1965

QUEENSLAND

ANNUAL REPORT

OF THE

DEPARTMENT OF FORESTRY

FOR THE

YEAR 1964-65

PRESENTED TO PARLIAMENT BY COMMAND

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SLASH PINE—PROGENY TRIALS—BEERBURRUM STATE FOREST

	Progeny Plot on left	Routine Plot on right
G.B.H.	20·5 in.	19·7 in.
Predominant Height	38·0 ft.	37·0 ft.
Volume Mean Tree	2·8 cu. ft.	2·5 cu. ft.

REPORT OF THE CONSERVATOR OF FORESTS

For the Year ended 30th June, 1965

INTRODUCTION

The deliberations of the Australian Forestry Council since its inception less than two years ago have made abundantly clear the fact that not only in Queensland but throughout the whole of Australia forestry activities are currently on a level that is quite inadequate to meet Australia's future requirements in forest products. Australia paid out over £100,000,000 in 1964-65 for imports of forest products and at the current rate of plantation establishment and treatment of the native forests this figure must become progressively larger each year. Australia has both the resources and the knowledge to grow its requirements in forest products effectively and efficiently. The longer action to increase the growth of forest products is delayed the worse the position becomes. This report can do no more than to state the problem in general terms and to point out the national need for early action.

The Australian Forestry Council has recommended that the softwood plantation programme in Queensland be increased from 5,000 acres to 10,000 acres annually and also that further action be taken to increase the productivity of our native forests. To achieve the recommended increase in plantations alone an additional annual expenditure of some £750,000 on present costs, is required.

The actual position is that the loan fund allotment to the Department in 1965-66 (known at the time of writing this report) is less than the allotment in the estimates in 1964-65.

Forestry is a long term investment. With the establishment of new plantations each year the area to be maintained is increased. This involves increased expenditures on maintenance of established assets. It is obvious that even to maintain a steady programme it is essential that increased funds be made available to forestry each year. This is further accentuated by the rising costs consequent on award increases, better leave provisions and improved conditions.

Queensland is not in a favoured position relative to other States in the availability of forest products. Imports of forest products in 1964-65 cost the State approximately £10,000,000. All major forest products are bulky to transport and correspondingly costly. Over a long period there is no more economic means of fulfilling the local needs for wood than growing it as close to the point of consumption as is permitted by the economic conditions and the suitability of the site for the growth of trees.

One outstanding feature of the year was a nett increase in the area of State Forests of 674,130 acres. This represents the greatest increase in any one year since provision was made for the setting aside of State Forests as permanent reservations for forestry purposes. The co-operation of both the Lands Department and the Department of Mines in facilitating the gazettal of these State Forests is acknowledged. The total area permanently dedicated to the production of wood and/or watershed protection was 6,202,597 acres at the end of the year.

The Department is making every endeavour to evaluate as rapidly as possible the timber on areas which are the subject of freeholding applications. This activity has become a major undertaking. New areas which became involved during the year totalled 3,565,000 acres compared with a figure of 3,484,000 acres covering all areas applied for in the previous three years. In the last 6 months of the year, applications were made to freehold 2,165,000 acres. Of 636 areas completed since provision was made for conversion, 265 were found to have negligible timber values and 371 areas were found to carry timber valued by the Department at £996,000. Thirty-three applications with an assessed timber value of £431,000 were opposed in the public interest.

Removal of pulpwood on a commercial scale continued during the year from plantation areas at Beerburrum. In conformity with world-wide trends there has been considerable interest displayed in the availability of this type of product from Queensland sources. Plantation management is assisted by the existence of a market for pulpwood. Supply must be on a guaranteed continuous basis calling for the maintenance of the planting programme if the necessary expenditure on plant for the processing of pulpwood is to be considered. Calculations of availability were proceeding at the end of the financial year with a view to inviting propositions for the use by industry of additional volumes of pulpwood.

An important matter in the Legislative field was the amendment of *"The Sawmills Licensing Act of* 1936". The original Act, designed to promote stabilisation in the Timber Industry, was assented to in 1936 and had not since been amended. The Act had, in the 29 years since it was enacted, been instrumental in giving to the Industry a considerable measure of stability, but administration of the Act over the years had shown the need for certain amendments. Changes too, had taken place in the Industry, and it became necessary to bring the Act up to date to meet these changes and to give necessary legislative support to permit of improved administration. The most important amendments were the change in the basis of the maximum productive capacity of a sawmill from a daily to a quarterly basis, and the adoption of a method of conversion from the daily to the quarterly capacity which removed much of the existing excess licensed sawmill capacity in Queensland and more closely equated total licensed capacity to supplies that are available, whilst at the same time permitting each miller to cut at least as much as was formerly cut at his sawmill.

Research work carried out by the Department has shown that great gains can accrue from the use of plantation stock from known parents of outstanding form and vigour and with good wood qualities. As a result of this work seed orchards of the major species being planted either have been established, or are in process of establishment.

It is with some pride that it is recorded that the entire plantings of some 3,000 acres of Slash Pine projected for planting in 1965-66 will be with stock produced from the slash pine seed orchard in 1963-64.

The severe drought that extended from late Spring through the Summer and Autumn showed no sign of breaking at the end of the year. The main areas affected were as Passchendaele and Pechey where the 1964 plantings failed. At Passchendaele the 1963 planting also suffered a 50 per cent. loss. In older stands at both centres deaths did not assume serious proportions. At Yarraman, stands of *Pinus patula* over 10 years of age suffered so severely that salvage logging was necessary. It is fortunate that this species has not been planted extensively at Yarraman.

Throughout the State the main plantation species, Hoop Pine, has again demonstrated its ability to withstand severe drought and on the coastal plain no losses were recorded in the extensive plantings of Slash Pine and *Pinus caribaea.*

At the commencement of the financial year the Fire Protection Officer was sent as one of a delegation of five Australian Forest Fire Control Officers to attend a Fire Study Tour of North America, sponsored by the Food Agricultural Organisation of the United Nations Organisation. As a result of recommendations made on his return, certain items of forest fire fighting equipment are in process of being purchased from overseas. Improvements to protection procedures have also been adopted.

The fire season was one of the most long-sustained ever experienced; but largely as a result of a vigilant detection system and greater public awareness of bushfire dangers, the actual outbreaks were kept reasonably low, though above-average. The most damaging single fire occurred in mid-December when about 12,000 acres of prime cypress pine forest were destroyed, and a camp burnt out. Following the fire immediate arrangements were made for the salvage of the trees that had been killed but were still useful. By the end of the year the salvage operation was almost completed.

The increase in total area of National Park and Scenic Area reservation during 1964-65 was small but included one area of great significance because of the principle involved: this was the addition to Noosa National Park of the esplanade around the shore-line. The Government is to be congratulated on its action which thus ensures the preservation free from interference of this small but vital strip of beach frontage.

Activities on National Parks during the year were restricted by lack of funds. Many letters were received from appreciative visitors, and there were many requests for extension of work both on staffed areas and on National Parks

where at present there is no staff. This drew attention to the fact that the funds provided for National Parks are inadequate—only £72,000 for the year, and also underlined the desirability of a special fund for financing work on the Parks. The small loan allocation for reforestation activities should not be required to provide funds for National Parks work.

The first self-guiding track in Queensland at Maiala National Park, Mt. Glorious, was opened by the Honourable Harold Richter, Minister for Local Government and Conservation at an official function held at the Park on 24th April, 1965. The self-guiding track, which is a circuit walk of about one mile, contains a number of lettered markers at points of specific interest, of which there is a brief descriptive account in a leaflet that is available. The opening ceremony, which was an outstanding success, was attended by about 180 official guests, including the Honourable D. E. Nicholson, who is the M.L.A. for the area, representatives of Forestry and other Government Departments, the University of Queensland, the Pine Rivers Shire Council, the National Parks Association, Queensland Field Naturalists' Club, Honorary Rangers' Organisation and the local Progress Association and many expressions of congratulations were received for this new service to the visitor.

An item worthy of record here is the commencement of work at Carnarvon National Park with the provision of an access road of about 2 miles from near the C.W.A. Hut to the north-western side of Kooramindangie Plain where a camping area has been prepared for visitors. Improvements effected include composite toilets, the reticulation of water from Carnarvon Creek and accommodation for a resident overseer.

Appreciation is expressed of the support and understanding of the Minister in control of Forestry work, the Honourable Harold Richter, M.L.A., during the year.

MANAGEMENT

General

The area of State Forests was increased by a nett 674,130 acres to a total of 6,202,597 acres. Of this area 469,206 acres were formerly Timber Reserve, including rain forests of North Queensland producing valuable cabinet woods.

Expenditure

Nett expenditure under the Reforestation Vote was £1,876,000 compared with £1,733,620 in the previous year and £1,864,257 in 1962-63. Expenditure from Trust funds on maintenance of capital improvements was £54,426.

Expenditure is itemised as follows:—

	Expenditure	Percentage of Total
	£	
Direct Expenditure—		
Plantations	452,969	23·5
Natural Regeneration	98,415	5·1
Nursery Expenses	56,013	2·9
Research	62,137	3·2
Protection	312,661	16·2
Surveys	42,921	2·2
New Construction	80,817	4·2
Maintenance of Capital Improvements	54,426	2·7
Total direct expenditure	£1,160,359	60·0
Indirect Expenditure—		
Wet Time, Holidays and Leave	193,668	10·0
Supervision, Tools, Transport, &c.	347,042	18·0
Camping Allowance	115,623	6·0
Pay Roll Tax	33,425	1·8
Workers' Compensation	23,120	1·2
Administration	36,110	1·9
Miscellaneous	28,114	1·5
Stores Suspense	Cr.7,035	—0·4
Total indirect expenditure	£770,067	40·0
Total expenditure	£1,930,426	100·0

Employment

The number of men engaged on Reforestation work was 1,256 at 1st July, 1964, and 1,543 at the end of June, 1965.

The average level of employment on this work was 1,401 men compared with 1,413 in 1963-64.

Average expenditure per man year was £1,378 compared with £1,267 in the previous year.

Timber Assessment

The assessment of State Forests by the establishment of permanent plots has been maintained at a rate similar to previous years, and an even greater emphasis placed on re-measurement of existing plots.

New plots, 630 in number, were established to sample 120,000 acres of State Forests, bringing the total to 18,920 plots sampling 2,430,000 acres.

The majority of these new plots was in North Queensland where three gangs are currently employed using a revised technique.

In order to obtain detailed information on timber stands which are not at present dedicated as State Forest, but which may be suitable for such a purpose, three survey gangs are permanently in the field and a total of 300,000 acres of Crown Land was covered during the year.

Valuation of Timber on Land for Conversion

The table below sets out the position of freeholding applications.

At the end of December most Districts had covered in the field the outstanding applications and three camps engaged on freeholding were placed on investigation of plantable areas for the Department's proposed increased planting programme.

In the latter 6 months of the year the effect of the amended Land Act was apparent with a total of 170 new applications totalling 2,165,000 acres being received. This was the greatest number of applications since the first 6 months of freeholding legislation and by far the greatest total acreage for a six months' period.

However, the new punching equipment in use by this section and streamlining of computer work has reduced time needed to complete timber valuations, after field assessment. A new departure is proposed for field inspections by aerial reconnaissance which it is hoped will considerably speed up work and effect a saving in money as well as time.

	As at 30th June, 1962		As at 30th June, 1963		As at 30th June, 1964		As at 30th June, 1965	
	No.	Area	No.	Area	No.	Area	No.	Area
		(Acres)		(Acres)		(Acres)		(Acres)
Total Applications made	388	1,053,000	660	2,472,000	880	3,592,000	1,226	7,152,000
Withdrawn before valuation	30	68,000	34	75,000	39	108,000	32	103,000
Requiring Valuation	358	985,000	626	2,397,000	841	3,484,000	1,194	7,049,000
Valued, including area through Land Court	206	588,000	317	914,000	..	..	..	..
Through Land Court	..	..	..	..	171	484,000	239	799,000
Valuation complete	..	..	..	..	278	1,044,000	458	1,848,000
Field assessment complete but not yet valued	59	145,000	42	125,000	230	1,096,000	182	1,036,000
To be assessed in field	93	252,000	267	1,358,000	162	860,000	315	3,366,000
Totals	358	985,000	626	2,397,000	841	3,484,000	1,194	7,049,000

Total effective applications as at 31st December, 1964, 1,024 blocks, 4,884,000 acres

Increase last 6 months 170 blocks, 2,165,000 acres.

Protection

The fire-season was one of the most prolonged ever recorded, due to the failure of the wet season. Declarations of States of Fire Emergency were requested by both Forestry and Rural Fires interests as late as May, a month when normally it is difficult to achieve a burn. Due to the general dry conditions, however, there was a public awareness of the danger of bushfires, and the number of outbreaks—192 (130 in 1963-4) was lower than might have been expected in such a year.

The following table gives details of fire outbreaks which were fought or investigated during the year:—

Month	Number of Fires	Size of Fires in acres*				
		0–10	11–100	101–1,000	1,001–10,000	10,001+
July	3	2	..	..	1	..
August	10	3	2	5	..	..
September	4	1	..	3	..	..
October	12	5	1	5	1	..
November	12	4	4	2	1	1
December	54	7	15	15	14	3
January	23	5	7	8	2	1
February	17	8	2	4	2	1
March	31	13	12	5	..	1
April	20	14	1	3	..	2
May	5	2	1	1	1	..
June	1	..	1	..	..	..
Total	192†	64	46	51	22	9

* The areas are totals, and include all private and Crown tenure country covered by the fires.

† Includes 9 restarts of fires.

Two fires (46·0 acres at Cathu in Mackay District and 43·7 acres at Passchendale in Warwick District) accounted for most of the 93·6 acres of plantation lost. Extensive replantings will be necessary, since recovery has been limited in both areas.

The most damaging fire at Dunmore State Forest in Dalby District, cost over £2,500 to suppress. Believed to have started from unauthorised burning off operations, the fire reached the State forest on a wide front, and destroyed 3,500 acres of high quality and 12,200 acres of average quality cypress pine, of a calculated royalty value of £48,000. To this loss must be added a wastage of £4,200 spent on recent timber stand improvement work in the area, a camp valued at £750, and 40 miles of roads of value £8,000 which will now be of limited usefulness. Since sales of burnt timber realised a nett £11,900, it will be seen that a nett loss exceeding £50,000 resulted, and additionally, it will be at least 50 years before the area produces commercial timber again.

In efforts to fight these and other fires more efficiently, work is continuing to improve detection, communications and equipment.

Fire towers are now being erected by the Department's own employees, and the year saw the completion of a 100-foot tower at Barakula (Dalby District), while two towers of 70 feet are in process of being built at Sunday Creek (Murgon District) and Brooyar (Gympie District). Foundations of a 75-foot tower near Inglewood (Warwick District) have been poured.

Aircraft have been used in several districts to supplement the tower detection system, and for tactical examination of going fires. For these purposes they have proved very useful and have saved much costly and time-consuming ground reconnaissance.

The programme of installation of modern transistorised radio transceivers increased in pace with the completion of the new Communications Centre in Outer Brisbane, and the technical staff of three has made good progress also with helping districts to upgrade telephone networks. Within two years it is anticipated that all old radios will have been replaced, and radio installation will be greatly expanded and extended to commence covering the north and central Queensland districts as well.

The Fire Protection Officer returned in September, 1964, from a North American Fire Study Tour sponsored by F.A.O. His recommendations for purchase of certain items of fire equipment seen overseas are being implemented. Additionally, a prototype of a newly designed slip-on unit is being field tested, while two more large specialised fire tankers were commissioned during the year.

The breakdown of fires by districts is presented below.

District	No. of Fires	Area Burnt Over (acres)			
		Crown Timber Areas		Private	Total
		Inside Protection Systems	Partly Protected or Unprotected		
Atherton	3	185	320	124	629
Brisbane	34	150	9,406	4,157	13,713
Dalby	23	28,060	11,221	81,700	120,981
Gympie	29	281	36,908	715	37,904
Mackay	5	1,606	8,270	..	9,876
Maryborough	18	10,933	116,799	..	127,732
Monto	7	786	5,454	400	6,640
Murgon	24	1,955	1,110	548	3,613
Warwick	19	9,680	2,441	8,500	20,621
Yarraman	19	1,049	437	2,560	4,046
National Parks	11	850	561	400	1,811
Total (including restarts)	192	55,535	192,927	99,104	347,566

Major known causes of outbreaks by percentages were:—

	Per cent.
Unauthorised burning off	22·8
Lightning	10·4
Smokers	8·7
Government and semi-government authorities	8·2
Camp fires	5·6
Other known causes	7·1
Fires of unknown origin accounted for	37·2

Total expenditure on Fire Fighting including patrol and detention was £71,126 (£41,576 in 1963-64), Direct Costs being £14,249 (£7,660). A further £5,361 (£5,537) was spent in prescribed and protection burns covering an area of 93,433 acres (138,548 acres) and £1,436 (£763) was spent in burning logging debris.

Expenditure on new fire roads and firebreaks was £106,106 (£100,402), whilst maintenance of fire roads cost £108,706 (£113,940).

Industrial Safety

This Department is making increasing efforts to improve the industrial accident record. Organised efforts began some four years ago and take the form of—

1. Instruction of officers to give a Job Safety Course to all supervisory levels. So far five officers have been trained to give courses and three are still active on a part time basis. A total of 305 supervisors have undergone the safety course, but due to other commitments by training officers, only 44 were instructed this year (170 in 1963-4).
2. The gathering and study of accident statistics to analyse basic causes and to get data on which to direct field efforts.
3. Dissemination of the results of this work in the form of a quarterly bulletin to all districts.
4. Field testing of approved items of safety equipment and advice to districts of results of these tests.
5. The production this year of a departmental Job Safety Handbook and the issue of this and a first aid booklet to all employees.

The result of these efforts are reflected in frequency rates since records were kept.

Year	Frequency Rate (accidents per 1,000,000 man hours worked)
1961-62	150·6
1962-63	150·1
1963-64	132·6
1964-65	120·5

Though comparison with other fields of industry is still not favourable, the indications are that the efforts are on the right lines, and it is hoped that further work will show further gains.

MECHANICAL EQUIPMENT

General

Preliminary work associated with the proposed increase in the approved planting programme of the Department has placed increased demands on the mechanical equipment operated by the Department, both in respect to heavy equipment and as regards additional vehicles.

The drought conditions experienced in South Queensland for the greater part of the year resulted in an increased usage rate for machines. Very dusty conditions under which machines operated called for increased attention to air filtering equipment in order to prevent excessive engine wear.

Staff

During the year a third Plant Inspector was appointed and took up duties in North Queensland with headquarters at Townsville. Mechanics were appointed to Roma, Chinchilla and Ingham Sub-districts whilst additional mechanics were engaged at Dalby, Beerburrum and Atherton. The staff of the Mechanical Equipment Section now consists of—

1 Mechanical Equipment Officer.
3 Plant Inspectors.
1 Clerk.
1 Clerk-typist.
24 Mechanics.

A service school for mechanics was conducted at Beerburrum during September, 1964, and covered the major units of the Department's equipment. A number of mechanics was also sent to schools conducted by the Queensland Agents for some of the major manufacturers. It is proposed to make greater use of such service schools in the future.

In most districts premises are now available as workshops for use by the District mechanics—the exceptions are Maryborough and Ingham.

Plant Hire Rates

During the year all plant hire rates were reviewed and new rates came into effect as from the 1st January, 1965. The new rates cover not only the cost of fuel, oil and repairs but also take into account interest on the purchase cost of the machine and depreciation.

In the case of heavy equipment a usage rate of 1,000 hours per year for dozers and 1,200 hours per year for power graders has been adopted. During 1964-65 these rates were achieved by the bulk of the more powerful units but usage rates for the smaller type dozers and dozer loaders were much below expectations.

Expenditure

Details of expenditure are—

	£
Purchase of Plant	209,563
Maintenance of Plant	252,254
Plant Hire Credits	337,414
Receipts from sale of plant and vehicles	15,062

The difference between Maintenance and Credits, i.e. £85,160, is remitted to the Treasury and is used to reduce the Department's Loan indebtedness to the Treasury. The amount so remitted in 1963-64 was £58,487.

The disposal of 5 dozers and 5 graders is pending.

Purchases

Major items of plant purchased during the year are as follows:—

1. Five (5) 100 h.p. plus Tractor/Dozers to replace machines which were 9 and 10 years old.
2. Five (5) 85 h.p. Power Graders to replace machines which were from 12 to 15 years old.
3. 54 replacement Motor Vehicles including a number of diesel-engined trucks.
4. 18 additional Motor Vehicles.

***Census of Plant* (as at 30th June, 1965)**

Item	Disposal	Purchases	Balance 30th June 1965
Motor Vehicles—			
Sedans and Station Sedans	1	8	22
Panel Vans, Light Utilities, and 4-wheel drive vehicles	38	39	246
1 to 2 ton	..	16	19
2 to 4 ton	14	3	103
4 to 6 ton	3	3	33
7 ton	..	3	3
Total	56	72	426
Tractors (D.B.H.P.)—			
(*a*) Track Type—			
Up to 50 h.p. with blade	..	..	33
Up to 50 h.p. without blade	..	..	..
50 to 100 h.p. with blade	..	5	27
Over 100 h.p. with blade	..	..	9
(*b*) Wheel Type (End Loaders and Rotary Hoes)	..	..	37
Total	..	5	106
Power Graders—			
40 to 80 h.p.	..	..	16
80 to 100 h.p.	..	5	14
Over 100 h.p.	..	..	7
Total	..	5	37
Road Compressors	3	1	12
Light Weight Rockdrills	..	4	21
Rotary Hoes	5	1	32
Rippers	1	..	20
Tilt Bed Trailers	..	3	6
Caravans	1	..	37
Concrete Mixers	..	3	36
Disc Plough	..	1	2
Welding Plants	..	2	8
Chain Saws	5	63	158
Firetanks, Slip-on Type	..	1	83
Firetanks (Various types)	..	6	44
Road Rollers	..	..	6
Disc Harrows	..	..	4
Road Scoops	13	..	5
Rotary Slashers	..	3	6

Acquisition of Land

During the year 1964-65 an amount of £15,726 8s. 8d. was expended on the acquisition of Land for Forestry purposes as follows:—

	£	s.	d.
Purchase of Land	14,592	13	9
Survey and Real Property Fees	1,133	14	11
	£15,726	8	8

The expenditure of £14,592 13s 9d. represents the purchase of six properties, comprising a total of 2,630 acres 3 roods 8 perches as additions to existing State Forest.

Forest Surveys

Thirty-six camps operated during the year, details being as follows:—

General Surveys.—Eighteen camps were engaged on general survey work. This was associated with the traversing of reserve, logging area, and compartment boundaries, firebreaks, roads, species separation, soil, timber and slope classification and road investigations. Two of these camps were engaged on theodolite control traversing, one in South and one in North Queensland.

Personnel.—At the end of 1964-65 the following were engaged in survey work: 11 Foresters, one Forest Surveyor, nine Forest Rangers, 35 Overseers, 11 trainees and 120 men. Drafting Branch personnel totalled 19 officers.

Details of work in miles

Theodolite Controls	Compass and Chain Traverse	Re-opening of old lines	Investigation Surveys	Stripping
118	935	370	202	6,310

REFORESTATION

General

The drought experienced in Central and Southern Queensland has been dealt with in the introduction to this report. As would be expected rainfall figures for the year are down on average and this is reflected in the growth recorded in centres affected. The following figures show rainfall for the year relative to normal:—

RAINFALL IN POINTS

	Hoop Pine Areas			Exotic Pine Areas		
Centre	Yarraman	Imbil	Kalpowar	Beerwah	Tuan	Bowenia
1964–65	2,815	3,669	2,771	4,880	4,307	4,775
Average	3,145	4,550	2,955	6,075	5,225	6,405

Growth rates are down about 35 per cent. in the main Hoop Pine areas and about 20 per cent. in the Beerwah-Toolara-Tuan plantations of Slash Pine. With *P. caribaea* in the Bowenia area growth was about the same as for the previous year which was itself below average.

The following table shows the extent of field operations for the year 1964-65 with the previous year's figures for comparison:—

	1963–64	1964–65
	Acres	Acres
Area of natural forest treated	60,326	44,912
Area of plantations established	4,644	4,861
Area of plantations covered in pruning ..	17,996	18,926
Area of plantations tended	68,645	60,183
Area thinned merchantably	5,639	6,962
Area thinned unmerchantably	5,213	4,572

These figures show a further decline in area of natural forest treated necessary to permit the maintenance of the softwood planting programme which is accorded first priority. It is seen that the area of plantations established is up by 217 acres and at the same time all necessary pruning and tending of plantations was carried out. The increase in area covered by merchantable thinning reflects the substantial increase in utilization of plantation thinnings in both Hoop Pine and Exotic areas. The area covered in unmerchantable thinning is down because of the decision taken to suspend this operation in most plantations in the South-East part of the State because of the possible expansion in the demand for pulp-wood from these forests.

Plantations

Details of the area planted from 1st April, 1964, to 31st March, 1965, are shown in Appendix F by districts and by species. From it the following are obtained:—

Species	Area planted (Acres)
Native Conifers (Chiefly Hoop Pine)	2,164·4
Exotic Conifers (Chiefly *Pinus elliottii, caribaea, radiata, patula*	2,551·5
Eucalypts	139·5
Miscellaneous Experimental	5·9
	4,861·3

The area of effective plantations established to 31st March, 1965, is 115,067·3 acres comprising the following:—

	Acres
Native Conifers	56,324·2
Exotic Conifers	53,636·2
Eucalypts	3,629·6
Other Broadleafed Species ..	1,276·1
Miscellaneous Experimental ..	201·2
	115,067·3

This figure has been obtained as a result of a review of the plantation areas conducted during the year. In the first place a plantation register was drawn up in Head Office to show all planted areas. This was referred to the districts for verification and the corrected data committed to punch cards. The appendices F and G in this report have been derived directly from the computer. Comparison with last year's report will show that the nett area of effective plantations as shown last year has been reduced by 1,325·4 acres. The new system of keeping areas has important advantages particularly in the way in which it permits areas to be taken out by years of planting and by species for compartments, reserves, districts and groups of these as well as for the State as a whole.

There has been a substantial increase in the area to be cleared for planting next year and to enable contractors to complete the job in time, tenders were called earlier than usual. As a result a greater area than usual had been handled by the end of this financial year and work was proceeding satisfactorily in all districts. In all, arrangements were made for the clearing of about 7,500 acres—5,200 acres for Exotics and 2,300 acres for Hoop pine. Of the 5,200 acres for Exotics approximately 4,300 acres involve machine and 900 acres hand falling. The machine clearing comprises 2,900 acres by contract and 1,400 acres by departmental plant whilst about 700 acres of the hand falling is by contract. Practically all of the 2,300 acres for Hoop pine is covered by contract and 1,100 acres involves machine clearing.

Pruning operations were carried out on 18,926 acres which was 930 acres up on the previous year. Distribution of this by stages of pruning was:—

Year	State of Pruning				Total Area
	1st	2nd	3rd	4th	
	Acres	Acres	Acres	Acres	Acres
1963–64 ..	4,427	5,978	4,914	2,677	17,996
1964–65 ..	5,252	5,258	5,515	2,901	18,926

Epicormic shoots were removed from high pruned stems on 952 acres in which pruning had previously been completed.

Areas covered by unmerchantable thinning during the year amounted to 4,572 acres distributed as follows:—

District	Exotics	Hoop Pine	Eucalpyts
	Acres	Acres	Acres
Brisbane	203·9	30·0	..
Gympie	467·4	225·3	633·0
Mackay	739·0	..	..
Maryborough	511·3	3·0	..
Monto	15·0	324·7	..
Murgon	..	92·0	..
Yarraman	547·0	372·0	..
Warwick	357·0	..	..
Atherton	5·0	46·0	..
Totals	2,845·6	1,093·0	633·0

The area covered in merchantable thinning totalled 6,962 acres giving an increase of 1,323 acres over the previous year. As pointed out earlier the increased activity in merchantable thinning was shown in both Hoop and Exotic pines. In the case of Exotics the increase was largely due to the pulp-wood operations of Australian Paper Manufacturers in the Beerwah district. Yield per acre thinned was slightly over 6,000 s. ft. per acre with a stumpage value of £22 per acre.

Entomology

Insects of Silvicultural Importance.—During the year investigational work has been carried out on Bagworms (*Hyalarcta hubneri*) a pest of *Pinus radiata*; on the Kauri coccid (*Conifericoccus agathidis*) a pest of Kauri pine; on white grubs (Scarabaeoidia) pests of nursery and newly established plantations; and on a small as yet unidentified moth which feeds on hoop pine seed cones. These insects consistently cause losses each year.

At Passchendaele the downward trend in population of Bagworms which was reported last year has continued and at the moment this pest is causing no concern. Long term experiments and observations are being continued.

The position in regard to the depredations of the Kauri coccid on plantations of *Agathis robusta* in the Mary Valley has shown no improvement and there has been, in general, a slight deterioration in the general condition of these stands. Trials using a number of sprays provided no real promise of economic control of the pest. Studies on the life cycle of the insect are continuing. Details of preliminary observations on this insect have been published in a paper in the Journal of the Entomological Society of Queensland and a further paper of wider scope is planned for publication early in the coming year.

White grubs caused serious losses in sections of the 1964-65 planting of Hoop Pine at S.F. 329 Avoca and large scale trials to control these by use of BHC in the tubing soil and by its addition to the planting hole are planned for this year's planting at that reserve.

In addition to the above pest species a wide range of insects were examined for identification and investigations of biology or control as required. Pest species in this category included the white fringed weevil *Pantomorus leucoloma* which damaged a considerable number of Slash pine seedlings at the Petrie nursery of A.P.M.; the pine mealy bug *Nipaecoccus aurilanatus*, as a pest of nursery stock; sundry lepidopterous pests of nursery stock of exotic and indigenous species; a Xyloryctid wood moth, *Uzucha borealis*, which was present in large numbers on Eucalptus maculata near Pomona.

Large scale nursery experiments on white grub control are being undertaken and these could well justify a change from lead arsenate to BHC for routine preventive seed bed soil treatment in hoop pine nurseries. Lead arsenate has been in use for some thirty years and has proved very satisfactory. The main consideration in the change to BHC is the considerable financial saving which can be effected. Experiments have shown that there is little difference in effectiveness between these two materials against the range of species of Scarabacoidea which cause the white grub problem.

Pathology

The nursery beds for the 1964 sowings at Passchendaele, Beerburrum and Beerwah were fumigated with Methyl Bromide for the control of *Phytophthora* root rot of *Pinus* seedlings. Results were generally good but some losses occurred in one bed at Beerburrum. The actual cause of these losses is not known but it appeared to be related to the method of fumigation.

Early in 1965 the Department purchased a soil injection rig for the application of soil fumigants. The rig is tractor mounted and allows injection of the fumigant into the soil in continuous strips. This method is becoming widely accepted for soil fumigation. The equipment was used for the first time at the Pechey nursery where damping-off losses have been serious in *Pinus patula* sowings. As a result of dry conditions no post emergence damping-off occurred but the fumigation gave a 100 per cent. increase in germination over an unfumigated section of seed bed.

Fumigation at Passchendaele for the August, 1965, sowings was carried out in May. Early treatment was necessary because the low soil temperatures experienced in winter would result in poor fumigation. The Beerburrum and Beerwah nurseries are to be fumigated in July.

Chlorosis of *Pinus caribaea* which has become a problem at Byfield nursery was controlled experimentally by fumigation. The cause of the chlorosis is not yet known but it could be pathological.

In the past damping-off losses have been high in the Hoop pine sowings in the Yarraman nursery. Good results in control were achieved experimentally with soil fumigation and seed and soil fungicide applications. Large-scale use of Captan 50 as a seed dust is planned for the 1965 sowings of Hoop pine.

A fungus tentatively identified as *Fomitopsis annosa* was found in a Hoop pine plantation in the Atherton District. *F. annosa* is the cause of the serious Fomes root rot problem in the Northern Hemisphere. The fungus found in the north could be an unimportant tropical strain.

Other Hoop pine problems reported during the year include root rot in North Queensland and a form of root rot at Imbil where also dead topping caused by an unidentified agent has occurred in patches of plantation. A "sore-shin" disease of Hoop pine caused by *Rhizoctonia* sp. was recorded at Jimna, few deaths occurred but the growth of the plants was affected.

In early summer, a disease causing death of the apical bud and a marked bending of the stem just behind the apex was recorded on *Pinus elliottii* at Beerburrum and Beerwah. The fungus causing this disorder is an as yet unnamed species of Colletotrichum.

Regeneration of Natural Forests

Areas covered in the past two years are shown in the following table:—

Forest Type	1963–64	1964–65
	Acres	Acres
Eucalypt Forest	38,389	28,723
Cypress Pine	19,843	15,658
Tropical Rain Forest	2,094	527
Natural Hoop Pine	..	4
	60,326	44,912

The average area treated over the last five years is approximately 60,000 acres. The area treated this year has fallen mainly due to lack of labour and concentration on plantation work. With an increased demand for labour by local authorities, primary industries and general industry, it has become more difficult to attract labour to this forestry work as much of it is carried out in areas distant from amenities. The greater use of hormones during the year also has affected area treated. Results from both cypress pine and hardwood treatments with hormone strongly support its use to secure good kills of small and large trees and seedling and coppice growth. Greater increment will be ensured for a much longer period. Work with the hormone "Tordon" gives great promise for control of the more difficult species. An estimate of the area of natural forest available for treatment shows treatable area of hardwood as 1,045,000 acres, cypress pine 640,000 acres and rain forest as 500,000 acres. With a total of 2,185,000 acres to treat, it is obvious when repeat treatments are considered, that much greater acreage will have to be treated each year to make our indigenous forests more productive.

Seed Collection

The demand for seed from abroad and within Australia resulted in the following sales:—

Species	*P. elliottii*	*P. taeda*	*P. patula*	*F. brayleyana*
Quantity ..	1,206 lb.	226 lb.	11½ lb.	100 lb.
Value	£3,591	£535	£53	£450

In addition there were small sales of seed of Hoop pine, Eucalypt and ornamental species.

As a result of this demand and further outstanding orders a record collection of *P. elliottii* seed was undertaken. In all, this amounted to 2,371 lb. of which 229 lb. came from seed orchards, 239 lb. from open pollination of outstanding parent trees and the remainder from superior stems selected for high pruning at 120 to 160 per acre.

As pointed out in the introduction to this report it is anticipated that the seed from orchards will provide stock adequate for the entire Slash pine planting in Queensland next winter and it is likely that increased yields from the orchards will meet the needs of the increased planting programme envisaged.

The only important import of seed during the year was 75 lb. of *P. caribaea*. Local collection of this species was 34½ lb. and it is expected that in the next year or so the yield from plantations at Bowenia and in North Queensland will meet our requirements.

Following failure of the Maple seed crop last year it was possible to make a large collection in North Queensland and from plantation trees at Amamoor: 235 lb. were collected and 100 lb. of this sold to Hawaii.

Though not a year of a general Hoop Pine crop it was possible to make a collection of 12,000 lb. of average quality seed in the Yarraman and Murgon districts. This brought stocks in cold storage up to capacity and removed cause for concern over seed supplies of this species to meet the needs of an expanded programme.

Nurseries

Output from 21 nurseries for the year was 3,200,000 plants and stock on hand to provide plants for the future is 6,500,000.

A new nursery to raise Slash pine is ready for sowing at S.F. 779 Gregory and one at S.F. 676 Woocoo to raise Hoop Pine will be sown next spring. Construction has also commenced on a new nursery at Kennedy in North Queensland and here the species to be raised is *P. caribaea*. In addition it has been necessary to extend the nurseries at Tuan, Toolara, Builyan, Gallangowan, Imbil, Kenilworth and Palen Creek.

Construction of additional low shade stand-down beds is planned for the Yarraman nurseries.

Sale of Trees

Trees supplied to the Public, to Schools and to other Government Departments amounted to 272,000. This is an increase of 75,000 on the figures for the previous year and by the end of the current planting season nearly all public requirements will have been met. Ample provision has been made in this year's sowings to catch up on any areas that are held over. There has been a big increase in the demand for *P. caribaea* for planting in coastal North Queensland and it is expected that this will be maintained. Sales of *P. radiata* decreased by 18,000 and this is related to the drought in the Granite Belt where this is the main species planted.

Distribution is as follows:—

By Species		By Type of Planting	
Pinus elliottii ..	175,000	Forest Plots ..	198,000
Pinus caribaea ..	32,000	Schools	6,000
Pinus radiata ..	9,000	Government Departments	16,000
Pinus taeda	4,000	Private Sales ..	52,000
Hoop Pine	4,000		
Pinus patula	1,000		
Miscellaneous ..	47,000		
	272,000		272,000

At 32,202, sales from Rocklea Nursery were down 3,000 on the year before; this was in part due to the influence of the drought. However the value of the sales at £2,502 11s. was nearly the same as in 1963-64.

The Dalby Nursery disposed of 4,100 plants for which £355 2s. was received and is filling a need in the supply of plants suited to the South-West.

Sales of Christmas trees increased by 1,259 to 5,826 with a value of £1,471 2s.

The value of plants and Christmas trees sold was £8,432 16s.

SILVICULTURAL RESEARCH

Staff—

During the year 14 graduate foresters and 1 science graduate—the biometrician—were engaged on silvicultural research. These offices were stationed as follows:—Atherton (2), Imbil (2), Beerwah (4), Yarraman (2), Dalby (2), Head Office (3), the latter includes the biometrician.

The main work has consisted of remeasurement and maintenance of current experiments.

North Queensland Rain Forests—Regeneration studies around seed trees of Group A species, mainly high quality cabinet timber species, continued during the year.

Observations on suitability of a number of species for enrichment planting in rain forests were continued. *Flindersia brayleyana* (Queensland Maple) has proved satisfactory. *Araucaria cunninghamii* (Hoop Pine) and *Agathis palmerstoni* (Kauri Pine) are showing promise. Initially the height growth of the two pines is slower than that of Queensland Maple.

Grafting of figured *Flindersia brayleyana* trees has continued. Seasonal grafting trials with this species have shown that summer and autumn are more favourable seasons than either winter or spring (54·4 per cent. and 52·5 per cent. takes vs 36·7 and 39·3 takes respectively).

Beerwah Regional Research Station

This station deals with research on plantation silviculture practice (exotic pines), tree improvement (exotic pines), forest nutrition (main plantation species) and the indigenous hardwood forests of South-east Queensland.

(i) Plantation Silviculture.—Work in this section at present entails (*a*) further investigation of thinning and pruning procedures for plantations of Slash, Caribbean and Radiata pines, (*b*) control of unwanted species, and (*c*) species introduction trials.

Over a period of many years a large number of species, mainly conifers, have been established in trial plots. So that data accumulated from these trial plots in Queensland can be readily compared and assessed, a standard species trial register was designed. Compilation of this register has begun at this station and in districts not served by the station.

Results have become available from a slash pine experiment designed to determine what age of unmerchantable thinning (4, 5 or 6 years) gave the best selection in terms of form and vigour, of 120 per acre crop stems at age 8. Advantage gained by deferring to age 6 was only slight.

Routine control of unwanted species on plantations and firebreaks by hormone treatment is now general, and the coppice problem is reduced. However on present knowledge Brush Box (*Tristania conferta*) cannot be controlled until large enough for cut stump treatment. Different herbicides are being assessed to attempt to find a substitute or additive for 2,4,5-T to enable Brush Box to be eradicated in pre-planting spraying.

A cost study on high pruning (above 20 ft.) is to be initiated using three methods of climbing, (*a*) the Swedish ladder, (*b*) the Morris high pruning equipment, and (*c*) the Swiss tree climbing bicycle. Modification is being made to the bicycle to enable it to be used more efficiently on smaller trees.

(ii) Forest Nutrition.—Throughout the year, existing field trials were maintained, and new experiments were established to test critical levels of phosphorus in slash pine, and form and method of application of phosphorus fertilizers.

The results of a number of completed glasshouse experiments that had been undertaken over the period 1959-64 confirmed the existence of a positive interaction between nitrogen and phosphorus in determining the response of Pinus species to fertilising. Field trials now 6-years old indicate however that this interaction is ephemeral in its effect on growth of *P. taeda* planted on good sites. Field work on marginal sites, where the response may be more prolonged, is continuing.

Further data collected on the use of foliar analysis to diagnose phosphorus deficiency, supported previous indications that the critical range is ·090 — ·099 per cent. in *P. taeda*.

Results of one experiment are quoted below:—

EXPT. 210 N.C. *P. taeda*, AGE 12 YEARS. 300 STEMS/ACRE
(Means of 3 Replications)

Rock Phosphate at Planting	Per Cent. Foliar Phosphorus 1964	Increment, 1963–64			
		Gbh	Mean Height	Basal Area/ Acre	Total Volume
		in.	ft.	sq. ft.	cu. ft.
Nil	·078	1·0	2·8	6·4	151
2 cwt/acre	·092	1·1	3·0	8·2	204
4 cwt/acre	·097	1·2	3·2	9·7	286
6 cwt/acre	·102	1·2	3·4	9·9	282
8 cwt/acre	·100	1·3	3·4	10·2	284

A study aimed at elucidation of some of the factors responsible for the healthy early growth of hoop pine when planted under established Pinus stands has indicated that plants capable of exploiting different forms of nitrogen (legume, grass, pine) all grew better in soil from under established Pinus plantations than from native eucalypt forest. A nitrogen immobilisation study conducted during the year showed that nitrogen use by hoop pine underplants at a stocking of 500 stems/acre is only 2 pounds nitrogen/acre/annum for the first 8 years. This slight amount is one which may be obtained, either through the activity of nitrogen-fixing soil micro-organisms, or from products of litter breakdown.

A small programme aimed at investigating different aspects of dry matter production under plantation conditions was initiated during the year. In two studies on *P. taeda*, one stand planted at 3 ft. x 3 ft. spacing was shown to have produced 15,300 pounds of dry matter/acre/annum in the trees above ground by age 3 years while in another investigation, the same species planted at 5 ft. x 5 ft. spacing averaged 13,800 pounds/acre/annum over the first 5 years.

(iii) Tree Breeding.—The programme has been maintained with only limited expansion. The major achievements are summarized as follows:—

P. elliottii. The first substantial collection of seed from the Slash Pine Seed Orchards was made during the year. This totalled about 220 lb. One of the seed orchards was established over the period 1956–58 at 24 ft. x 24 ft. spacing and yielded 103 lb. of seed. It contains grafts of the better plus trees. The other orchard, the major one, was established over the period 1958–63, and contains just over 1,200 grafts also at 24 ft. x 24 ft. spacing. Approximately half of this orchard is now productive. Many of the clones in the larger orchard have already been progeny tested, all clones are from outstanding trees selected mainly for straightness and vigour, and all are considered to have satisfactory wood characters. Next year it is hoped to plant 300 acres, 10 ft. x 9 ft. spacing, with stock from improved seed. Future collections should be considerably larger, and no difficulty is anticipated in supplying improved seed for all future slash pine plantings in Queensland.

The crossing programme between the Seed Orchard trees will be completed in 1965. The progeny trial associated with this programme planted in 1965 covered 9 acres.

P. caribaea (variety *hondurensis*). The Seed Orchard of 7 acres at Kuranda in North Queensland was planted with stocks for later field grafting. The grafting is planned for 1966. Eighteen trees were selected as potential candidates for the Orchard. Following wood quality evaluations at present in progress the best fourteen will be selected as the Orchard parents.

The problem of grafting incompatability with this species has received attention. Incompatability is possibly the major technical problem facing forest geneticists and may be defined as graft failure at the union some time (2 years or more) after apparently successful grafting. It is associated with specific trees and these cannot be included in orchards unless the problem is solved. Trials using the tree's own seedlings as stock plants, interstocks and other species as stock plants are under way. Air-layering trials and other propagation methods are also being tested.

The first large trial of control-pollinated *P. caribaea* was sown at Bowenia. This contains 19 crosses between some of the best *P. caribaea* trees available in Queensland.

The inter-varietal hybridization programme continued. This aims to cross all three varieties of *P. caribaea* with each other as well as with the two varieties of *P. elliottii*. The first sowings were made this year at both Beerwah and Bowenia. Combination of the vigour of Honduras variety with the straightness of the Cuban variety could prove valuable.

P. elliottii (variety *elliottii*) x *P. caribaea* (variety *hondurensis*) *Hybrid.*

A further 4 hybrid families were planted out last Summer at both Beerwah and Bowenia. This year's sowings (March, 1965) will provide a further 11 families for trial. It is planned to expand the production of this hybrid to widen the field for selection of outstanding hybrid trees. The hybrid appears to combine the vigour of Honduras *P. caribaea* with some of the straightness qualities of *P. elliottii*. As it also appears to grow well in swampy areas and to produce viable seed it may have considerable potential. The first two hybrid plus trees have been selected.

(iv) Coastal Hardwoods. Approximately 50 per cent. of the total area within Hardwood Reserves in south-east Queensland (excluding Dalby and Monto Districts) can be broadly classified as either "spotted gum-ironbark" or "ironbark" forest type. Research in these forests, therefore, forms a major part of the Hardwoods programme, and the scope of this work is briefly reviewed.

Establishment and development of regeneration.—A large number of observations and experiments on seedling and lignotuberous regeneration have been carried out over many years. This work has now been reviewed for publication. One of the features of lignotuberous regeneration in these forests is its restriction to the typical straggling lignotuber habit for an indefinite period, even where the level of overwood appears to be particularly light. In one study involving complete removal of overhead canopy, a striking lignotuber response was obtained, except for those lignotubers within about 75 links of the crown extremities of the surrounding canopy. It is postulated that in a spotted gum-ironbark forest lignotubers and smaller size classes generally are very sensitive to some form of competition from a wide arc of the surrounding stand.

Logging and Treatment.—The logging and treatment schedules used in Queensland hardwood forests are aimed, in part, at maintaining the log supply from the forests for as many cutting cycles as possible. To achieve this, a minimum cutting girth is prescribed, and standards are defined to ensure that a spaced stand of the best available stems below the minimum limit are retained. Some of the larger retained stems may have relatively weak vigour and barely acceptable form. A series of five studies have been designed to measure the effect of a scattering of these trees on the form and vigour of the smaller advance-growth, and the effect on overall volume production.

Prescribed Burning.—A study of the effects of annual prescribed burning in spotted gum-ironbark forest was commenced in 1952. In the 1963-64 Report, evidence of decline in spotted gum increments on the annually burned areas was reported, starting about 5 years after initiation of the burning programme. During the past two years, the increment on spotted gum in the Maryborough District generally has been abnormally low. In the unburnt study area there was nil increment in 1963-64, and a mean gbh increment on only 0·22 in. in 1964-65; on the burnt area these annual increments were nil and 0·11 in. respectively. Samplings of soil and foliar nitrogen and phosphorus was continued during the past year and confirms the evidence in the 1963-64 Report that under the impact of annual burning there has been a decline in soil fertility level.

Dalby Regional Research Station

The programme at this station was expanded during the year to include work aimed at improving the productivity of cut-over rainforests in the high rainfall areas along the southern Dividing Range near Gladfield and Emu Vale. In addition silvicultural research into inland Cypress Pine and hardwood stands in the Warwick district was brought under the control of the Dalby station, to amalgamate all work in these western forests at the one centre.

Cypress Pine.—Observations on the flowering and fruiting habits of this species, together with quantitative data on seedfall obtained from seed traps established in 1959, have shown that Cypress Pine normally produces a heavy and general seed crop every three years, following a similar triennial cycle of abundant pollen flow 12 to 14 months earlier. During general seed years seedfall may extend from November to March, with at least 80 per cent. of all viable seed being shed in November and December. In good quality, well-stocked stands the quantity of seed shed in general seed years is of the order of 40 to 60 pounds per acre, or from 500,000 to 900,000 viable seed per acre; viability ranges from 30 to 40 per cent. or from 12,000 to 15,000 viable seed per pound of clean seed during good seed years. With triennial seedfalls of this magnitude, lack of seed is unlikely to be a critical factor in limiting natural regeneration in Cypress Pine stands, however the combination of abundant seed supplies and climatic conditions favourable to large scale regeneration occurs much less frequently, being of the order of one in twelve years on observations to date.

The review of thinning experiments while not yet complete, has indicated that a slight broadening of the spacings previously adopted in the pre-merchantable thinning of even-aged Cypress Pine stands is desirable, especially with the introduction of hormone treatment which will reduce the necessity for frequent treatments to remove competing weed growth. Spacings now adopted are: 6–12 ft. high, 12 ft. x 12 ft.; 12–30 ft. high, 16 ft. x 16 ft.; over 30 ft., 20 ft. x 20 ft. In stands up to 30 ft. high a second pre-merchantable thinning would be necessary, whereas in stands over 30 ft. high subsequent thinnings should be on a merchantable basis. There is also some evidence from recent increment trends in the older experiments that the basal area associated with maximum basal area increment increases with increasing age. These data are being checked further but indications from good quality sites are that optimum basal area will range from about 35 square ft. per acre in 40 year old stands to 50-55 sq. feet per acre in 65 to 70 year old stands.

The chemical control of unwanted species continued to be a major field of investigation, and a number of new experiments were established to refine techniques of application and to test new arboricides. Initial results from seasonal trials involving basal stem injections with 2,4,5-T amine and 2,4,5-T butyl ester has shown a pronounced seasonal effect in the more resistant species (*E. maculata* and *A. costata*) with kills being significantly improved over the April to October period; these trials are being continued. With most species 2,4,5-T amine in water has given consistently better kills than 2,4,5-T ester in distillate. Picloram (4-amino-3,5,6-trichoro picolinic acid) applied to stumps, frills and basal stem injections has given outstanding results for all species in the initial screening trials; indications are that picloram will find its greatest use in stem injection treatments where it exhibits greater lateral translocation than 2,4,5-T, allowing widely spaced injections to be used with relatively low concentrations (0.5% w/v).

Remeasurement of two plots of Slash Pine (*P. elliottii* v. *elliottii*) planted on Family Pine (*C. preissii* sub sp. *verrucosa* x *C. columellaris*) sites has shown that this species, once established, will maintain a reasonable growth rate on these infertile deep raw sands. Increment figures since establishment are—

Location	Age	Stems/ acre	GBH BA (ins.)		Height (ft.)		BA/acres (sq. ft.)		Mer Vol. (cu. ft.)	
			Mean	MAI	Mean	MAI	Total	MAI	Total	MAI
R. 81 Tandan	36	..	49·27	1·37	72·2	2·0	..	..	..	..
R. 122 Inglewood	18	309	20·79	1·16	41·4	2·3	73·9	4·1	827·6	46·0

A study on bark thickness to allow for the introduction of overbark measurement in Cypress Pine log sales, was completed during the year. This study established that Volume U.B. = ·8063 Volume O.B., and this relationship is applicable to all size classes; minor variations occur with height of girth measurement and locality but these are of no practical importance.

Rainforests.—The current work in the rainforests along the southern Dividing Range has so far been of an exploratory nature dealing primarily with the establishment of yield plots to study stand composition, growth rates and development of regeneration of commercial species in both cut-over and virgin forests, and also to ascertain species suitable for enrichment planting on steep and remnant areas. The enrichment planting trials have shown that both Hoop Pine and Kauri Pine can be successfully established by early summer plantings along snig tracks or brushed strip lines but that quick release of the overwood will be necessary to promote satisfactory growth. Trials to determine the timing and degree of canopy release necessary, together with development of economic methods of destroying unwanted trees with arboricides are proposed during the coming year.

Imbil and Yarraman Research Stations

(i) Plantation Silviculture.—Most of the work at these centres involved maintenance and measurement of long term experiments in Hoop Pine Plantations. Seed testing is carried out at each centre as required. New experiments established during the year concerned—

(*a*) the mechanics (and a cost study) of high pruning;

(*b*) the maintenance of fertility in Kauri Pine replant areas;

(*c*) the possibility of extending Hoop Pine planting into forest types at present considered marginal

(*d*) the effect of hormone sprays on hoop pine in first year plantations;

(*e*) a check on the hoop pine volume table;

(*f*) Critical revision of results of thinning, pruning and spacing experiments.

Spacing.—The select stems of two spacing experiments, each with 6 ft. x 6 ft., 8 ft. x 8 ft., 9 ft. x 9 ft., and 10 ft. x 10 ft., spacing were examined for vigour, straightness and branch size. It was found that the value of standing trees and the thinnings increased with increase in initial spacing. Stem form deteriorated with increase in spacing, but the select stems of the 10 ft. x 10 ft. spacing were no worse than those of the 9 ft. x 9 ft. spacing. The selects of the 6 ft. x 6 ft. spacings had considerably smaller branches than the 8 ft. x 8 ft., 9 ft. x 9 ft., and 10 ft. x 10 ft., spacings, but the difference amongst the latter three was not significant.

Thinning in Select Fraction (Imbil).—Two approaches to this type of thinning are under investigation—

(*a*) Thinning from below, i.e., thinning operations are directed from below by removing the weakest crop stems to the stages, 120, 100, and 80, crop trees per acre.

(*b*) Thinning to favour final crop trees. The final 80 crop trees per acre are selected and then their most serious competitors are thinned to stages, 120, 100, and 80 crop trees per acre.

Seed Collection.—A major routine seed collection was undertaken in late December and early January. This collection was preceded by extensive sampling of plantations where high pollen production was observed in 1962-63 to determine the areas likely to produce the most viable seed. Recommendations as to the best areas for collection were based on results obtained from samples. L.G.C. (first test) of seed collected from plantation areas ranged from 23·0 per cent. to 47·25 per cent, and from natural stands from 16·5 per cent. to 57·25 per cent.

Hormone Spray and Hoop Pine.—The effect on hoop pine of a misting machine application of 6 per cent. 2,4-D as amine salt in water six weeks after planting was assessed three months after spraying. It was found that the solution applied had no apparent adverse effect on the growth or form of any part of hoop pine plants. These plants will be kept under observation. Further trials to test different formulations and rates and season of application will be done.

Under-planting.—*Flindersia brayleyana* under Hoop Pine continues to give promising results. Growth data for four plots, under-planted to 570 stems per acre in 1954, is tabulated below.

Overwood, 1964		Underplants		
		1954	1964	1964
B.A. ac.	Pre Ht. (ft.)	Ht. (ins.)	Mean Ht. (ft.)	B.A. acre (sq. ft.)
129·3	96·9	6–10	26·5	19·2
151·9	97·1	6–10	24·5	15·9
139·5	95·2	6–10	25·7	19·6
146·0	97·4	6–10	21·6	13·5

Survival, health and form of the under-plants is excellent, and mean length of clear bole of selects is in excess of 14 ft. At this stage there is no evidence to suggest that the under-plants are affecting the growth of the overwood. Rather the effect has been to replace a low value scrubby understory with a highly desirable and valuable cabinet timber.

(ii) Tree Breeding.—Hoop Pine.—During the year there were further deaths amongst the patch grafts planted in 1959. The main symptoms in the failures are the development of a swelling above the union, followed by chlorosis and retardation in growth of the scion, and ultimately, death. Grafting trials have been established to investigate—

(*a*) the effects of age and vigour of stocks,

(*b*) the influence of different physiological ages of the scions,

(*c*) incompatibility,

(*d*) the (patch) grafting technique,

(*e*) other grafting methods.

The search for the best phenotypes in the Mary Valley and Brisbane Valley plantations continued through the year. Studies of the wood characters of a number of the best phenotypes have been carried out. At present only those trees classified as having excessive spiral grain will be excluded as seed orchard candidates.

Seed from controlled pollinations and open pollinations was collected in December at Yarraman and sown for raising plants for progeny testing. At Imbil approximately 36 acres of open and controlled pollinated progenies were planted out, 23 acres of which were established in progeny trials. Further controlled pollinations of seed orchard candidates were carried out at Imbil and Yarraman.

General

A volume table for Queensland Maple based on g.b.h. and merchantable height was prepared and issued for use in rainforest and under-planting experiments, as well as plantation areas. Further work on volume tables for rainforest species is proposed.

During first thinning of a group of compartments at Yarraman in 1960, it was found that the standard hoop pine volume table was overestimating volume to an extent which necessitated the preparation of a separate local volume table for the area. Investigation at the time indicated abnormal form in the larger unpruned stems as the source of the

differences. Second thinning of these areas commenced during the year, and a further check showed that the standard volume table could now be applied with complete confidence.

Revision of the slash pine volume table is not yet complete.

The current slash pine site index table was investigated in relation to published equations for American stands, and some modification of these would appear necessary for local conditions. Revision of this and other site index tables is proposed.

NATIONAL PARKS

New Reservations

During the year seven new National Parks and Scenic Areas were declared, viz:—

(i) National Park 584 in the parish of Waterview over an area of about 2,360 acres of the surrounds of waterfalls which commence in a narrow mountain defile and descend into Station Creek in a series of cascades. The National Park is situated about 18 miles from Ingham and its proximity to Ingham and also the city of Townsville enhances the tourist potential of the area.

(ii) National Park 575, in the parish of Ongera, an area of about 1,180 acres, and

(iii) Scenic Area 574 also in the parish of Ongera, an area of about 865 acres.

The setting apart of these two Parks is in accordance with one of the recommendations of the North Queensland Land Classification Committee. They are situated on Cannabullen, Cochable and Koolmoon Creeks, north of the Tully River and embrace the Cannabullen, Carter and Elizabeth Grant Waterfalls. They are in a setting of extremely rough and rugged country and the height of the Elizabeth Grant Falls has been estimated at 950 feet.

(iv) Scenic Area 933 in the parish of Alford an area of about 720 acres located at the junction of the Macpherson Range and Great Dividing Range and embracing Wilson's Peak of an elevation of 4,035 feet.

(v) Scenic Area 27 in the parish of Barrett embracing about 530 acres containing Mt. Fox, an interesting residual volcanic cone situated about 42 miles south-west of Ingham and rising to about 2,660 feet above sea level and about 1,200 feet above the surrounding tableland.

(vi) Scenic Area 929 in the parish of Kerry—area 31 acres 1 rood 16 perches.

(vii) Scenic Area 930 in the parish of Kerry—an area of 24 acres 2 roods 7 perches.

These two areas were donated by Mr. R. W. Lahey, M.B.E.

Scenic Area 929 is a long narrow strip on top of the precipice which forms the western boundary of Lamington National Park. It is in its virgin state and will afford complete protection to the jungle clad precipice.

Scenic Area 930 situated along the road from Canungra to O'Reilly's Guest House at Lamington National Park, is also virgin scrub and was donated by Mr. Lahey as a memorial to his late father on the understanding that the area be kept free of any timber operations and that no part be made available for tourist leases.

Areas added to existing Parks during the year comprised—

(*a*) An area of about 260 acres to National Park 477, parishes of Hinchinbrook and Waterview (Mt. Spec). This area is in the vicinity of the tourist township of Paluma and was formerly Timber Reserve and a small Recreation Reserve. The Main Roads Department many years ago had constructed walking tracks to a waterfall and to Witts Lookout, a fine vantage point for scenic views. These are being restored by the Department and the former Recreation Reserve will make an ideal spot for the provision of picnic facilities.

(*b*) An area of about 55 acres to Scenic Area 340, parish Weyba (Noosa National Park).

This area was formerly an esplanade and its inclusion in the Park thus ensures the preservation free from interference of this small but vital strip of beach frontage.

The Government is to be congratulated on the action taken which is of great significance because of the principle involved.

(*c*) An area of about 165 acres to Scenic Area 750, parish of Beerwah (Mt. Beerwah—one of the Glasshouse Mountains), to improve access and to consolidate the Park's boundaries.

Several small areas, totalling about 40 acres, were released during the year, including about 14 acres for tourist lease purposes on Long Island, whilst re-computations of areas resulted in a loss of about 1,233 acres to the overall total.

	National Parks		Scenic Areas		Total	
	No.	Acres	No.	Acres	No.	Acres
30-6-1964	73	1,005,442	169	35,623	242	1,041,065
30-6-1965	75	1,008,022	172	37,961	247	1,045,983

An amount of £72,071 was expended during 1964-65 bringing the total expenditure on Parks to £889,878.

Interpretative Services

(i) National Parks Booklet—

The general booklet on Queensland's National Parks referred to in last year's Annual Report was released in July, 1964, and during the year approximately 1,500 copies were sold and about 1,000 complimentary copies issued.

The booklet was very favourably received and many congratulatory remarks made on the standard of the publication. A typical example is the following comment by the late Honourable E. Evans, Minister for Mines and Main Roads—

> "This is a very fine publication and I have read it not only with interest but also with pride. I feel it will be admirable for the purpose for which it was designed."

(ii) Opening of First Self-guiding Track in Queensland—

The opening of the first self-guiding track in Queensland at Maiala National Park was performed on the 24th April, 1965, by the Honourable H. Richter, M.L.A., Minister for Local Government and Conservation at an official function at the Park attended by about 180 guests.

A printed leaflet is available at the entrance to a circuit track and, as well as giving some general information, there are a number of lettered paragraphs describing points of interest and keyed to lettered markers along the track. Visitors may take a leaflet and refer to the description as they walk around. There is no charge for the leaflets and the rate of usage—about 300 per week—indicates their popularity.

The following letter was received from a visitor.

314 Stanley Terrace,
Taringa.
29 July, 1965.

The Conservator of Forests,
Department of Forestry,
108 George Street,
Brisbane.

Dear Sir,

Your improvement of the facilities at Maiala National Park, Mount Glorious, Queensland, is very helpful.

The facilities for picnics and the levelling of the area surface creates an atmosphere which enhances the beauty of the natural scrub and scenic attractions.

Your leaflet No. 1 is intriguing and makes the stroll through meaningful.

The party I was with yesterday endorsed my appreciation when I said I would write to your Department.

Many thanks!

Yours sincerely,
(Sgd.) LLOYD WORFOLD.

(iii) *General—*

One Brisbane school organised a visit to Maiala and the Department arranged for the resident overseer to guide the pupils and for an officer to talk to them about National Parks prior to their trip.

General talks were also given to the Toowoomba Field Naturalists' Club and the Australian Institute of Park Administration whose 1965 national conference was held in Brisbane. This organisation subsequently published the paper delivered—"National Parks and Wildlife in Queensland"—in their journal "Australian Parks".

Biological Work

Though some progress has been achieved with surveys of plant and animal life at Carnarvon National Park in 1963-64 and Lamington National Park in 1964-65, the work so far has only served to emphasise how little is known about our parks and Queensland's wildlife generally. If our national parks system is to be adequate for the future needs of this state and if even the minimum of interpretative services are to be provided, it will be necessary to obtain additional trained staff to carry out the basic studies.

Track System

During the year 185 chains of new tracks were constructed, including 100 chains at Conway Range, 35 chains at Cape Hillsborough, 10 chains at Dunk Island, 30 chains at Magnetic Island and 10 chains at Hinchinbrook Island.

The total length of the track system at 30th June, 1965, was 261 miles 36 chains.

Some Features of the Year's Work

Apart from the major task of maintaining and expanding the walking track system within the Parks, some details of the year's activities are as follows:—

Carnarvon.—A notable achievement was the development of a camping area with attendant facilities at Carnarvon National Park and the construction of a short access road through forest country to service the Park.

The number of visitors here now averages more than 100 per month and the provision of camping ground facilities is much appreciated by these visitors.

Bunya Mountains.—Water was gravitated from Burton's Well to the picnic area where two additional table/seat units were provided. At Dandabah three fireplaces were built on the camping area and three table/seat units were erected; four seats were provided at strategic points along the track system.

Mount Glorious.—In connection with the self-guiding track, an attractive leaflet shed was provided at Maiala, new gent's conveniences were erected here also and an exit road around the perimeter of the picnic area was formed and gravelled.

Springbrook.—New conveniences at Turramurra entrance were completed; a very attractive alcove to house a "Tourist Information Guide" was erected at Lyrebird Ridge turn-off.

Noosa Heads.—Almost 2,000 cubic yards of decomposed granite were placed to improve the low-lying parking area and further fire protection work was carried out to the Park.

Killarney (Queen Mary Falls).—New composite conveniences have been completed.

Eungella.—A new shelter shed and barbecue were built at Sky Window and at Broken River a pumping unit was installed to supply water to the picnic area. Seats were supplied at the swimming pools and also at vantage points along the tracks. A number of new information and direction signs were erected on this Park including a large entrance sign at Pioneer Valley.

The Finch Hatton Gorge tracks were re-opened after having been abandoned for some time and concrete steps constructed to give access to the swimming pool.

Conway Range was opened up by the provision of a 60-chain circuit track and also a 40-chain track to a high point on the eastern slopes of Mount Rooper. From this elevated point fine views are available of many of the island groups.

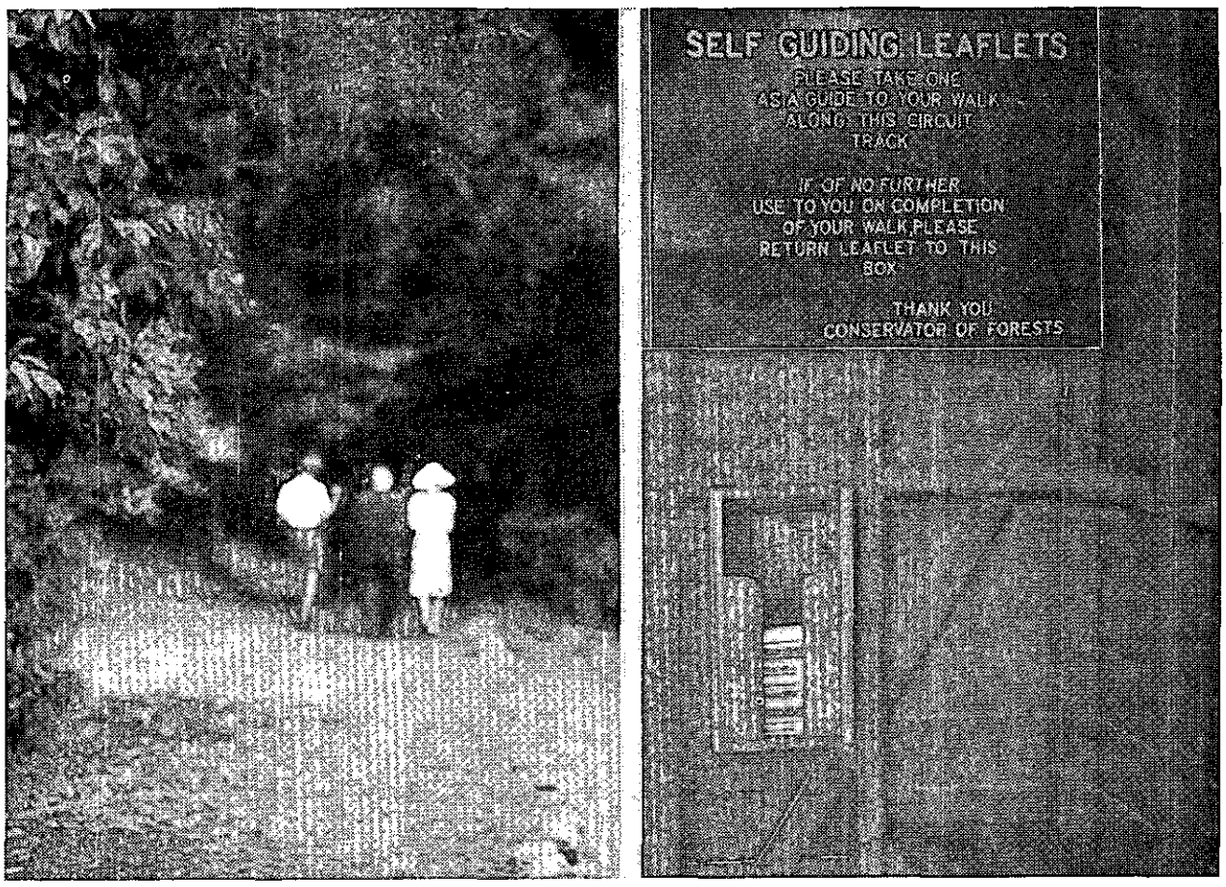
A picnic area was established in a natural clearing on Langford Creek, four tables were provided and a well and fireplace are under construction.

Cape Hillsborough was also opened up during the year with track construction of 35 chains providing an interesting walk through attractive scrub to elevated points overlooking the recently opened tourist resort and Wedge Island. Other features made available by the track are some caverns and tunnel caves showing traces of copper and other minerals of geological interest.

Chillagoe and Mungana Caves.—These areas are arousing an ever increasing tourist interest and the number conducted on tours has been approximately 1,700, more than double those known to have visited them last year.

With the influx of visitors has come a greater incidence of vandalism as evidenced by name writing and breaking of formations and the maintenance of cleanliness and removal of names from walls has been a major concern in the work at these Parks.

The Minister for Local Government and Conservation, the Honourable Harold Richter, M.L.A., addressing the gathering at the official opening of the first self-guiding track in Queensland at Maiala National Park, Mt. Glorious.



Setting out to enjoy the circuit track at Maiala National Park, Mt. Glorious, assisted by the Self-Guiding Leaflet.

HARDWOOD FORESTS OF THE FUTURE

However attention was also given to the facilitation of access by the grading and clearing of paths to entrances to the Royal Arch Caves, Donna Cave and Markham Cave whilst a marked improvement in access to the Ryan Imperial Cave was made by the laying of a set of cement steps.

Lake Eacham.—An access road was built, with a subsidy from the Eacham Shire Council, to a ramp for launching boats onto the Lake.

Hand basins were installed in the toilets, seats provided in the picnic area and a footbridge with concrete abutments built over the Vision Falls track.

Lake Barrine.—Here also an access road was built, with a subsidy from the Eacham Shire Council, to a launching ramp.

Also the parking area and an entrance road were graded and sealed.

Seats were provided at the picnic area and around the lakeside track.

Hinchinbrook Island.—Commencement was made on the establishment of facilities for visitors by the clearing of a picnic area where three table/seat units, a barbecue and pit system toilets have been provided. Ten chains of track were cleared to a watering point.

Dunk Island.—Approximately 10 chains of track were constructed linking the Muggy Bay and the Mount Kootaloo track to provide access to the main tracks while the suspension bridge was under repair. Further signs were erected and four new table/seat units provided.

Magnetic Island.—Attention was given to the whole of the track system and 30 chains of new track were constructed on the completion of a link between Radical and Horseshoe Bays.

Weekend and Holiday Patrols

These patrols were continued on selected week-ends by uniformed personnel and it is reported that the patrol officer is being sought out more and more by visitors seeking information on the various Parks.

As pointed out in last year's report, it is the desire that the patrol officer's role should be more that of a guide and a source of information rather than that of an enforcer of regulations and it is encouraging that this seems to be the trend.

From the protection aspect the presence of a uniformed officer has helped to curb vandalism.

Number of Visitors

Accurate figures are not available as to the number of visitors to all National Parks during the year but it is known that a sharp increase occurred in South Queensland where over 630,000 visitors were recorded, easily the highest total to date. A conservative estimate of the total throughout Queensland would be 900,000—and this figure could even approach the one-million mark.

HARVESTING AND MARKETING

General

The Volume of milling timber cut from Crown land during the year under consideration was over 229,000,000 superficial feet, this being the highest annual cut since 1953-54 with the exception of the 1959-60 peak year.

Reduced activity attributed to credit restrictions and first noticeable early in 1961 has been followed by progressively increasing annual cuts indicating industry recovery.

The operation of plantation grown timber increased by nearly 25 per cent. relative to 1963-64, and at over 41,000,000 superficial feet was almost double the cut of natural Hoop and Bunya Pine for the year.

For the first time an appreciable volume of small size plantation grown material is reported as being cut for pulpwood.

There was a marked reduction in the demand for railway timbers during 1964-65 this being mainly related to a decrease in requirements following the completion of major construction works within the State.

Mill Logs Cut—Crown and Private Lands

This table shows logs cut by all mills in the State, annually, for the periods indicated.

Year	Queensland Grown							Imported	Total
	Hoop and Bunya Pine	Kauri Pine	Plantation Thinnings	Hardwood	Cabinet Woods	Miscellaneous	Cypress Pine		
	(1,000 superficial feet Hoppus)								
1959–60	37,614	2,081	26,420	264,069	24,644	49,595	55,738	19,944	480,105
1960–61	35,027	2,223	25,959	252,482	27,389	48,558	50,473	17,091	459,202
1961–62	25,822	2,124	26,632	215,450	20,914	39,791	45,275	12,612	388,620
1962–63	28,277	2,114	31,443	212,014	21,404	38,937	50,044	12,833	397,066
1963–64	29,597	1,685	33,276	230,424	20,306	42,772	53,328	12,478	423,866
1964–65 Estimated ..	26,000	2,000	*43,000	235,000	23,000	47,000	57,000	13,000	446,000

*Includes pulpwood (3,637,000 super. feet)

Mill Logs—Crown Lands

The following are the annual quantities of Mill Logs obtained from Crown lands as from 1955-56:—

	Super. feet (hoppus)		Super. feet (hoppus)
1955–56	223,000,000	1960–61	219,000,000
1956–57	221,000,000	1961–62	187,000,000
1957–58	213,000,000	1962–63	194,000,000
1958–59	228,000,000	1963–64	212,000,000
1959–60	239,000,000	1964–65	229,000,000

A comparison of quantities of the various species of log timber cut from Crown Forests during the past five years is illustrated hereunder:—

Year	Hoop and Bunya Pine	Kauri Pine	Cypress Pine	Forest Hardwoods	Scrub Hardwoods	Cabinet Woods	Miscellaneous	Plantation Timbers	Pulpwood
	(1,000 superficial feet Hoppus)								
1960–61	31,849	2,188	24,093	76,879	11,302	18,118	28,601	26,234	..
1961–62	22,324	2,171	23,731	62,722	9,695	15,726	23,599	26,660	..
1962–63	24,393	2,253	26,037	60,479	9,029	17,302	23,108	31,116	..
1963–64	25,236	1,615	28,932	66,664	11,405	16,653	27,949	33,243	416
1964–65	21,195	1,913	31,944	66,381	14,050	19,697	33,106	37,757	3,637

The Timber Business

	1963–64	1964–65
(a) Mill Logs—		
Hoop and Bunya Pine	25,336,000 super. feet	21,195,000 super. feet
Forest Hardwoods	66,664,000 super. feet	66,381,000 super. feet
Scrub Hardwoods	11,405,000 super. feet	14,050,000 super. feet
Cypress Pine	28,932,000 super. feet	31,944,000 super. feet
Kauri Pine	1,615,000 super. feet	1,913,000 super. feet
Cabinet Woods	16,633,000 super. feet	19,675,000 super. feet
Miscellaneous Species	27,949,000 super. feet	33,106,000 super. feet
Plantation Timbers	33,243,000 super. feet	37,757,000 super. feet
Pulpwood	416,000 super. feet	3,637,000 super. feet
Limb Logs, Head Logs, Stumps and Flitches	20,000 super. feet	22,000 super. feet
	212,213,000 super. feet	229,680,000 super. feet
(b) Construction Timbers—		
Headstocks, Transoms, Crossings, Braces, &c.	310,973 super. feet	112,081 super. feet
Sleepers	979,761 pieces	852,664 pieces
Girders, Corbels, Piles, Sills, and Girder Logs	49,417 lineal feet 238,771 super. feet	62,378 lineal feet 128,338 super. feet
Poles	265,482 lineal feet	317,871 lineal feet
House Blocks	27,015 lineal feet	38,878 lineal feet
Mining Timbers	393,714 lineal feet 33,526 pieces	519,742 lineal feet ..
Gross receipts from Timber Sales, &c.	£1,958,506 8 4	£1,872,454 19 7
Nett Revenue	£976,941 8 3	£965,051 10 10

Rosewood

No Rosewood and/or Sandalwood was purchased or exported during the year.

Timber Felling and Timber Getting Award—State

During the twelve months under review the basic wage rate under the above Award varied as follows:—

On 13th July, 1964 .. £15 17s. to £16 11s.
On 7th December, 1964 £16 11s. to £16 17s.
On 29th March, 1965 .. £16 17s. to £17

Logging

During 1964-65 the following quantities were hauled by, and payments made to contractors to the Department:—

Class	Quantity	Expenditure
	Super. feet	£ s. d.
South Queensland—		
Hoop and Bunya Pine	13,802,522	
Forest Hardwoods	2,382	
Scrub Hardwoods	27,008	
Miscellaneous	66,689	
Cedar	9,922	
	13,908,523	149,815 1 1
North Queensland—		
Cabinet Woods	873,122	
	873,122	10,127 10 4
Totals	14,781,645	159,942 11 5

Constructional Timbers—Departmental Contracts

A comparison of supply of constructional timbers from Crown Lands with the two previous years is given hereunder:—

Class of Timber	1962–63	1963–64	1964–65
Sleepers	339,103 pieces	526,159 pieces	338,831 pieces
Crossings	103,569 super. feet	117,793 super. feet	14,268 super. feet
Transoms	72,724 super. feet	77,230 super. feet	12,159 super. feet
Bridge Timber (Round)	15,590 lineal feet	11,714 lineal feet	13,724 lineal feet
Bridge Timber (Square)	1,702 super. feet	1,512 super. feet	Nil super. feet

Hewn Timber Prices

No price change made during the year.

Logging Roads—1964-65

The Department's Road programme for the year constituted 60 miles of construction. Location and working surveys covering 70 miles were carried out.

Expenditure from Forestry Votes was as follows:—

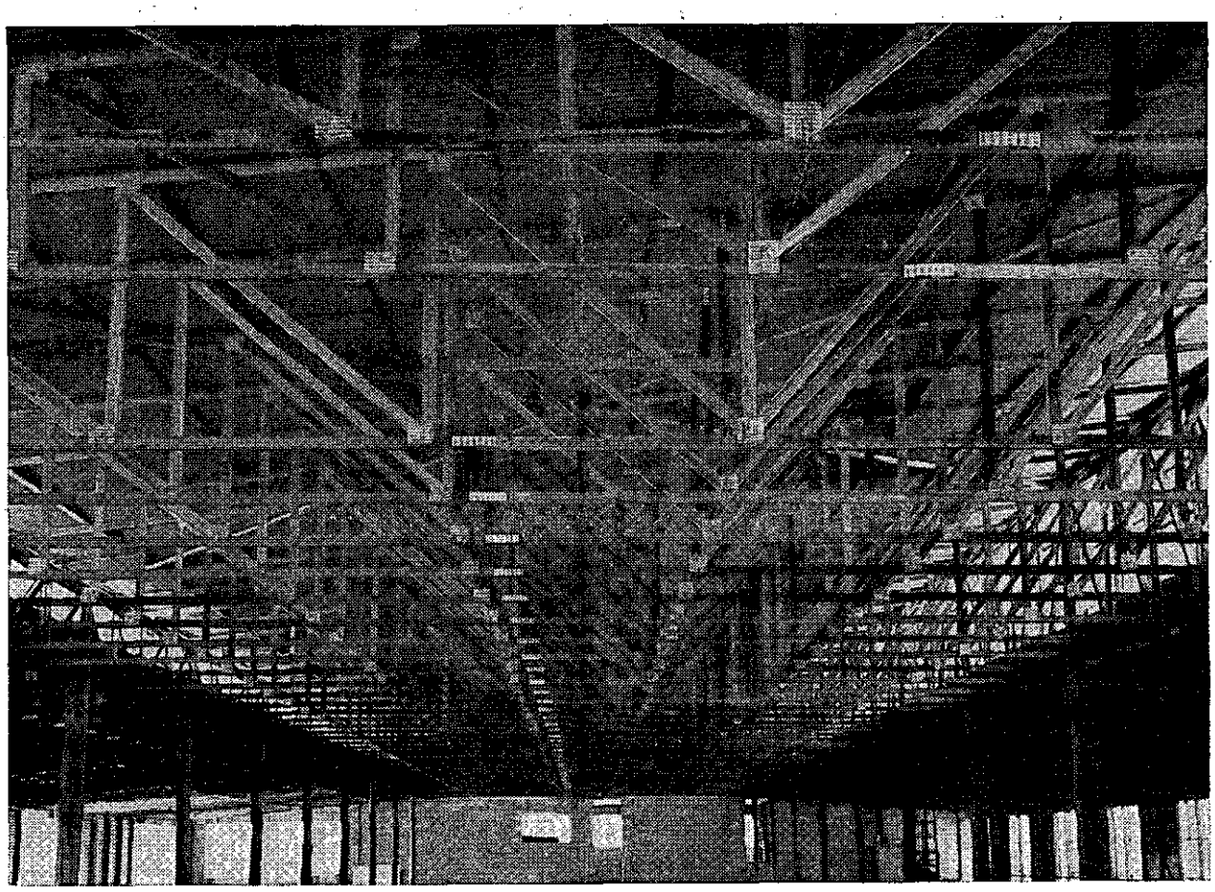
	£
New Construction	143,105
Maintenance	59,177
Subsidies to Shire Councils	24,356
Workers' Compensation	1,721
Pay Roll Tax	2,925
Surveys	1,687
Fares and Freights	2,185
Resumption for Access	1,730
	236,886

SAWMILLS LICENSING

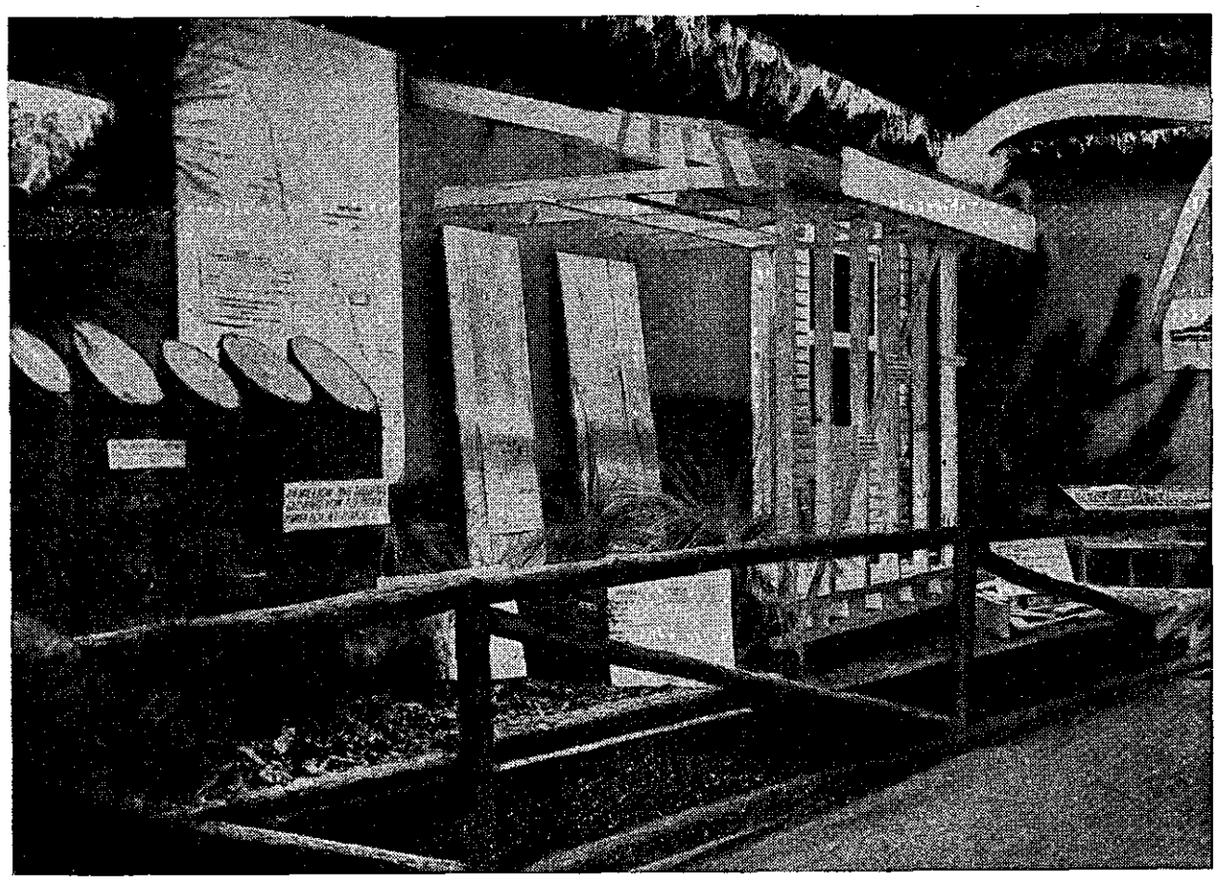
The number of mills in active operation during the year was 560 during the first quarter, 555 during the second quarter and 551 during the third quarter. Figures for the final quarter which are incomplete indicate a corresponding reduction in the number of mills operating.

The increasing shortage of timber supplies is partly responsible for the withdrawal of mills from the industry, and the mills involved were of the small or medium capacity groups. The decrease was also contributed to by amalgamations of mills.

The Sawmills Licensing Committee, as well as giving consideration to general matters pertaining to Sawmills Licensing during the year, was also engaged in matters concerning amendments to the Sawmills Licensing Act.



MODERN ROOF CONSTRUCTION
Gang Nailed Wooden Trusses for Wide Spans



FORESTRY EXHIBIT
Royal National Exhibition—1965

"The Sawmills Licensing Act Amendment Act of 1965" assented to on 21st April, 1965, and regulations thereunder, was significant in that it has effected some desired alterations in an Act that has remained unchanged for almost thirty years.

The definition of a Sawmill now embraces mills engaged in the processing of logs into wood wool, chip board and wood pulp but excludes plants solely engaged in resawing, dressing or planing sawn timber. These latter plants do not now require a License.

An important feature is the change from a daily licensed maximum productive capacity to capacity on a quarterly basis.

This is in line with the recommendations made by the Timber Inquiry Committee in 1959, and represents an endeavour to achieve more realistic licensed capacity, based on the actual performance of the sawmills involved taken from records over a five year period.

Provision has also been made for fees in keeping with present administrative costs.

The original fees in force since 1936, bore no relation to the expense involved in administering this State wide Act, now described as *"The Sawmills Licensing Acts,* 1936 *to* 1965".

The following table sets out the position with regard to Sawmills Licenses as at 30th June, 1965:—

Number of Licenses as at 30-6-64	Classification	New Licenses Issued	Changes in Classification		Licenses not Renewed			Current Licenses as at 30-6-65	Total as at 30-6-65
			Plus	Minus	Refused	Relinquished	Under Consideration		
602	General mills	2	..	1	3	22	5	573	578
14	Case mills	1	..	..	..	1	..	14	14
46	Sleeper mills	1	..	..	2	4	..	41	41
16	Other restrictions	1	..	..	..	1	..	16	16
72	Re-saw and dressing	2	1	..	..	8	..	67	67
750		7	1	1	5	36	5	711	716

Offences

During the year ended 30th June, 1965, officers reported 143 breaches of the Acts and Regulations administered by the Department.

Proceedings were successfully instituted against seven persons and fines totalling £119 imposed.

In 79 cases of unauthorised timber operations, where it was considered the offences did not warrant proceedings, the value of the timber was collected and warnings issued. In some instances part of the costs of investigations was charged. Appropriate action was taken in other cases.

As a result of action taken in all cases an amount of £3,659 14s. 6d. was recovered by the Crown in timber revenue.

FOREST PRODUCTS RESEARCH

I. Engineering and Seasoning

(*a*) *Sawmill Engineering.*—During the year assistance was given to the Department of Native Affairs on sawmill design and a visit was made to its mill at Bamaga. The cause of the unsatisfactory operation of the new power unit was rectified.

Although very little change has occurred in South Queensland, some mills in North Queensland have undertaken modernization plans and the assistance of this Department has been sought by several sawmillers.

(*b*) *Seasoning.*—Several enquiries were received for the improvement of seasoning practices and where improvements have been made in reductions in seasoning time of 1/3rd have been achieved.

There has been little demand for kiln design but hot water heated kilns have been installed at Gympie and these are now operating satisfactorily. New kilns to C.S.I.R.O. design have been installed in North Queensland.

It is considered that seasoning losses in Queensland could be considerably reduced by using covers during drying and although some firms are doing this there is a need for wider use in Industry to give fuller and better utilisation.

Two successful seasoning schools were conducted during the year, one in Atherton and the other in Brisbane, and an expansion of this service would undoubtedly increase seasoning efficiency.

During the year some 2,700 samples were tested for moisture content mainly for the Queensland Housing Commission and some 7 per cent. were outside the recommended range for use.

II. Sawmill Economics and Biometrics

(*a*) *Economics.*—No mill studies were carried out at commercial sawmills during the year.

The following sawing studies were carried out at the Department's Experimental Sawmill at Rocklea:—

(i) A study of 30 large pruned Hoop Pine stems ex Imbil, which included a peeling study, of some of the pruned sections.

(ii) A study of 30 large pruned Slash Pine stems ex Beerwah, which included a peeling study of one of the pruned sections.

(iii) A comparative study of plantation-grown and naturally regenerated Rose Gum thinnings ex Gympie.

Log Pricing determinations from mill studies on Hoop Pine Thinnings carried out during the previous year are nearing finality. Log Pricing of North Queensland species is also at an advanced stage.

It is anticipated that a series of mill studies on Cypress Pine will be arranged for the coming year.

Timber Movement Surveys for hardwood and cypress pine were repeated during the year, and a new survey initiated for Plantation Pine. As the response has been disappointing, the continuance of this joint project with the Industry is under consideration.

(*b*) *Biometrics and Data-processing.*—A total of 173,000 cards was punched during the year. Of these 52,000 related to statistical and biometrical work carried out by the Branch. Additional punch-card equipment has been acquired by the Department which will permit an increase in the scope of data-processing work attempted by this Branch.

Where possible it has been the practice to use the University Computer for biometrical and statistical computations where large quantities of data are involved. Standard programmes have been developed for various types of experimental design, for heritability calculations and for collation and tabulation of 10 per cent. Samples of logs harvested and log extraction data.

III. Utilisation

The Department's advisory services on the correct use of timber were again in heavy demand and some 2,000 enquiries were received.

Identification of some 3,000 wood specimens was made throughout the year for timber industry and Forestry purposes. A number of Punch cards for identification purposes were prepared for district officers. Assistance was given to the Central Technical College in timber subjects and to the Royal National Association in the judging of timber exhibits.

Material was supplied to a number of research workers in resins, essential oils and drugs, including samples to the Queensland University and Division of Wood Technology, N.S.W. Forestry Commission and the Admiralty is testing the latex of *Excoecaria agallocha* as a shark repellant.

A survey of Forestry districts revealed no distillation of Eucalyptus oil at present although suitable areas of Lemon-Scented Gum (*Eucalyptus citriodora*) are known. A Melbourne company has offered a firm price of 8s. 6d. per lb. on rail for regular supplies of this oil. Two species of Sword Grass (*Gahia sieberiana* and *G. aspera*) are under trial for broom manufacture.

With reduced supplies of hardwoods to meet the Brisbane demand it is important to introduce other timbers to limit growing imports.

The answer to the problem of providing adequate timber supplies in south-eastern Queensland lies in the greater use of pines from maturing plantations. This is a reversal of the official pine conservation policy in World War II and in post-war years when limited virgin pine supplies were needed for war purposes.

To develop the use of plantation-timbers the Department is undertaking research into building design and wherever possible this material is used in its own building programme.

This year has seen an expansion in the use of prefabricated trusses in Queensland and industry has shown that for commercial use and home building this method is much cheaper than conventional practices including the use of steel trusses.

Good progress has been made with the production of Standard Grading Rules. The adoption of these standards by the producer and the user will ensure the conservation and better use of native grown timbers.

It is hoped that Standards for Pine and Rain Forest Species will be completed during the coming year and with the Standards for Forest hardwoods and Cypress now available, the whole range of Queensland Timbers will be covered.

A new pamphlet No. 5 "Queensland Building Timbers and Specifications for Their Use" covering some 360 Queensland species, was published and has been made available to Architects, Builders, and all persons interested in timber for building.

Five lectures on "Timber Borers and Imported Timbers" were given to Customs Department trainees under the Technical Training Scheme and at the request of the Railway Department a visit was made to the Ipswich Railway workshops and recommendations made for the better use of Queensland timbers in railway rolling stock.

The usual close liaison was maintained with the Division of Forest Products, C.S.I.R.O. and with the Division of Wood Technology, New South Wales Forestry Commission.

Inspection of C.S.I.R.O. test samples treated by preservatives against marine borers was continued and the results to date have given an increased use of pressure treated piles by Port authorities of Brisbane.

The usual inspections in relation to "The Timber Users' Protection Acts" were carried out and some 200 buildings were inspected.

Thirty complaints were received, the majority being settled between the parties concerned and one conviction was obtained with others still under investigation.

IV. Wood Structure and Timber Physics

Wood Quality Assessment and Inheritance Studies

(*a*) Preliminary narrow-sense heritability estimates have been determined for a number of wood characteristics in morphologically preselected *Pinus elliottii* Engelm. var. *elliottii*, using 11-year-old open-pollinated progenies.

Heritability values estimated for tracheid length, spiral grain and percentage latewood ranged from low to moderate, and for basic density from low to high. Ring width estimates were consistently low and micellar angle consistently high.

(*b*) The heritability of vigour and several stem and branching traits is being determined, using the same trees, and genotypic, phenotypic and environmental correlations between morphological and wood characteristics calculated, with a view to determining the effect of preselection for certain external features on wood quality indicators.

(*c*) An invited paper on the heritability of fibre characteristics and its application to wood quality improvement in forest trees was prepared for presentation at a forthcoming meeting of the Working Group on Wood Quality, International Union of Forestry Research Organizations.

(*d*) Assessment of the wood quality of a further 10 potential seed-orchard trees of Hoop pine *(Araucaria cunninghamii Ait.)* raises to 30 the number of preselections assessed by an objective ranking technique which is aimed, for the present, at ensuring that the wood quality of initial seed-orchard representatives shall be of satisfactory standard, rather than superior. Twenty-one of the 30 trees had total wood quality and spiral grain scores to pre-determined minimum acceptance standards.

(*e*) Determination of the wood characteristics of twenty-three 8 to 17 years old trees preselected for a *Pinus caribaea* Morelet seed orchard in North Queensland has been completed and wood quality assessment standards and ratings are now being compiled. Differences in certain wood characteristics between this British Honduras provenance and the Pinar del Rio (Cuba) provenance previously studied are apparent.

Spiral grain values were generally very good and it is particularly interesting to note that spirality was predominantly negative (i.e., to the left), as in *P. elliottii*, whereas *A. cunninghamii* and *Agathis palmerstoni* F.v.M. have predominantly positive spirality. Tracheid length averaged 4·00 mm. in the tenth ring and average micellar angle values were exceptionally good. Pith to bark trends for percentage latewood and basic density have become evident, mean values at 19·3 per cent. and 27·5 lb./cu. ft. respectively, being higher than for younger material previously studied.

Wood Anatomy

Intra-ring variation in tracheid length in 23-years-old *P. elliottii* was studied to determine sampling procedures for parent-tree assessment and heritability work. The use of ring segments such as last-formed latewood to represent whole-ring values was not vindicated by the results and whole-ring or strip-mean values are being used in current work.

Defect Studies

(*a*) The incidence and cause of pitch streaks and heart shakes in *Pinus elliottii* has been investigated. Three main types of streaks were recognised, shakes being almost invariably associated with one of these.

Both defects appeared more prevalent in older stands and less prevalent in pruned than unpruned stems from the same area.

It was concluded that shakes and two types of streak are caused primarily by normal stem growth stresses, intensified by enclosure of live branches and lateral roots; that their incidence and extent is relatable to branch size, number and angle and reduced by pruning; that preselection of seed-orchard candidates for improved branching characteristics should reduce incidence and extent in future stock.

(*b*) Resin and bark pockets, especially in *Pinus patula*, have been under study, but little further work on this may be necessary, in view of work published elsewhere on apparently the same defect, which has been attributed to abnormal localised cambial activity following the development of radial checks in the cambial zone due to wind action.

V. Section of Wood Chemistry and Preservation

TIMBER PRESERVATION

(i) Treatment Plants.—

The number of registrations issued under T.U.P.A. has now increased to 149 with applications for a further four plants. These include 20 Vacuum-pressure impregnation installations ranging in size from 25 ft. x 3 ft. (diameter) to 88 ft. x 6 ft. diameter. Of these, three plants are principally on pole treatment but the remainder are treating primarily sawn timber for building purposes.

Research and Commercial studies have again been concentrated upon the application of the Vacuum–Pressure–Diffusion Process and high vacuum techniques as developed by the Department and the result has been a major saving in treatment costs, this saving being conservatively 10s. per 100 s. ft. Of the 20 plants now installed, 17 are operating on the Vacuum–Pressure–Diffusion Process, 12 at high vacuum and 5 at low vacuum.

When considered in terms of end usage and available timber supplies it is the opinion of this Department that existing vacuum pressure plants are more than adequate in capacity, particularly when combined with Open Tank Processes using Boron compounds for immunisation of Lyctus susceptible timber. Major investigations were initiated into the treatment characteristics of rain forest species, some of which are difficult to wet and show preferential absorption of components of the copper-chrome-arsenic formulations.

In the veneer and plywood field, there has been increased application of the treatment of veneer using dieldrin emulsion by the Momentary Dip Process. Analysis of fluoride treated veneer continues to show difficulty in attainment of the required minimum of 0·1 per cent. (as sodium fluoride) in thick veneers of the rain forest species. Continued interest has been shown in the treatment of plywood by multi-salts and it is now evident that some selection of veneer species in terms of treatability is necessary.

(ii) General.—

(a) Exposure tests of Stakes.—Exposure of Stakes which have been treated with a number of preservatives has continued at two sites viz. Jolly's Lookout and Gadgarra. Concurrent exposure of treated material to Lyctus has been completed but in view of the degree of Lyctus attack, full chemical analysis of a number of test samples will be necessary to determine toxic concentration.

(b) Sleeper Trials.—Tests of Open Tank and Spray treated sleepers have continued in Q.G.R. tracks at Normanby. The evidence is very strongly in favour of the open tank treatment using creosote, as mechanical degrade in such material is markedly reduced.

In addition tests continued of sleepers impregnated under 1,000 p.s.i. using creosote and also copper-chrome-arsenic formulations. Although the test is of insufficient duration to draw conclusions it is evident that free-splitting species, e.g., Turpentine, should be excluded from sleeper service.

(*c*) Tests on painted Slash Pine external sheeting, treated with boron compounds, have shown that a major percentage of the original boron concentration has been lost over a period of approximately 4 years. Exposure tests under service conditions of C.C.A. treated material have continued for purposes such as departmental buildings and National Park signs, &c.

(*d*) Final Preservative treatments were made for 400 Slash Pine Poles in a co-operative experiment with P.M.G. Some poles have now been prepared for service trials.

WOOD CHEMISTRY, PLYWOOD AND VENEER

Studies in these fields included gluing trials and several rain forest species, and it was found that a material identified commercially as Bollywood was difficult to glue using hot press urea formaldehyde formulations.

Studies were extended to include the effect of preservative treatment (sodium fluoride) upon species of high natural acidity such as Northern Silky Oak; in addition in what is termed "the Gummy Oak", it was found that high temperatures such as in mechanical driers or hot presses caused degradation of ray contents and resulted in a significant darkening of the veneer. Pretreatment with borax was found necessary.

Peeling and gluing studies of a small quantity of Rose Gum were carried out in co-operation with a local plymill. Recovery in terms of quality veneer were low and based on this material it would appear that this species is not a commercially suitable veneer species.

CHEMICAL LABORATORY

The marked increase in preservative treatment has again resulted in heavy demands upon the laboratory. For the current year determinations were as follows:—

Preservative Spot Tests—1,409 involving 2,800 determinations.

Total Chemical Analysis of water, preservatives, &c.—1,302 involving 4,000 determinations.

Major investigations were also carried out in relation to chemical methods and equipment.

vi. Insects of Forest Products Importance

(*a*) *Pests of Unseasoned timber.*—Considerable concern has again been expressed on a number of occasions during the year by users of CCA treated timber on which attack by auger beetles (family Bostrychidae) had occurred. In no instance has damage following treatment been shown to affect the strength or longevity of the timber and it is considered that the problem is largely one of a lack of understanding of the mode of action of the treatment and the biology of the insect species. It then becomes a phase in the process of acceptance of treated timber.

A similar number of enquiries as for previous years has resulted from damage by other borers which initiate an infestation on green logs.

(*b*) *Pests of Seasoned Timber.*—As in other years this aspect gave rise to a large volume of enquiries from other Government Departments, Industry, Pest Control Operators and the general public. Termites mainly *Coptotermes* and *Cryptotermes* species, borers mainly *Lyctus* and *Calymmaderus* species, and a range of less common pests have been referred for advice on identity, habit, biology and control.

STAFF

At the 30th June, 1965, there were 421 salaried officers in the staff, comprising 166 in Head Office and 255 at District Centres. This represents an increase of 18 on the number as at 30th June, 1964. The number of wages staff employees increased from 1,602 to 1,899.

Thirty salaried officers left the Department during the year and four officers—Messrs. I. Le F. Loveday, L. G. Emerson, J. C. Loweke and P. Cummings—retired.

It is with deep regret that the deaths are recorded of Mr. E. P. Courtenay, Clerk (Costs) Stores Section, Brisbane, and Mr. L. M. O'Brien, Forest Ranger Division I, Inglewood. The sympathy of all members of the Department is extended to the bereaved relatives.

Mr. G. B. Wood was awarded a Research Scholarship in Botany and commenced three years special leave to study at the Australian National University, Canberra during April 1965.

ACKNOWLEDGEMENT

I desire to record my appreciation of the loyal and efficient service of all members of the staff during the past year.

A. R. TRIST,
Conservator of Forests.

APPENDICES

APPENDIX A

Return of Timber, &c., removed from Crown Lands during the Year ended 30th June, 1965

Species	Quantity Super. feet	Super. feet
Milling Timber—		
(a) Native Forests—		
Hoop and Bunya Pine—		
Ply	2,913,105	
Logs	9,076,859	
Tops	9,205,062	
		21,195,026
Kauri Pine	1,912,627	
Cypress Pine	31,943,748	
Forest Hardwoods	66,381,474	
Scrub Hardwoods	14,050,099	
Cabinet Woods	19,675,491	
Miscellaneous Species	33,106,179	
Limb Logs, Head Logs, Stumps and Flitches	21,444	
		167,091,062
(b) Plantation—		
Hoop Pine	28,560,483	
Bunya Pine	211,761	
Kauri Pine	2,391,800	
Slash Pine (*Pinus elliottii*)	2,544,020	
Loblolly Pine (*Pinus taeda*)	1,731,438	
Pinus patula	1,507,132	
Pinus radiata	586,088	
Rosegum	110,479	
Blackbutt	68,727	
Red Cedar	8,773	
Exotics (Miscellaneous) including *Caribaea* and *Pinaster*	28,708	
Silky Oak	8,014	
		37,757,423
Pulp Wood—		
Slash	2,164,880	
Loblolly	1,137,262	
P. palustris	268,323	
P. echinata	66,821	
		3,637,286
		229,680,797

Other Classes—		Expressed as Superficial feet (Hoppus) Log Measure
Sleepers Hewn	66,272 pieces	2,518,336
Sleepers Sawn—5 ft.	222,986 pieces	6,243,608
Sleepers Sawn—7 ft.	314,896 pieces	11,966,048
Sleeper Blocks (as sleepers contained)	248,510 pieces	8,946,360
Transoms, Crossings, Headstocks, Longitudinals	112,081 superficial feet	179,330
Girders, Corbels, Piles, Sills, Kerb Logs	62,378 lineal feet	1,122,804
Girder Logs	128,338 superficial feet	128,338
Poles	317,871 lineal feet	2,225,097
House Blocks	38,878 lineal feet	233,268
Fencing Material—Split	227,538 pieces	2,047,842
Fencing Material—Round	61,861 lineal feet	154,652
Mining Timber—Split	Nil pieces	...
Mining Timber—Round	519,742 lineal feet	1,039,484
Mangrove Case Timber	21,682 superficial feet	21,682
		36,826,849

Other Classes—*continued*—	
Fuel	33,163 tons
Trees and Plants (number)	256,419
Sand, Gravel, Soil, Antbed, &c.	589,645 cubic yards
Freestone	2,344 cubic feet
Fibre, Bark, Dry Leaves, Reeds	63 bags
Duboisia	3,300 pounds
Flora	1,036 pieces
Peat	171 bags
Mulga Wood	96 tons
Poling Timber (Copper Refining)	2,570 tons
Bee Hives	2 hives
Boat Knees	12 pieces
Black Wattle	597 stems

APPENDIX B

Total Receipts, Department of Forestry, for the Year ended 30th June, 1965

Receipts from Districts	£	s.	d.
Group 1—South Queensland (Beerburrum, Beerwah, Benarkin, Bundaberg, Fraser Island, Gallangowan, Gympie, Imbil, Jimna, Kalpowar, Maryborough, Monto, Murgon, Yarraman)	954,386	0	4
Group 2—North Queensland (Atherton, Cairns, Cooktown, Charters Towers, Herberton, Hughenden, Ingham, Innisfail, Port Douglas, Ravenswood, Townsville)	408,967	7	10
Group 3—Dalby, Roma, Taroom, Charleville, Mitchell, Quilpie	127,340	0	4
Group 4—Warwick, Goondiwindi, Inglewood, St. George, Stanthorpe, Cunnamulla	66,230	18	10
Group 5—Mackay, Rockhampton, Clermont, Bowen, Proserpine, Emerald, Springsure, Theodore	70,683	9	7
Group 6—Barcaldine, Blackall, Jundah, Longreach, Muttaburra, Stonehenge, Winton, Aramac, Isisford, Jericho	1,065	18	11
Group 7—Cloncurry, Boulia, Kynuna, Mackinlay, Richmond	7	19	6
Group 8—Burketown, Coen, Croydon, Georgetown, Normanton, Thursday Island		Nil	
	£1,628,681	15	4

Other Receipts	£	s.	d.	£	s.	d.
Forestry and Lumbering				179,759	5	10
Sale of Plants, Material, &c.				12,388	11	5
Licenses* (See note after Appendix C)				3,793	14	6
Rents and Grazing Dues				13,404	11	2
Miscellaneous, Salisbury Area Timber Account, Forfeited Wages, Expenditure Recoveries, &c.				19,365	4	9
Sale of U.S. Tractors, Trucks &c.				15,061	16	7
				£1,872,454	19	7
Plant Hire—						
Charged Loan Fund Projects	246,951	6	8			
Trust Fund Projects	89,384	19	4			
Revenue Fund Projects	1,077	15	5			
				337,414	1	5
				£2,209,869	1	0

APPENDIX C

Proceeds of Sales of Timber, &c., for the Period 1st July, 1964, to 30th June, 1965

Groups*	1961–62	1962–63	1963–64	1964–65
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Group 1	929,551 3 6	962,516 15 5	977,440 6 11	954,386 0 4
Group 2	413,157 6 6	417,796 12 7	386,068 5 1	408,967 7 10
Group 3	92,704 11 3	96,415 1 6	114,962 11 6	127,340 0 4
Group 4	65,935 4 4	61,203 8 10	75,710 18 0	66,230 18 10
Group 5	50,695 6 2	40,297 0 4	59,571 12 11	70,683 9 7
Group 6	1,065 1 3	960 15 10	759 3 4	1,065 18 11
Group 7	1,076 2 10	4,569 11 6	199 14 10	7 19 6
Group 8	4 0 0	237 10 0	..	..
	1,554,188 15 10	1,583,996 16 0	1,614,712 12 7	1,628,681 15 4
Receipts—Forestry and Lumbering	154,927 9 3	155,746 9 9	284,626 2 1	179,759 5 10
Sale of Plants, Material, &c.	21,782 18 7	11,337 3 0	8,942 7 2	12,388 11 5
Licenses†	3,442 3 4	3,316 11 0	3,493 4 6	3,793 14 6
Rents and Grazing Dues	9,950 2 1	11,175 8 6	11,997 16 5	13,404 11 2
Miscell. (Salisbury Area Timber Account, forfeited wages, Expenditure Recoveries, &c.)	..	19,050 10 3	34,734 5 7	19,365 4 9
Sale of U.S. Tractors, Trucks, &c.	..	..	..	15,061 16 7
	1,744,291 9 1	1,784,622 18 6	1,958,506 8 4	1,872,454 19 7

* For Districts within the groups, see Appendix B.
† Includes the following license fees :—Fuel, Quarry, Royalty, Brand, Sawmill, Apiary, Forest Products, Sales Permit.

APPENDIX D

Constructional Timber Supplied During Financial Year 1964–65 *under Forestry and Lumbering Operations*

Class of Timber	Quantity	Sales Value		
		£	*s.*	*d.*
Hewn Crossings ..	11,845 superficial feet	586	6	8
Sawn Crossings ..	2,423 superficial feet	119	18	9
Hewn Transoms ..	6,774 superficial feet	1,578	9	11
Sawn Transoms ..	5,385 superficial feet	293	9	8
Piles	5,918 lineal feet ..	2,382	1	3
Girders—Dressed ..	7,806 lineal feet ..	8,287	12	6
Hewn Sleepers ..	17,449 pieces ..	11,706	16	1
Sawn Sleepers ..	72,924 pieces ..	48,894	0	4
Sleeper Blocks (as sleepers contained) ..	248,458 pieces ..	100,301	9	2
Split Posts and Rails, &c.	16,178 pieces ..	2,434	4	1
Total ..	..	£176,584	8	5

APPENDIX E

Comparative Statement of Expenditure for Years 1963–64 and 1964–65

——	1963–64	1964–65
	£	£
Revenue—		
Salaries	580,676	633,155
Travelling Expenses and Incidentals ..	35,124	37,999
Fares, Printing, Stores, &c.	4,960	4,997
Cash Equivalent of Long Service Leave	6,972	3,987
National Parks	22,849	32,841
Loan—		
Reforestation	1,733,620	1,876,000
Acquisition of Land for Forestry Purposes	9,963	15,726
Access Roads	181,407	151,245
Purchase of Plant	258,597	209,563
Purchase of Radio Equipment ..	19,910	6,954
National Parks	37,354	39,229
Trust—		
Hardwood Supplies to Railway Department and Others	254,248	166,214
Harvesting and Marketing Timber ..	578,806	575,579
Access Roads—Maintenance and Subsidies	91,732	85,642
Maintenance of Capital Improvements	56,780	54,426
Maintenance of Plant	234,346	252,254
Interest and Redemption on Loans ..	976,941	965,052
Total .. .. .. £	5,084,285	5,110,863

APPENDIX F

Net Area of Plantation Established 1st April, 1964, to 31st March, 1965

Species	Brisbane	Gympie	Mackay	Mary-borough	Monto	Murgon	North Queens-land	Warwick	Yarraman	Queens-land Total
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Conifers										
A. Native Conifers—										
Hoop Pine	50·1	457·4	..	40·0	219·6	361·9	78·3	..	878·6	2,085·9
Kauri Pine	..	64·6	..	..	..	..	..	..	..	64·6
Bunya Pine	..	13·9	..	..	..	..	..	..	..	13·9
Total—Native Conifers ..	50·1	535·9	..	40·0	219·6	361·9	78·3	..	878·6	2,164·4
B. Exotic Conifers—										
P. elliottii	545·5	428·0	86·0	559·3	7·5	..	..	28·0	..	1,654·3
P. taeda	41·2	27·2	..	..	..	..	..	..	..	68·4
P. patula	..	..	..	..	6·4	1·5	..	..	75·3	83·2
P. caribaea	4·4	43·0	490·9	44·0	..	..	12·5	..	..	594·8
P. radiata	..	..	..	..	..	..	..	136·0	..	136·0
Other Exotic Conifers	..	0·4	14·3	..	..	..	0·1	..	..	14·8
Total—Exotic Conifers ..	591·1	498·6	591·2	603·3	13·9	1·5	12·6	164·0	75·3	2,551·5
Total—Conifers	641·2	1,034·5	591·2	643·3	233·5	363·4	90·9	164·0	953·9	4,715·9
Broadleaved Species										
C. Native Forest Hardwoods—										
Euc. grandis (and *E. saligna*) ..	52·1	..	..	..	..	..	..	..	..	52·1
Euc. microcorys	24·4	..	..	..	..	..	..	..	..	24·4
Euc. pilularis	3·0	43·5	..	..	..	..	..	..	..	46·5
Euc. cloeziana	..	16·5	..	..	..	..	..	..	..	16·5
Total—Native Forest Hardwoods	79·5	60·0	..	..	..	..	..	..	..	139·5
Miscellaneous Experimental—All Species	5·9	..	..	..	..	..	..	..	..	5·9
Total—All Species	726·6	1,094·5	591·2	643·3	233·5	363·4	90·9	164·0	953·9	4,861·3

APPENDIX G

***Net Area of Effective Plantation Classified into Forestry Districts to 31st March, 1965**

Species	Brisbane	Gympie	Mackay	Mary-borough	Monto	Murgon	North Queens-land	Warwick	Yarraman	Queensland Totals
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Conifers										
A. Native Conifers—										
Hoop Pine	785·0	17,496·0	0·8	230·4	3,669·6	10,256·5	1,251·8	..	20,301·7	53,991·8
Kauri Pine	5·2	1,404·8	0·5	69·7	3·6	4·9	277·3	..	7·4	1,773·4
Bunya Pine	0·9	392·1	..	0·8	1·2	58·8	0·2	..	49·8	503·8
Other Native Conifers	2·1	7·1	0·5	1·9	..	..	0·2	..	..	11·8
Total—Native Conifers	793·2	19,300·0	1·8	302·8	3,674·4	10,320·2	1,529·5	..	20,358·9	56,280·8
B. Exotic Conifers—										
P. elliottii	12,818·9	9,268·3	2,548·9	11,668·2	51·4	15·6	11·5	794·4	713·6	37,890·8
P. taeda	3,532·2	65·6	7·1	49·3	1·0	103·7	14·0	235·6	10·5	4,019·0
P. patula	19·0	36·1	7·9	8·0	22·6	165·4	35·0	458·9	3,446·7	4,199·6
P. caribaea	110·4	156·3	3,817·1	236·0	..	..	78·1	..	0·2	4,398·1
P. radiata	0·5	..	..	..	..	..	..	2,153·3	470·7	2,624·5
P. palustris ..	238·9	1·6	7·1	0·6	..	..	..	8·8	1·4	258·4
Other Exotic Conifers	39·0	22·6	89·6	13·5	8·7	1·1	7·7	27·6	36·0	245·8
Total—Exotic Conifers	16,758·9	9,550·5	6,477·7	11,975·6	83·7	285·8	146·3	3,678·6	4,679·1	53,636·2
Total—Conifers ..	17,552·1	28,850·5	6,479·5	12,278·4	3,758·1	10,606·0	1,675·8	3,678·6	25,038·0	109,917·0
Broadleaved Species										
C. Native Forest Hardwoods—										
Euc. grandis (and *E. saligna*	199·4	1,279·6	..	0·2	..	42·9	1·1	..	168·2	1,691·4
Euc. drepanophylla ..	189·1	182·4	..	0·1	..	71·1	37·8	..	475·2	955·7
Euc. microcorys ..	99·6	18·5	..	0·7	..	..	28·2	..	10·5	157·5
Euc. pilularis ..	199·4	260·0	..	0·3	..	..	..	..	0·5	460·2
Euc. cloeziana ..	..	239·9	..	0·1	..	..	..	..	..	240·0
Others	12·0	99·7	..	0·9	..	..	9·2	..	3·0	124·8
Total—Native Forest Hardwoods ..	699·5	2,080·1	..	2·3	..	114·0	76·3	..	657·4	3,629·6
D. Other Broadleaved species—										
Silky Oak	..	124·6	..	0·4	..	25·0	31·1	..	645·9	827·0
Queensland Maple ..	..	62·2	..	..	0·6	..	238·6	..	..	301·4
Red Cedar	..	2·3	..	..	..	..	31·3	..	..	33·6
Others	0·1	77·9	0·3	0·4	0·2	..	34·1	..	1·1	114·1
Total—Other B.L. Species	0·1	267·0	0·3	0·8	0·8	25·0	335·1	..	647·0	1,276·1
Total — Broadleaved Species	699·6	2,347·1	0·3	3·1	0·8	139·0	411·4	..	1,304·4	4,905·7
Miscellaneous Experimental— All Species	55·4	56·0	22·7	..	..	0·1	10·4	12·6	44·0	201·2
Total—All Species ..	18,307·1	31,253·6	6,502·5	12,281·5	3,758·9	10,745·1	2,097·6	3,691·2	26,386·4	115,023·9

* Figures quoted in this Appendix have been reviewed and corrected.

For explanation see page 9.

APPENDIX H

Areas of Natural Forest Treated

A.—EUCALYPTS

Sub-District	Treated 1964–65	First Treatment 1964–65	Total as at 30th June, 1965
	Acres	Acres	Acres
Brisbane	1,482	914	28,371
Beerburrum	561	153	20,343
Gympie	533	517	19,765
Imbil	..	..	159
Mackay	3,098	504	5,504
Emerald	..	..	33,875
Maryborough	7,249	5,167	104,676
Bundaberg	2,175	1,239	35,241
Fraser Island	975	15	21,862
Monto	1,579	1,206	19,791
Murgon	2,420	2,420	32,239
Atherton	..	..	3,689
Ingham	..	..	2,985
Warwick	805	295	10,462
Inglewood	..	..	15,697
Yarraman	23	23	6,414
Benarkin	..	..	2,051
Dalby	7,823	7,763	79,190
Total—Eucalypts	28,723	20,216	442,314

APPENDIX H—*continued*

B.—CYPRESS PINE

Sub-District	Treated 1964–65	First Treatment 1964–65	Total as at 30th June, 1965
	Acres	Acres	Acres
Bundaberg	..	..	2,152
Fraser Island	..	..	4,424
Monto	..	..	2,496
Inglewood	5,241	2,569	91,628
Dalby	10,417	7,149	212,784
Total—Cypress Pine	15,658	9,718	313,484

APPENDIX H—*continued*

C.—RAIN FOREST

Sub-District	Subsequent Treatment 1964–65	First Treatment 1964–65				First Treatment Completed 1964–65	Total as at 30th June, 1965
		Brushed	Ringbarked and Thinned	Logged under Treemarking Conditions	Trees Interplanted		
	Acres	Acres	Acres	Acres	Number	Acres	Acres
Natural Hoop Pine—							
Maryborough	..	..	..	..	..	..	65
Bundaberg	..	..	..	4	..	4	9,926
Total—Natural Hoop Pine	..	..	..	4	..	4	9,991
Natural Rain Forest—							
Atherton	..	63	297	3,243	29	297	5,786
Ingham	19	90	190	3,990	1	190	1,229
Warwick	..	21	..	..	21	21	21
Total—Natural Rain Forest	19	174	487	7,233	51	508	7,036
Total—Rain Forest	19	174	487	7,237	51	512	17,027

APPENDIX H—*continued*

Grand Total—	Acres
Eucalypts	442,314
Cypress Pine	313,484
Rain Forest	17,027
	772,825

APPENDIX I

State Forests, Timber Reserves, National Parks and Scenic Areas listed by Forestry Districts and Sub-Districts at 30th June, 1965

District	Sub-District	State Forests		Timber Reserves		National Parks		Scenic Areas	
		No.	Area	No.	Area	No.	Area	No.	Area
			A. R. P.		A. R. P.		A. R. P.		A. R. P.
Brisbane ..	Beerburrum	29	100,423 3 8	16	6,742 1 29	1	1,669 3 20	10	2,391 0 28
	Brisbane ..	38	184,814 1 26	20	35,375 2 13	9	77,078 2 0	24	6,302 0 20·6
	Total ..	67	285,238 0 34	36	42,118 0 2	10	78,748 1 20	34	8,693 1 8·6
Dalby ..	Chinchilla–Barakula	14	811,352 0 18	3	17,911 0 0	1	22,000 0 0	..	..
	Dalby ..	17	478,614 2 35	5	5,977 0 39	1	13,145 0 0	..	..
	Roma ..	11	268,880 1 37	5	112,202 0 0	..	..	..	..
	Total ..	42	1,558,847 1 10	13	136,090 0 39	2	35,145 0 0	..	..
Gympie ..	Gympie ..	34	291,587 2 37	4	2,704 0 7	..	..	3	941 0 0
	Imbil ..	10	145,015 2 0	2	148 2 3	..	..	1	640 0 0
	Total ..	44	436,603 0 37	6	2,852 2 10	..	..	4	1,581 0 0
Mackay ..	Emerald ..	3	132,478 3 35	10	210,762 2 0	2	131,400 0 0	..	..
	Mackay ..	6	138,337 0 0	23	140,477 2 19·1	24	255,325 0 0	64	15,618 1 38
	Rockhampton	12	264,357 2 4	18	148,153 2 22	2	12,954 0 0	13	1,020 0 0
	Total ..	21	535,173 1 39	51	499,393 3 1·1	28	399,679 0 0	77	16,638 1 38
Maryborough	Bundaberg ..	18	162,255 2 4	23	86,740 2 31	..	..	..	..
	Fraser Island	1	371,890 0 0	..	..	..	..	..	..
	Maryborough	38	366,187 0 13	18	31,276 0 37	3	10,540 0 0	3	805 0 0
	Total ..	57	900,332 2 17	41	118,016 3 28	3	10,540 0 0	3	805 0 0
Monto ..	Kalpowar ..	4	28,077 2 0	14	46,635 0 35	..	..	..	..
	Monto ..	15	377,198 3 35	39	215,606 1 25	1	3,830 0 0	5	1,077 0 0
	Total ..	19	405,276 1 35	53	262,241 2 20	1	3,830 0 0	5	1,077 0 0
Murgon ..	Gallangowan	3	37,910 0 0	..	..	..	..	..	..
	Jimna ..	7	99,511 1 14	..	..	..	..	..	..
	Murgon ..	9	96,223 0 0	11	54,920 1 3	..	..	..	..
	Total ..	19	233,644 1 14	11	54,920 1 3	..	..	..	..
North Queensland	Atherton ..	36	776,755 3 6	35	818,324 0 13	13	252,264 1 28	31	6,806 0 19
	Ingham ..	10	432,961 0 0	7	65,883 1 6	15	201,052 0 0	13	1,835 0 0
	Total ..	46	1,209,716 3 6	42	884,207 1 19	28	453,316 1 28	44	8,641 0 19
Warwick ..	Inglewood ..	21	373,897 0 31	5	16,764 0 8	..	..	..	..
	Warwick ..	13	82,039 3 37	4	6,887 1 28	3	15,677 3 0	4	494 3 0
	Total ..	34	455,937 0 28	9	23,651 1 36	3	15,677 3 0	4	494 3 0
Yarraman ..	Benarkin ..	4	70,775 0 0	3	4,442 2 26	..	..	..	..
	Yarraman ..	15	111,052 3 20	11	14,758 1 25	..	11,085 0 0	1	30 3 0
	Total ..	19	181,827 3 20	14	19,201 0 11	..	11,085 0 0	1	30 3 0
	Grand Total	368	6,202,597 2 0	276	2,042,693 1 9·1	75	1,008,021 2 8	172	37,961 1 25·6

At 30th June, 1965—

Total area set apart as—

	A.	R.	P.
State Forests	6,202,597	2	0
Timber Reserves	2,042,693	1	9·1
National Parks	1,008,021	2	8
Scenic Areas	37,961	1	25·6
Total Reservations	9,291,273	3	2·7

APPENDIX J

Reservations for the Year ended 30th June, 1965

1st July, 1964, to 30th June, 1965

State Forests

	No.	A.	R.	P.
At 1st July, 1964	355	5,528,467	1	9
Proclaimed 1–7–64 to 30–6–65	20	200,404	2	29
Proclaimed Converted Timber Reserves	1	469,206	3	39
V.C.L. added to existing State Forests		24,015	0	34
Timber Reserves amalgamated with State Forests		147	3	6
Areas released		−24,486	2	36·7
Recomputation of boundary		+4,842	0	39·7
State Forests amalgamated with existing State Forests	−8	..	..	
Total at 30th June, 1965	368	6,202,597	2	0

Timber Reserves

At 1st July, 1964	285	2,526,578	1	38·1
Proclaimed 1–7–64 to 30–6–65	10	49,245	0	0
Areas released		−11,311	0	24
Reserves cancelled	−19	−521,819	0	5
Total at 30th June, 1965	276	2,042,693	1	9·1

APPENDIX J—*continued*

National Parks

	No.	A.	R.	P.
At 1st July, 1964	73	1,005,441	2	8
Proclaimed 1–7–64 to 30–6–65	2	3,540	0	0
Scenic Areas converted to National Park		27	0	0
V.C.L. added to existing National Parks		260	0	0
Recomputation of boundary		−1,233	0	0
Areas released		−14	0	0
Total at 30th June, 1965	75	1,008,021	2	8

Scenic Areas

At 1st July, 1964	169	35,623	0	26
Proclaimed 1–7–64 to 30–6–65	5	2,170	3	23
V.C.L. added to existing Scenic Areas		220	0	0
Scenic Areas amalgamated with National Parks or Scenic Areas	−2	−27	0	0
Areas Released		−25	2	23·4
Total at 30th June, 1965	172	37,961	1	25·6

APPENDIX K

Distribution of Personnel, 30th June, 1965

Salaried officers	421
Other employees	1,899
	2,320

By Authority: S. G. Reid, Government Printer, Brisbane