUNE, 1934, 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 ... ... ... tons | ... | ... | ... | 957 | ... | ... | ... | ... | ... | ... | 12,898 | 13,855 tons |
| Sleepers for Goldfields Wood Lines ... ... ... cubic ft. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 20,528 | 20,528 c. ft. |
| Firewood including Charcoal ... tons | 251 | 17,152 | 1,026 | 69 | 480 | ... | 177 | 28,993 | 5,580 | 221 | 132,335 | 186,284 tons |
| Mining Firewood ... ... ,, | ... | ... | ... | ... | 705 | ... | ... | ... | ... | ... | 258,050 | 258,755 tons |
| Piles and Poles * ... ... lin. ft. | 3,461 | 4,465 | 23,937 | 49,833 | 55,618 | 5,944 | 8,522 | 12,232 | 26,181 | 20,114 | ... | 210,307 lin. ft. |
| Fencing Posts and Rails ... No. | 960 | ... | ... | 800 | 3,166 | ... | 1,468 | 11 | 260 | 122 | ... | 6,787 No. |
| Blackboy ... ... ... ... tons | ... | ... | ... | ... | ... | ... | ... | ... | 225 | ... | ... | 225 tons |
| Mallet Bark * ... ... ... ,, | ... | ... | ... | ... | ... | ... | 3,154 | ... | ... | ... | ... | 3,154 tons |
| Wandoo Bark ... ... ... ,, | ... | ... | ... | ... | ... | ... | 273 | ... | ... | ... | ... | 273 tons |
| Marri Kino... ... ... ... ,, | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... | 4 tons |

* From Crown lands and 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 sixty-one breaches of the Forests Act and Regulations were reported, of which fifty concerned the illegal cutting of timber and eleven the illegal stripping of mallet bark. In fourteen cases proceedings were taken against the offenders and fines amounting to £120 with costs and damages totalling £78 were imposed. The remainder of the offences were of a minor nature and apart from the collection of royalties, license fees or damages, or the disposal of the forest produce illegally cut, no further action was taken. Royalties, etc., recovered in this way amounted to £384.

Approximately 18 tons of sandalwood, valued at £485, were confiscated for various breaches of the regulations, and after making compassionate payments to the pullers to cover costs incurred by them in respect of this wood and payment of freight and cartage, the Department received £351 from the sale of this sandalwood.

## CHAPTER III.

(1)—EXPENDITURE.

Owing to the necessity to appoint additional Timber Inspectors administration costs charged to Consolidated Revenue Fund increased from £12,835 to £14,742.

An amount of £141,602 was made available to the Department from General Loan Fund for unemployment relief, and throughout the year an average of approximately 1,000 men were engaged upon reproductive work.

Three-fifths of the net revenue of the Department, exclusive of Sandalwood, produced £26,521 during the financial year, and that amount was credited to the Reforestation Fund in accordance with Section 41 of "The Forests Act, 1918."

The following statement shows the position of the Reforestation Fund at the close of the year 1933-4:—

| | £ | £ |
|---|---|---|
| Revenue for year 1933–34 ... ... ... ... ... ... ... ... | | 89,895 |
| Less Sandalwood ... ... ... ... ... ... ... ... ... | | 13,918 |
| | | 75,977 |
| Consolidated Revenue Fund Expenditure ... ... ... ... ... | 14,742 | |
| Less Expenditure adjustments ... ... ... ... ... ... | 813 | |
| | 13,929 | |
| Interest on Loans ... ... ... ... ... ... ... ... | 16,097 | |
| Sinking Fund ... ... ... ... ... ... ... ... | 778 | |
| Special Acts ... ... ... ... ... ... ... ... | 837 | |
| Audit Fee ... ... ... ... ... ... ... ... | 113 | |
| | | 31,754 |
| Net Revenue ... ... ... ... | | £44,223 |
| Reforestation Fund— | | |
| Balance at 30th June, 1933 ... ... ... ... ... ... ... | | 12,320 |
| Three-fifths Revenue transferred ... ... ... ... ... | 26,521 | |
| Adjustment, 1932–33 ... ... ... ... ... ... | 65 | |
| Direct Credits ... ... ... ... ... ... ... | 3,378 | |
| | | 29,964 |
| | | 42,284 |
| Less Expenditure, 1933–34 ... ... ... ... ... ... | | 14,209 |
| Balance available ... ... ... ... ... ... | | £28,075 |

## (2.) REFORESTATION OPERATIONS.

### (A) FOREST MANAGEMENT.

SUMMARY OF WORK CARRIED OUT DURING YEAR.

| Division and District. | Topographical Survey. | Assessment Survey. | Roads and Tracks Cleared. | Telephone Lines Constructed. | Houses Built. |
|---|---|---|---|---|---|
| | miles. | acres. | miles. | Miles. | |
| DIVISION 1— | | | | | |
| Busselton ... | ... | ... | ... | ... | ... |
| Margaret River | ... | ... | ... | ... | ... |
| DIVISION 2— | | | | | |
| Mundaring ... | 133 | 2,000 | 6 | 5 | ... |
| DIVISION 3— | | | | | |
| Dwellingup | 79 | 500 | 46 | 2 | ... |
| Wuraming ... | 205 | 2,100 | 24¾ | ... | ... |
| Huntly ... | 63 | 800 | 23 | ... | ... |
| Duncans ... | 51 | 1,200 | 24 | ... | ... |
| DIVISION 4— | | | | | |
| Collie ... | 191 | ... | 19¼ | 4 | ... |
| Muja ... | ... | ... | ... | ... | ... |
| Worsley ... | 99 | ... | ... | ¾ | ... |
| Wellington | ... | ... | 10¼ | 4 | ... |
| DIVISION 5— | | | | | |
| Kirup ... | 43 | ... | 4¼ | ... | ... |
| Noggerup ... | ... | ... | ... | ... | ... |
| Bridgetown | 6 | ... | 4¼ | ... | ... |
| Jarrahwood | ... | ... | ... | ... | ... |
| Nannup ... | 14 | ... | 18¼ | ... | ... |
| DIVISION 6— | | | | | |
| Manjimup | 220 | 6,220 | 39 | ... | 1 |
| DIVISION 7— | | | | | |
| Narrogin ... | ... | ... | ... | 24 | ... |
| DIVISION 8— | | | | | |
| Jarrahdale ... | 233 | ... | 69 | 17¼ | 1 |
| Karragullen | 280 | 500 | 41 | ... | ... |
| Solus ... | 53 | ... | 3¼ | 11 | ... |
| DIVISION 9— | | | | | |
| Metropolitan | ... | ... | ... | ... | ... |
| Albany | ... | 1,600 | ... | ... | ... |
| DIVISION 10— | | | | | |
| Hamel ... | ... | 850 | ... | 1½ | ... |
| Willowdale | 425 | 880 | 37½ | 12½ | 4 |
| Mornington | 102 | 3,100 | 14½ | ... | ... |
| Totals ... | 2,197 | 19,750 | 384 | 81¾ | 6 |

### FOREST SURVEYS.

The number of survey camps was reduced during the year from 12 to 7. These camps were engaged on topographical survey, the location and survey of Compartment boundaries, and firelines, the type mapping of adjacent country, and the establishment of base lines through Compartments. In addition, attention was paid to the determination and location of high points suitable for fire lookout stations. In all 2,197 miles of traverse lines were surveyed by compass and chaining.

### ASSESSMENT SURVEY.

A classification of timber types was carried out over 6,220 acres in the Manjimup District.

Detailed assessments to determine the suitability of soils for forest settlements and for pine plantations and preliminary work in connection with stocktaking for a regional survey of the Jarrah forest were conducted over 13,530 acres.

Prior to the commencement of regeneration operations the customary type mapping was carried out by Divisional staffs. This, however, is not recorded in above tabular statement.

PERMANENT ESTABLISHMENTS.

Five houses were erected and one house purchased during the year. Four of these were built at the Willowdale Forest Settlement. One new house was erected in the Jarrahdale District and one purchased in the Manjimup District. A 30ft. fire tower was erected on Mt. Solus in the Jarrahdale District.

By the opening up of old tramlines and whim tracks on the boundaries of and intersecting compartments, the road and track system, vitally necessary in the fire season, was extended by an additional 384 miles.

With the extension of silvicultural work and the fire-control organisation, especially in Divisions 8 and 10, it became necessary to connect up new centres of operations by telephone. An earth circuit tree-line system is adopted, and this was increased by 81¾ miles.

## (B) SILVICULTURE.

(a) *Jarrah.*

SUMMARY OF OPERATIONS FOR THE YEAR.

| Division and District. | Top Disposal. | Treated for Regeneration. | Thinning. | Improvement Work. | Tree-marking. | |
|---|---|---|---|---|---|---|
| | | | | | Sawmilling. | Hewing. |
| DIVISION 2— | acres. | acres. | acres. | acres. | acres. | acres. |
| Mundaring ... ... ... | 150 | 587 | 278 | 30 | ... | ... |
| DIVISION 3— | | | | | | |
| Dwellingup ... ... ... | 1,297 | 3,081 | 891 | ... | 841 | 3,243 |
| Wuraming ... ... ... | 1,270 | 957 | 1,306 | ... | 2,048 | ... |
| Huntly ... ... ... ... | 442 | 780 | 451 | ... | 523 | ... |
| Duncan's ... ... ... | 3,439 | 2,650 | 876 | ... | 1,750 | ... |
| DIVISION 4— | | | | | | |
| Collie ... ... ... ... | 471 | 2,658 | 1,958 | ... | 449 | 4,459 |
| Worsley ... ... ... ... | ... | 1,109 | 75 | ... | ... | 484 |
| Wellington ... ... ... | 693 | 1,002 | 244 | ... | 2,267 | 1,514 |
| DIVISION 5— | | | | | | |
| Kirup ... ... ... ... | ... | 4,488 | 777 | 100 | 2,298 | ... |
| Noggerup ... ... ... | ... | 487 | 290 | 197 | ... | 561 |
| Bridgetown ... ... ... | ... | ... | 791 | ... | ... | 923 |
| Nannup ... ... ... ... | ... | 2,884 | ... | ... | ... | ... |
| DIVISION 6— | | | | | | |
| Manjimup ... ... ... | 2,495 | 575 | 170 | ... | ... | ... |
| DIVISION 8— | | | | | | |
| Jarrahdale ... ... ... | ... | 2,582 | ... | ... | 900 | ... |
| Karragullen ... ... ... | 11,000 | 2,369 | 1,900 | ... | 3,560 | 10,000 |
| Solus ... ... ... ... | ... | ... | 2,383 | ... | ... | ... |
| DIVISION 10— | | | | | | |
| Willowdale ... ... ... | 1,262 | 1,936 | 1,416 | ... | 465 | 1,547 |
| Mornington ... ... ... | ... | 1,266 | 1,064 | ... | 425 | 1,902 |
| Totals ... ... | 22,519 | 29,411 | 14,870 | 327 | 15,526 | 24,633 |

Although during the past year increased production in the timber trade led to a much larger area being cut over for mill logs than in any year since 1930-31, the provisions of the general Working Plan laid down in 1929 are being adhered to, and the area of forest brought under intensive management since that date exceeds that over which sawmilling operations have taken place. The additional area of Jarrah and Karri forest given silvicultural treatment during 1933-34 was 25,129 acres, while the area cut over for sawmilling was 22,555 acres. Comparative figures since 1929 are as follows:—

Cut over for sawmilling, 1929-34—108,480 acres.
Treated for regeneration, 1929-34—188,166 acres.

In this manner the leeway caused by uncontrolled exploitation and absence of reforestation measures of past years is gradually being reduced.

The area of Jarrah forest treated for regeneration to restock cut-over bush carrying malformed regrowth and useless trees was 29,411 acres, being 1,500 acres less than the previous year. On the other hand, the area over which thinning of regrowth resulting from the silvicultural treatment of past years was carried out increased from 6,637 acres to 9,681 acres, and a corresponding increase is to be expected yearly as the vigorously growing young crop needs attention. The total area thinned, both in sapling stands of the above class and in stands of natural regrowth not given any previous treatment other than top disposal, was 14,870 acres.

The continuance of reforestation operations on this scale has been possible owing to the use of unemployment relief workers. The number of these employees throughout the year averaged approximately 1,000 men, many of whom had had no previous experience in forest work. Under the direction and supervision of trained overseers, the great majority quickly settled down and were able to carry out their allotted tasks with reasonable efficiency.

The revival in the timber industry is reflected in the figures relating to areas on which trees were marked for sawmilling and hewing, and the disposal of tops after logging has taken place. The figures for 1932-33 and 1933-34 are:—

| | 1932–33. | 1933–34. |
|---|---|---|
| | acres. | acres. |
| Tree-marking for Sawmilling ... | 13,055 | 15,526 |
| Tree-marking for Hewing ... ... | 316 | 24,633 |
| Top Disposal ... ... ... | 8,842 | 22,519 |

The areas cut over by certain mills working under minimum girth restrictions, and numerous sleeper hewers operating on land listed for alienation, are not included in the above totals.

(b) *Karri.*

Operations in the Karri forest in the Manjimup District were very greatly extended during the past year.

Immediately following the trade cutting of certain areas a seed year occurred and as these only occur at intervals of three or four years, advantage was taken of this fact to establish two new centres at Treen Brook and Lefroy Brook, bringing the total number of centres where reforestation work is in progress in the district to five.

The area treated for regeneration during the year was 3,778 acres. An additional 428 acres, carrying insufficient seed trees for natural regeneration, was spot sown with Karri seed. The area of Karri forest which has been regenerated and placed under fire control since 1927 amounts to 12,479 acres.

(c) *Mallet.*

The reforestation of mallet on the unproductive areas of poor soil in the Narrogin area was increased by the sowing of a further 1,429 acres, bringing the total area now sown to 5,407 acres.

Clearing, preparatory to sowing, was extended over 2,253 acres. A further 105 acres of young stands were thinned, 50 acres of this being an experimental thinning of regrowth resulting from the 1927 sowing at Lol Gray. Nine hundred and fifty-four acres in all have now been thinned.

Two hundred and seventy-eight lbs. of mallet seed were collected during the year.

(d) *Sandalwood.*

No sowing was done during the year on the sandalwood plots in the Eastern Goldfields. The information available from results of past sowings does not warrant any further action in this direction for the present.

The past season was particularly dry and an exceptionally hot summer was experienced. This was responsible for many deaths among the young plants. It is noted that young plants are suffering in height growth from the effects of the past four dry seasons. Seasons such as these, however, are the cause of high mortality among rabbits, thus lessening to a great extent the serious damage which these pests do among the seedlings.

Experimental sowings of this species are now being undertaken in the South-West, where there is an abundance of woody undergrowth of the same genera as the host plants of the drier interior.

**(C).—FIRE CONTROL.**

| District. | Area under Fire Control. | Area afforded Complete Protection. | | | | | |
|---|---|---|---|---|---|---|---|
| | | Indigenous Forest. | | | Pine Plantation. | | |
| | | In course of Treatment. | Regenerated and tended to 15th June, 1933. | Fire Losses. | Being Cleared for Planting. | Planted Area. | Fire Losses. |
| | acres. | acres. | acres. | acres. | acres. | acres. | acres. |
| DIVISION 1— | | | | | | | |
| Busselton ... ... | 6,000 | ... | ... | ... | 515 | 1,122 | ... |
| Margaret River ... | 5,000 | ... | 2,366 | ... | 490 | 265 | ... |
| DIVISION 2— | | | | | | | |
| Mundaring ... ... | 10,500 | 617 | 2,920 | ... | 393 | 2,169 | 6·5 |
| DIVISION 3— | | | | | | | |
| Dwellingup ... ... | 200,000 | 3,081 | 43,061 | 24 | ... | ... | ... |
| Wuraming ... ... | | 957 | | | | | |
| Huntly ... ... ... | | 780 | | | | | |
| Duncan's ... ... | | 2,650 | | | | | |
| DIVISION 4— | | | | | | | |
| Collie ... ... ... | 155,000 | 2,320 | 39,698 | 120 | 20 | 356 | ... |
| Muja ... ... ... | | ... | | | ... | 65 | ... |
| Worsley ... ... | | 1,050 | | | ... | ... | ... |
| Wellington ... ... | | ... | | | ... | ... | ... |
| DIVISION 5— | | | | | | | |
| Kirup ... ... ... | 183,000 | 703 | 35,558 | ... | 412 | 193 | ... |
| Noggerup ... ... | | 197 | | ... | ... | ... | ... |
| Bridgetown ... ... | | ... | 6,525 | ... | ... | ... | ... |
| Nannup ... ... | | 2,316 | 17,436 | ... | ... | 64 | ... |
| DIVISION 6— | | | | | | | |
| Manjimup ... ... | 20,000 | 575<br>*3,778 | 13,546 | 46 | 185 | 129 | ... |
| DIVISION 7— | | | | | | | |
| Narrogin ... ... | 50,000 | †1,500 | 6,218 | ... | ... | ... | ... |
| DIVISION 8— | | | | | | | |
| Jarrahdale ... ... | 210,000 | 2,582 | 3,657 | ... | ... | ... | ... |
| Karragullen ... ... | | 2,369 | 16,845 | ... | ... | ... | ... |
| Solus ... ... ... | | ... | 8,623 | ... | ... | ... | ... |
| DIVISION 9— | | | | | | | |
| Metropolitan ... ... | 4,500 | ... | ... | ... | 892 | 2,344 | ... |
| Albany ... ... ... | 700 | ... | ... | ... | 215 | 398 | ... |
| DIVISION 10— | | | | | | | |
| Hamel ... ... ... | 20,000 | ... | 13,855 | ... | 366 | 1,152 | ... |
| Willowdale ... ... | | 917 | | ... | ... | ... | ... |
| Mornington ... ... | | 812 | | ... | ... | ... | ... |
| Total ... ... | 864,700 | 27,204 | 210,308 | 190 | 3,488 | 8,257 | 6·5 |

* Karri. † Mallet.

Although, according to meteorological data, the summer of 1933-34 was one of the most trying on record, and the century mark was reached on more days than the previous year, a year of record high temperatures, it is noteworthy that losses incurred were practically negligible. One important factor which influenced this was the continued high relative humidity experienced which, although it rendered the actual work in fire control and suppression extremely arduous for the Divisional and District staffs, lessened the danger of outbreak and spread of fires. No spells of particularly bad weather or "blow up" days were experienced.

The past fire season was notable for the amount of research work carried out in the technique of fire detection, control and suppression.

With the rapid extension of silvicultural operations and the consequent larger area of treated country to overlook, it has become apparent, that the number of fire towers to be manned continuously during the summer months must be considerably increased.

The technique of fire suppression was advanced a further stage when experiments with the use of water as a method of control were tried out at Dwellingup. A mobile fire brigade equipped with up-to-date fire-fighting equipment consisting of a motor truck fitted with water tank, pump, hose, sprays, etc., did useful work and it is proposed to continue work on these lines during the next season to determine how far it will prove economical to extend this idea to other districts.

An important step towards obtaining an estimate of dangerous fire weather conditions was taken in establishing a Fire Hazard Research Station at Dwellingup. Co-operation between this station and the Meteorological Bureau in Perth enables weather forecasts to be made, but more particularly will the data collected at the field station supplement this by giving a more accurate local estimation of the fire possibility, fire run and inflammability existing from hour to hour during the day.

Further work in the improvement of fire lines, and the opening up of subsidiary tracks through treated compartments have assisted in reducing the danger from outbreaks to a minimum and rendered their suppression a more simple task.

Losses sustained were .08 per cent. of treated or planted country and .02 per cent. of the area under fire control.

## (3.) AFFORESTATION.

AREAS OF CONIFERS ESTABLISHED DURING THE MONTHS OF JUNE, JULY, AND AUGUST, 1933.

| District. | Plantations. | Area established prior to 1933. | | | | Area established, 1933. | | | | Grand Total. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *Pinus radiata.* | *Pinus pinaster.* | Other conifers. | Total. | *Pinus radiata.* | *Pinus pinaster.* | Other conifers. | Total. | |
| | | acres. | acres. | acres. | acres. | acres. | acres. | acres. | acres. | acres. |
| Division 1— | | | | | | | | | | |
| Busselton ... | Coolilup ... | 7 | 771 | 23 | 801 | ... | ... | ... | ... | 801 |
| | Stirling ... | 1 | 293 | 20 | 314 | 2 | 5 | ... | 7 | 321 |
| Margaret River | Boranup ... | 23 | 12 | ... | 35 | 10 | ... | ... | 10 | 45 |
| | Keenan ... | ... | ... | ... | ... | 160 | 60 | ... | 220 | 220 |
| Division 2— | | | | | | | | | | |
| Mundaring ... | Helena ... | 477 | 130 | 45 | 652 | ... | ... | ... | ... | 652 |
| | Greystones | 437 | 192 | 57 | 686 | ... | ... | ... | ... | 686 |
| | Beraking ... | 143 | 65 | 92 | 300 | ... | ... | ... | ... | 300 |
| | Mudros ... | 138 | 30 | 29 | 197 | 3 | 80 | ... | 83 | 280 |
| | Darkin ... | 85 | 23 | 4 | 112 | 30 | 109 | ... | 139 | 251 |
| Division 4— | | | | | | | | | | |
| Collie ... ... | Mungalup | 59 | 5 | 3 | 67 | ... | ... | ... | ... | 67 |
| | Proprietary | ... | 278 | 4 | 282 | ... | 7 | ... | 7 | 289 |
| Division 5— | | | | | | | | | | |
| Kirup ... ... | East Kirup | ... | ... | ... | ... | 169 | 22 | 2 | 193 | 193 |
| Division 6— | | | | | | | | | | |
| Manjimup ... | Big Brook... | 84 | ... | 45 | 129 | ... | ... | ... | ... | 129 |
| Division 9— | | | | | | | | | | |
| Metropolitan ... | Applecross | ... | 551 | ... | 551 | ... | 118 | ... | 118 | 669 |
| | Gnangara ... | ... | 778 | 7 | 785 | ... | 129 | ... | 129 | 914 |
| | Collier ... | ... | 458 | ... | 458 | ... | 93 | ... | 93 | 551 |
| | Scaddan ... | ... | ... | ... | ... | ... | 210 | ... | 210 | 210 |
| Albany ... ... | Pardelup ... | 272 | 26 | 1 | 299 | 8 | 77 | ... | 85 | 384 |
| Division 10— | | | | | | | | | | |
| Hamel ... ... | Myalup ... | 2 | 578 | 21 | 601 | ... | 94 | ... | 94 | 695 |
| | Harvey Weir | 230 | 51 | 25 | 306 | 52 | 39 | ... | 91 | 397 |
| | Hamel ... | 18 | 33 | 2 | 53 | ... | 7 | ... | 7 | 60 |
| Experimental | | | | | | | | | | |
| Areas ... ... | Nannup ... | 14 | 32 | 18 | 64 | ... | ... | ... | ... | 64 |
| | Bowelling ... | 9 | 29 | 27 | 65 | ... | ... | ... | ... | 65 |
| | Albany ... | 1 | 4 | 9 | 14 | ... | ... | ... | ... | 14 |
| Totals ... | ... ... | 2,000 | 4,339 | 432 | 6,771 | 434 | 1,050 | 2 | 1,486 | 8,257 |

During the eight years in which a planting programme has been in operation, 8,257 acres have been established, and the proposed plan of 1,000 acres annual planting has been maintained. The area planted in 1933 constituted a record, 1,486 acres in all being established. This was occasioned by the planting of the first areas at three new centres—Margaret River, East Kirup, and Scaddan (Mt. Lawley).

The principal plantations and the areas planted at each are:—

| | Planted 1933. | Total. |
|---|---|---|
| | acres. | acres. |
| Metropolitan Plantations ... ... | 550 | 2,344 |
| Mundaring Plantations ... ... | 222 | 2,169 |
| Ludlow-Margaret River Plantations ... | 237 | 1,287 |
| Harvey-Hamel Plantations ... ... | 192 | 1,152 |

*Pinus pinaster* again constituted the chief planting stock, 1,050 acres being planted, compared with 709 acres in 1932. Four hundred and thirty-four acres of *Pinus radiata* were established in 1933, as against 197 acres in 1932. This increase in *Pinus radiata* was due to the development of Margaret River and East Kirup, where tracts of good loamy soil warranted the use of this species. No further planting of other species was attempted. The results from past planting of other exotics are not yet far enough advanced to indicate whether any of the 23 species now growing at various centres in the South-West will warrant their establishment on a more extensive scale.

Thinning of the older stands at Mundaring Weir and Hamel continued, and the total quantity of pine supplied to local sawmills from Crown lands during the year was 25,289 cubic feet, a slight increase on the 1932 figure. Supplies from private property sources, however, dropped from 17,124 cubic feet in 1932 to 8,329 cubic feet. The majority of these supplies are from old-established farms in the South-West, whose owners are now reaping the benefit of the foresight which prompted them, in earlier years, to plant wood-lots on their property.

Since 1927 the removal of pine logs, both as a final crop and as thinnings, from the Hamel Pine Plantation has given a total yield of 105,450 cubic feet. The importance of this figure lies in the fact that only 13¾ acres were clear felled and 14¾ acres were thinned, the average yield per acre in the former case being 100 loads, and in the latter 50 loads.

Continued use has been made of relief workers in the clearing, planting and tending of all plantations. Up to 150 men have been given employment. In the metropolitan area the tending of the plantations at Applecross, Collier, Scaddan, and Gnangara has been carried out by sustenance men.

During the last year a soil survey on intensive lines was carried out on the older compartments at Mundaring Weir, and subsequently the work was extended to embrace all plantations at Mundaring Weir, Harvey Weir, and Pardelup. Soil profiles are prepared, and the laboratory work in connection with analyses of soils is carried out by the Government Chemical Laboratory. The data collected will prove valuable when other plantations are opened up, and may shed light on problems which are now claiming attention at all centres.

## (4) RESEARCH AND INVESTIGATION.

*Pine Establishment Experimentation.*

Field experiments have been conducted in accordance with modern methods of field trials with plot replication and statistical analyses of results.

Experiments were largely concentrated in the Metropolitan and Busselton Districts, and have been made with a number of different treatments in raising plants in nurseries, lifting, packing and transporting, setting in the field, preparation and subsequent treatment of planting site, manuring, and provenance studies in *Pinus pinaster*.

44 experiments have been completed or have been in progress for more than 12 months, and 40 new experiments were established in the 1934 planting season.

The results obtained have permitted an improvement in planting technique.

*Soil Survey.*

The mapping of soil types has been carried out over several plantations, attention being confined mainly to areas at Mundaring Weir, Harvey Weir, Pardelup and Albany plantations. Numerous areas of marginal jarrah forest and gully lands in the South-West, where attention has been directed towards the establishment of Forest Settlements, have also been the subject of considerable soil survey and classification.

The methods of survey adopted have followed closely those generally practised by officers of the Waite Institute. Approximately 4,500 acres of plantation country have been mapped and subsequent mechanical and chemical analyses of type samples carried out. At Mundaring Weir, some 2,000 acres of country have been surveyed in considerable detail by similar methods as used for irrigation areas in South Australia.

Nitrate nitrogen studies have been continued throughout the year at the Myalup plantation.

*Stocktaking in the Jarrah Forest.*

A study of the character and composition of the Jarrah forest and data relating to localised and regional differences has been carried out. This has resulted in the accumulation of information regarding:—

(i) The composition of the forest, embracing height variances with diameter classes, basal area distribution in diameter classes, log lengths and volumes;
(ii) The determination of quality classes;
(iii) The correlation of soil type with crop quality;
(iv) The crown development and distribution and its relation to breast high diameter.

*Jarrah Crown Studies.*

The manner of development of the crown, and the relationship of crown spread to height increase from the juvenile crown form in the young sapling to the assumption of the adult crown in the older tree, is a factor of first importance influencing thinning of the growing crop. Considerable departure from the normal shape, with often subsequent development of a forked habit, is shown by jarrah under the influence of probably numerous external agencies, important among which is fire. A study is being made, with photographic as well as written descriptive record, of the behaviour of crowns of certain classified types on different sites, and with varying degrees of stocking.

*Fire Hazard.*

At the Fire Hazard Research Station established in the Jarrah belt observations were made on factors affecting fire possibility, forest inflammability and fire-run. The measurements recorded were Barometric Pressure, Rainfall, Temperature, Humidity, Evaporation, Wind Velocity, Wind Direction and Variations in Moisture Content of wood cylinders.

This initial work has shown the value of such observations in the recognition of the approach of forest fire weather, and further investigations will be carried out this summer.

*Fire Suppression.*

Experiments in methods of fire suppression have been carried out, using a mobile fire fighting unit with motor transport and modern equipment. With the establishment of a satisfactory technique and the extension of these units to most districts in the Jarrah bush, a very considerable advance in the suppression of forest fires will have been made.

*Utilisation.*

From the point of view of practical application there is not a great deal to report on investigations carried out during the year, but these should lead to more tangible results in the near future. Over the past two years a great deal of investigation work has been carried out aiming at the establishment of better grading rules in the timber industry. There is evidence that the general attitude of the trade is becoming more favourable to the whole subject, and it is hoped that the coming year will see further advances than can be reported for the year under review.

During the year the Utilisation Officer paid an extended visit to Victoria and Tasmania, the object being to obtain first-hand information on modern developments in commercial kiln design and operation and to keep in touch with research work being carried out by the Division of Forests Products with particular reference to those projects concerning West Australian timbers. The greater portion of time available was devoted to seasoning investigations. Visits were made to typical plants and a fortnight was spent in Tasmania with the seasoning officer of the Division putting initial charges through two commercial plants which had just been erected to C.S.I.R. designs.

From first-hand observations it is obvious that West Australian sawmillers have dropped behind hardwood sawmillers in the Eastern States in the matter of efficient seasoning practice, one firm only having installed modern kilns compared with 22 in Victoria and 11 in Tasmania. Since the close of the year the State Saw Mills have decided to erect two modern cross shaft internal fan kilns at Wuraming and it is hoped that other firms will now also follow the lead set by Messrs. Bunning Bros. Detailed plans are being prepared, incorporating modern ideas in kiln design. These will be available to any firm considering installation of kilns. The two kilns for State Sawmills will be erected to designs supplied by the Department. Supervision of their erection will also be carried out by the Utilisation Branch acting in conjunction with the Mill Superintendent.

A considerable amount of time has been devoted to investigations in connection with sleeper inspection standards. Detailed internal reports covering these have been prepared.

Draft grading rules for jarrah flooring approved by a Western Australian sub-committee of the Standards Association have now been published as Australian Standards by the Association. A movement is now on foot to place the grading of flooring for the local market on a sounder basis. This Department has been asked by the Timber Merchants' Association to inspect and brand all merchantable flooring sold on the metropolitan market. The specification used will be substantially that for "Merchantable" as published in the Standards Association rules with a stated allowance for docking of larger defects by the buyer in a percentage of boards. Proposals which represent a considerable advance on present practice should be in full operation within a few months time.

A number of minor inquiries have been dealt with during the year. Individually these do not take a great deal of time but collectively they encroach seriously on time available for major investigations. It has not been found possible to devote any time to a number of projected lines of research which should yield results of considerable practical value to the industry but steps are being taken to appoint an assistant utilisation officer and this should considerably ease the position.

Close touch has at all times been maintained with the Division of Forest Products who have given assistance on a number of problems. Results of comprehensive strength tests on Karri by the Division according to standard methods for testing small, clear specimens are now available with respect to green material. When similar tests on air dry material have been completed, the whole of the results will be published.

(5) ARBORICULTURE.

During the distributing season, which closed on August 31st, 1933, 312,941 trees were sent out from Hamel Nursery. Of these 41,579 were sold to the public, 720 were issued free of charge to public bodies, charitable institutions, etc., and 270,642 were supplied to the various departmental plantations and arboreta. The number of trees sold represented an increase of nearly 20 per cent. on the sales for the previous year.

*Pinus pinaster,* of which 9,800 were sold, proved the most popular tree, and was followed by *Eucalyptus cladocalyx* (Sugar Gum), 7,600, and *Pinus radiata* 5,600. *Eucalyptus ficifolia* (Red Flowering Gum) 1600, and *Schinus molle* (Pepper Tree) 1,500, also sold well.

## CHAPTER IV.

(1) LEGISLATION.

*Forests Act Amendment Act,* 1933.

An amendment to "The Forests Act, 1918," was assented to on the 14th December, 1933, which excluded the whole of the revenue from sandalwood from the provisions of Subsection (2) of Section 41 of the principal Act and provided for its transfer to Consolidated Revenue. The provisions of this Act were made retrospective to the 30th June, 1932, and continued in force until the 30th June, 1934.

*Forest Regulations.*

With a view to standardising practices which have been more or less generally applied during recent years, and to lessen to some extent the amount of clerical work involved in connection with the preparation of mill returns, a new regulation was introduced in November last governing the method of measuring and recording mill logs. A revised Log Table was also issued in conjunction with this regulation.

(2) ADMINISTRATION.

During the period from 7th December, 1933, to 30th June, 1934, the services of the Conservator, Mr. S. L. Kessell, were loaned to the Government of New South Wales to investigate and report on the forests and forestry administration of that State. During the absence of the Conservator, Mr. T. N. Stoate occupied the position of Acting Conservator.

*Professional Division.*

Messrs, A. J. Milesi, D. W. R. Stewart, and W. R. Wallace were promoted from Assistant Divisional Forest Officer to Divisional Forest Officer in September, 1933.

Mr. H. L. Gloe completed his Diploma Course at the Australian Forestry School, Canberra, and commenced duty as a probationer in January, 1934.

One nominated student is at present attending for his second year at the Australian Forestry School, Canberra.

*General Division.*

Five Assistant Foresters were promoted to "C" Grade Foresters, five "D" Grade Assistant Foresters were appointed, one "D" Grade Assistant Forester reverted to the rank of Overseer, and one resigned.

It affords me great pleasure to place on record the loyal and efficient service rendered by all ranks of the Service during the year. The revival in the timber industry, together with the extensive programme of Unemployment Relief works handled by the Department have meant a very busy year for the staff, who have responded splendidly to the extra demands made on them.

S. L. KESSELL,
Conservator of Forests.

Perth, September, 1934.

## LIST OF APPENDICES.

## APPENDIX 1a.

### CONSOLIDATED REVENUE FUND.

*General Statement of Revenue and Expenditure for the Year ended 30th June, 1934.*

| Dr. | £ | s. | d. | Cr. | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|---|---|---|---|
| To Log Royalty ... ... ... ... | 52,468 | 0 | 3 | By Salaries ... ... ... | 10,864 | 6 | 8 | | | |
| „ Sandalwood Revenue ... ... | 13,917 | 12 | 9 | „ Travelling and Forage Allowances ... ... ... | 1,388 | 0 | 0 | | | |
| | | | | | | | | 12,252 | 6 | 8 |
| „ Hewn Timber Royalty ... ... | 8,065 | 11 | 0 | „ Maintaining State Nursery ... | 49 | 13 | 11 | | | |
| „ Miscellaneous Royalty ... ... | 6,757 | 11 | 7 | „ Postage and Telephone ... | 90 | 13 | 4 | | | |
| „ Inspection Fees ... ... ... | 4,324 | 13 | 11 | „ Stationery ... ... ... | 85 | 6 | 3 | | | |
| | | | | „ Travelling ... ... ... | 284 | 2 | 2 | | | |
| „ Rents ... ... ... ... ... | 1,299 | 12 | 9 | „ Fares and Freights ... ... | 114 | 6 | 11 | | | |
| | | | | „ Material ... ... ... | 102 | 0 | 11 | | | |
| „ Sales ... ... ... ... ... | 1,326 | 13 | 1 | „ Mileage ... ... ... | 1,028 | 4 | 0 | | | |
| | | | | „ Refunds ... ... ... | 8 | 9 | 9 | | | |
| „ Miscellaneous Revenue ... ... | 1,735 | 11 | 5 | „ Miscellaneous ... ... | 167 | 19 | 7 | | | |
| | | | | „ Sandalwood Expenses ... | 116 | 15 | 9 | | | |
| | | | | „ Bark for Tanning ... ... | 270 | 1 | 7 | | | |
| | | | | „ Extra Remuneration (Reg. 76) ... ... ... ... | 11 | 17 | 3 | | | |
| | | | | „ Workers' Compensation ... | 10 | 8 | 7 | | | |
| | | | | Timber Industry Regulation ... | 150 | 0 | 0 | | | |
| | | | | | | | | 2,490 | 0 | 0 |
| | | | | „ Excess Revenue over Expenses ... ... ... | ... | | | 75,153 | 0 | 1 |
| | £89,895 | 6 | 9 | | | | | £89,895 | 6 | 9 |

## APPENDIX 1b.

*Statement of Reforestation and Afforestation Expenditure for the Year ended 30th June, 1934.*

| Dr. | £ s. d. | £ s. d. | Cr. | £ s. d. | £ s. d. |
|---|---|---|---|---|---|
| To Division No. 1— | | | By Cash Order Expenditure unallocated at 1st July, 1933 ... ... | | 2,974 2 10 |
| General ... ... ... | 487 16 10 | | „ Loan Provision ... ... | | 141,520 19 4 |
| Ludlow ... ... ... | 3,151 8 9 | | | | |
| Boranup ... ... | 571 14 4 | | „ Reforestation Fund ... | 14,209 6 9 | |
| Keenans ... ... ... | 1,780 16 6 | | Less credits to Expenditure ... ... | 263 11 3 | |
| | | 5,991 16 5 | | | 13,945 15 6 |
| „ Division No. 2— | | | | | |
| General ... ... ... | 727 13 9 | | | | |
| Mundaring ... ... | 7,860 0 7 | | | | |
| | | 8,587 14 4 | | | |
| „ Division No. 3— | | | | | |
| General ... ... ... | 2,637 4 0 | | | | |
| Dwellingup ... ... | 9,695 7 3 | | | | |
| Huntly ... ... ... | 6,585 2 3 | | | | |
| Wuraming ... ... | 6,246 3 9 | | | | |
| Duncan's ... ... ... | 5,810 8 11 | | | | |
| | | 30,974 6 2 | | | |
| „ Division No. 4— | | | | | |
| General ... ... ... | 1,333 15 1 | | | | |
| Collie ... ... ... | 10,083 4 3 | | | | |
| Collie Outer ... ... | 5,232 5 8 | | | | |
| | | 16,651 5 0 | | | |
| „ Division No. 5— | | | | | |
| General ... ... ... | 1,496 11 9 | | | | |
| Kirup ... ... ... | 8,024 12 6 | | | | |
| Greenbushes ... ... | 740 8 6 | | | | |
| Nannup ... ... ... | 2,543 14 7 | | | | |
| | | 12,805 7 4 | | | |
| „ Division No. 6— | | | | | |
| General ... ... ... | 607 8 6 | | | | |
| Manjimup ... ... | 7,095 11 6 | | | | |
| | | 7,703 0 0 | | | |
| „ Division No. 7— | | | | | |
| General ... ... ... | 1,019 10 7 | | | | |
| Narrogin ... ... ... | 4,949 12 4 | | | | |
| | | 5,969 2 11 | | | |
| „ Division No. 8— | | | | | |
| General ... ... ... | 2,060 8 6 | | | | |
| Jarrahdale ... ... | 15,043 15 6 | | | | |
| Carinyah ... ... ... | 12,968 14 7 | | | | |
| | | 30,072 18 7 | | | |
| „ Division No. 9— | | | | | |
| General ... ... ... | 463 5 2 | | | | |
| Gnangara ... ... ... | 2,949 11 10 | | | | |
| Collier ... ... ... | 993 14 7 | | | | |
| Applecross ... ... | 973 6 3 | | | | |
| Pardelup ... ... ... | 518 14 5 | | | | |
| Scaddan ... ... ... | 690 1 1 | | | | |
| | | 6,588 13 4 | | | |
| „ Division No. 10— | | | | | |
| General ... ... ... | 503 1 0 | | | | |
| Mornington ... ... | 3,315 6 2 | | | | |
| Willowdale ... ... | 11,639 10 4 | | | | |
| Harvey Weir ... ... | 1,009 10 0 | | | | |
| Myalup ... ... ... | 1,846 2 8 | | | | |
| Hamel ... ... ... | 480 14 4 | | | | |
| | | 18,794 4 6 | | | |
| Training of Staff ... ... | 162 7 5 | | | | |
| Research and Investigation ... | 1,222 3 7 | | | | |
| Topographical Survey ... ... | 1,285 4 1 | | | | |
| General Silviculture ... ... | 160 16 10 | | | | |
| Salaries and Allowances ... | 4,684 0 2 | | | | |
| General Equipment ... ... | 4,075 12 1 | | | | |
| | | 11,590 4 2 | | | |
| Cash Order Expenditure unallocated 30th June, 1934 ... ... | | 2,712 4 11 | | | |
| | | £158,440 17 8 | | | £158,440 17 8 |

## APPENDIX 2a.

*Exports of Timber, Tanning Barks, Sandalwood and Essential Oils for the Year ended 30th June, 1934.*

| Item and Country of Destination. | Quantity. | Value. |
|---|---|---|
| TIMBER— | cubic feet. | £ |
| *Dressed, N.E.I.:* | | |
| Commonwealth of Australia | 95 | 25 |
| United Kingdom ... ... | 31,439 | 3,110 |
| British Malaya ... ... | 1,646 | 164 |
| Ceylon ... ... ... | 3,118 | 327 |
| India ... ... ... | 74 | 8 |
| Egypt ... ... ... | 76 | 7 |
| France ... ... ... | 361 | 21 |
| Germany ... ... ... | 639 | 42 |
| Mauritius ... ... ... | 16 | 2 |
| Netherlands East Indies ... | 443 | 36 |
| China ... ... ... | 33 | 3 |
| Sweden ... ... ... | 398 | 36 |
| | 38,338 | 3,781 |
| *Undressed, Railway Sleepers:* | | |
| Commonwealth of Australia | 541,837 | 63,131 |
| United Kingdom ... ... | 8,393 | 1,007 |
| Ceylon ... ... ... | 357,722 | 42,926 |
| Hong Kong ... ... | 207,117 | 24,854 |
| Iraq ... ... ... | 15,000 | 1,800 |
| Mauritius ... ... ... | 56,250 | 6,750 |
| New Zealand ... ... | 696 | 84 |
| South African Union ... | 349,403 | 39,233 |
| Portuguese East Africa ... | 102,319 | 12,190 |
| Persia ... ... ... | 251,808 | 29,217 |
| | 1,890,545 | 221,192 |
| *Undressed, N.E.I.:* | | |
| (*a*) Commonwealth of Australia | 965,699 | 119,134 |
| United Kingdom ... ... | 563,826 | 70,405 |
| British Malaya ... ... | 147 | 20 |
| Ceylon ... ... ... | 98,673 | 12,311 |
| Hong Kong ... ... | 8,272 | 993 |
| Mauritius ... ... ... | 35,084 | 4,259 |
| New Zealand ... ... | 100,671 | 12,079 |
| South African Union ... | 184,672 | 21,537 |
| Egypt ... ... ... | 2,333 | 322 |
| Portuguese East Africa ... | 93,061 | 11,447 |
| Belgium ... ... ... | 34,294 | 4,257 |
| China ... ... ... | 4,366 | 553 |
| Germany ... ... ... | 13,097 | 1,556 |
| Italy ... ... ... | 2,759 | 331 |
| Netherlands ... ... | 24,993 | 3,071 |
| | 2,131,947 | 262,275 |
| Total, Timber Exports | ... | 487,248 |
| WOOD MANUFACTURES— | | |
| *Casks and Shooks:* | | |
| (*b*) Commonwealth of Australia | ... | 61,547 |
| | ... | 61,547 |
| *Furniture:* | | |
| Commonwealth of Australia | ... | 6,997 |
| | ... | 6,997 |

| Item and Country of Destination. | Quantity. | Value. |
|---|---|---|
| WOOD MANUFACTURES—*contd.* | | £ |
| *Other:* | | |
| Commonwealth of Australia | ... | 7,405 |
| United Kingdom ... ... | ... | 129 |
| Norway ... ... ... | ... | 15 |
| Sweden ... ... ... | ... | 13 |
| United States of America | ... | 1 |
| | ... | 7,563 |
| Total, Wood Manufactures | ... | 76,107 |
| Total, Timber and Wood Manufactures ... | ... | 563,355 |
| SANDALWOOD— | cwt. | |
| British Malaya ... ... | 3,342 | 5,068 |
| Ceylon ... ... ... | 222 | 340 |
| Hong Kong ... ... | 18,279 | 27,458 |
| India ... ... ... | 4,068 | 6,216 |
| China ... ... ... | 23,258 | 34,805 |
| Japan ... ... ... | 620 | 953 |
| Netherlands East Indies ... | 380 | 584 |
| | 50,169 | 75,424 |
| TANNING BARK— | | |
| Commonwealth of Australia | 27,101 | 13,353 |
| Belgium ... ... ... | 1,034 | 410 |
| China ... ... ... | 1 | 1 |
| Germany ... ... ... | 3,206 | 2,273 |
| Netherlands ... ... | 10,568 | 4,867 |
| | 41,910 | 20,904 |
| ESSENTIAL OILS— | | |
| *Non-Spirituous, N.E.I.:* | | |
| Commonwealth of Australia | ... | 7,126 |
| United Kingdom ... ... | ... | 7,508 |
| British Malaya ... ... | ... | 54 |
| Ceylon ... ... ... | ... | 85 |
| Hong Kong ... ... | ... | 2,150 |
| India ... ... ... | ... | 103 |
| South African Union ... | ... | 111 |
| China ... ... ... | ... | 1,975 |
| Germany ... ... ... | ... | 1,019 |
| Japan ... ... ... | ... | 6,315 |
| Philippine Islands ... | ... | 28 |
| | ... | 26,474 |
| *Eucalyptus:* | | |
| British Malaya ... ... | ... | 157 |
| Ceylon ... ... ... | ... | 30 |
| India ... ... ... | ... | 59 |
| | ... | 246 |
| Total, all Exports ... | ... | £686,403 |

(*a*) Value includes £1,225 of staves for which no quantity is shown. (*b*) Includes empty returns.

## APPENDIX 2b.

*Imports of Timber, Tanning Substances and Essential Oils for the Year ended 30th June, 1934.*

| Item and Country of Origin. | Quantity. | Value. |
|---|---|---|
| TIMBER— | cubic feet. | £ |
| *Timber, Dressed :* | | |
| *Architraves, Mouldings, etc :* | | |
| Commonwealth of Australia ... ... ... | ... | 1,161 |
| *Tongued and Grooved :* | | |
| Norway ... ... ... | 11,150 | 1,007 |
| Sweden ... ... ... | 8,979 | 829 |
| | 20,129 | 1,836 |
| *Timber, Dressed, N.E.I. :* | | |
| Commonwealth of Australia ... ... ... | 240 | 172 |
| (*a*) United Kingdom ... | 3 | 5 |
| Canada ... ... ... | 194 | 62 |
| Germany ... ... | ... | 75 |
| Norway ... ... ... | 4,701 | 434 |
| Sweden ... ... ... | 5,971 | 594 |
| United States of America | 263 | 91 |
| | ... | 1,433 |
| *Timber, Undressed—* | | |
| (*b*) *Timber for making Boxes :* | | |
| Canada ... ... ... | 42,973 | 1,878 |
| British Malaya ... ... | 8,264 | 622 |
| New Zealand ... ... | ... | 122 |
| Germany ... ... | 20 | 28 |
| Netherlands ... ... | 190 | 170 |
| Norway ... ... | 8,622 | 801 |
| Sweden ... ... ... | 37,922 | 3,482 |
| | ... | 7,103 |
| *Timber, Undressed, N.E.I.—* | | |
| Commonwealth of Australia ... ... ... | 120,842 | 21,588 |
| United Kingdom ... | 4 | 3 |
| British Honduras ... | 4 | 5 |
| British Malaya ... ... | 3 | ... |
| Canada ... ... ... | 100,919 | 7,914 |
| New Zealand ... ... | 15,766 | 3,227 |
| French Indo China ... | 185 | 66 |
| Japan ... ... ... | 91 | 31 |
| Noumea ... ... ... | 280 | 127 |
| Pacific Islands ... ... | 213 | 74 |
| Philippine Islands ... | 4,796 | 465 |
| Sweden ... ... ... | 820 | 58 |
| United States of America | 65,245 | 9,900 |
| | 309,168 | 43,458 |
| WOOD MANUFACTURES— | | |
| *Barrels and Casks :* | | |
| Commonwealth of Australia ... ... ... | ... | 47,750 |
| *Clothes Pegs* | | |
| Commonwealth of Australia ... ... ... | ... | 1,322 |
| Sweden ... ... ... | ... | 7 |
| | ... | 1,329 |
| *Furniture :* | | |
| Commonwealth of Australia ... ... ... | ... | 11,596 |
| United Kingdom ... | ... | 1,479 |
| British Malaya ... ... | ... | 15 |
| Canada ... ... ... | ... | 26 |
| Ceylon ... ... ... | ... | 1 |
| India ... ... ... | ... | 1 |
| New Zealand ... ... | ... | 1 |
| Austria ... ... ... | ... | 132 |
| China ... ... ... | ... | 5 |
| Esthonia ... ... | ... | 45 |
| France ... ... ... | ... | 36 |
| Germany ... ... | ... | 33 |
| Japan ... ... ... | ... | 122 |
| Netherlands East Indies | ... | 3 |

| Item and Country of Origin. | Quantity. | Value. |
|---|---|---|
| WOOD MANUFACTURES—*contd.* | | |
| *Furniture*—continued. | cubic feet. | £ |
| Russia ... ... ... | ... | 64 |
| Sweden ... ... ... | ... | 1 |
| United States of America | ... | 197 |
| | ... | 13,757 |
| *Plywood and Veneers :* | | |
| Commonwealth of Australia ... ... ... | ... | 19,782 |
| United Kingdom ... | ... | 48 |
| Canada ... ... ... | ... | 26 |
| New Zealand ... ... | ... | 3 |
| Japan ... ... ... | ... | 628 |
| Manchukuo ... ... | ... | 90 |
| Norway ... ... ... | ... | 58 |
| United States of America | ... | 73 |
| | ... | 20,708 |
| *Spokes, Rims and Felloes :* | No. | |
| Commonwealth of Australia ... ... ... | 17,610 | 1,157 |
| United States of America | 96 | 107 |
| | 17,706 | 1,264 |
| *Tool Handles (including Axe) :* | | |
| Commonwealth of Australia ... ... ... | ... | 7,118 |
| United Kingdom ... | ... | 138 |
| Canada ... ... ... | ... | 677 |
| United States of America | ... | 3,437 |
| | ... | 11,370 |
| *Wood Manufactures, N.E.I. :* | | |
| Commonwealth of Australia ... ... ... | ... | 20,445 |
| United Kingdom ... | ... | 904 |
| Canada ... ... ... | ... | 406 |
| British Malaya ... ... | ... | 1 |
| Ceylon ... ... ... | ... | 1 |
| New Zealand ... ... | ... | 889 |
| China ... ... ... | ... | 2 |
| France ... ... ... | ... | 17 |
| Germany ... ... | ... | 257 |
| Japan ... ... ... | ... | 150 |
| Latvia ... ... ... | ... | 3,426 |
| Norway ... ... ... | ... | 133 |
| Sweden ... ... ... | ... | 5,711 |
| United States of America | ... | 433 |
| | ... | 32,775 |
| Total Timber Imports ... | ... | 183,944 |
| TANNING BARK— | cwt. | |
| Commonwealth of Australia ... ... ... | 3,124 | 1,795 |
| TANNING EXTRACTS— | | |
| Commonwealth of Australia ... ... ... | ... | 305 |
| United Kingdom ... | ... | 723 |
| British Borneo ... ... | ... | 50 |
| British Malaya ... ... | ... | 112 |
| India ... ... ... | ... | 183 |
| South African Union ... | ... | 493 |
| Argentine ... ... | ... | 158 |
| Italy ... ... ... | ... | 29 |
| Jugo Slavia ... ... | ... | 138 |
| Paraguay ... ... | ... | 226 |
| Turkey ... ... ... | ... | 40 |
| United States of America | ... | 58 |
| | ... | 2,515 |

(*a*) Value includes £2 for which no quantity is shown. (*b*) Value includes £479 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 ... ... ... | ... | 1,667 | Guiana, French ... | ... | 53 |
| United Kingdom ... | ... | 277 | Hungary ... ... | ... | 2 |
| British Malaya ... ... | ... | 1 | Italy ... ... ... | ... | 320 |
| British West Indies ... | ... | 75 | Japan ... ... ... | ... | 837 |
| Ceylon ... ... ... | ... | 241 | Netherlands ... ... | ... | 7 |
| Hong Kong ... ... | ... | 67 | Netherlands East Indies ... | ... | 55 |
| India ... ... ... | ... | 2 | Reunion Island ... | ... | 2 |
| Africa French, West ... | ... | 1 | Russia ... ... ... | ... | 1 |
| Belgium ... ... ... | ... | 4 | Spain ... ... ... | ... | 6 |
| China ... ... ... | ... | 14 | United States of America | ... | 101 |
| France ... ... ... | ... | 151 | | ... | 3,888 |
| Germany... ... ... | ... | 4 | Total, All Imports ... | ... | 192,142 |

## APPENDIX 2c.

*Summary of Exports of Forest Produce since 1836.*

| Year. | Timber. | | Sandalwood. | | Year. | Timber. | | Sandalwood. | | Tanning Bark. | Essential Oils.* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | cub. ft. | Value. | Tons. | Value. | | cub. ft. | Value. | Tons. | Value. | Value. | Value. |
| | | £ | | £ | | | £ | | £ | £ | £ |
| 1836*a* ... | 10,000 | 2,500 | ... | ... | 1885 ... | 848,150 | 67,850 | 4,527 | 36,216 | ... | ... |
| 1837 ... | ... | ... | ... | ... | 1886 ... | 626,150 | 50,092 | 3,431 | 27,450 | ... | ... |
| 1838 ... | ... | ... | ... | ... | 1887 ... | 354,800 | 28,384 | 4,317 | 34,533 | ... | ... |
| 1839 ... | ... | ... | ... | ... | 1888 ... | 525,750 | 42,060 | 4,470 | 33,525 | ... | ... |
| 1840 ... | ... | ... | ... | ... | 1889 ... | 788,500 | 63,080 | 6,385 | 57,465 | ... | ... |
| | | | | | 1890 ... | 1,172,200 | 82,052 | 5,136 | 51,355 | ... | ... |
| 1841 ... | ... | ... | ... | ... | 1891 ... | 1,273,950 | 89,179 | 3,760 | 37,600 | ... | ... |
| 1842 ... | ... | ... | ... | ... | 1892 ... | 1,082,650 | 78,419 | 5,716 | 42,870 | ... | ... |
| 1843 ... | ... | ... | ... | ... | 1893 ... | 512,950 | 33,888 | 3,893 | 32,160 | ... | ... |
| 1844 ... | *b* | 163 | ... | ... | 1894 ... | 1,063,700 | 74,804 | 2,784 | 23,430 | ... | ... |
| 1845 ... | ... | ... | 4 | 40 | 1895 ... | 1,255,250 | 88,146 | 3,851 | 30,863 | ... | ... |
| 1846 ... | 2,550 | 255 | 32 | 320 | 1896 ... | 1,545,600 | 116,420 | 6,848 | 65,800 | ... | ... |
| 1847 ... | 12,200 | 1,120 | 370 | 4,444 | 1897 ... | 2,393,300 | 192,451 | 5,852 | 49,480 | ... | ... |
| 1848 ... | 3,350 | 333 | 1,335 | 13,353 | 1898 ... | 4,086,150 | 326,195 | 4,349 | 31,812 | ... | ... |
| 1849 ... | ... | ... | ... | ... | 1899 ... | 6,913,550 | 553,198 | 4,084 | 29,719 | ... | ... |
| 1850 ... | 10,500 | 1,048 | ... | ... | 1900 ... | 5,725,400 | 458,461 | 5,095 | 39,038 | ... | ... |
| 1851 ... | 1,250 | 268 | 219 | 1,593 | 1901 ... | 7,150,600 | 572,354 | 8,864 | 73,931 | ... | ... |
| 1852 ... | 7,050 | 806 | ... | ... | 1902 ... | 6,256,750 | 500,533 | 7,995 | 61,771 | ... | ... |
| 1853 ... | 52,200 | 5,220 | ... | ... | 1903 ... | 7,748,450 | 619,705 | 4,406 | 37,913 | 859 | ... |
| 1854 ... | 58,500 | 7,023 | ... | ... | 1904 ... | 8,072,300 | 654,949 | 4,510 | 25,417 | 32,876 | ... |
| 1855 ... | 76,900 | 12,076 | ... | ... | 1905 ... | 8,709,500 | 689,943 | 5,521 | 38,817 | 154,087 | ... |
| 1856 ... | 70,500 | 9,671 | ... | ... | 1906 ... | 8,830,700*c* | 708,993 | 8,848 | 70,958 | 140,720 | ... |
| 1857 ... | 69,200 | 9,449 | 280 | 2,524 | 1907 ... | 6,409,550*c* | 511,923 | 9,212 | 65,999 | 98,773 | ... |
| 1858 ... | 29,250 | 2,340 | 745 | 7,455 | 1908 ... | 9,869,500*c* | 813,591 | 9,564 | 76,668 | 79,934 | ... |
| 1859 ... | 67,250 | 6,051 | 1,278 | 17,259 | 1909 ... | 10,830,450*c* | 867,419 | 4,805 | 37,456 | 59,633 | ... |
| 1860 ... | 54,800 | 4,932 | 1,687 | 16,360 | 1910 ... | 12,074,100*c* | 972,698 | 8,228 | 70,775 | 93,733 | ... |
| 1861 ... | 27,750 | 2,497 | 2,558 | 24,945 | 1911 ... | 12,449,500*c* | 986,341 | 6,907 | 65,506 | 83,470 | ... |
| 1862 ... | 68,800 | 7,151 | 2,393 | 21,541 | 1912 ... | 11,297,100*c* | 903,396 | 3,154 | 27,533 | 49,094 | ... |
| 1863 ... | 32,900 | 2,963 | 2,807 | 25,265 | 1913 ... | 13,619,850*c* | 1,089,481 | 6,260 | 47,589 | 47,377 | ... |
| 1864 ... | 58,300 | 5,508 | 2,724 | 24,520 | 1914*d* ... | 6,279,750*c* | 502,153 | 4,702 | 39,800 | 18,197 | 5 |
| 1865 ... | 183,950 | 15,693 | 1,686 | 13,490 | 1915*e* ... | 9,968,500*c* | 808,392 | 8,375 | 78,926 | 6,127 | 381 |
| 1866 ... | 85,650 | 6,849 | 2,965 | 23,722 | 1916*e* ... | 5,432,100 | 441,991 | 6,271 | 61,381 | 10,208 | 1,102 |
| 1867 ... | 56,750 | 4,541 | 2,305 | 18,442 | 1917*e* ... | 3,890,650 | 310,893 | 7,230 | 72,669 | 18,959 | 2,060 |
| 1868 ... | 8,000 | 638 | 3,256 | 26,045 | 1918*e* ... | 3,436,250 | 274,141 | 6,504 | 81,834 | 16,886 | 3,995 |
| 1869 ... | 179,900 | 14,273 | 4,124 | 32,998 | 1919*e* ... | 4,135,750 | 344,119 | 8,998 | 117,072 | 18,875 | 3,987 |
| 1870 ... | 157,200 | 17,551 | 6,112 | 48,890 | 1920*e* ... | 5,065,300 | 487,666 | 14,355 | 240,579 | 22,121 | 3,704 |
| 1871 ... | 218,500 | 15,304 | 3,366 | 26,926 | 1921*e* ... | 9,816,250 | 1,162,735 | 10,839 | 181,801 | 23,073 | 10,107 |
| 1872 ... | 37,000 | 2,590 | 3,942 | 31,536 | 1922*e* ... | 8,309,750 | 1,063,475 | 3,990 | 54,769 | 13,328 | 6,878 |
| 1873 ... | 68,150 | 4,771 | 6,292 | 62,916 | 1923*e* ... | 7,911,310 | 1,009,831 | 7,623 | 102,912 | 21,161 | 20,075 |
| 1874 ... | 345,600 | 24,192 | 7,057 | 70,572 | 1924*e* ... | 11,126,861 | 1,379,022 | 14,081 | 348,713 | 29,606 | 39,877 |
| 1875 ... | 342,350 | 23,965 | 6,646 | 66,465 | 1925*e* ... | 11,844,303 | 1,491,925 | 6,243 | 186,775 | 40,136 | 42,057 |
| 1876 ... | 219,050 | 23,743 | 6,577 | 65,772 | 1926*e* ... | 12,001,384 | 1,533,030 | 7,771 | 238,203 | 15,056 | 47,819 |
| 1877 ... | 336,150 | 36,979 | 4,247 | 31,851 | 1927*e* ... | 12,580,262 | 1,659,876 | 6,821 | 199,754 | 15,818 | 26,454 |
| 1878 ... | 580,900 | 63,902 | 4,675 | 35,064 | 1928*e* ... | 10,384,784 | 1,274,482 | 4,829 | 147,426 | 27,662 | 39,131 |
| 1879 ... | 627,250 | 69,742 | 4,667 | 35,001 | 1929*e* ... | 7,835,237 | 967,038 | 7,582 | 225,208 | 35,850 | 63,307 |
| 1880 ... | 662,550 | 66,252 | 5,197 | 51,970 | 1930*e* ... | 6,579,743 | 812,112 | 943 | 22,228 | 40,628 | 77,510 |
| 1881 ... | 792,750 | 79,277 | 7,716 | 77,165 | 1931*e* ... | 4,127,856 | 533,997 | 1,606 | 43,790 | 35,333 | 56,170 |
| 1882 ... | 936,500 | 93,650 | 9,605 | 96,050 | 1932*e* ... | 3,062,673 | 447,188 | 1,386 | 40,546 | 42,016 | 59,301 |
| 1883 ... | 997,000 | 79,760 | 7,031 | 56,250 | 1933*e* ... | 2,235,540 | 342,949 | 3,068 | 88,846 | 33,352 | 26,331 |
| 1884 ... | 861,700 | 68,936 | 2,620 | 20,960 | 1934*e* ... | 4,060,830 | 563,355 | 2,508 | 75,424 | 20,904 | 26,720 |
| | | | | | TOTAL ... | 311,781,633 | £30,440,357 | 415,015 | £5,024,009 | £1,345,852 | £556,971 |

*a* The exports up to the year 1831 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 III.

### TIMBER INDUSTRY REGULATION ACT, 1926.

*Annual Report for year ended 31st December,* 1933.

At the close of the year there were 31 mills operating which are subject to the provisions of this Act. The average number of persons employed on timber holdings, exclusive of hewers, increased from 1,205 in 1932 to 1,365 last year. The working and living conditions of the workers, imposed under this Act, have been carefully observed and maintained and in only one instance was it found necessary for the District Inspector to serve a requisition on a mill manager requiring defects to be remedied. As managers and owners now accept the requirements of the Act as standard practice, the work of the inspector is made much easier, and there is not now the necessity for such frequent inspections on timber holdings as was the case following the introduction of this legislation.

Three hundred and ten notifiable accidents were reported during the year, and of this number two proved fatal. The number of notifiable accidents that occurred to every 100 persons employed was 22.71 as compared with 16.68 for the previous year, and the average period of incapacity was 25.8 days per person.

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, 1933.

(2) The number of notifiable accidents reported during the year 1933, 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 times of sustaining the accidents by persons injured.

(5) The number of accidents reported during the year 1933, classified according to the cause of accident and location of injury.

(6) The number of accidents reported during the year 1933, classified according to the cause of accident and nature of injury.

(7) The number of accidents reported during the year 1933, classified according to the location and nature of injury.

(8) The personal cause of the accidents reported during the year ended 31st December, 1933, as determined by the district inspector.

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By Authority: FRED. WM. SIMPSON, Government Printer, Perth.