1976

QUEENSLAND

ANNUAL REPORT

OF THE

DEPARTMENT OF FORESTRY

FOR THE

YEAR 1975–76

PRESENTED TO PARLIAMENT BY COMMAND

BRISBANE:
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PRINCIPAL OFFICERS

As at 30th June, 1976

Conservator of Forests	W. BRYAN, B.Sc. (For.), Dip.For. (Canb.)
Deputy Conservator of Forests	T. F. RYLEY, B.Sc. (For.), Dip.For. (Canb.)
Senior Forester	W. M. ROBINSON, B.Sc. (For.), Dip.For. (Canb.)
Senior Forester	J. D. H. MUIR, B.Sc. (For.), Dip.For. (Canb.)
Officer-in-Charge, Harvesting and Marketing Branch	T. F. YORKSTON, B.Sc. (For.), Dip.For. (Canb.)
Silviculturist	J. A. J. SMART, B.Sc. (For.), Dip.For. (Canb.)
Officer-in-Charge, Forest Resources Branch	H. E. VOLCK, M.Sc., Dip.For. (Canb.)
Officer-in-Charge, Forest Products Research Branch	A. W. GARDNER, B.Sc. (For.), Dip.For. (Canb.)
Officer-in-Charge, Forest Research Branch	P. J. HAWKINS, B.Sc. (For.), Dip.For., (Canb.) Dip.For. (Oxon.)
Secretary to the Conservator of Forests	F. J. McCAUL, A.A.U.Q.
Accountant	N. J. FLYNN, A.A.S.A., A.A.U.Q.

DISTRICT FORESTERS

Gympie	G. O'BRIEN, B.Sc. (For.), Dip.For. (Canb.)
Atherton	J. J. KELLY, B.Sc. (For.), Dip.For. (Canb.)
Maryborough	P. J. KANOWSKI, B.Sc. (For.), Dip.For. (Canb.)
Dalby	J. B. SCHAUMBERG, B.Sc. (For.), Dip.For. (Canb.)
Brisbane	T. RYAN, B.Sc. (For.), Dip.For. (Canb.)
Murgon	P. T. CRANNY, B.Sc. (For.), Dip.For. (Canb.)
Yarraman	W. A. GREASLEY, B.Sc. (For.), Dip.For. (Canb.)
Rockhampton	J. F. BARDSLEY, B.Sc. (For.), Dip.For. (Canb.)
Monto	J. E. DUUS, B.Sc. (For.), Dip.For. (Canb.)
Warwick	P. J. TWEEDY, B.Sc. (For.), Dip.For. (Canb.)

PRINCIPAL STATISTICS

FOREST AREA:	Hectares	
STATE FOREST RESERVE	3,337,629	
TIMBER RESERVE	635,162	
Acquisitions 1975–76	70,232	
Revocations 1975–76	48,691	
PLANTATIONS—		
Total Area (Net) at 31st March, 1976	101,361	
Area Planted (Net), 1975–76	5,218	
TIMBER CUT—CROWN LANDS 1975–76		
SAWLOG:		
NATIVE FORESTS—	Cubic Metres	
Broad-leaved	360,843	
Coniferous	134,247	
		495,090
PLANTATIONS—		
Broad-leaved	138	
Coniferous—		
Native	88,619	
Exotic	58,450	
		147,207
PULPWOOD		
Broad-leaved	13,990	
Coniferous—		
Native	13,805	
Exotic	77,045	
		104,840
TOTAL		747,137
FINANCIAL		
RECEIPTS:		$
Consolidated Revenue Fund		9,511
Loan Funds		280,171
Forestry and Lumbering Trust Fund		8,683,259
Reforestation Trust Fund		14,691,487
		$23,664,428
EXPENDITURE:		$
Consolidated Revenue Fund		6,328,983
Loan Fund		61,041
Trust and Special Funds—		
Forestry and Lumbering Trust Fund		8,688,458
Reforestation Trust Fund		14,126,656
		$29,205,138

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REPORT OF THE CONSERVATOR OF FORESTS

For the Year ended 30th June, 1976

TO THE HONOURABLE THE MINISTER FOR LANDS, FORESTRY, NATIONAL PARKS AND WILDLIFE SERVICE

INTRODUCTION

The commencement of an Organisational Development programme directed at an improvement in overall Departmental performance was mentioned in last year's Annual Report.

This programme has proceeded satisfactorily, and the assistance of officers of the Administrative Development Centre of the Public Service Board is gratefully acknowledged.

Although aimed at long term results a solid foundation has already been laid to achieve increased efficiency and improved quality of work life for Departmental members.

Staff at all levels were invited to participate in the planning of improvements, and the first priority identified was a need for restructuring within the Department.

A new Divisional structure for Head Office was approved towards the end of the year with a better grouping of interests for present circumstances, and the potential for shortening the process of decision making and achieving greater efficiency in work flow.

Although this new structure is not yet effective the following report is set out on the proposed Divisional basis.

The present District structure will remain largely unaltered, although inter-District committees have been established which will meet regularly at suitable country centres for discussion on matters of common interest.

Because of the importance of new work responsibility in relation to the Departmental restructuring, emphasis is now being placed on staff development at all levels.

Related to staff performance and operating efficiency is the very important matter of job safety, and a remarkable and heartening reduction of 25 per cent. in the disabling injury frequency rate has been achieved during the year. Apart from a safety education programme there were twenty-eight safety committees operating at centres throughout the State, and the work of these committees and the wider acceptance of protective equipment doubtless played a large part in the accident reduction success.

This year saw the inaugural presentation of two safety shields, for annual competition.

The Minister's shield for the lowest frequency rate was won by the North Queensland District, whilst the Conservator's shield for the most improved safety record was won by Warwick District.

The Commonwealth Government has been providing loan funds on favourable terms for ten years, to permit a build up in the rate of plantation establishment to a level which could allow the State to achieve nett self sufficiency in timber requirements by the end of the century or soon thereafter.

These funds have been made available under the terms of the Softwood Agreements Act which expired on 30th June, 1976. An extension of this Agreement for twelve months, but on less favourable terms, is proposed by the Commonwealth, however the subsequent position is quite uncertain.

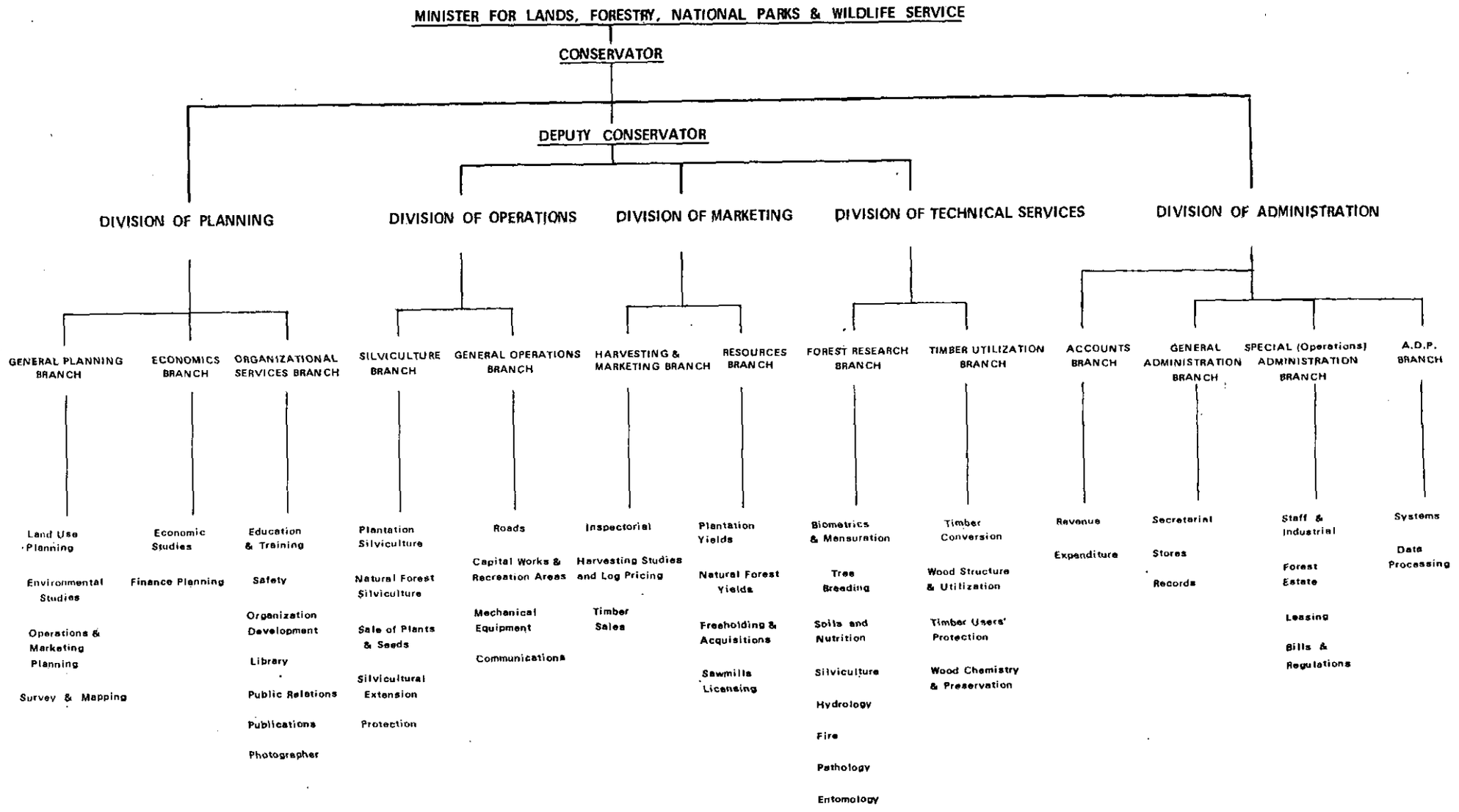
This is a most unsatisfactory situation from the point of view of forward planning as clean out logging in advance of planting, roading, nursery sowings, and site preparation work all must be planned and put in hand some considerable time before the actual planting commences.

Furthermore it would be most undesirable to have to reduce the planting rate because of a reluctance by the Commonwealth to provide further loan funds, having in mind sale commitments already made and the important advantages of nett self sufficiency in timber products which are recognised in such statements as the Forwood Report and the stated forestry policy of the Australian Conservation Foundation.

As it is, the plantation establishment level has been reasonably maintained in the face of rising costs only by a reduction of the pruning programme and by a decrease in the proportion of native Hoop Pine planted as compared to the less expensive exotic species of pine.

This year it was possible to slightly increase the area of natural forest given silvicultural treatment to promote growth on desirable stems, and it is important to continue this work, which tends in the public mind to be overshadowed by the more spectacular plantation establishment.

DEPARTMENT OF FORESTRY



DIVISIONAL STRUCTURE TO OPERATE AS FROM 1976/77

Seasonal conditions were generally favourable this year for plantation establishment, and the fire season was a very mild one. Despite the limited number of suitable days for winter burning a considerable area of native hardwood forest was covered in hazard-reduction burning by aerial ignition, and prescribed burning under exotic pine plantations was also extended. These techniques provide a great measure of protection against a bad summer wildfire season.

The Department has a substantial road building programme and during the past year constructed 79 kilometres of access logging roads as well as 142 kilometres of management and fire protection roads of lower standard.

The bulk of the access logging roads are built to serve native forest stands, with about half of the expenditure being in North Queensland. However the emphasis will now move away from native forests as these are now reasonably well served. Work will need to be concentrated in the future on better and faster access into plantation areas, which are assuming more and more importance in log production.

Departmental activities require a substantial vehicle fleet as well as a backbone of heavy plant, which is supplemented by private hire machines for plantation establishment and road building. One of the problems this year was that the replacement programme for vehicles and machinery fell well behind because of difficulties in securing deliveries.

The volume of Crown log timber sold this year increased relative to the previous year, but there was a further decline in the production from private forests. This decline is expected to continue.

It is of significance that the cut of plantation grown timber for the first time exceeded the cut from Crown forests of any other species group, and the Crown plantation cut will continue to increase substantially in the next two decades.

Considerable progress has been made, with industry cooperation, in the determination of a suitable basis to be used in selling Crown log timber non-competitively, following the abandonment of the auction system. Meanwhile sales have been held at a satisfactory level using an interim formula.

A joint Departmental and Industry Research Working Group has now been established, primarily to investigate problems of growing and harvesting timber with a view to reducing harvesting costs. Tests of new harvesting equipment have been started with promising results, and the Department has approved outrow thinnings as standard for pulpwood operations in exotic pine plantations.

Costs of log measuring have also risen sharply and the Department is looking at alternative methods in an effort to reduce such costs. These include the selling of hardwood and scrubwood logs on a gross rather than a nett volume basis, the elimination of log classification in Cypress Pine, weight scaling for plantation pulpwood, and paint marking of plantation timber generally for removal.

Research work on Honduras Caribbean Pine has been continued to the stage where a substantial part of the exotic pine plantings in coastal South Queensland will be in this species in the 1976 winter planting season.

This will partially replace Slash Pine, which has been the major species planted in this area over the last twenty-five years, and it is expected that the proportion of Caribbean Pine to Slash Pine will increase progressively.

The planting of Honduras Caribbean Pine outside the tropics is based on the well researched assessment that it is biologically suited to coastal sub tropical Queensland, that it is generally more productive than Slash Pine in this environment, that its form is satisfactory when produced from improved seed, and that its wood is suitable for most uses.

A factor that has contributed to the acceptance of Caribbean Pine is the development of a technique that will allow open root planting in South East Queensland, with very considerable cost reduction relative to planting of tubed stock.

An interesting development in another field has been the establishment of a relationship between value increment of trees in hardwood forests and observable crown and bole characteristics. This has provided a firm basis on which to determine the trees which should be removed in logging and treatment and those which should be retained as growing stock.

On a less happy note it has been established that patch deaths of trees in rainforests in the Mackay and Ingham hinterlands are associated with the root-rotting Cinnamon fungus (*Phytophthora cinnamomi*).

Although these appear to be the first losses of consequence in natural forests in Queensland's history they are viewed with concern as this fungus has the potential to devastate forest areas.

It has been present in the State at least since the days of early civilisation, and its eradication in the forest situation would seem impossible. However a team has been set up to study the incidence of the disease, and will be reporting on effective means to limit its spread.

DIVISION OF PLANNING

General

Perhaps the most innovative organisational change associated with the new Departmental structure has been the setting up of a Division of Planning.

While this Division is to assume responsibility for certain on-going activities within the Department, its function will also be to initiate, integrate and intensify planning, both short and long-term, in all fields of Departmental activity. It would likewise seek to co-ordinate requirements for current activities and programmes of the other Divisions as a means of improving overall efficiency and effectiveness.

GENERAL PLANNING

As the new Division begins to operate it will progressively assume a greater responsibility for certain planning functions previously undertaken by other sections of the Department. In this regard however, its involvement will primarily be in those areas of broader or longer range concern.

Land use planning must necessarily continue to be a growing field of involvement. The Department is a major landholder and its activities are such that it must be closely involved on its own behalf with both regional and local land use studies, and is also coming to be involved to an increasing degree in an advisory capacity in this type of work.

Environmental Studies

Greater public interest in environmental matters dictates that the Department increase and co-ordinate its activities in these areas. While it has followed for very many years a responsible policy of environmental concern with regard to its field activities, it now faces a need to secure factual data to justify its management decisions in the face of often poorly informed and narrowly based criticism.

In order to secure this data a separate unit has been established to provide and co-ordinate the necessary technical expertise in the many disciplines concerned.

Environmental impact studies are being carried out with respect to significant departmental activities with initial emphasis on the major exotic planting programmes.

A range of environmental guidelines is also being prepared to assist staff in field operations, and guidelines were produced during the year for the retention of native vegetation within exotic pine planting areas to ensure continued provision of floral and faunal habitat for species indigenous to the locality.

Survey and Mapping

Surveys associated with the plantation programme and native forest management in the ten forestry districts involved a toal of 15 survey parties. The length of surveys completed during the year was as follows:

Forest Entitlement Area boundaries	11 km
Theodolite Control Traverses	36 km
Levels	433 km
Compass Traverses	967 km
Connections Traverses	483 km
Boundary definition Traverses	232 km
Road locations Traverses	245 km
Survival counts	180 ha

Timber assessments made in connection with Crown land freeholding actions, and miscellaneous forest inventory assessments to provide basic management data, were carried out by six survey parties operating mainly within four forestry districts.

As part of the intra-departmental Forest Trainee Course, specialised survey instruction was given during the year to 17 general trainees at a two-week school followed by three months practical training in various survey camps.

A series of new metric maps was commenced on a scale of 1:50 000 based on the sheet system adopted by the National Mapping Council. Seven such sheets of a group of eleven covering the Cypress Pine forests of the Western Creek area in the Dalby District have so far been published.

Also on the programme is a nine sheet series which used for the first time the Main Roads Department's Automatic Plotter to provide Cadastral base plots.

Nearing completion is a map of Queensland on a scale of 1:2 000 000 showing Forestry reserves, and a six sheet series of a similar nature on a scale of 1:500 000 covering areas of Forestry interest is in progress. One sheet has been published and three have been completed to publication stage.

Metric conversion and revision of plantation and natural forest maps is continuing. The increasing demand for the 1:50 000 scale maps, management designed mainly for fire protection purposes in coastal areas, is engaging a considerable number of staff in the constant revision and up-dating of this series. These maps are also proving to be very popular with the public for touring and recreational uses and are made available for sale.

Picnic facilities on one of the forest recreation areas being provided by the Department for public use.

Small format aerial photography is being investigated. A pilot run is being organised to evaluate its suitability as an alternative to ground surveys for the supply of mapping detail. The exotic pine plantations of the coastal wallum area have been selected for the initial test.

ECONOMICS

Softwood Agreement

The second five-year Softwood Forestry Agreement between the Commonwealth Government and the States was due to expire at the end of the financial year. Consideration is being given to a possible third Agreement but in the meantime continued assistance at a reduced level will be provided by a one-year extension of the existing Agreement.

Financial assistance provided by way of loans under these Softwood Agreements has allowed the State to increase its planting programme to the level which, if continued, would allow expected demand for timber at the turn of the century to be met. Unless Commonwealth assistance continues to be provided, however, an increased allocation of State funds would be necessary for the required planting programme to be maintained.

Assistance provided to Queensland during the five years of the second Agreement has exceeded $8 million and has funded the establishment of an additional 8,215 hectares of plantation together with maintenance of areas previously established under the scheme.

ORGANISATIONAL SERVICES

Organisation Development (O.D.)

The O.D. programme commenced in June last year has been continued and has embraced the whole field of departmental activities.

While the most tangible development so far associated with the programme has been the organisational restructuring, the broad concept of seeking improved performance and greater job satisfaction at all levels through active staff participation has been actively pursued throughout the Department.

Activities undertaken were co-ordinated by a three man project team. A comprehensive staff survey provided input for nine seminars involving 150 staff from all levels. These seven day seminars each developed proposals for future development of the Department for consideration by senior management.

Following the seminars the O.D. project team has been undertaking team building, in-service training, and specific work in some Head Office areas.

O.D. sectional representatives have been appointed in Head Office and Districts. They have attended a five day training seminar, and will assist the O.D. project team.

Following the adoption of the new departmental structure the programme in the coming year will focus on team building and job design in Head Office and District centres, an expanded "in service" training programme, and supervisory management training in Districts.

Technical and Field Staff Training

Five State forestry university scholarships were awarded in 1976, three to new marticulants and two to students already undertaking a degree course in Forestry.

The number of undergraduates holding State Forestry Scholarships as at 30th June, 1976 were:— First Year 3; Second Year 2; Third Year 4; Fourth Year 5.

Six scholarship holders graduated during the year and took up duty as Foresters with the Department.

Twelve Forest Trainees completed the three year intra-departmental Forest Trainee Course in January 1976, and were appointed as field Overseers. Nine new trainees, selected from applicants of at least third year High School (Junior Certificate) standard, commenced training in February. At 30th June, 1976, thirty-four forest trainees were in training.

The Adult Trainee Scheme was continued during the year. This scheme is designed to supplement the Forest Trainee Scheme by providing training and an avenue of promotion for older wages staff with supervisory potential. Seven adult trainees completed their training during the year, and at 30th June, 1976, a further fifteen were in training.

Job Safety

The disabling injury frequency rate for the year was 85·7 compared with 114·0 for 1974–75 and 134·0 for 1972–73. This represents a reduction of 25 per cent. from the previous year and is a most pleasing trend.

Twenty-three Accident Prevention Courses were conducted during the year with a total attendance of 200 supervisory staff. The practice introduced last year of including a safety segment at the regular Forest Trainee Schools was continued. In addition, a direct approach by way of lectures and films at workman level was commenced.

The year saw the inaugural annual presentation of two Safety Shields for performances during the 1974–75 period. The Minister's Shield, for the district with the lowest frequency rate, was won by Atherton District and was presented by the Honourable the Minister for Lands, Forestry, National Parks and Wildlife Service at a function coinciding with the opening of the new Cardwell office. The Conservator's Shield, for the district with the most improved safety record, was won by Warwick District, and was presented by the Conservator of Forests at a function in the Warwick Office.

Twenty-eight intra-departmental Safety Committees operated during the year and the work of these Committees allied with the safety education programme and the wider acceptance of protective equipment was doubtless responsible for the significant reduction in the Department's accident rate.

DIVISION OF OPERATIONS

REFORESTATION

General

Total expenditure in 1975–76 on reforestation works was $12,354,981, representing an increase of 15 per cent. over the amount spent in 1974–75. This has largely been offset by the decrease in money values due to inflation. Expenditure included $11,493,000 from Reforestation Trust Fund, up $1,172,173 on 1974–75, with the balance financed principally by non repayable grants under Regional Employment Development Schemes, Commonwealth Unemployment Relief, and Aboriginal Advancement Fund. Expenditure from these latter sources enabled some concentration of work on silvicultural treatment of native forests and on removal of a heavy build-up lantana in Hoop Pine plantations.

The average annual employment of wages staff on reforestation projects was 1 275 compared with 1 402 in 1974–75. Costs per man-year rose from $7,660 in 1974–75 to $9,690 in 1975–76.

The summary below compares the main silvilcultural operations in 1974–75 and 1975–76.

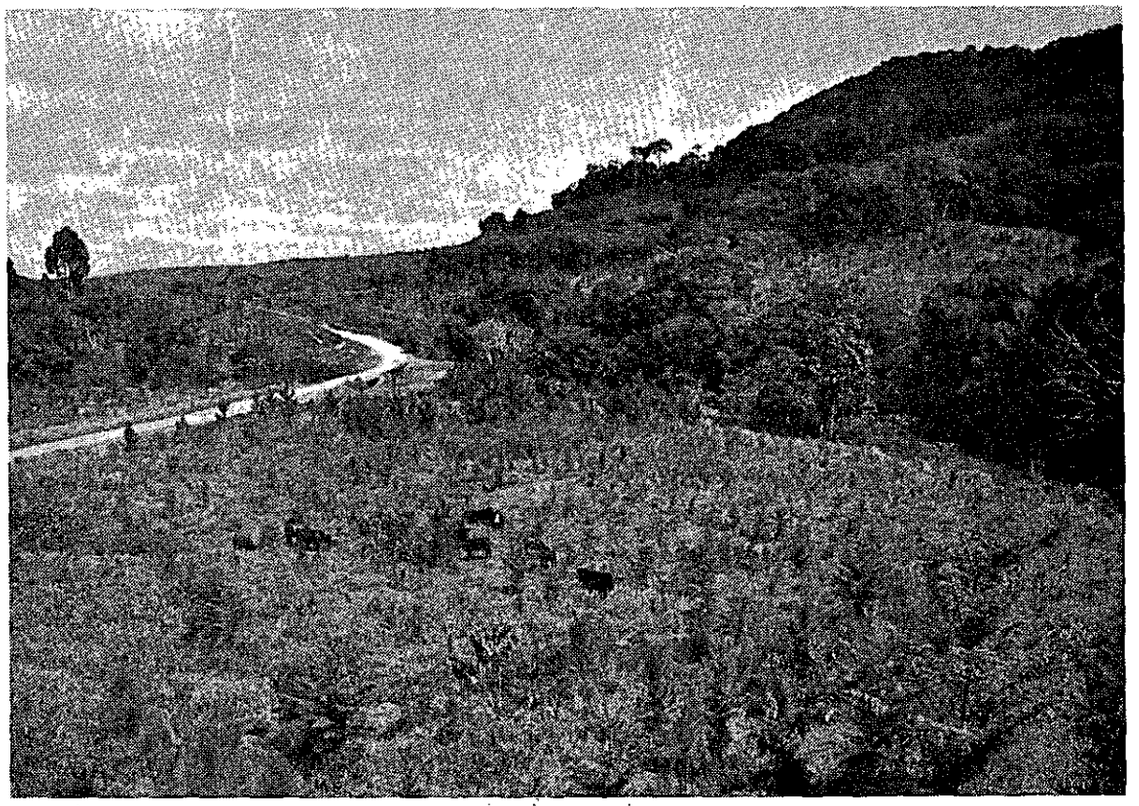
Operation	1974–75	1975–76
	hectares	hectares
Area of plantations established	5 460	5 218
Area of plantations tended	41 962	36 651
Area of plantations fertilized	5 000	6 900
Area of plantations thinned non-commercially	281	526
Area of plantations thinned commercially	4 348	5 003
Area of natural forest treated	19 260	20 761

PLANTATIONS

Plantation Establishment

The area of softwood plantations established between 1st April, 1975, and 31st March, 1976, was 5 218 hectares increasing the total area of effective plantation, as at 31st March, 1976, to 101 360 hectares. Details of these areas are shown in Appendices E and F, and the growth of the Department's plantation estate since 1920 is illustrated graphically.

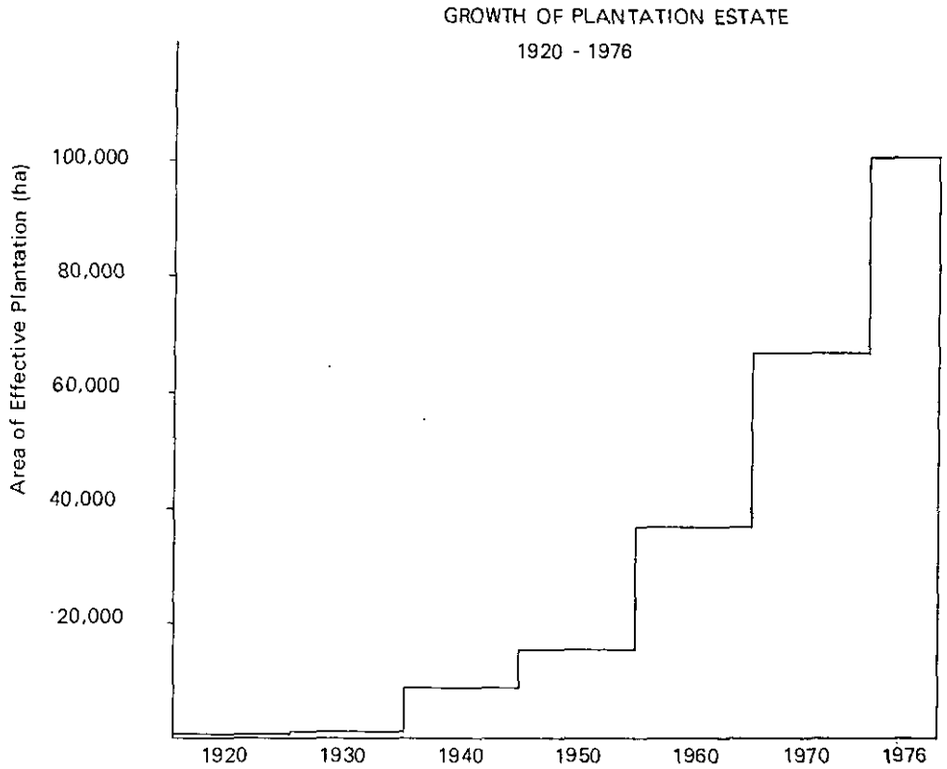
At 31st March, 1976, an estimated 24 200 hectares of privately owned plantation had also been established in the State, comprising about 23 000 hectares of softwood and about 1 200 hectares of hardwood.



Grazing young plantations being established on old farmland at Danbulla in North Queensland.

Departmental plantings of the major species in the past two years have been:—

Species	1974–75	1975–76
Native conifers (mainly Hoop Pine)	1 243·8	986·4
Exotic Conifers—		
Slash Pine	3 311·5	3 470·3
Caribbean Pine	767·3	575·4
Other Species	133·9	186·0
TOTALS	5 456·5	5 218·1



Most of the planting of exotic conifers was at the major centres of Tuan, Toolara and Beerburrum where extensive use was made of planting machines developed and manufactured in the Department's workshop at Maryborough.

To this time the principal species planted in the coastal lowlands have been Slash Pine in the sub-tropics and Honduras Caribbean Pine in the tropics. It has been possible to plant the former species open root, whereas until now it has been necessary to use more costly tubed plants to secure satisfactory survival of Caribbean Pine. This year, however, Caribbean Pine was planted open-root by machine at Toolara, Tuan and Beerburrum on a large scale for the first time, following the successful development in recent years of a nursery technique for the production of suitable open root planting stock of this species. Provided satisfactory survival can be maintained in these routine operations over the range of seasonal conditions, advantage can be taken of the faster growth of Honduras Caribbean Pine by planting it on many well-drained sites on the sub-tropical coastal lowlands which would otherwise be planted to open root Slash Pine.

Trials are similarly being continued with machine planting of open root Hoop Pine, with the largest planting in 1975–76 being 36·6 ha at Brooweena. Results have been promising and it is hoped may also lead to wider use of this cheaper planting method with this species on areas of suitable topography.

In addition to the normal plantings, 62·9 ha of Slash Pine plantation at Beerburrum and Toolara were underplanted with Hoop Pine following first thinning of the overwood. Research indicates that on some sites the Hoop Pine can be grown under these conditions without detrimental effect on the growth of the Slash Pine.

Tending

9 184 hectares of exotic pine plantation were tended during the year compared with 8 186 ha in 1974–75. Use was made of Departmentally developed and produced tending ploughs in about half these operations, supplemented by spot spraying where necessary in the rows. Little tending is required after the fourth year, however the present plantation establishment technique of overall ploughing, followed by a second ploughing prior to planting, will further reduce the amount of post-plant tending necessary in exotic pine plantations.

The tending of Hoop Pine plantations is still a continuing requirement and the area tended this year was 27 467 ha as compared with 33 776 ha in 1974–75. Lantana control in stands of all ages represents the major part of this activity. High spring and summer rainfall this year stimulated the growth of this weed and also restricted field operations for tending, leading to

Root pruning Slash Pine in Toolara nursery using a *departmentally* designed and constructed reciprocating unit.

some back-log in the work. There is a real need for effective biological control of this introduced weed and while insects so far released for the purpose have some effect under open conditions they do little conspicuous damage to lantana growing under the dense canopy of Hoop Pine plantations.

Misting with hormone is now used for weed control in the older Hoop Pine plantations following research which has shown that risk of damage is minimal, and this method is less costly than the previously used techniques of manual tending or the use of manually operated sprayers.

Fertilizing

An area of 6 900 hectares of exotic pine plantations was fertilized compared to 5000 ha in 1974–75. The increase in area was due partly to some carry over of new areas from the previous year at Tuan and Beerburrum and partly to a need to refertilize some of the 1970 plantings which had received less than optimum amounts of phosphorus.

In most circumstances it is desirable to apply fertilizer as soon as possible after planting. The overall cost of aerial application is comparable with that incurred with tractor spreading and allows for more rapid completion of the task. Wet ground conditions can delay tractor application and at times can even necessitate the use of costly manual application on some areas. Aerial application is therefore generally preferred and fertilizing of new plantations in 1975–76 covered 3 524·2 ha. Those sections not suited to aerial application because of location size or shape were in general fertilized by tractor application, although some areas of ground water podsol were fertilized manually by individual tree application. This method minimises uptake of fertilizer by the heath vegetation and stimulates early pine growth in order to allow the plants to better handle the heavy weed competition common on this soil type.

Pruning

Areas of plantation pruned in 1975–76 were:—

Species	Stage of Pruning			Total
	1st	2nd	3rd	
Hoop Pine	707 ha	415 ha	828 ha	1 950 ha
Exotic Pines	1 286 ha	1 014 ha	1 064 ha	3 364 ha
TOTALS	1 993 ha	1 429 ha	1 892 ha	5 314 ha

In order to more adequately meet expected future industry needs, and also to contain rising costs, a significant change has been made in pruning practices. Whereas pruning was previously carried out to a height of 6·4 metres in three stages, all new pruning is now done in two stages to a height of 5·2 metres.

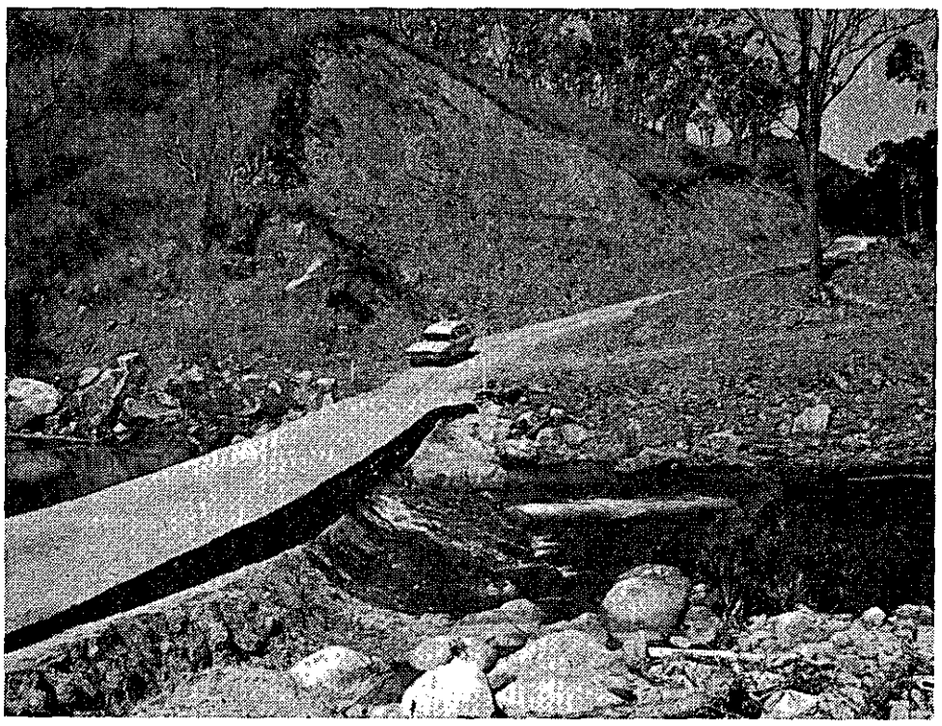
Areas shown above as pruned to a third stage, had already been partially pruned on the earlier basis and pruning was therefore completed to 6·4 metres on these areas. During the year a decision was also made in the exotic pine plantations to omit from pruning those rows which may be removed later in mechanised row thinning. Pruning is therefore now omitted in every second row in stands where the distance between rows is 2·4 metres or less, and in every fifth row where the inter-row distance is 2·7 metres or more. This slightly reduces the number of stems pruned to 200–250 stems per hectare in such areas, but this is considered adequate to meet industry requirements.

Manual pruning is both a difficult and costly operation. Preliminary field trials with a tractor-mounted pruning head developed in conjunction with C.S.I.R.O. were conducted on both Slash and Caribbean Pines. Results were sufficiently encouraging to warrant production design work on the pruning head which it is hoped will lead to early testing of a commercial unit.

Wind and Storm Damage

Cyclone "David" caused damage in January 1976 to plantations of exotic pines at Byfield in the Rockhampton District, and to a much lesser extent at other centres. Damage was very severe on only about 130 ha of older plantings however and severe on 140 ha of younger 1971–72 plantings. Salvage logging of wind blown merchantable trees is in progress at this centre. The cyclonic winds also caused limited damage to Hoop Pine in plantations at Bulburin, Nanango and Jimna, where young areas up to five years old were those mainly affected by varying degrees by lean and windthrow, and some older stands suffered broken tops. Remedial work was able to be carried out as necessary on areas of plantation up to three years old. Beyond that age tree size precludes effective straightening.

Windthrow following an unusually wet spring and summer at Passchendaele necessitated salvage logging of about 3 000 cubic metres, mainly of Radiata Pine, and a hail storm which caused major damage to property in Toowoomba city on 12th January, 1976 also caused unusually severe bark damage to about 42 hectares of one year old plantation of Radiata Pine at Pechey.



Departmental road construction for logging access—Mt. Windsor Tableland, North Queensland

NATIVE FORESTS

Regeneration or Silvicultural Treatment

Silvicultural treatment to remove unmerchantable stems and to space regeneration so as to improve forest growth was carried out on 20 761 ha (19 389 ha in 1974–75). The areas so treated comprised Eucalypt 8 909 ha, Cypress Pine 10 989 ha, Cypress Pine and Eucalypt mixed forest 852 ha and rainforest 11 ha. Further particulars of these areas are given in Appendix G. Extension of treatment operations into mixed stands of Cypress Pine and Spotted Gum at Barakula increased the area covered this year in inland Districts. Application of the weedicide Tordon 105 to waist high cuts made with a tomahawk has given good results in coastal hardwood forest at a cost lower than that of the previously used butt injection treatment and also contributed to the increased acreage treated.

Enrichment planting with seedlings of Blackbutt and Gympie Messmate was carried out to improve the stocking of certain highly productive types of wet sclerophyll and eucalypt forest. This work covering 80 hectares, including 20 hectares on Fraser Island, was carried out on sections where inadequate natural regeneration had resulted from earlier logging and treatment. On Fraser Island a further 50 hectares were treated during the year to promote natural regeneration of Blackbutt from natural seed-fall by appropriate logging, seed-bed preparation and prescribed burning techniques.

NURSERIES

Seventeen forest nurseries were operated during 1975–76 and over 8 million plants were raised mainly for use in Departmental plantations. Numbers of plants raised by species was as follows:

Species	Open Root Stock	Container Stock	Total
Hoop Pine	..	1,673,000	1,673,000
Caribbean Pine (principally Honduras)	524,000	900,000	1,424,000
Slash Pine	4,642,000	..	4,642,000
Radiata Pine	175,000	30,000	205,000
Loblolly Pine	50,000	..	50,000
Patula Pine	..	10,000	10,000
Eucalypts	..	107,000	107,000
TOTALS	5,391,000	2,720,000	8,111,000

In addition to the above, three amenity nurseries were operated for the production of ornamental plants for sale to the public.

Following research and successful field trials, the first large scale sowings of Honduras Caribbean pine to produce open root stock for routine use were made this year at Beerburrum and Toolara nurseries. A reciprocating root wrencher and a clay slurry dipping tank were also designed and built for use in the Toolara nursery as aids to ensuring better field survival both in this species and in Slash Pine.

Full sanitation measures are now in force at the Department's two major exotic pine nurseries at Toolara and Beerburrum following installation during the year of water chlorination facilities at both centres.

A shaded annexe with an annual output capacity of 100,000 plants was constructed at the Toolara nursery for raising eucalypts in small containers for the enrichment planting programme, and possibly also some Caribbean Pine for special purposes.

Sale of Plants

A total of 406,000 plants were sold from Departmental nurseries. These included 141,000 sold at concessional rates for private planting in forest plots and comprising mainly Slash Pine (60,950), Caribbean Pine (51,746) and Hoop Pine (14,820). A further 265,000 were sold for ornamental and windbreak use and came mainly from the amenity nurseries at Salisbury and Bunyaville, in Brisbane, and at Dalby.

SEED COLLECTION

Seed collected was sufficient to meet Departmental requirements for all species and surplus seed was offered for sale.

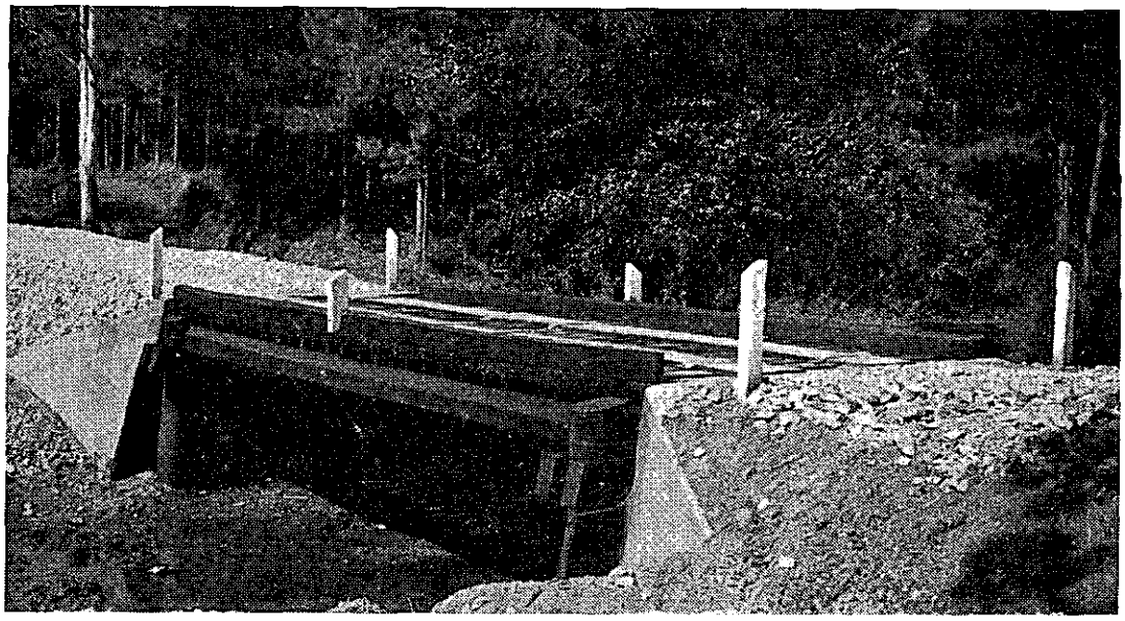
Honduras Caribbean Pine seed was the principal species sold. Improved orchard seed of this species available was sufficient only for departmental needs but 500 kg of routine grade seed from the 1974–75 collection was sold to overseas buyers in 1975–76. Cyclonic conditions adversely affected collection of this species in 1975–76 but a surplus of 470 kg of seed from this collection should be available for sale next season and it is hoped to increase future collections significantly to satisfy a buoyant world demand.

A collection of Hoop Pine seed from a number of isolated stands on Cape York Peninsula yielded some 650 kg of seed for trial plantings to broaden the gene resource of the species for future parent tree selection.

Details of seed collected in 1975–76 are as follows:—

Species	Weight Collected (kg)
Hoop Pine	870
Bunya Pine	2 220
Slash Pine	660
Caribbean Pine (principally Honduras)	710
Radiata Pine	35
Loblolly Pine	40
Eucalypts	90
Various Amenity Species	220

GENERAL OPERATIONS



An expanding plantation road construction programme is being undertaken to meet the increasing needs of management and logging.

FIRE PROTECTION

General

Each year a programme of protective (hazard reduction) burning is carried out in plantations and hardwood forests throughout the State under mild winter conditions. This lessens the risk of damaging fires occurring during hot dry summer periods.

Relatively wet winters in both 1975 and 1976 reduced the period available for this work but adoption of aerial ignition on hardwood areas nevertheless allowed the effective coverage of over 50,000 hectares this year.

Prescribed burning to a pattern within exotic plantations is now well established and is a most significant and positive recent development in the protection of these areas. Some 3,700 hectares were covered in the past season and field staff are now well experienced in this technique.

Seasonal Characteristics

This year rain persisted through the months of June, July and into early August in most areas and reduced the number of days available for protection burning. Good rains in Spring and Summer however resulted in one of the mildest summer fire seasons for at least six years.

Fire Incidence

The Department fought only 44 fires as against 146 the season before. Four fires were over 400 ha in area but these occurred mainly on privately owned land or low value Crown forests. Four plantation fires burned 3·4 ha Hoop and Exotic Pine.

There were two successful prosecutions for breaches of the Rural Fires Act involving fires affecting State Forests, and the Department also recouped by demand from private individuals $1213 in costs incurred in fighting fires. Ten letters of warning were sent to land occupiers for lesser infringements of either the Rural Fires Act or Forestry Act affecting Departmental lands, and a letter of appreciation was sent to a person who especially assisted in fighting a fire.

The number of fires reported by month of occurrence and size reached was:—

Month	Number of Fires	Size of Fires in Hectares			
		0–4	5–40	41–400	401+
July	1	1	..	..	..
August	10	3	6	1	..
September	4	1	2	..	1
October	8	3	1	3	1
November	11	4	4	2	1
December	8	1	4	3	..
January	..	..	..	..	..
February	..	..	..	..	..
March	..	..	..	..	..
April	..	..	..	..	..
May	..	..	..	..	..
June	2	1	1	..	..
TOTALS	44	14	18	9	3

The following table shows fire occurrence by Districts and by the degree of protection given the areas burnt:—

District	Number of Fires	Area (ha) Burnt by Protection Classes			
		*Intensive	†Extensive	Non-Protected	Total
Atherton	1	1	..	..	1
Brisbane	7	8	88	..	96
Dalby	6	647	80	348	1,075
Gympie	10	281	1,059	34	1,374
Maryborough	12	620	4,916	..	5 536
Monto	3	..	206	..	206
Murgon	1	2	..	..	2
Rockhampton	2	..	208	..	208
Warwick	..	..	..	..	..
Yarraman	2	2	..	..	2
TOTALS	44	1 561	6 557	382	8 500

*Intensive means land covered by a detection system where fire suppression will normally start within two hours of report to local headquarters.

†Extensive means areas not covered by a detection system, or where more than two hours will pass between report and attack.

The pattern of fire origin was similar to that reported in previous years with the most frequent cause again being escapes from legal burning-off operations by landholders and public authorities. This indicates a continuing need for greater public education and training in the use of fire.

Detection

Due to the mild season relatively little use of aircraft was necessary for detection purposes this year. An aircraft was used in the inspection of one wildfire on Fraser Island.

Construction started on a new fire tower at Jimna. With a designed height of some 50 metres it will be the tallest built to date by the Department.

Equipment

Ten small portable pumps were purchased and six portable tanks were manufactured.

A second privately owned Britten Norman Islander aircraft has been modified to accommodate aerial ignition equipment following the success of the aerial protective burning programme, and will be available for charter for this purpose.

COMMUNICATIONS

Radio purchases duing the year included:—

(i) 12 VHF mobile transceivers
(ii) 4HF Single-Side-Band (SSB) mobile transceivers
(iii) 6 VHF portable radio transceivers
(iv) One Signal generator for bench testing.

Long range, high frequency Single-Side-Band units were installed at Pony Hills near Injune and road camps in the Atherton District where special communications problems exist. One new VHF base was installed at Bowenia near Rockhampton and a second aircraft was fitted with Departmental radio equipment for air to ground control during aerial ignition operations.

National Parks and Wildlife Service upon its inception as a separate organisation acquired 21 of our radio units. They will utilise the same channels as those in use by adjacent Forestry Districts.

Roads

The need for construction of major access roads into new areas of native forest is now starting to decline since most of the large stands of timber in Queensland have been provided with access. The emphasis will in future, shift away from these areas and concentrate on providing better and faster access into the plantation areas. With the increasing volumes of plantation timbers being harvested, maintenance of these roads is becoming more expensive, and an upgrading programme is in operation, involving substantial road and bridge reconstruction.

To open up new natural timber stands a total of 79 km of access logging roads were constructed in the year, of which 40 km were in the North Queensland Area. In addition 76 km of road location and working surveys were carried out in this area. Construction of road access is continuing into the major timber stands on the Windsor Tableland area, and the second stage will shortly be completed. There is an expected volume of 300 000 m^3 of milling timber to be logged from this area.

In South Queensland work was completed on an access road to serve Timber Reserve 209 parish of Bowman and a major bridge was completed over Tinana Creek east of Tiaro which will allow shorter logging access from the extensive Tuan pine plantations to the Bruce Highway.

Management roads constructed into plantations and native forest areas for access for silvicultural, establishment, and fire protection requirements amounted to 141·9 kms. A lower standard of construction of these roads generally is suitable for the relatively light traffic that uses these roads initially, but this construction must allow for later upgrading when they are required for timber haulage.

Studies are being undertaken into the hydrological and environmental aspects of forest roading, particularly in the higher rainfall areas of North Queensland. Factors such as road location and potential erodability of the soil type are being given particular consideration.

MECHANICAL EQUIPMENT

In the heavy equipment field the purchase of five replacement graders, is expected to lead to improved performance by the grader fleet. Two heavy dozers purchased last year and put into service in July, 1975, have proved to be economical on large scale plantation clearing operations in coastal areas.

In an effort to achieve significant economies in vehicle running costs an emphasis was placed this year on purchase of lighter 4 cylinder vehicles as far as possible as replacements. Four small two cylinder utilities were also purchased as nursery carriers and are proving very successful.

The regular vehicle replacement programme lagged this year due to difficulties in securing deliveries and a substantial carry over of orders into next year has occurred.

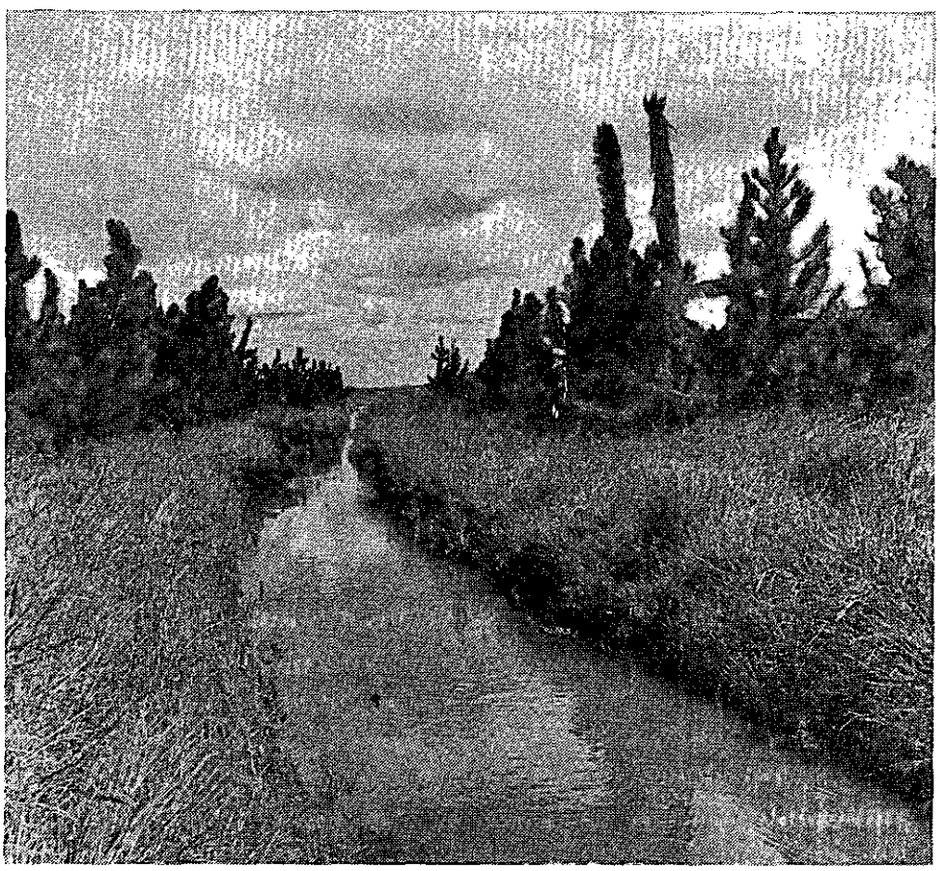
Purchase of Plant: Major items of Plant purchased during the year were:—

5 Graders
1 Crawler Dozer
5 Rubber Tyred Tractors
58 Replacement Motor Vehicles and
4 Additional Motor Vehicles.

Census of Major Plant as at 30th June, 1976:—

469 Motor Vehicles/Trucks
59 Crawler Dozers
87 Rubber Tyred Tractors and
34 Graders.

A new workshop constructed at Dalby is expected to facilitate maintenance work in the area and should lead to a substantial saving on maintenance costs.



Constructed major drainage channel for plantation establishment of Caribbean Pine of the coastal lowlands at Byfield in Central Queensland.

DIVISION OF MARKETING

HARVESTING AND MARKETING

General

The mill log yields from Crown and private lands during 1975–76 are shown in the appendices to this report.

The overall yield from private lands continues the steep decrease shown over the previous five years. Cypress Pine is the only species group which has maintained its yield from private lands.

On the other hand, the yield from Crown forests this year has shown a notable upsurge, almost to the record level of 1972–73, in an effort to make up this deficiency. The total yield from Crown forests in 1975–76 was 747 137 cubic metres and it is important to note that for the first time the yield of plantation timbers exceeded that of any other species group. Record cuts of both plantation sawlog and pulpwood were established.

The cut of forest hardwood sawlogs was also the highest since 1965–66 and was almost 40 per cent. higher than the 1974–75 cut which however had been the lowest cut for some 28 years. This increase is partly explained by rebuilding of mill stocks which had fallen to very low levels in 1974–75 and also by some recovery in trade.

All other species groups showed a decline in cut compared to the previous few years. The cut of naturally grown Hoop Pine, most of which is harvested by contractors to the Department, was hampered by wet weather. There is a good demand for Hoop Pine and every effort is made to supply as much as possible, but areas of supply are becoming scarce and more difficult to operate, and fewer contractors are available.

While imports of sawn conifers were high, overall sawn imports were less than in 1973–74 as also were log imports.

Operations under the first major sale of plantation thinnings of Caribbean Pine at Byfield near Rockhampton had not begun when Cyclone David struck the area in January, 1976. Construction of the sawmill was still in progress, with difficulties being experienced in delivery of equipment.

Apart from effects on stands suitable for producing log timber some young areas suitable only for producing pulpwood were blown down. Whilst the bulk of log timber could be expected to be salvaged within a reasonable time once the sawmill was in operation, there was no existing local market for the salvage of pulpwood. However, it was possible to arrange a substantial salvage of pulpwood with the material being transported by road and rail to a particleboard plant at Gympie, over 500 kilometres to the south.

This salvage of pulpwood was notable not only for the distance involved but more importantly that it was the first sale here of pulpwood in which weight scaling rather than log measurement was used to determine the volume sold.

MARKETING PROCEDURES

Log Measuring

Costs of log measuring have been rising sharply, and attention has been given to ways of reducing these costs.

In plantation timbers, trials of paint marking have indicated substantial cost savings, over previously used methods. Further investigations into sampling techniques in lieu of total measure and into weight scaling, particularly for pulpwood sales, are being undertaken. Weight scaling is a common method of sale in many countries and sale by weight i.e. per tonne or by establishing a weight/volume relationship i.e. tonnes per cubic metre, are both used. Sampling or weight scaling for sawlog plantation timber sales would however involve a different basis for log pricing than the present one which provides for varying prices based on diameter and height classes.

With Cypress Pine, logs are classified as first or second class, with second class logs having certain allowable defects and a price differential. Elimination of log classification by adjusting log pricing on an averaging basis would achieve log measuring economies in this species group and is also being investigated.

For hardwood sales, economies in measuring can be made with the introduction of a gross (as opposed to nett) system of log pricing. The measurement of defect would thus be largely eliminated and this is the time consuming (and contentious) aspect of log measuring in hardwood.

Hardwood logs removed under treemarking of a mature forest—Blackdown Tableland Rockhampton District.

Gross Measure

The cost of marketing log timbers has increased significantly over recent years. Rather than pass this increase directly to the timber industry, the Department has examined possibilities of revising its marketing procedures to simplify operations wherever possible. One avenue where significant improvements could be effected is the marketing of log timber from native hardwood and rain forest stands.

The present nett measure system of marketing in these stands involves the calculation of an allowance for defect for each log sold. This allowance is deducted from the total or gross volume of the log to give a nett volume for charging purposes.

The Department is now proposing a gross measure system of marketing which eliminates the necessity to calculate defect allowance for individual logs.

The gross volume of the log is applied directly to a log price incorporating average defect allowances by localities. It would be intended to arrive at the same overall cost for a log parcel as under the present system.

Determination of this average defect allowance has been facilitated by the introduction of computerised log timber accounting. Statistics on all log timber processed by the compu'er have been accumulated and average defects have been calculated for the full range of species and log size classes. This type of analysis was not practicable prior to computerisation.

Institution of this new system would result in some changes to the price list structure but the Department intends to retain the existing log price relationship between locality and key market, together with the principle of higher prices for larger diameter logs. In some localities however the average defect allowances increase so rapidly with log diameter that this size/price differential is offset. Where this occurs only the one gross price will be set for all sizes.

The Department hopes to introduce this system of marketing in several stages during the coming year.

Outrow Harvesting Systems in Plantations

An outrow system of thinning is the simplest method of allowing highly mechanised harvesting systems access to the forest, particularly where pulpwood operations are the main production. Some loss of productivity may be involved and this requires to be offset by savings in harvesting costs.

Approval was given during the year for a tenth row outrow system to be adopted as standard for pulp operations in Exotic Pine plantations with the proviso that since the areas presently being pulp thinned have had high pruning (to 6·4 metres) carried out on selected stems, the outrow could deviate between the 9th and 11th rows to save the best of these high pruned stems.

This has worked quite well, with logs pre-bunched to the outrow by small rubber tyred tractor and the bunches of logs picked up by a forwarder travelling the outrow.

In unpruned stands, consideration to closer outrow spacings is being given, and pruning schedules in young stands are being adjusted to accommodate outrow thinning.

Pulpwood being removed from Hoop Pine plantations in the Mary Valley for particleboard manufacture.

Damage to Plantation Stems in Logging

The Department has always required a high standard of logging expertise from operators of logging equipment in its forests. Hoop Pine is quite sensitive to damage, and the Exotic pines to a lesser degree.

Departmental sale agreements have for many years provided for monetary penalties for damage to stems where such damage is considered to have been avoidable by taking reasonable precautions. With the rapid changes in money values over the last few years, these penalties had become less effective.

New penalties have now been approved which are more appropriate to current money values. In addition a sliding scale of penalties has been introduced, heavier penalties applying to stands at later stages of thinning where there is more room within the stand to operate equipment, and of course the stems themselves are more valuable.

New Mill Sales—Railway Sleepers, etc.

In order to utilise residue from hardwood mill log operations, including standing trees unsuitable for normal milling timber, seven separate auction sales with new mill licence provisions were offered in Brisbane, Murgon, Monto, Bundaberg and Rockhampton Districts.

A total of 17 000 cubic metres of hardwood suitable for the processing of about 6 800 cubic metres of sawn railway and tramway sleepers, sawn mining timbers and other sawn timbers was offered.

Three of the sales were purchased, one at above upset prices, and these comprised almost 60 per cent. of the total volume of timber offered.

Allocation of Crown Log Timber

Since regular auction sales of Crown Timber were abandoned in May 1975 all Crown Log Timber has been sold non-competitively on an interim basis pending finalisation of non-competitive allocations to individual mills.

The big advantage of the proposed non-competitive basis of selling timber over the auction system is that mills now have an assured supply of timber from Crown sources and can plan for the future.

The Department and Sawmilling Industry have agreed that allocations should be introduced with minimum disturbance. Plantation timber sales will be made according to entitlements established by previous operation. Cypress Pine and North Queensland rainforest timbers will be sold using established quotas as the basis of allocation.

The hardwood forests of South East Queensland are the main problem areas. This is the area of maximum demand for timber but not only are the Crown forests limited in area, and consequently capable of inadequate production, but the privately owned forests have been heavily overcut, and large areas of them have been and still are being converted to grazing and agriculture so that they will no longer continue to supply logs to industry.

This region has been divided into a number of supply zones for which the sustainable yield of Crown hardwood has been determined.

The recorded Crown and private cuts for each mill in each zone are related to this sustainable yield and an allocation of Crown timber has been determined for each mill based on the principle of minimum disturbance and ensuring that no mill will receive less than 85 per cent. or more than 120 per cent. of the quantity of Crown timber cut in the four years 1970-71–1973-74.

Allowance will be made for the fact that during the base period mills may have been cutting considerable volumes of private timber in order to meet the owners' desires to clear their land and at the same time to conserve Crown supplies.

Sharing of sales under the new system will not be permitted in future except between mills in a zone and under the same ownership, and the minimum allocation of Crown timber to any mill will be 50 cubic metres.

North Queensland Mill Quotas

In 1948 a log quota system was introduced in North Queensland under which mills then operating Crown rain forest timber were granted an annual quota equal to the peak annual intake of Crown logs over the three preceding years.

Subsequently mills which had a quota determined in this manner at a figure of less than 1 500 cubic metres per annum were granted an increase in their annual quota to 1 500 cubic metres provided they had sufficient unrestricted sawmill capacity.

Although the auction system continued to operate at that time no mill was permitted to exceed its annual quota.

With the recent withdrawal of the auction system, under which almost all purchasers availed themselves of the sharing provisions in order to obtain supplies or species to suit a particular market, it became necessary to investigate alternative arrangements. It was approved to permit the grouping of quotas by mills under the one ownership. It is considered that economies will be effected by both industry and the Department by this arrangement.

Computerisation of Accounts

Stumpage Accounts for log timbers sold "at stump" are now being processed by computer for all Districts except Atherton and Mackay Sub-District. It is expected that these two remaining centres will be computerised during the coming year.

Minor problems which have occurred during the year have been overcome by modification to the computer system and streamlining of all operations has resulted in faster processing time. Delays in issuing accounts have been minimised.

LOG PRICING

Re-Grouping of Mackay Scrubwood Species

A series of meetings with Mackay sawmillers during the year led to mutual agreement to re-group the species in the Mackay Scrubwoods for pricing purposes.

Broadly they will now fall into the following groups:—

(A) Individually priced species (ten species individually).

- (a) Conifers—Hoop Pine, Brown Pine.
- (b) Cabinetwoods such as Red Cedar, Southern Silver Ash, Crows Ash, White Beech, Silver Quandong, Black Bean and White Cheesewood.
- (c) Structural Timbers—Mackay Tulip Oak.

(B) Grouped Species. The remaining 100 or so species are now grouped for pricing purposes as:—

- (1) General Purpose Cabinetwoods—Group I
- (2) General Purpose Cabinetwoods—Group II
- (3) Rain Forest Structural Timbers—Group I
- (4) Rain Forest Structural Timbers—Group II
- (5) Forest Hardwoods.

This grouping is fully compatible with the current groupings used in the North Queensland rain forest timbers and also with general selling practices in sawn timber and plywood.

Hardwood Log Pricing

Some substantial modifications in the hardwood sawn timber markets over the last few years are being incorporated in Crown log pricing proposals for hardwoods.

The major changes are—

(1) Increase Rockhampton Key Market prices to the same as Brisbane.

(2) Create new Sub-Key Markets (smaller markets than full Key Markets) at Maryborough, Bundaberg and Gladstone. These have been calculated by assuming a 'local' market for an appropriate volume of sawn timber at Brisbane and Rockhampton prices in the zone of supply to the new Sub-Key Market.

HARVESTING STUDIES

An Australian Harvesting Research Working Group to advise the Standing Committee of the Australian Forestry Council became operational during the year. The Department and private industry are represented on this Group which co-ordinates the work of State Committees.

The main objective of these joint Departmental–Timber Industry Harvesting committees is to look at the problems of growing and harvesting timber with a view to reducing costs of harvesting.

To date, the Queensland Committee on plantation harvesting has been the most active and during the year initiated large scale trials on several machines.

(1) The "Windsor" R.W. 30 Harvester.

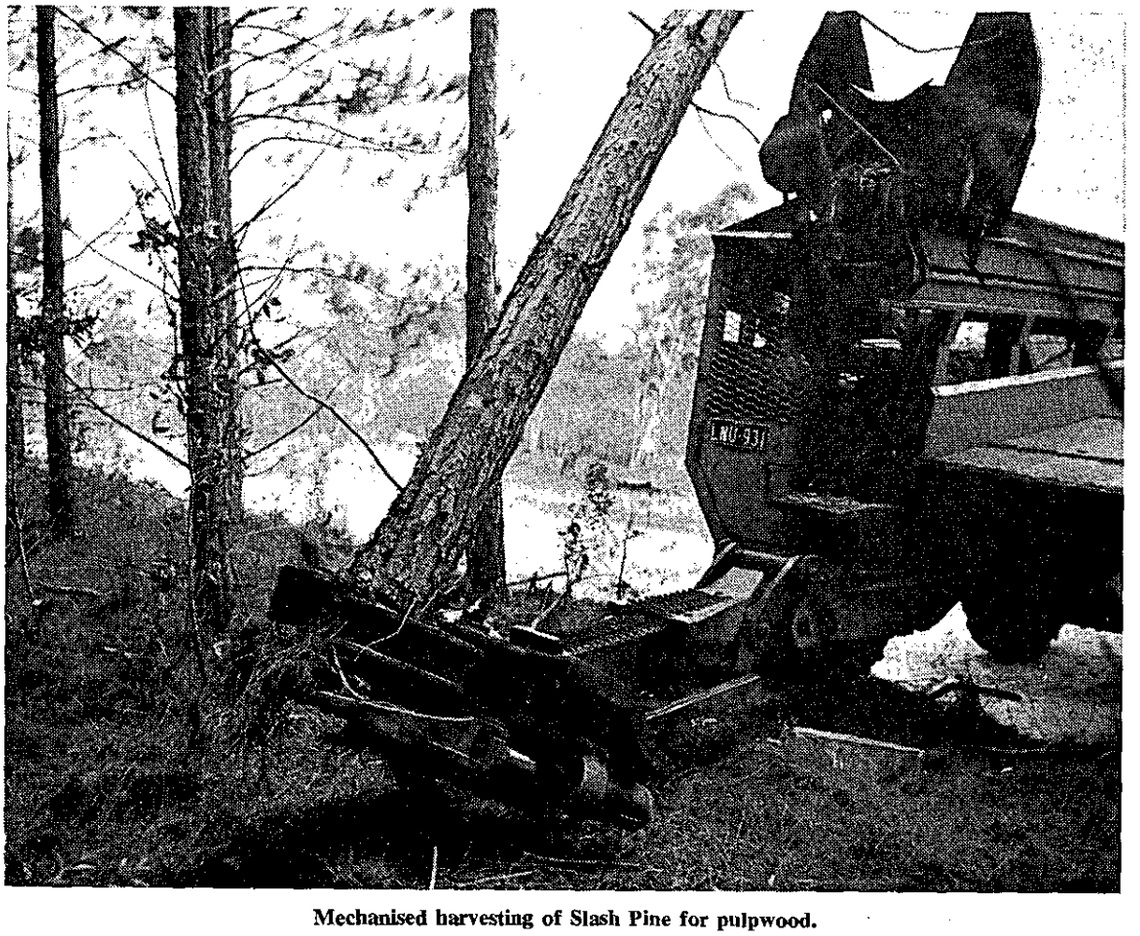
(2) The "Clark-Melroe" Feller Buncher and a locally assembled machine.

(3) The "Timber-master" Skyline.

The first two operated in exotic pine plantations while the third was used on steep Hoop Pine plantations.

The capabilities of all machines were fully tested and the trials were encouraging. The conditions for operation have yet to be determined before the machines are used on routine work.

The State Committees in Cypress pine and hardwood harvesting are to meet early in 1976-77.



Mechanised harvesting of Slash Pine for pulpwood.

TIMBER RESOURCES

Assessment

Field work in the Department's exotic plantation areas involved collection of data for management purposes and of information for purchasers to plan felling operations.

This work involved:

Standing volume and girth distribution assessment . .	1 200 hectares
Site index strip assessment	745 hectares
Determination of growth increment (by remeasurement of plots)	7 000 hectares
Installation of new plots sampling younger plantations	680 hectares.

Two major coastal hardwood reserves involving 24 000 hectares were remeasured to update volume information.

Strip assessments to determine timber resources on Crown land were carried out over 33 000 hectares of hardwood forest areas and 69 000 hectares of Cypress Pine areas.

Assessment of Crown areas for freeholding purposes covered a further 137 000 hectares.

Valuation of Timber for Conversion of Tenure

There has been a further decline in the number of freeholding actions, only 68 applications being received. Of the 3,484 applications received since the inception of freeholding 41 have been withdrawn, 68 are awaiting field assessment, and 143 are awaiting the Land Court determination. In area these figures mean that of the total of 11 199 600 hectares to be assessed and valued, only 209 340 hectares await final determination by the Land Court and 176 650 hectares still have to be assessed.

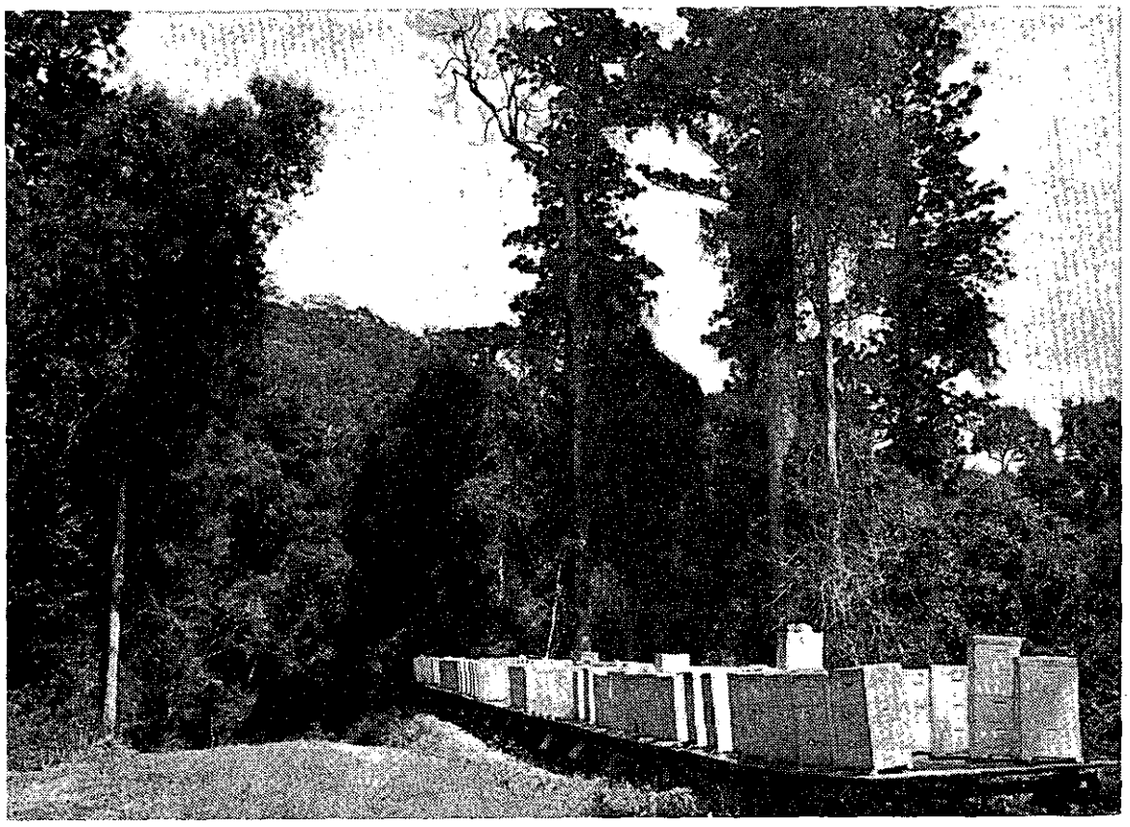
SAWMILLS LICENSING

The number of licensed sawmills decreased by 2 during the year to 433, of those 354 were General Purpose Mills, 60 were Other Than General Purpose Mills and 19 were Portable Mills.

General Purpose Mills are those producing in the main, scantling timber for use by the building industry, whereas Other Than General Purpose Mills principally produce sleepers and similar specialised timbers.

The category Portable Mill relates to plants which as the name suggests can be shifted from site to site, mainly for the operation of small parcels of log timber.

The Sawmilling Industry continued to take advantage of the Department's amalgamation policy which permits plants similarly classified and situated within appropriate zones to amalgamate upon one site to enable more efficient operation. During the year a further four licences were withdrawn following amalgamation with other licences.



Apiary site on an intensively managed State Forest, Imbil, Gympie District.

DIVISION OF TECHNICAL SERVICES

Mechanised row thinning of Slash Pine for pulpwood as part of the harvesting research programme.

FOREST RESEARCH

General

There are three regional forest research stations located at Atherton, Beerwah and Dalby. The Atherton station, with an outstation at Cardwell, is involved in research into rain forest silviculture and plantation management in north Queensland. The Beerwah station is responsible for research into exotic pine plantation management on the coastal lowlands from the Mackay area south to the New South Wales border. It has outstations for this work at Maryborough, Byfield and Gympie. The Dalby regional station handles research into the native forests west of the Great Dividing Range in south Queensland. In addition local research stations at Imbil and Yarraman are responsible for work on Hoop Pine plantation management on rain forest sites in the elevated coastal hinterland of south Queensland, and that at Gympie is responsible for research into the management of native hardwood forests in south Queensland, east of the Dividing Range and for fire research. The direction and integration of the work of these stations is carried out by Forest Research Branch officers located in Brisbane. Entomological and pathological advice for the Department is provided from a laboratory situated in Brisbane. The combined work of these stations is reported on below under broad work headings.

SOFTWOOD PLANTATION SILVICULTURE

For the past six years efforts have been directed to determining techniques which will permit the planting of Caribbean Pine as open-root stock in lieu of expensive container grown stock. The first large-scale plantings of open-root Honduras Caribbean Pine in the sub-tropical coastal lowlands were established during the year, based on new techniques which have been developed. These techniques aim at winter planting of one-year-old stock following

a July sowing. Nursery conditioning involves fortnightly undercutting of roots at a depth of 13 cm when seedlings attain a height of 15–20 cm, and side cutting of lateral roots at six weekly intervals. Seedling roots are dipped in a clay slurry immediately after lifting for planting; survival is enhanced by machine planting. The feasibility of extending open-root planting of Honduras Caribbean Pine further north into the tropical coastal lowlands, where greater climatic extremes prevail, is being examined in current trials. At Byfield on the Tropic, results have indicated that a suitable regime for summer planting when soil moisture is optimum is May sowing, weekly undercutting plus monthly side cutting of roots, and clay-dipping of roots at lifting. Alternative techniques involving direct sowing into a variety of planting containers are also being tested at Cardwell. Current research is also seeking to determine reliable open-cut planting techniques for Hoop Pine on rain forest and transition forest sites.

A major review of all long-term Slash Pine thinning and spacing experiments was completed during the year. These experiments have examined the effect on growth and productivity of initial plant espacement, non-commercial thinning, residual stand density during commercial thinning, and direction of thinning. The findings from this review will be considered in relation to current management practices in Slash Pine plantations. New experiments are being established to test the effect of rectangular spacings and outrow thinning systems which permit the introduction of mechanized procedures in both cultural and harvesting operations.

Control of weed regrowth in Hoop Pine plantations is an expensive and recurrent operation. Earlier research has defined optimum low volume pre-plant misting techniques using various formulations of 2,4–D and 2,4,5–T either alone or in mixture depending on weed composition. For early post-plant tending, high volume knapsack applications with similar formulations have been adopted. Low volume post-plant misting offers however a means of further reducing tending costs in young plantations and trials conducted this year have demonstrated that concentrations of 2,4–D amine as low as 1·07 litres active ingredient per hectare give very effective control of small Inkweed, and appear to reduce subsequent germination of this weed with no apparent detrimental effect to the young Hoop Pine.

TREE IMPROVEMENT

The main work in this area involves extensive testing of populations and intensive breeding within and between desirable populations for adaptation, high yield and improved quality of stem and wood. Work is concentrated on Honduras Caribbean Pine, Slash Pine and Hoop Pine.

The two currently productive seed orchards of Slash Pine at Beerburrum, established in 1954-58 and 1958-62, comprise clones from trees selected in the older plantations which then covered a narrow range of soils and localities. Although their progeny are growing well on the full range of sites now planted, it appeared desirable to establish a third seed orchard with a much broader genetic base, with allowance for heavy culling when the results of progeny tests are known. Accordingly, one half of a new 5 ha orchard, comprising 81 clones, was field grafted in 1975; fifteen of these clones were selected from pedigree stands, and the others from routine second generation stands covering almost the whole range of sites now planted.

The 9 ha Honduras Caribbean Pine seed orchard at Kennedy has been established in four stages (1968, 1972, 1974, 1975) using the best clones available at each stage. Intensive selection of superior trees within routine plantations and progeny trials provided 36 trees, of which six are pedigree selections, for use in the final section during 1975. This orchard now contains a total of 88 different clones representing selections from plantations in all major planting localities.

A combination clonal bank and seed producing area (clonal bank 127B) of Honduras Caribbean Pine was established progressively at Byfield between 1960 and 1972. Several trials outplanted at Beerburrum, Byfield and Cardwell containing stock from early seed collections from clonal bank 127B and from various other local and introduced seed sources were measured and assessed seven years after planting. Stock derived from local seed sources, either the fairly intensively selected parent trees in the clonal bank or the less intensively selected open pollinated trees in routine plantations, was superior to stock derived from unselected, introduced seedlots. This superiority of the best locally derived stock (from clonal bank 127B) was most evident in stem straightness and wind-firmness as is illustrated on p. 23 (Figs. 1 and 2).

Clonal seed orchards of Hoop Pine which were established at Imbil (1965) and Taromeo, near Blackbutt, (1970) are beginning to come into seed production. Most of the current work on genetic improvement is concerned with testing the progeny of the orchard clones at several localities (to provide information for culling the orchards), and with breeding families for second-generation selection for new orchards and for further breeding.

Another important aspect of the work with Hoop Pine is the collecting and testing of "new" populations from the very wide range of the species in New South Wales, Queensland, and New Guinea. Thus provenance trials have been extended in recent years with the establishment since 1970 of more than 40 provenances in trials at over 20 localities. Preliminary assessments show there are large differences among provenances in early growth rate, morphology and other characters. Several "new" or little-used northern provenances are showing considerable promise. There is great potential, therefore, for large genetic gains in the future.

NATIVE FOREST SILVICULTURE

RAIN FORESTS. In the tropical rainforests of North Queensland recent work has concentrated on the assessment of several experiments in which a range of silvicultural treatments has been applied following logging. The general findings are that the regeneration, stand representation and increment of prime quality cabinet woods can all be greatly improved by silvicultural treatment. In these studies emphasis is being placed also on assessment of logging damage as a guide to improving tree-marking and logging techniques, and to ensure that adequate growing stock is being retained in an undamaged condition to sustain timber supplies for future generations. Ground disturbance sustained during logging is being assessed also to provide a basis for improved logging guidelines aiming at minimal disturbance to existing stand conditions.

HARDWOOD FORESTS. Enrichment planting with Blackbutt in logged hardwood stands at Cooloola has resulted in good survival and excellent growth. Brush Box and many rain forest species are developing as a thick under-storey to the Blackbutt which have grown to an average of 10 cm diameter and 10 m in height in a little over 3 years.

An excellent growth of improved pasture has been established under the thinned Spotted Gum stand in the previously reported timber/pasture experiment at Neerdie, near Gympie. The pasture result is very encouraging as it has become successfully established after a very dry period immediately following sowing. Grazing began in June, 1976, and cattle will be kept on the pasture for several months during the winter. Combined productivity of the pasture and timber stand will be assessed on a continuing basis.

The first Departmental tree planting on a sandmined site at Fraser Island was established in May, 1976, with six indigenous tree species. After mining the site was contoured, the top soil replaced, and hybrid sorghum seed sown. A mulch of litter, collected from the unmined forest adjacent, was placed over the seeded area and the trees planted approximately two months later. One site is in an exposed situation and the other protected. The two older plantings of Blackbutt on simulated sand-mined sites have continued to display excellent growth.

CYPRESS PINE FORESTS. A series of experiments was established during the year aimed at determining costs, response, and financial returns applicable to silvicultural treatment operations over a range of stand types in the Cypress Pine forests. The results from these trials will assist in determining priorities and critical profitability levels to be applied to areas available for treatment work. Analysis of cost data in one of these trials has revealed that a major proportion of the treatment cost was spent in removing a relatively small proportion of the competition, and a modified treatment technique has therefore been proposed to enable maximum economic returns to be obtained from treatment in this type of stand.

The growth, spread, and control of the noxious weed, Moonlight Cactus, on Western Creek State Forest (near Millmerran) over the past 75 years was reviewed in a paper submitted for publication during the year. The results of extensive experimental trials are discussed in this review in relation to the future treatment of the infested area, which is currently estimated at 12 000 ha. A treatment schedule which aims at the eradication of this plant from the State Forest is also included in the paper.

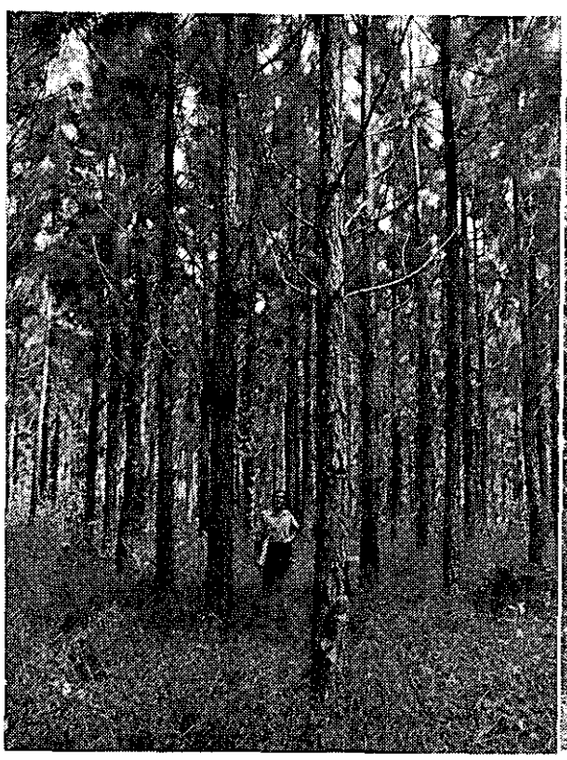


Figure 1. Straight stemmed wind-firm trees grown from local seed sources.

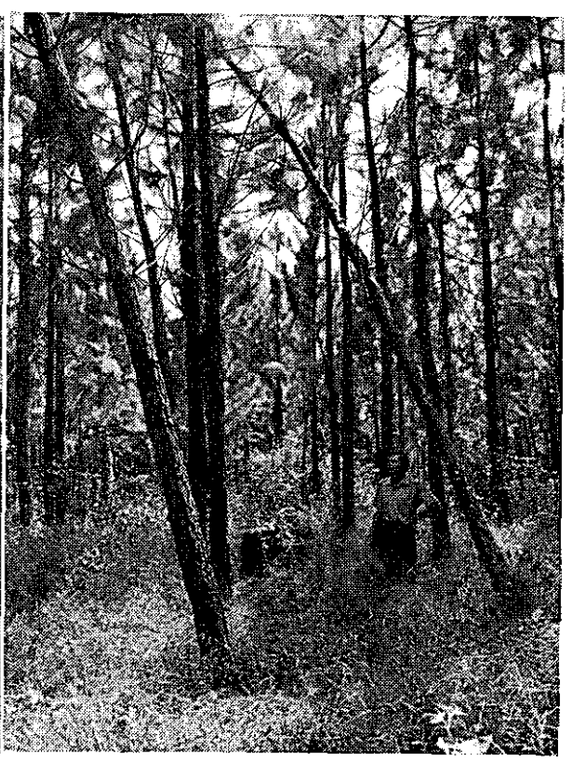


Figure 2. Less wind-firm trees of poorer form grown from introduced seed.

FOREST SOILS AND NUTRITION

The major effort for the year has gone into identifying nutrient deficiencies in Slash and Caribbean Pine in the coastal lowlands from Beerburrum to Byfield; this has entailed extensive foliage analysis and upgrading of mensurational data. Phosphorus deficiency is general in all areas, while there are less significant deficiencies involving, to a greater or lesser degree, nitrogen, potassium, copper and zinc in different areas. Copper and zinc deficiencies appear more widespread in pole sized plantations than was generally thought to be the case. Recommendations for refertilising are currently in preparation.

The fourth and final trial in the series designed to determine the nutrient requirements of Hoop Pine in eucalypt forest soils in the Mary Valley was established during the year. The sites cover the range from poor quality Bloodwood open forest to a wet sclerophyll Brush Box type. To date marked responses to site preparation have been obtained with nitrogen and phosphorus deficiency becoming evident in the third season as the cultivation effect decreases. A set of plots in an age series of Hoop Pine plantations, was selected during the year at Imbil, together with matched plots in adjacent rain forest, to enable an examination to be made of long term changes in nutrient cycling and soil values consequent on plantation establishment in this type. A complementary series is being planned at Yarraman, a lower rainfall area.

Nursery work aimed at defining optimum organic matter levels and mineral fertilizer regimes for Hoop Pine has been continued. Promising results have been obtained with sawdust treated with urea formaldehyde, particularly in combination with NPK fertilisers; the available nitrogen status of the nursery appears to be the overriding factor determining productivity in Hoop Pine nurseries which are generally well supplied with other nutrients. Some growth problems associated with highly mineralised nursery water supplies at Yarraman and Gallangowan are also under investigation.

FOREST HYDROLOGY

The main function of this work is to investigate the influence of forest vegetation on water and soil resources and to arrive at methods of forest management which maintain soil and water values at a high level. Work so far has concentrated on two small experimental catchments on the wet tropical coast near Babinda. One catchment has been maintained with a rainforest cover since this project commenced in 1969; the other catchment was logged in 1971 and cleared in 1973. The increase in total water yield which followed clearing (see 1975 Annual Report) has been maintained during the past year; suspended sediment levels which increased markedly following clearing show no sign yet of returning to their pre-clearing levels.

A co-operative project with Dr. M. Bonell of James Cook University, designed to investigate the drainage processes in a tropical rainforest environment, was commenced during the year. A small project was also initiated at Toolara to assess the impact of exotic pine plantation establishment on the sedimentation of streams in the area.

FIRE RESEARCH

Following successful development of plantation prescribed burning techniques in past years, responsibility for routine prescribed burning in coastal exotic pine plantations was transferred to district staff during the year. A manual outlining the techniques was issued and instructional schools were held at major plantation centres to provide essential field training. The feasibility of expanding prescribed burning to the inland Radiata and Patula Pine Plantations near Pechey and Passchendaele is being examined.

Work on fire ecology in plantations and native forests in the coastal region is continuing with the object of defining optimum burning regimes for individual species and groups of species. As part of Australia-wide investigations, important fuel types within the State are being defined to determine the range of fire behaviour differences between these fuel types.

MENSURATION AND BIOMETRICS

The biometrical service to research stations and other branches was maintained, with requests for analyses at about the same level as last year. Projects in which biometrics staff have been involved include studies of daily diameter fluctuations and growth in Cypress Pine, season of growth in Hoop Pine, analysis of data for soft rot of poles, the provision of an analysis of variance program for genetics experiments, supervision of sampling for aerial fertilizing and development of a model for Slash Pine basal area increment.

Field measurement data for about 500 plantation experiments were presented for computer processing. This work generally proceeded smoothly, and in addition a large number of outstanding corrections to past measures have been brought up to date.

Analysis of samples taken in connection with weight scaling in a salvage sale of Honduras Caribbean Pine pulpwood showed that the technique would be quite satisfactory for this species.

FOREST ENTOMOLOGY AND PATHOLOGY

Forest insect populations during the past year were generally high following the recent mild winters and warm wet summers. In native forests defoliating insects were very active but although the damage they cause is conspicuous it is mostly of a temporary nature only. Sawflies were particularly prevalent in Spotted Gum stands, often causing complete defoliation, while phasmatids selectively attacked some species, particularly Turpentine, in wet sclerophyll forests. No major problems were encountered in plantation areas.

The occurrence of dead patches of trees and understorey species in rainforest in the Mackay and Ingham hinterlands was investigated during the year. The root rotting cinnamon fungus was found to be associated with the roots of affected trees. Deaths have occurred of commercial timber trees as well as other trees and understorey species. Officers have been assigned to investigate this potentially serious disorder.

FOREST PRODUCTS RESEARCH AND SERVICES

General

The Timber Utilisation Branch of the Department consists of four basic working sections:—

Timber Conversion, Seasoning and Mechanics

Wood Structure and Utilisation

Wood Chemistry and Preservation

Timber Users' Protection Act.

The Branch provides research and extension services to Branches and Districts of the Department, the timber producing and wood using industries, other Government Department and instrumentalities, Local Authorities and the general public.

The extension services provided are an important part of the Branch's activities and depend on continuing research and investigation.

TIMBER CONVERSION, SEASONING AND MECHANICS

The sawmill, seasoning kiln and timber testing laboratory at Salisbury have been fully employed during the year carrying out sawing and seasoning studies, quality assurance tests and timber strength determinations.

The sawing studies were concerned principally with determination of sawn recovery by grade in the three conifer species which compose the great bulk of the State's plantations—Hoop Pine, Slash Pine and Caribbean Pine. These studies are intended to assist in development of silvicultural management pogrammes as well as in the pricing of logs produced from Departmental plantations.

Sawn output from these and other trials was used for further work on seasoning methods for pines and hardwoods using chemicals, pre-soaking, a variety of kiln temperature schedules and sawing patterns. Both the sawing and seasoning trials are proceeding.

Tests with refractory hardwood species have given some indication that seasoning of some of these species may be speeded up by soaking, steaming or chemical pre-treatment or by wider application of high temperature techniques, with, in some cases a higher recovery of better quality timber. Sawing "bark to bark" and subsequent drying of the wide boards also shows promise with some hardwood species.

Advisory assistance to industry on new seasoning methods, particularly high temperature drying, and new kiln installations is being continued as a means of improving the marketing of timber. There is good acceptance by, and co-operation with, industry in this field but standards of commercial kiln operation are still too variable.

The Timber Testing Laboratory is now registered by the National Association of Testing Authorities, Australia, and issues Certificates bearing the N.A.T.A. stamp. Current operations include quality assurance testing for commercial operators of mechanical stress grading machines, collection of strength/stiffness data for a variety of species, determination of mechanical properties of a number of native species and their relation to wood anatomy, and the effects of preservative solutions on strength of Slash Pine.

Some strength testing is carried out on a commercial basis for specialty users of wood such as ladder manufacturers who require intimate quality control of their materials, and the Amsler Testing Machine is also used part-time on a commercial basis in the quality assurance testing programme for industry.

WOOD STRUCTURE AND UTILISATION

Wood quality tests were carried out on trees proposed for inclusion in seed orchards or tree breeding programmes. Trees not attaining a satisfactory wood quality grading were excluded from future consideration. A new X-ray unit which will allow direct densitometric measurements of wood sections is being installed to assist in this work.

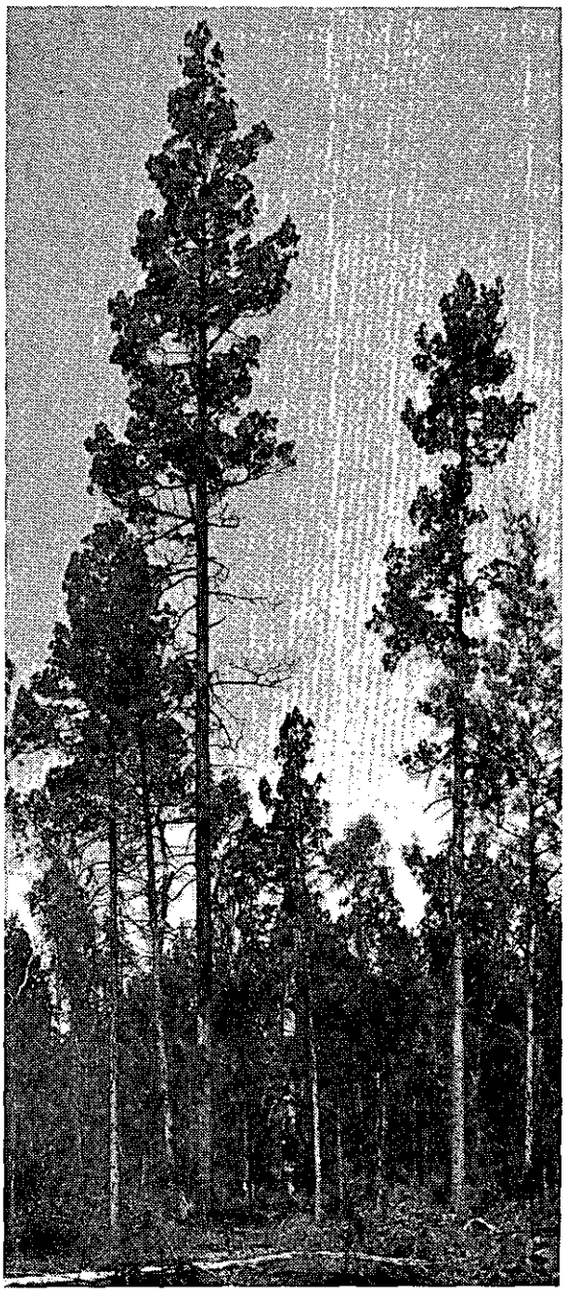
Studies are continuing on differences in wood growth patterns in Honduras Caribbean Pine planted over a latitudinal range from the New South Wales border in the south to the Atherton Tableland in the north. The influence of climatic factors is being analysed and used in the search for high quality/high yielding families best suited to each major plantation location.

Douglas Fir imported from New Zealand and rainforest timbers from the S.W. Pacific and S.E. Asia, sometimes of relatively low strength and durability, have displaced some local woods in general building because of their lower price, even though they are often unsuited for use in positions exposed to weather or in structures designed to use timber of higher intrinsic strength.

The availability of visual strength grades for Cypress Pine has helped producers to better compete in the framing market in southern and central Queensland which is now using an increasing proportion of the Cypress Pine produced in south-western parts of the State.

The use of structural plywood flooring, finger jointed softwood framing and wall cladding, and wider use of particle board has necessitated studies of simulated construction practices which included the effect of varying moisture content, wetting and drying and exposure to sunlight on the performance of the materials. Most so-called "sealers" or water repellants tested showed to be of little advantage in these tests. Tests of nailed and glued laminated beams and fabricated studs comprising sawn and veneered timber edge strips bonded to particle board have shown promising results.

Queensland-grown Slash Pine has been successfully tested by C.S.I.R.O. for the production of strong high-yielding paper pulp by the new low-pollution carbon dioxide explosion pulping process. This information could be of considerable assistance in the establishment of an integrated logging and wood using industry based on the Beerburrum-Toolara-Tuan plantation complexes on the coastal plain between Brisbane and Bundaberg. Forest Products Research Branch has also helped the local pulp industry by checking energy consumed in processing raw material from varying sources. This variation was found to be due to a processing variable, not to the wood source.



Mature Cypress Pine Tree. Height 33·5 metres. Barakula, Dalby District.

A major part of the extension work undertaken by this section is the identification of samples of wood used in building under the control of the Queensland Housing Commission and some Building Societies and of samples collected in the course of investigating complaints under The Timber Users' Protection Act. This work is assisted by the reference collection of authenticated wood samples which is being expanded and which covers the native timbers and most of the imported timbers met in the market place.

During the year extension courses for private pest control operators were arranged at the major coastal centres and the industry has indicated strong support for such work.

Extension advice, lectures and on-site discussions have also helped builders and other users of wood to ensure that wood is being used to the best advantage in engineering undertakings and in structures as diverse as houses, bridges, boats, pre-school centres and sewerage treatment plants and the assistance and co-operation of industry based timber organisations in this area is acknowledged.

WOOD CHEMISTRY AND PRESERVATION

Work in these fields concerns both research and development and consumer protection.

New methods of measuring copper content in preservative treated wood are being developed and show promise. It is hoped adoption of these in routine analysis will be possible in the near future.

Data supplied by the various electricity supply authorities throughout Queensland are being processed in the continuing study of "soft rot" attack on the sapwood of preserved hardwood poles. This involves a major study to clarify the involvement of wood species, locality of both supply and use, preservative type, treatment plants, climate, soil, and other local environmental factors. Samples from affected poles are anlysed for preservative retention to check the standard of treatment and any losses of preservative in service.

The testing of pole bandage prophylactic treatments employing diffusable chemicals, and the development of alternatives to the preservatives at present in use is proceeding in co-operation with the State Electricity Commission of Queensland and the Preservation Section of the C.S.I.R.O. Division of Building Research. It is too early in the programme to report definite results but indications are promising.

TIMBER USERS' PROTECTION ACT

Investigations under the Timber Users' Protection Act involve all Sections of the Branch. One quarter of the complaints inspected during the year involved log borers (i.e. other than sawn timber borers) which are not covered by the Act. This probably reflects the unusually wet conditions which occurred in the bush during 1974 and 1975 when egg laying occurred in logs prior to sawing and adult insects are now emerging from the sawn material.

Most complaints made to the Department are subsequently settled by negotiation between the parties concerned without the need for legal action. Two prosecutions were successfully laid however and a third case remains the subject of a civil action.

Timber covered by the complaints has mostly been found to have been imported from interstate or overseas sources. This shows that the local industry has in general applied successful quality controls in its production and in the operation of preservative treatment plants.

OTHER ACTIVITIES

Branch members are serving on a number of Standards Association Committees and are directly involved in preparing new or amended Standards dealing with timber and forest products and in promoting their use by specifiers, contractors and lending authorities.

Some of these Standards are now legislative requirements and others serve as guides or codes of practice. Increased use of these Standards and Codes by industry in general would lead to fewer disputes and requests for arbitration on matters of grading, good building practice and performance of materials.

DIVISION OF ADMINISTRATION

General

The restructuring of the Department did not affect this Division significantly with service branches and sections remaining within the same organsational framework—viz. Secretarial, Staff and Industrial, Forest Estate, Leasing, Bills and Regulations, Stores, Records, Accounts and Automatic Data Processing.

AUTOMATIC DATA PROCESSING

The Automatic Data Processing Branch provides a computer programme-writing and development service for other Departmental Branches and has the following staff:—Officer in Charge, 2 Systems Analysts, 4 Programmers, 8 Machine Operators.

Investigation and system design work during the year included:—

The processing of stumpage accounts for mill logs, Atherton District and Mackay Sub-District.

The maintenance of Purchasers' monthly Log Timber Accounts.

Yield control plantation thinnings.

Cypress pine growth studies.

Improvement in data preparation has been effected by the installation of two key to disc machines which, for the majority of our systems, are more efficient than card punch machines.

INDUSTRIAL MATTERS

During the year, the average increase in wages for Forestry employees under State Awards was approximately 13·5 per cent. Discussions between the Department of the Public Service Board, this Department and the Australian Workers' Union were held with a view to updating and consolidating the Forestry Employees' Award—State Government, particularly in regard to accommodation and work classification.

FOREST ESTATE

During the year the nett increase in area of State Forests and Timber Reserves was 21 540 hectares. The major portion of the land added became available through surrender of parts of Crown grazing leases subject to action for conversion to freehold under the Land Act. The only significant revocation of State Forest was the making available of 21 784 hectares to establish the Cooloola National Park.

During 1975–76, an amount of $55,930.00 was expended on the acquisition of land for Forestry purposes as follows:—

	$
Purchase of Land	2,580.15
Survey Fees (includes costs of survey of 25 blocks obtained by surrender from Crown holdings)	52,844.30
Real Property Fees and Lands Department Charges	505.55
	55,930.00

LEGISLATION

A Bill to amend the Forestry Act in certain particulars was assented to on 2nd April, 1976. This Act provided, amongst other things, for a wider interpretation of the concept of management of State Forests to include protection of watersheds whether or not the primary use of the land is timber production.

While still providing for the Conservator to exercise a considerable degree of discretion in formulating management policy, the amending legislation placed an obligation on him to give due consideration to:—

(a) the benefits of permitting grazing on the area.

(b) the desirability of conservation of soil and the environment and of protection of water quality.

(c) the purpose of applying the area to recreational purposes, in order to promote the multiple use aspect of State Forest management.

These amendments recognise practices followed by the Department for many years.

OFFENCES

During the year 69 breaches of the Forestry Act and 6 breaches of the Sawmills Licensing Act were reported. Prosecution proceedings were successfully pursued against 15 offenders with fines totalling $890 being imposed.

In those cases of unauthorised interference with timber and other forest products where it was considered the circumstances did not warrant prosecution, the Department recovered by demand, the value of the forest products and costs of investigations totalling $15,346.77. Appropriate letters of warning were directed to the offenders.

Forest Officers in their capacity as Fire Wardens also investigated 4 breaches of the Rural Fires Act.

STAFF

At 30th June, 1976, the approved salaried staff establishment was 643, an increase of 11 over the previous year. Actual staff level at 30th June, 1976, was 620. The number of wages staff employed at that date was 1413. Appendix K provides details of staff distribution.

The apparent decrease of 326 in wages staff during the year was due mainly to the fact that the numerical strength at 30th June, 1975, had been inflated by the temporary employment at that time of over 250 men under the Regional Employment Development Scheme. The balance of the decrease followed restrictions imposed in normal replacement of labour because of limitation in funds available.

During the year, sixty-nine salaried officers left the Department including three officers who retired with more than twenty years of meritorious service namely:—

Mr. N. McCloy, Secretary to the Conservator of Forests, Brisbane (47 years).

Mr. J. H. Kluver, District Forester Division I, Brisbane (46 years).

Mr. J. Good, Road Engineer, Brisbane (29 years).

We wish these officers a long and happy retirement.

It is with deep regret that the deaths are recorded of:—

Mr. K. F. Jarrett (Forest Ranger Division II (Surveys), Brisbane).

Mr. W. Menolotto (Clerk, Bundaberg).

Mr. J. C. Cummings (Male Assistant, Brisbane).

These officers had served the Department faithfully and efficiently. Their untimely deaths will be greatly felt by all who had served with them. Deepest sympathy is extended to their bereaved families.

ACKNOWLEDGEMENTS

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

W. BRYAN,
Conservator of Forests.

APPENDIX A

MILLING TIMBER REMOVALS FROM CROWN LANDS 1975–76

—	Atherton	Brisbane	Dalby	Gympie	Mary-borough	Monto	Murgon	Rock-hampton	Warwick	Yarraman	1975–76 Total	1974–75 Total
Forest Hardwood	9,100	26,365	37,413	15,794	40,650	22,655	24,520	29,454	4,256	8,310	218,517	157,912
Rain Forest Structural Timbers ..	60,526	709	..	153	333	165	256	13,296	958	419	76,815	88,664
Prime Cabinet Woods	29,787	3	..	2	35	12	17	278	11	..	30,145	33,844
Miscellaneous Cabinet Woods ..	32,386	468	..	95	260	128	113	984	837	95	35,366	42,282
Hoop, Bunya and Kauri	2,827	1,021	..	1,953	14,508	2,776	5,347	1,821	996	1,400	32,649	41,165
Native Plantation Conifers ..	67	..	..	37,194	312	5,097	11,496	..	..	34,453	88,619	75,230
Exotic Plantation Conifers ..	228	24,859	..	5,774	10,465	..	1,232	432	10,636	4,824	58,450	43,386
Plantation Non-Conifers	..	..	..	..	..	..	..	..	..	138	138	267
Cypress	..	218	77,383	24	372	..	533	2,948	20,120	..	101,598	109,720
TOTAL	134,921	53,643	114,796	60,989	66,935	30,833	43,514	49,213	37,814	49,639	642,297	592,470

APPENDIX A—continued

PULPWOOD REMOVALS FROM CROWN LANDS 1975–76

—	Atherton	Brisbane	Dalby	Gympie	Mary-borough	Monto	Murgon	Rock-hampton	Warwick	Yarraman	1975–76 Total	1974–75 Total
Native Conifer	..	..	..	9,680	..	..	3,925	..	..	200	13,805	12,928
Exotic Conifer	..	23,638	..	20,453	30,699	..	..	..	..	2,255	77,045	28,895
Non-Conifer	..	1,928	..	..	..	..	..	..	..	12,062	13,990	9,462
TOTAL	..	25,566	..	30,133	30,699	..	3,925	..	..	14,517	104,840	51,285

APPENDIX A—continued

MILLING TIMBER REMOVALS FROM PRIVATE LANDS 1975–76

——	Atherton	Brisbane	Dalby	Gympie	Mary-borough	Monto	Murgon	Rock-hampton	Warwick	Yarraman	Total 1975–76	Total 1974–75
Hoop, Bunya and Kauri	70	2,635	..	441	560	..	72	56	977	565	5,376	8,597
Cypress	324	81	54,726	..	23	..	..	70	26,372	12,777	94,373	87,030
Forest Hardwood	5,447	95,034	8,913	7,585	45,271	25,136	9,847	27,051	9,648	4,337	238,269	266,610
Rain Forest Structural Timbers ..	10,554	592	..	..	29	..	..	674	777	43	12,669	21,127
Prime Cabinetwoods	3,284	194	..	..	5	..	..	340	1	2	3,826	5,031
Miscellaneous Cabinetwoods ..	10,169	946	..	..	21	..	..	1,927	166	88	13,317	11,031
Plantations, Native	..	..	..	64	..	..	..	..	..	..	64	..
Plantations, Exotics	..	9,753	..	..	99	..	..	..	588	..	10,440	7,688
Plantations, Non Conifer	..	132	..	..	..	..	..	..	..	..	132	..
TOTAL (estimated)	29,848	116,260	63,639	8,090	46,008	25,136	9,919	30,118	38,529	17,812	385,359*	419,049†

* Including 6 893 m³ imported.
† Including 11 935 m³ imported.

APPENDIX A—continued

MISCELLANEOUS REMOVALS FROM CROWN LANDS 1975–76

Sleepers Hewn	459	pieces
Sleepers Sawn—1·5 m	65,353	pieces
Sleepers Sawn—2·15 m	278,326	pieces
Sleeper Blocks (as Sleepers contained)	2,133	pieces
Transoms, Crossings, Headstocks, Longitudinals	1,469	cubic metres
Girders, Corbels, Piles, Sills, Kerb Logs	22,678	metres
Girder Logs	539	cubic metres
Poles	25,122	metres
House Blocks	729	metres
Fencing Material—Round	80,495	metres
Fencing Material—Split	81,072	pieces
Mining Timbers—Round	127,448	metres
Mining Timbers—Sawn	271	cubic metres
Offcuts—Pallet and Short length Sawn Timber	702	cubic metres
Fuel	8,746	tonnes
Quarry Material—Sand, Gravel, Soil, &c.	866,061	cubic metres
Fibre, Bark, Dry Leaves, Reeds	26	bags
Flora	3,410	pieces
Peat	254	bats
Lawyer Cane	9	tonnes
Boat Knees	80	pieces
Bee Hives	49	hives
Black Wattle	258	stems
Charcoal	65	tonnes
Trees and Plants (number)	406,241	
Tea Tree Bark	2	tonnes

APPENDIX B

TOTAL RECEIPTS, DEPARTMENT OF FORESTRY, FOR THE YEAR ENDED 30TH JUNE, 1976

RECEIPTS FROM DISTRICTS

	Totals $
Group 1—Brisbane, Gympie, Maryborough, Monto, Murgon, and Yarraman Districts	2,754,891
Group 2—Atherton District	1,271,615
Group 3—Dalby District	603,181
Group 4—Warwick District	407,935
Group 5—Rockhampton District	308,318
Revenue from Sales of Timber and Forest Products	$5,345,940

OTHER RECEIPTS

	$
Forestry and Lumbering	781,723
Sale of Plants, Materials, &c.	192,717
Licenses	55,149
Rents	38,991
Grazing Dues	68,046
Miscellaneous (Salisbury Area Timber Account, Forfeited Wages, Expenditure Recoveries, &c.)	1,188,533
T.R.A.D.A.C.	171,750
Sale of U.S. Tractors, trucks, &c.	174,172
	$8,017,021
Plant Hire— Charged to Works Projects	2,030,979
	$10,048,000

		$
The above receipts were disposed of as follows:—		
Regional Employment Development Scheme		628,315
Unemployment Relief		173,170
Aboriginal Grants		273,574
To Consolidated Revenue Fund as repayment of previous expenditure		9,511
To Loan Fund—		
Repayment of previous expenditures	174,172	
Surplus plant hire	105,999	
		280,171
To Forestry and Lumbering Trust Fund as expenditure on marketing of log timber, maintenance of access roads, capital improvements, plant, T.R.A.D.A.C., &c.		5,623,715
As Interest and Redemption on Loans		3,059,544
		$10,048,000

APPENDIX C

PROCEEDS OF SALES OF TIMBER, ETC.

FOR THE PERIOD 1ST JULY, 1972, TO 30TH JUNE, 1976 (FINANCIAL YEARS)

Groups	1972–73	1973–74	1974–75	1975–76
	$	$	$	$
Group 1	2,490,215	2,345,146	2,446,876	2,754,891
Group 2	1,363,635	1,188,709	1,388,030	1,271,615
Group 3	397,018	442,894	522,306	603,181
Group 4	268,994	245,077	254,714	407,935
Group 5	221,119	230,635	272,574	308,318
	4,740,981	4,452,461	4,884,500	5,345,940
Timber Research and Development Advisory Council	112,998	161,336	167,509	171,750
	4,853,979	4,613,797	5,052,009	5,517,690
Receipts—Forestry and Lumbering	849,463	427,287	624,831	781,723
Sale of Plants, Materials, &c.	61,273	82,339	107,882	192,717
Licenses	23,539	32,879	36,740	55,149
Rents and Grazing Dues	91,501	96,909	98,627	107,037
Miscellaneous (Salisbury Area Timber Account, Forfeited Wages, Expenditure Recoveries, &c.)	47,452	40,779	410,718	1,188,533
Sale of Tractors, Trucks, &c.	137,898	313,146	228,274	280,171
	6,065,105	5,607,136	6,559,081	8,123,020

APPENDIX D

COMPARATIVE STATEMENT OF EXPENDITURE BY FUNDS FOR YEARS 1974–75 AND 1975–76

—	1974–75	1975–76
	$	$
CONSOLIDATED REVENUE FUND—		
Salaries	5,179,054	5,740,881
Cryptotermes Brevis Investigation	5,508	8,385
Fares, Printing, Stores, &c.	20,655	24,422
Travelling Expenses and Incidentals	414,165	465,632
National Parks	418,496	..
Cash Equivalent of Long Service Leave	116,085	89,663
	6,153,963	6,328,983
LOAN FUND—		
National Parks	324,243	..
Recreational Facilities—State Forests	98,528	61,041
Amount to be credited to Reforestation Trust Fund	9,260,000	11,366,000
	9,682,771	11,427,041
TRUST AND SPECIAL FUNDS—		
FORESTRY AND LUMBERING TRUST FUND—		
Interest and Redemption on Loans	2,515,509	3,059,544
Hardwood Supplies to Railway Department and Others	590,074	724,954
Harvesting and Marketing Timber	2,094,509	2,310,717
Access Roads—Maintenance and Subsidies	431,541	439,662
Maintenance of Plant	1,647,868	1,721,882
Maintenance of Capital Improvements	291,371	254,999
T.R.A.D.A.C.	177,560	176,700
	7,748,432	8,688,458
REFORESTATION TRUST FUND—		
Reforestation	10,741,040	12,354,981
Land Acquisitions	42,353	55,930
Purchase of Plant	1,109,768	916,196
Access Roads	782,164	774,584
Purchase of Radio Equipment	13,384	13,924
Purchase of Firefighting Equipment	38,857	11,041
	12,727,566	14,126,656

APPENDIX E

NETT AREA OF SOFTWOOD PLANTATION ESTABLISHED 1ST APRIL, 1975, TO 31ST MARCH, 1976

Species	Brisbane	Gympie	Rock-hampton	Mary-borough	Monto	Murgon	North Queens-land	Warwick	Yarraman	Totals
	ha	ha	ha	ha	ha	ha	ha	ha	ha	ha
1. Conifers										
A. Native Conifers—										
Hoop Pine	59·3	274·0	35·6	87·8	47·1	188·8	39·1	..	248·0	979·7
Bunya Pine	3·0	..	..	..	..	3·7	..	..	..	6·7
Total—Native Conifers	62·3	274·0	35·6	87·8	47·1	192·5	39·1	..	248·0	986·4
B. Exotic Conifers—										
Slash Pine	687·3	1 446·4	..	1 314·3	..	..	..	..	22·3	3 470·3
Loblolly Pine	45·3	..	..	..	..	..	..	..	..	45·3
Patula Pine	..	..	..	..	..	..	..	..	4·0	4·0
Caribbean Pine	31·6	..	107·4	146·7	..	..	249·7	..	40·0	575·4
Radiata Pine	..	..	..	..	..	..	..	98·5	19·9	118·4
Other Exotic Conifers	..	..	..	16·8	..	..	1·5	..	..	18·3
Total—Exotic Conifers	764·2	1 446·4	107·4	1 477·8	..	..	251·2	98·5	86·2	4 231·7
Total—Conifers	826·5	1 720·4	143·0	1 565·6	47·1	192·5	290·3	98·5	334·2	5 218·1

APPENDIX F

NETT AREA OF EFFECTIVE PLANTATION CLASSIFIED INTO FORESTRY DISTRICTS TO 31ST MARCH, 1976

Species	Brisbane	Gympie	Rock-hampton	Mary-borough	Monto	Murgon	North Queens-land	Warwick	Yarraman	Totals
	ha	ha	ha	ha	ha	ha	ha	ha	ha	ha
1. Conifers										
A. Native Conifers—										
Hoop Pine	1 240·8	10 822·6	262·1	1 418·4	2,476·5	7 048·1	996·8	13·0	12 596·0	36 874·3
Bunya Pine	6·4	230·7	..	0·4	0·5	116·3	1·3	4·0	110·2	469·8
Other Native Conifers	4·7	36·9	1·1	28·9	1·4	1·3	124·1	0·7	3·2	202·3
Total—Native Conifers	1 251·9	11 090·2	263·2	1 447·7	2 478·4	7 165·7	1 122·2	17·7	12 709·4	37 546·4
B. Exotic Conifers—										
Slash Pine	11 319·2	16 750·7	1 008·9	17 404·3	21·7	0·6	4·6	329·3	457·5	47 296·8
Loblolly Pine	1 781·0	207·2	4·1	22·6	0·9	3·4	5·7	98·7	16·7	2 140·3
Patula Pine	5·3	7·4	3·6	3·3	9·7	36·2	14·1	196·7	1 403·1	1 679·4
Caribbean Pine	294·5	321·2	3 757·7	1 688·8	0·4	0·3	1 723·6	..	98·5	7 885·0
Radiata Pine	0·3	..	..	..	..	4·5	..	1 885·3	546·8	2 436·9
Other Exotic Conifers	130·7	17·5	43·4	30·7	4·0	2·2	31·7	22·4	33·1	315·7
Total—Exotic Conifers	13 531·0	17 304·0	4 817·7	19 149·7	36·7	47·2	1 779·7	2 532·4	2 555·7	61 754·1
Total—Conifers	14 782·9	28 394·2	5 080·9	20 597·4	2 515·1	7 212·9	2 901·9	2 550·1	15 265·1	99 300·5
2. Broadleaved Species										
Rose Gum	126·4	489·7	0·1	..	..	7·8	0·7	..	71·4	696·1
Grey Ironbark	86·1	93·9	..	..	..	5·8	15·3	..	171·4	372·5
Blackbutt	95·8	93·1	..	47·6	..	3·5	0·1	..	0·2	240·3
Others	49·3	237·0	1·4	1·4	0·4	9·6	149·4	..	164·3	612·8
Total—Broadleaved Species	357·6	913·7	1·5	49·0	0·4	26·7	165·5	..	407·3	1 921·7
Miscellaneous Experimental	28·0	18·4	4·5	21·9	0·2	0·7	17·7	9·6	37·4	138·4
Total—All Species	15 168·5	29 326·3	5 086·9	20 669·3	2 515·7	7 240·3	3 085·1	2 559·7	15 709·8	101 360·6

APPENDIX G

AREAS OF NATURAL FOREST TREATED 1975–76

Sub District	Eucalyptus	Cypress Pine	Cypress Pine and Eucalypt Mixed Forest	Rainforest
	ha	ha	ha	ha
Beerburrum	249	..	..	..
Brisbane	28	..	..	..
Dalby–Chinchilla–Roma	186	9 229	852	..
Gympie	2 561	..	..	..
Imbil	523	..	..	..
Mackay–Emerald–Rockhampton	250	..	..	..
Maryborough	1 886	..	..	..
Bundaberg	741	..	..	..
Fraser Island	440	..	..	..
Monto	637	..	..	..
Murgon–Jimna	398	..	..	..
Atherton	470	..	..	11
Ingham	..	..	..	..
Warwick	..	..	..	..
Inglewood	..	1 760	..	..
Yarraman	..	..	..	..
Benarkin	..	..	..	..
TOTALS	8 909	10 989	852	11

APPENDIX H

STATE FORESTS AND TIMBER RESERVES LISTED BY DISTRICTS AND SUB-DISTRICTS AT 30TH JUNE, 1976

District	Sub-District	No. of Reservations	State Forests—Areas	No. of Reservations	Timber Reserves Areas
			hectares		hectares
Brisbane	Beerburrum	26	52 066·378	2	256·518
	Brisbane	26	49 461·613	9	4 955·0291
	Totals	52	101 527·991	11	5 211·5471
Dalby	Chinchilla–Barakula	17	358 443·536	1	5 768·0
	Dalby	13	225 352·325	2	1502·033
	Roma	35	219 604·278	2	19 750·08
	Totals	65	803 400·139	5	25 668·2833
Gympie	Gympie	30	95 625·024	1	514·0
	Imbil	9	58 583·0	1	0·2094
	Totals	39	154 208·024	2	514·2094
Maryborough	Bundaberg	18	96 395·326	19	23 774·221
	Maryborough	35	275 996·699	14	10 419·654
	Totals	53	372 392·025	33	34 193·875
Monto	Kalpowar	7	16 277·266	12	26 318·7899
	Monto	40	273 613·321	9	10 033·452
	Totals	47	289 890·587	21	36 352·2419
Murgon	Jimna	4	47 108·0	..	..
	Murgon	20	80 082·543	6	5 610·4983
	Totals	24	127 190·543	6	5 610·4983
North Queensland	Atherton	34	350 509·486	33	327 004·9986
	Ingham	17	237 281·0	2	798·4
	Totals	51	587 790·486	35	327 803·3986
Rockhampton	Emerald	8	76 075·371	10	106 927·8
	Mackay	11	70 226·921	16	39 143·22
	Rockhampton	32	426 134·867	10	39 934·87
	Totals	51	572 437·159	36	186 005·89
Warwick	Inglewood	31	202 303·457	1	69·59
	Warwick	20	45 198·786	5	3 145·597
	Totals	51	247 502·243	6	3 215·187
Yarraman	Benarkin	4	28 732·0	3	1 798·324
	Yarraman	20	52 557·7	10	8 788·298
	Totals	24	81 289·7	13	10 586·622
STATE TOTALS	..	457	3 337 628·897	168	635 161·7526

APPENDIX I

RESERVATIONS FOR THE YEAR ENDING 30TH JUNE, 1976

(1ST JULY, 1975, TO 30TH JUNE, 1976)

——	No.	Hectares
STATE FORESTS		
As at 1st July, 1975	466	3 292 290·530
Declared	14	26 018·002
Declared and added to existing State Forests	..	19 791·4589
Timber Reserves declared State Forests	11	20 976·65
Timber Reserves declared State Forests and amalgamated with existing State Forests	..	2 804·6
Reservations revoked	..	..
Areas released to National Parks and Wildlife Service	..	−21 784
Amalgamation of existing State Forests	−34	..
Recomputation of boundary	..	−1 799·158
Areas released for road	..	−14·4559
Areas transferred	..	−654·73
Totals as at 30th June, 1976	457	3 337 628·897
TIMBER RESERVES		
As at 1st July, 1975	186	658 959·8006
Declared and added to existing Timber Reserves	..	640·901
Timber Reserves declared State Forests	−13	−20 976·65
Timber Reserves declared State Forest and added to existing State Forests	−2	−2 804·6
Amalgamation of existing Timber Reserves	−1	..
Timber Reserves declared National Parks	−1	−414
Reservations revoked	−1	−129·5
Areas released	..	−78·0
Recomputation of boundary	..	36·199
Totals as at 30th June, 1976	168	635 161·7526

APPENDIX K

DISTRIBUTION OF PERSONNEL, 20TH JUNE, 1976

——	Metropolitan	Districts	Total
Salaried Officers—			
Graduate	52	70	122
Technical	79	29	108
Field Supervisory	9	107	116
Clerical	138	123	261
Miscellaneous (Drawing Office Aides, General and Laboratory Assistants, &c.)	12	1	13
Sub Total	290	330	620
Wages Staff—			
Reforestation Works	11	1,085	1,096
Marketing and Resources	21	153	174
Road Construction and Maintenance	0	62	62
Maintenance of Plant	7	74	81
Sub Total	39	1,374	1,413
Total	329	1,704	2,033

APPENDIX J

VOLUME OF LOG TIMBER PROCESSED BY SAWMILLS OPERATING DURING 1975–76 BY VOLUME GROUPINGS

Less than 500m³		501m³—1 000 m³		1 001 m³—5 000 m³		5 001 m³—10 000 m³		10 001 m³—20 000 m³		Greater than 20 001 m³		Total	
No. of Mills	Volume Processed	No. of Mills	Volume Processed	No. of Mills	Volume Processed	No. of Mills	Volume Processed	No. of Mills	Volume Processed	No. of Mills	Volume Processed	No. of Mills	Volume Processed
	m³		m³		m³		m³		m³		m³		m³
123	25 736	67	47 479	147	370 109	41	282 143	17	230 290	4	122 548	399	1 078 305

APPENDIX L

BOTANICAL NAMES

A. NATIVE CONIFERS

Bunya Pine	*Araucaria bidwillii*
Cypress Pine	*Callitris columellaris* syn. *glauca*
Hoop Pine	*Araucaria cunninghamii*
Kauri Pine	*Agathis robusta*

B. EXOTIC CONIFERS

Brown Pine	*Podocarpus elatis*
Caribbean Pine	*Pinus caribaea*
Douglas Fir	*Psuedotsuga menziesii*
Honduras Caribbean Pine	*Pinus caribaea* var. *hondurensis*
Loblolly Pine	*Pinus taeda*
Patula Pine	*Pinus patula*
Radiata Pine	*Pinus radiata*
Slash Pine	*Pinus elliottii* var. *elliottii*

C. EUCALYPTUS

Blackbutt	*Eucalyptus pilularis*
Grey Ironbark	*Eucalyptus drepanophylla*
Gympie Messmate	*Eucalyptus cloeziana*
Rose Gum	*Eucalyptus grandis*
Spotted Gum	*Eucalyptus maculata*

D. OTHER BROADLEAF SPECIES

Black Bean	*Castanospermum australe*
Bloodwood	*Eucalyptus gumiffera*
Brush Box	*Tristania conferta*
Crows Ash	*Flindersia australis*
Mackay Tulip Oak	*Argyrodendron actinophyllum*
Red Cedar	*Toona ciliata* var. *australis*
Silver Quandong	*Elaeocarpus grandis*
Southern Silver Ash	*Flindersia schottiana*
Turpentine	*Syncarpia glomulifera*
White Beech	*Gmelina dalrympleana*
White Cheesewood	*Astonia scholaris*

E. WEEDS, GRASSES, ETC.

Inkweed	*Phytolacca octandra*
Lantana	*Lantana camara*
Moonlight Cactus	*Ercoiereus tortuosus*

By Authority: S. R. HAMPSON, Acting Government Printer, Brisbane

QUEENSLAND

SHOWING AREAS UNDER FORESTRY CONTROL

SCALE 1 : 6 000 000

0 25 50 100 150 200 250 300 350

kilometres

LEGEND

STATE FOREST	
TIMBER RESERVE	
DISTRICT HEADQUARTERS	O
SUB-DISTRICT HEADQUARTERS	o
DISTRICT BOUNDARIES	———
DISTRICT NAMES	DALBY
SUB-DISTRICT BOUNDARIES	— — —

AS AT 30-6-76

GULF OF CARPENTARIA

NORTH QUEENSLAND

SOUTH PACIFIC OCEAN

NORTHERN TERRITORY

SOUTH AUSTRALIA

NEW SOUTH WALES

Wenlock River

GREAT DIVIDING RANGE

Archer River

Holroyd River

Coleman River

Mitchell River

Gilbert River

Einasleigh River

Leichhardt River

Norman River

Flinders River

Gregory River

Thompson River

Barcoo River

Diamantina River

Lake Phillipi or Wickamunina

Lake Machattie

Lake Yamma Yamma

Bulloo River

Lake Bulloo

Wareego River

Burdekin River

Lake Buchanan

Lake Galilee

Belyando River

Suttor River

Isaac River

Comet River

Dawson River

Fitzroy River

Nogoa River

Mackenzie River

Maranoa River

Balonne River

Moreton River

Condamine River

Barwon River

Macintyre River

Beardmore Dam

Fairbairn Dam

ATHERTON

INGHAM

MACKAY

ROCKHAMPTON

EMERALD

DALBY

ROMA

TOOWOOMBA

WARWICK

INGLEWOOD

CHINCHILLA

KALPOWAR

MONTO

Wuruma Dam

BUNDABERG

MARYBOROUGH

Burnett River

GYMPIE

MURGON

YABRAMAN

BENARKIN

Somerset Dam

Brisbane River

IPSWICH

BRISBANE

McPHERSON RANGE

SEE INSET

INSET

SCALE 1:3 000 000

0 25 50 75 100 125 150

kilometres

CARTOGRAPHY BY SURVEY AND MAPPING SECTION
DEPARTMENT OF FORESTRY QUEENSLAND