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# FORESTRY

ANNUAL REPORT 1979 · 80

Queensland Department of Forestry

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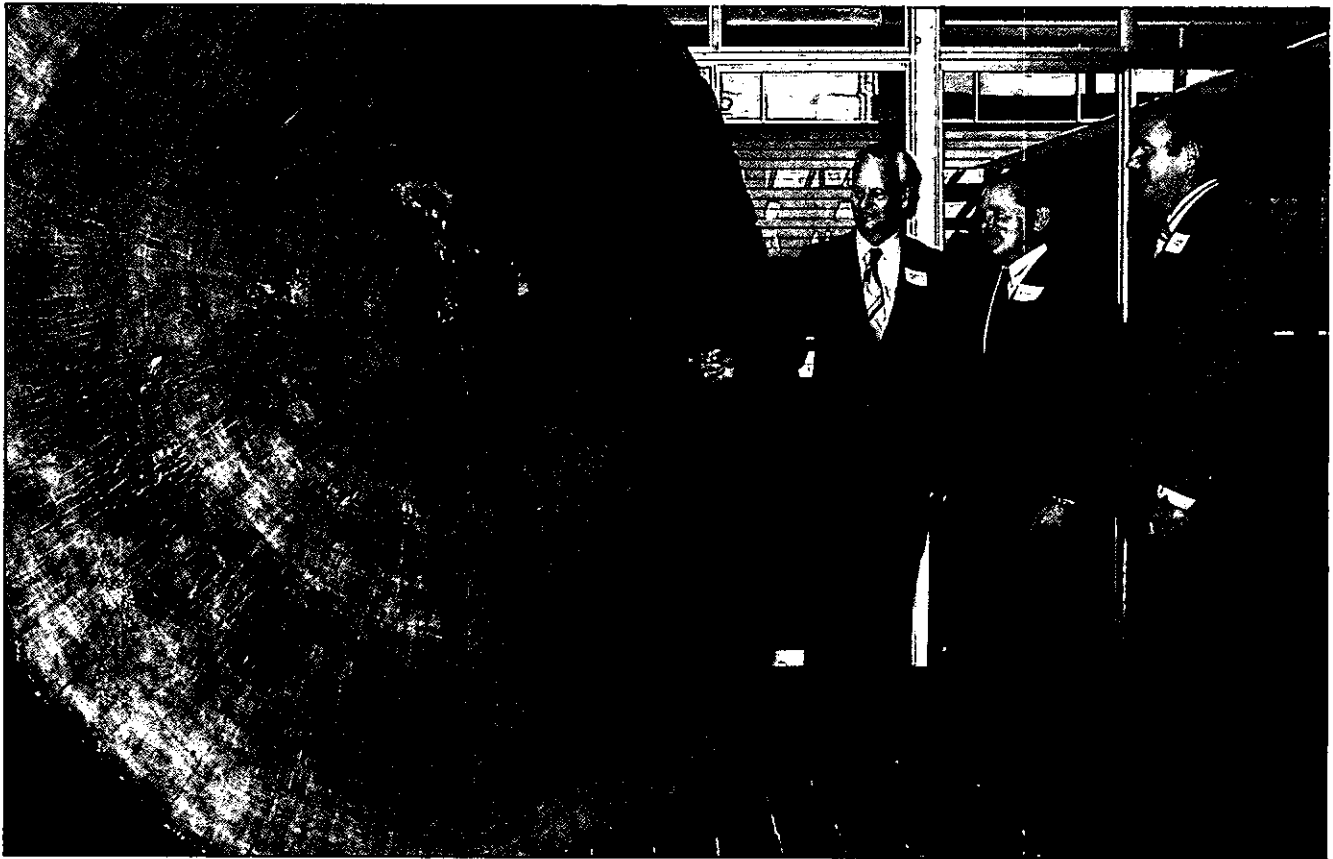
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# Introduction



The Honourable the Minister for Lands, Forestry and Water Resources, Mr N. E. Hewitt, the Conservator of Forests, Mr W. Bryan, and Mr P. Cranny, District Forester, Gympie, inspecting the butt of a large kauri pine in the entrance to the new Gympie District Office.

Operations during the year resulted in a high level of achievement in both main areas of activity, reforestation and marketing.

New softwood plantations established totalled 7 775 hectares, the highest annual planting rate attained to date in the State. The winter planting season was, however, exceptionally dry and severely tested the effectiveness of the current planting techniques. It was most encouraging to record good survivals at all centres despite the adverse conditions which generally prevailed immediately following planting.

At the new planting front recently commenced on Wongi State Forest north of Maryborough, the first major planting of almost 1 000 hectares was successfully carried out this year. Some further increase in the rate of planting in North Queensland was possible as a result of the continued phasing down of new establishment work at Beerburum where the available planting land remaining is limited.

The Department needs to maintain a higher rate of planting for at least the next decade if future timber needs are to be met. In these

long-term forestry programmes, some assured continuity of funding is vital to adequate forward planning. Existing financial arrangements do not entirely meet this need, and this is a matter which will continue to require attention.

Construction work commenced on a new seedling nursery at Ingham to supply plants for the proposed increased plantings in this area of the State to meet future timber needs. The rate at which these plantings can proceed will be dependent, however, on future availability of funds and of suitable planting land.

Associated with the very dry season, drought indices reached record levels at several centres with some very damaging fires occurring on or near State Forests. On the Dunmore State forest near Dalby, extensive fires caused by a series of lightning strikes burnt some 4 800 hectares of cypress pine forest. Lightning also caused the loss of over 100 hectares of slash pine on Toolara State Forest under conditions which could have resulted in a major disaster but for prompt and effective early control action by Departmental staff.

As part of a continuing programme to upgrade our fire-fighting capability, delivery was taken of four new fire tankers of improved design.

The marketing of timber from State Forests and other Crown lands continued at a high rate. Total removals reached a record level and were some 15 per cent higher in volume than the previous year. This increase reflects the increasing yield from Departmental softwood plantations, as well as some economic recovery in the sawmilling industry and an increasing dependence on Crown supplies as availability of logs from private sources continues to decline.

This continuing decline in the productivity of private forests is a matter for concern. The Department already provides extension advice and assistance to private land holders, but it is evident that some more positive form of financial or other incentive is required to arrest the present decline.

Log prices were adjusted to increase stumpages on Crown log timber by 13.5 per cent from 1st July, 1979. It is pleasing to report that, in addition to compensating for movement in the Consumer Price Index during the year, this increase provided partial recovery of the substantial loss in money value which has occurred in stumpage levels since 1974.

Special efforts were required during the year to salvage considerable volumes of log timber damaged by natural causes. The large fire at Dunmore previously referred to resulted in the need for emergent logging of some 7 000 cubic metres of cypress pine. Hail damage and subsequent fungal attack superimposed on drought stress also caused heavy localized losses of plantation pine in the Maryborough District and necessitated the harvesting of about 80 000 cubic metres of sawlog and pulpwood.

In these circumstances, it is vital that any salvage be effected as quickly as possible to minimize deterioration in log quality and consequent loss of volume and value. Excellent co-operation from industry enabled the Department to achieve a high level of utilization of the damaged timber in both these cases.

Mill allocations of Crown hardwood in South-East Queensland were reviewed during the year in the light of the available log supply. Unfortunately, it was necessary to reduce the allocations significantly in some supply zones where the remaining resource is insufficient to maintain existing operating levels. Similar periodic reviews

of Crown log timber allocations in the various supply regions throughout the State are envisaged in consultation with the sections of industry involved.

A further stage in the development of the Forestry Complex at Gympie was completed and opened for use. This provided office and laboratory accommodation for local district administration and for research staff. It is adjacent to the Forestry Training Centre already in use on the site. Early completion of the final stages of this complex is most desirable to allow its optimum use, and it will then provide a forestry centre unique in Australia.

As part of a continuing process of internal reviews, a conference involving both routine and research staff carried out a comprehensive examination of hoop pine plantation management policies and practices. Many of the recommendations made by this conference have already been accepted and implemented.

The first section of a 20 hectare second-stage Honduras Caribbean pine seed orchard in North Queensland was grafted with highly improved parent material. Work has also been accelerated on development of a promising slash—Caribbean pine hybrid. It is expected that both these projects will be important to the Department's future operations.

A research forester spent a period with a private company in Victoria under the Public Service Officer Exchange Scheme studying computer growth modelling in plantations.

The extensive fumigation programme against the West Indian drywood termite continued in the Brisbane area. Public assistance was sought to report any remaining suspected infestations. The good response achieved did bring to light several scattered colonies which now will also be treated.

The Department continued its active programme of encouraging public awareness and understanding of its operations, and it is significant that the use of recreational facilities provided on State Forests continues to increase by some 15 per cent annually. Very successful Open Forest Days were again organized at several centres throughout the State and attracted high attendances and favourable comment. Constructive discussions were also held with industry and other interested bodies on various aspects of forest management and practice, and good progress has been made in developing a range of information literature for public use.

# Principal Officers

## SENIOR MANAGEMENT

Conservator of Forests .....	W. BRYAN, B.Sc.(For.), Dip.For.(Canb.)
Deputy Conservator of Forests .....	J. A. J. SMART, B.Sc.(For.), Dip.For.(Canb.)
Secretary to the Conservator of Forests and Director, Division of Administration	F. J. McCAUL, A.A.U.Q.
Director, Division of Marketing .....	P. J. HAWKINS, B.Sc.(For.), Dip.For.(Canb.), Dip.For.(Oxon.)
Director, Division of Operations .....	J. J. KELLY, B.Sc.(For.), Dip.For.(Canb.)
Director, Division of Planning .....	J. D. H. MUIR, B.Sc.(For.), Dip.For.(Canb.)
Director, Division of Technical Services	W. M. ROBINSON, B.Sc.(For.), Dip.For.(Canb.)

## DISTRICT FORESTERS

Brisbane .....	N. StC. CLOUGH, B.Sc.(For.), Dip.For.(Canb.)
Dalby .....	D. M. WILSON, B.Sc.(For.), Dip.For.(Canb.)
Gympie .....	P. T. CRANNY, B.Sc.(For.), Dip.For.(Canb.)
Maryborough .....	P. J. KANOWSKI, B.Sc.(For.), Dip.For.(Canb.)
Monto .....	G. J. SWARTZ, B.Sc.(For.), Dip.For.(Canb.)
Murgon .....	J. F. BARDSLEY, B.Sc.(For.), Dip.For.(Canb.)
North Queensland .....	J. B. SCHAUMBERG, B.Sc.(For.), Dip.For.(Canb.)
Rockhampton .....	J. E. DUUS, B.Sc.(For.), Dip.For.(Canb.)
Warwick .....	T. N. JOHNSTON, B.Sc.(For.), Dip.For.(Canb.)
Yarraman .....	W. A. GREASLEY, B.Sc.(For.), Dip.For.(Canb.)

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## Objectives

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- To develop and manage the State's forest resources in the best long-term interests of the general community.
- To manage the forests, including production forests, to cater for multiple use such as recreation and protection of the environment.
- To contribute as appropriate to the development of effective general land use policies and practices.
- To promote the development and stability of the wood using industry.
- To undertake research relevant to the needs of forestry and the timber industry.
- To undertake training in forestry and encourage the development of safe working practices in the forest.
- To provide extension advice to the public and the timber industry in the fields of forestry and timber utilization.

## Highlights of the Year

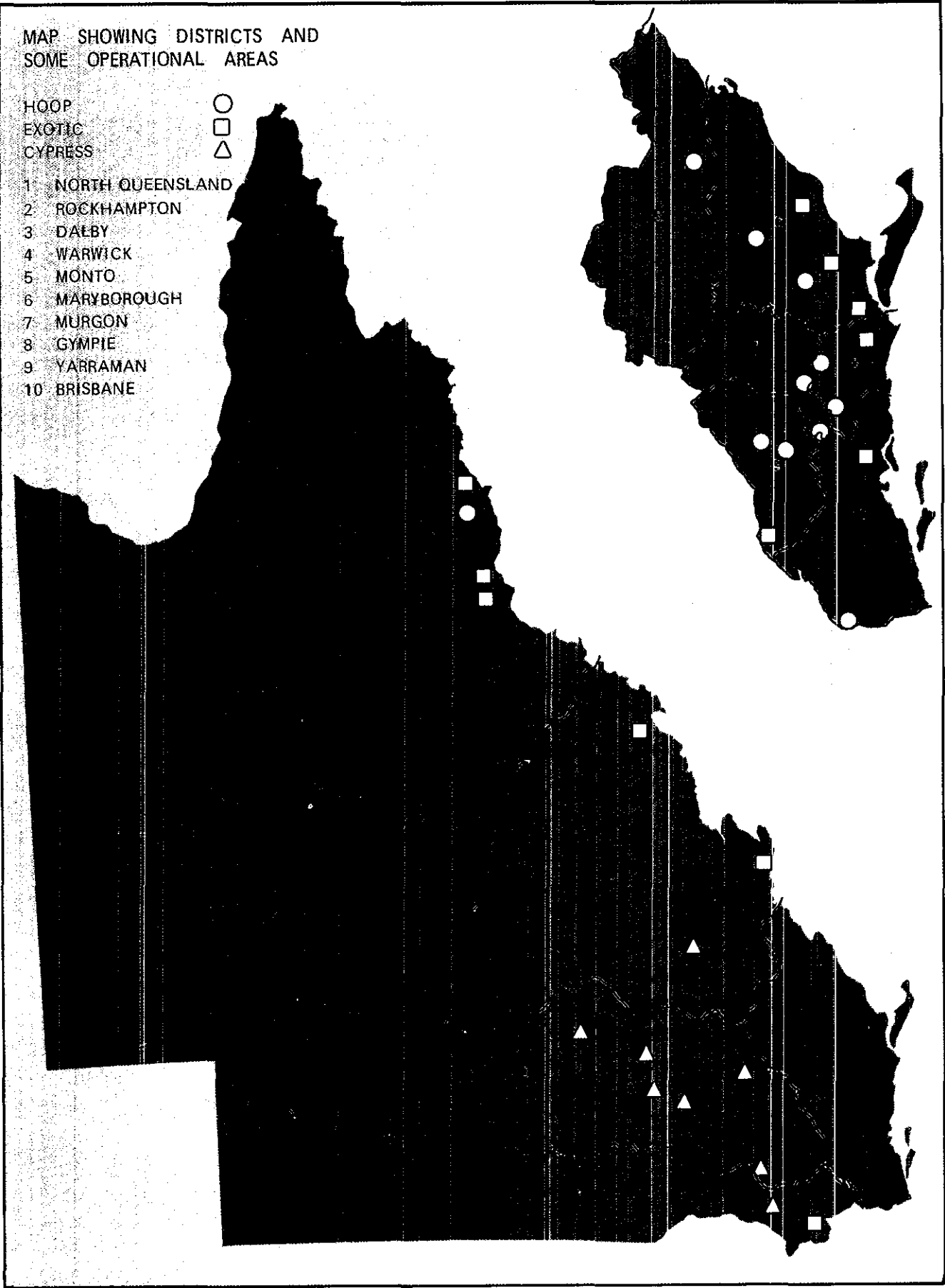
1978-79		1979-80
	<b>FOREST ESTATE</b>	
3 609 652	State Forest—hectares .....	3 715 823
589 207	Timber Reserve—hectares .....	595 324
	<b>EXPENDITURE</b>	
\$7,678,270	Forestry and Lumbering .....	\$8,462,302
\$17,777,034	Forestry Development .....	\$19,309,455
	<b>PLANTATIONS MANAGEMENT</b>	
6 827	New plantations—hectares .....	7 775
119 452	Total area—hectares .....	127 411
	<b>NURSERY</b>	
9 078 000	Plantations—seedlings raised .....	11 533 000
142 566	Amenity—number sold .....	174 898
	<b>NATIVE FOREST MANAGEMENT</b>	
13 433	Area treated—hectares .....	9 430
	<b>ROADS CONSTRUCTED</b>	
42	Logging—kilometres .....	49
238	Management—kilometres .....	249
	<b>HAZARD REDUCTION BURNING</b>	
58 074	Native Forests—hectares .....	107 000
5 500	Plantations—hectares .....	7 800
	<b>WILDFIRES</b>	
37	Number of fires .....	206
2 913	Area burnt—hectares .....	62 835
	<b>TIMBER CUT—CROWN LANDS</b>	
567 335	Native Forest—cubic metres .....	637 408
229 409	Plantations—cubic metres .....	284 580

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MAP SHOWING DISTRICTS AND SOME OPERATIONAL AREAS

HOOP ○  
EXOTIC □  
CYPRESS △

- 1 NORTH QUEENSLAND
- 2 ROCKHAMPTON
- 3 DALBY
- 4 WARWICK
- 5 MONTO
- 6 MARYBOROUGH
- 7 MURGON
- 8 GYMPIE
- 9 YARRAMAN
- 10 BRISBANE





# Timber Marketing



Cutter felling a large ironbark tree in the Jimna State Forest.

## THE FOREST ESTATE

**Forest Reservations:** The total area of land set apart as State Forest and Timber Reserves was increased by 112 287 hectares during the year, and now stands at 4 311 147 hectares.

It presently includes 127 411 hectares of plantation, which will provide increasing quantities of log timber, particularly as the older plantings mature and become available for clear-felling.

Further reservation of productive natural timber areas is now mainly dependent on land becoming available either as a result of surrender from, or the expiry of, Crown leases. In recent years, coastal wallum land largely unsuitable for grazing has been purchased for the establishment of exotic pine plantations. In 1979-80, 3 111 hectares were purchased in the Tuan-Toolara area to sustain the planting programme.

During the year, Parliament sanctioned the excision of 1 919 hectares from existing State Forests, mainly for water storage purposes.

## FOREST RESOURCES

**Native Forest Resources:** In terms of broad forest classification, the native forest can be divided into hardwood, cypress pine and rainforest.

The bulk of the commercial hardwood forest, apart from some of the drier forest, is restricted to the coastal belt where rainfall exceeds 750 millimetres per annum. The present estate is estimated to cover 4 795 000 hectares, of which 3 386 000 hectares are under Crown control and available for logging.

Since first settlement, large areas of hardwood forests have been alienated for agricultural and pastoral pursuits. Relatively few of the commercial hardwood forests remaining under private ownership are being managed for long-term timber production; this must lead to a continuing decline in the availability of logs from private lands and place greater dependence on Crown-owned forests for maintenance of hardwood timber supplies. It can be expected also that hardwood production from Crown lands will decline slightly, due largely to the loss of Crown forest area by freeholding; the extent of the decline will be influenced also by the standard of utilization accepted by industry.

Cypress pine forests cover about 1 686 000 hectares situated in the central and western regions of the State. About half the resource is located on Grazing Selections and Pastoral Holdings. State Forests and Timber Reserves contain 682 000 hectares of productive cypress

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pine forest. The private cypress pine cut has been held recently at about the present level through some conversion of Grazing Selections to freehold; however, it is expected the private cut here also will decline in the future. There is opportunity for a substantial increase in the Crown cut of cypress pine in the future, but the uncommitted resource is in locations remote from towns and major markets, and is largely unattractive economically at present.

The bulk of the commercial rainforest is located in tropical North Queensland. The area of this forest is estimated at 1 085 000 hectares of which 773 000 hectares is under Crown control. The private cut of rainforest timber is now negligible, and the Crown cut is also likely to decline as logging operations progressively move from virgin to recut areas. The future viability of operations on recut areas will depend on the sawmilling industry being able to economically extract lower volumes per hectare in smaller sized material and, to some extent, in less attractive species.

In recent years, there has been a big increase in the public use of native forests. This, and demands for conservation of various forest types and habitats, is placing pressure on the native forests as a source of raw material to sustain the existing industry.

**Plantation Resources:** It was realised in the 1920's that the native forests of the State would be unable to supply the future timber demand, so a programme of softwood plantation establishment was commenced. The major hoop pine plantation resource is located within the Yarraman, Murgon and Gympie districts. The exotic pine plantations are located mainly on the coastal lowlands extending from Brisbane to Cairns.

At present, only thinnings from these plantations are committed to the existing softwood industry. This involves the annual supply of up to 120 000 cubic metres of hoop pine sawlogs, 30 000 cubic metres of hoop pine pulpwood, 115 000 cubic metres of exotic pine sawlogs, and 135 000 cubic metres of exotic pine pulpwood. This level of commitment can be expected to increase substantially in the near future from clear-felling of mature plantations, and increased thinning of the expanding plantation estate.

**Conversion of Tenure:** Under the provisions of the Land Act, lessees may apply to convert Grazing Selections to freehold tenure. When a freeholding application is made, the standing timber and its value are assessed. Freeholding action is opposed on areas with substantial stands of timber where it is considered the best long-term value of the area is as forest.

The State Forest estate has been gradually increased over the years through conversion of Grazing Selections in part or whole to State Forest

following freeholding applications. However, the more scattered stands of timber are often freeholded and largely lost to long-term timber production.

To a large extent, it has been the freeholding of such areas that has enabled the private cut to be held at a high level. Crown lands other than State Forests and Timber Reserves at present provide 18 per cent of the Crown native forest sawlog cut and also contribute heavily to the production of mining timbers, sleepers and quarry materials. Some areas of low productivity have been converted to State Forest to conserve supplies of mining timbers, sleepers and quarry materials in areas where a future demand is forecast.

To date, 3 506 freeholding applications involving 11 027 222 hectares have been finalized. There are currently 186 applications being processed or awaiting assessment.

### HARVESTING AND MARKETING

**Marketing Policy:** Departmental policy aims at the orderly marketing of forest products from Crown lands, in accordance with the limits of the available forest resource, to promote stable and efficient wood-processing industries within the State, whilst at the same time ensuring that the Crown receives an equitable return.

More specifically, this involves the—

- Maintenance, and review where necessary, of effective and well-defined sales policies and procedures to meet current and anticipated market conditions
- Development of realistic information systems based on estimates of current and future forest resources, and market demands
- Development, maintenance and updating of accurate and efficient forest inventory systems to enable precise estimates to be made of the forest resource and its growth, both for short- and long-term planning in the marketing areas
- Avoidance of wastage of the available forest resource by establishing reasonable standards of utilization which do not unfairly penalize industry, and to seek ways of establishing new markets for sub-standard logs and trees
- Evaluation and utilization of the non-wood-producing values of the forest estate
- Adoption and implementation of harvesting practices which do not have long-term adverse effects on the forest environment



Logging operation in a natural hoop pine forest.

- Application of a consistent and realistic policy with regard to the maintenance of existing native forests on other Crown lands, including acquisition under State Forest tenure of those areas which are best suited for forestry purposes
- Maintenance of effective communication with industry organizations and individual members who are involved in the processing of forest products.

**Pricing:** It is general policy to increase Crown log prices at intervals in accordance with the upward movement of logging costs and the Consumer Price Index, in order to maintain the real value of timber revenue.

Because of the depressed economic situation and adverse trading conditions, no general increases in Crown log stumpages on this basis were applied from 1974 to 1979. However, with the general improvement in trading conditions and greater stability in the industry, Crown log stumpages were increased by 13.5 per cent from 1st July, 1979, representing the increase of 9.0 per cent in the Consumer Price Index for the 1978 calendar year, and 4.5 per cent as part of the deficit accumulated since 1974. It is anticipated

that the remaining deficit will be reduced further when increases applicable from 1st July, 1980, are determined.

A detailed review of the current pricing system is under way with regard to North Queensland rainforest species, and similar reviews will be extended to other species groups as time permits. They will examine means of simplifying current pricing systems, and also of restoring price relativity between species groups and size classes which may have been distorted through the application of flat percentage increases.

Trials are being conducted in co-operation with the hardwood industry to develop a local area pricing system for application to native hardwood forests.

Pulpwood from Departmental conifer plantations and native hardwood forests is sold under long-term agreement to firms involved in the paper-making, particle board and hardboard industries. These arrangements allow for adjustments in pulpwood stumpages through negotiations with individual firms. As a result of these negotiations, pulpwood stumpages were increased by 10.0 per cent on 1st January, 1980. It is proposed to continue negotiations for further increases during the coming year to restore pulpwood prices to the real value of this material.

**Sales Procedures:** All regular sales of naturally-grown Crown log timber are now made non-competitively to individual mills under an allocation system. This system requires the precise estimation of available resources, and their growth, in each allocation zone of the four major species groups.

In consultation with the relevant section of Industry, allocations of Crown hardwoods and scrubwoods in South-East Queensland were reviewed for the three-year period from 1st October, 1979. Unfortunately, it was necessary to apply some substantial reductions in some allocation zones, where the remaining resource is insufficient to sustain previous commitments.

Further review of allocations are due for south Queensland cypress pine and inland hardwoods from 1st October, 1980, for central Queensland cypress pine, hardwoods and scrubwoods from 1st October, 1981, and for north Queensland rainforests from October, 1981. Detailed resource assessment is being carried out in each of these regions, and preliminary discussions have been held with the Industry groups involved on the criteria to be adopted.

A task force formed during the year has been determining volumes (by species, time of availability, size and product classes and location) which will become available for sale in the near future from the clear-felling of mature softwood plantations. It is also examining the range of options available for sale of this material, and pricing structures which may be applicable.

**Measurement:** Current Departmental measuring procedures were largely developed for the purpose of selling large logs from the mature natural forest. Logs from this type of forest are extremely variable in size and quality, and individual log measurement was appropriate. The log supply is now increasingly being drawn from plantations or from native forests which have been managed for a considerable period of time. Because these forests produce logs of more uniform quality and size, more economical methods of measurement are practicable.

Measurement of hardwood logs on a gross measure basis, with provision for defect on an average pricing basis rather than through individual log measurement, was introduced in 1977. This system has resulted in a saving to the Department in the cost of measuring. Further simplification should be possible. Plantation timbers are measured by use of two-way volume tables incorporating predominant height and diameter measurement.

In both natural and plantation forests, individual tree measurement is, however, still general practice. Bulk measurement, such as weighing of logs and converting the mass to

volume by using known conversion factors which can be continually checked and updated, has been established practice in many parts of the world. The Department has been working in co-operation with industry towards the introduction of such a weight-scaling system in cypress pine forests and in plantation conifers.

The system was adopted this year for the salvage logging of some 7 000 cubic metres of fire-damaged cypress pine near Cecil Plains and of some 80 000 cubic metres of hail-damaged slash pine near Maryborough. These large-scale trials have shown very satisfactory results both from the Departmental and Industry viewpoint, whilst at the same time indicating problems which may arise during routine implementation.

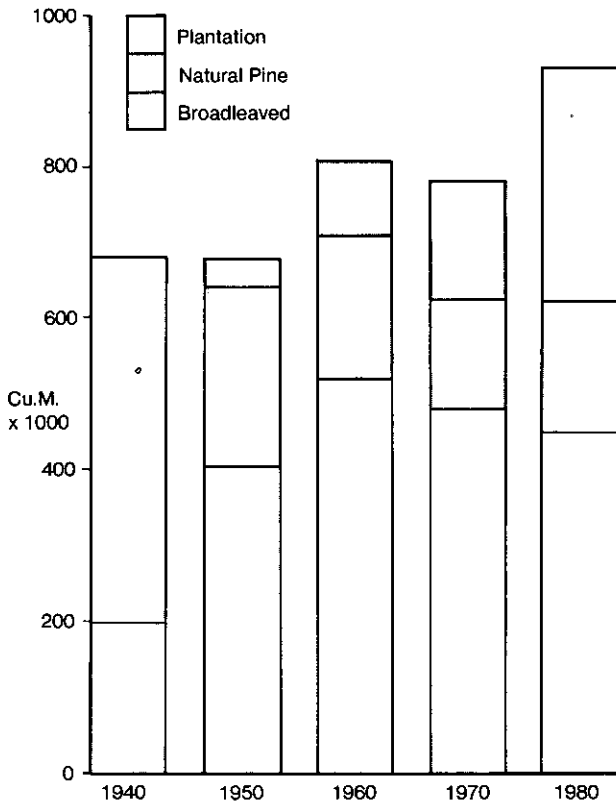
## FOREST PRODUCE AND FOREST INDUSTRIES

**Timber Harvesting:** The volume of timber harvested from Crown and private lands during 1979-80 is shown in the Appendices. The overall cut of timber, including pulpwood, from Crown lands during the year was a record high of 921 988 cubic metres. This represents an increase of 15.7 per cent over the previous year. Timber revenues also attained a record high of \$8,560,121, an increase of 23.9 per cent over the previous year.

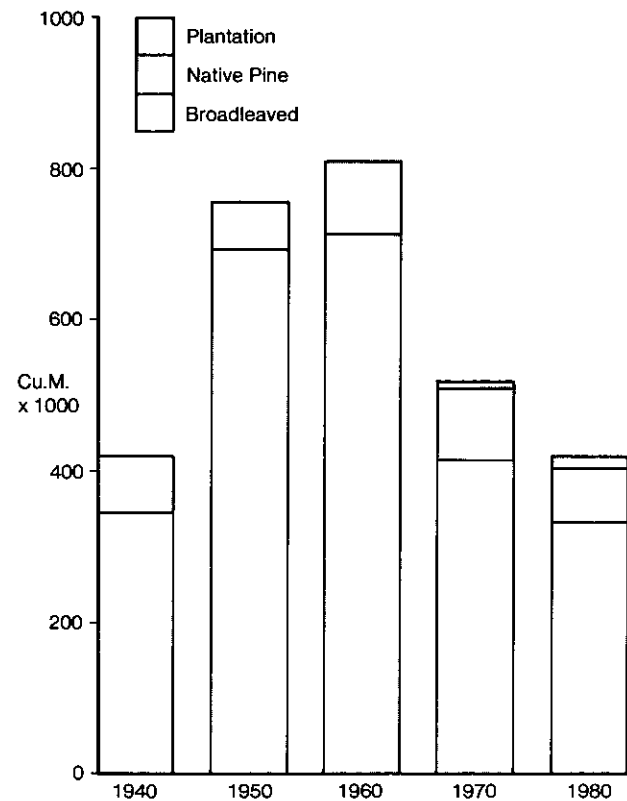
The figures reflect an increasing demand for forest products due to generally favourable trading conditions during the year in the wood-based industries. The increased cut from Crown lands is also associated with the decline in availability of timber from private lands. This decline has been a continuing process and is illustrated by comparing the volume of timber processed from private lands during 1969-70 of 620 000 cubic metres with the 1979-80 cut of 352 000 cubic metres, a decrease of 43 per cent. During the same period, the Crown log timber cut increased by 17 per cent from 787 000 cubic metres to 922 000 cubic metres.

It is apparent the Crown lands have only been able to compensate partly for the decline in availability of log timber from private sources. The remaining deficit has been largely supplied by sawn timber, particularly hardwood and radiata pine from interstate. The movement of hardwood from New South Wales into the State now appears to be declining slowly. In the future, the shortfall will be supplied increasingly by timber becoming available from maturing plantations within the State.

**Sawn Timber Industry:** The year has been brighter for sawn timber producers, particularly in South-East Queensland. Production has been limited only by supply, with almost all purchasers operating at near maximum capacity. This has been the major factor in establishing a record cut of Crown log timber.



Timber cut from Crown Land



Private Timber Processed

Milling timber removals increased by 14.9 per cent over the previous years, and increases have occurred in all species groups; the cut of plantation conifers increased by 20.6 per cent.

**Railway Timber Industry:** The Department controls the removal from State Forests, Timber Reserves and Crown lands of timber for railway sleepers by the issue of Forest Service Orders to contractors who cut and deliver sleepers to railway sidings. These contractors produce sleepers from logs unsuitable for production of sawn building timbers, particularly from Crown lands which are largely unsuitable for State Forest reservation. In addition, sales are also made to sawmills licensed to produce railway sleepers, largely from forest areas where the species composition and log quality are unsuitable for saw log production.

Details of removals for this purpose are shown in Appendix 10. Removals have been comparable over the past two years, though there has been some variation in size classes cut.

In addition to sleepers for the Queensland Railway Department, smaller size sleepers (of 2.0 metres and less in length) are produced for use in tramways used in the sugar industry. Increasing

production in this industry has resulted in a high demand for these small-size sleepers during 1979-80.

**Pulp and Particle Board Industries:** The situation which existed in 1978-79, where plants were operating at 50 to 60 per cent capacity, has gradually improved with the most encouraging growth occurring during the last few months of the year. A small but significant export market has developed in South-East Asia. Pulpwood removals for these industries from Crown lands increased by 24.1 per cent over the previous year.

**Hardboard Industry:** The one hardboard producer in the State has operated in relatively stable market conditions. This industry obtains most of its log supplies from private sources so that, although the Crown cut of hardwood logs for pulp wood has declined more than 50 per cent during the year, this is not of major significance to the Department's overall logging operations.

During recent years, this producer has been buying increasing quantities of sawmill waste from hardwood sawmills. This is an encouraging trend which results in better utilization of forest products and more economic operations for both sawmiller and hardboard producer.

**Plywood Industry:** There has been a high demand for plywood throughout the year, although removals of plywood logs from Crown lands were slightly lower than in the previous year. These removals have been fairly stable in recent years; however, the supply of ply logs from natural pine stands is rapidly becoming exhausted. Nevertheless, it is expected that when this occurs, significant volumes of pruned plantation material will be available—some of which will undoubtedly be converted to ply.

**Round Timber Industry:** While traditional users of round timbers, i.e. Railway Department, Electrical Authorities, Telecom, Mining Industry and rural land holders, continue to make increasing demands for round timbers from Crown lands, as private supplies are depleted additional demands are also being made by the more recent trend towards the use of round timbers in landscape gardening.

This latter demand can be met in many cases by thinning poorer trees from hardwood forests so that the productivity of the residual forest for the primary purpose of producing sawmill timber and the better classes of round timber is increased rather than depleted.

**New Industries:** Considerable interest has been shown in developing an export market for chips derived from hardwood sawmill waste; however, no such operation has commenced so far.

During the year, one new plantation sawlog commitment was sold at auction. A volume of three thousand cubic metres, with a later increase to four thousand cubic metres per year of plantation thinnings, was sold from Cathu in the Mackay sub-district.

A major sale of quarry material from a site near Beerburum was finalized during the year. It is anticipated that this quarry will be operational by early 1981, when it will meet the strong demand for road-base and aggregate material being experienced on the Sunshine Coast.

Negotiations are proceeding with a consortium on the provision of raw material for a major kraft pulp mill in South-East Queensland, in lieu of the prior proposal relating to a thermo-mechanical pulp mill. A feasibility study is in progress to examine the availability of raw material supplies from softwood plantations and to evaluate alternative mill locations. Raw materials would be drawn chiefly from Departmental coastal exotic pine plantations south of Bundaberg and from private sources in the same region. If the proposal proceeds, it will be essential to maintain a high rate of planting until the necessary resource is fully established.

**Salvage Operations:** The Department was faced with a number of salvage operations during the year which required urgent action to avoid rapid deterioration and loss of substantial volumes of commercial timber.

Extensive fires on Dunmore State Forest near Dalby necessitated the urgent salvage of some 7 000 cubic metres of cypress pine. Cyclone damage at Byfield State Forest, near Rockhampton, caused extensive wind-throw requiring the salvage of about 10 000 cubic metres of Caribbean pines.

About 400 hectares of 23 to 25 year-old slash pine plantation at Tuan State Forest, near Maryborough, were severely damaged by a late summer hail storm; some 80 000 cubic metres required salvage by clear-felling. It is pleasing to record the excellent co-operation received from industry in this massive salvage operation.

Drought losses have continued in exotic pine plantations in the Yarraman district, and a sale of 20 000 cubic metres of timber was made during the year to accelerate clear-felling of those species which are now considered to be unsuited to the climatic conditions prevailing.

**Sawmill Licensing:** The Department controls the processing of log timber through the Sawmills Licensing Act which has been in operation since 1936. Licenses are issued for the operation of Crown and/or private timber when it can be shown that there is sufficient resource to justify the establishment of a new sawmill. The declining resource of native forests in private ownership with forested lands being cleared for agricultural and pastoral purposes has meant that licensed sawmill capacity has exceeded the current resource available.

In 1969, the Department introduced a policy which permitted the amalgamation of licensed sawmills so that mills with insufficient supplies could amalgamate with other sawmills within defined zones. This policy aims at permitting small sawmills to maintain the size of their operations at an economic level.

At the time of the introduction of this policy, there were 517 licensed sawmills of which 472 were General Purpose mills, six were restricted to the production of fruit cases, 27 were restricted to the production of railway sleepers and 12 were otherwise restricted.

At the end of 1979–80, the number of mills had declined to 378 of which 305 were General Purpose Mills, 50 were Restricted License mills and 23 were Portable Mills.

# Forest Management



Severe hail damage resulting in heavy localized losses in slash pine plantations near Maryborough.

## PLANTATIONS

**Establishment:** The total area of softwood plantations is now 125 337 hectares, comprising 84 339 hectares of exotic pines and 40 998 hectares of native species mainly hoop pine. The aim of the Department is to establish at least 200 000 hectares of softwood plantations. The actual area required will depend on the productive quality of the land available for planting and the demand for sawn wood and other processed wood products in relation to the State's population and industrial growth.

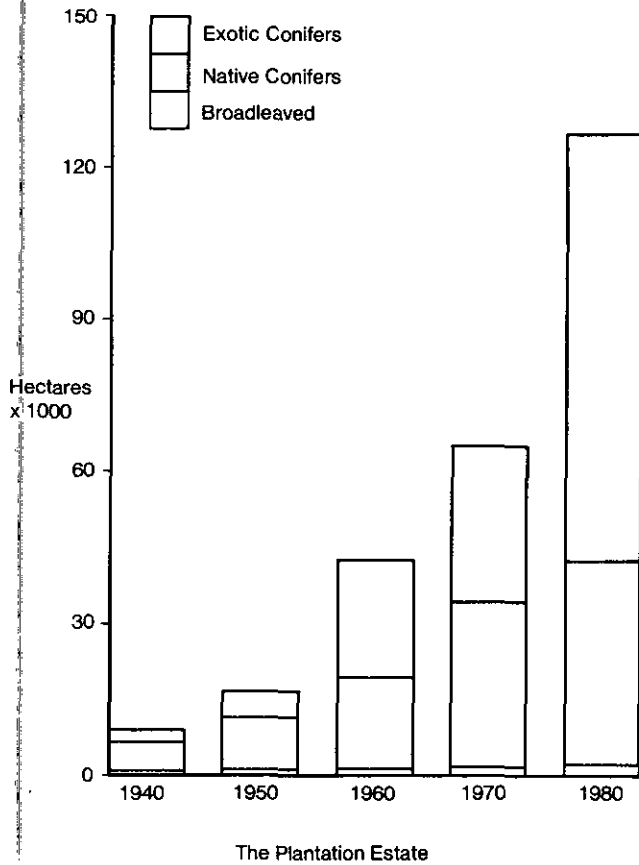
Private investment in plantation establishment and management of commercial native forest stands is encouraged through the Department's extension service and the provision of plants at concessional rates.

During the period under review, the area of Departmental plantations established comprised 7 918 hectares, of which 6 855 hectares were exotic pines and 1 063 hectares native species, mainly hoop pine. This was achieved despite the very dry weather conditions which occurred during the winter planting of exotics.

Of the exotic pines, Honduras Caribbean pine is preferred due to its better wood quality and faster growth. This year 2 669 hectares were planted, but it is expected that its proportion of the total exotic pine programme will increase with the increased availability of improved seed. Honduras Caribbean pine is planted principally north of Maryborough as well as in the better drained soils further south. Its apparent drought hardiness and adaptability indicate that it can be expected to satisfactorily meet the wide range of conditions that apply from north Queensland to south Queensland. Nine hundred and eighty hectares were planted at Wongi, north of Maryborough, the first major planting at this new planting front.

Hoop pine establishment of 1 051 hectares included 129 hectares of replanting of failed exotic pine areas and a small second rotation trial. The hoop pine programme is expected to decrease due to the reduced availability of areas suitable for planting. The species is still subject to the same nursery technique as previously adopted except that there is greater usage of shade cloth to provide temporary protection during the germination and development period.

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**Weed Control:** Weed control in plantations is under constant review, particularly in the development of techniques with the use of new herbicides.

The Department is ensuring that its present practices are as effective and safe as possible. A revised code of practice for herbicides was introduced, and this will ensure the highest practical level of field safety. In hoop pine plantations, results of experiments have allowed a reduction in the strength of phenoxy pre-plant misting mixtures. The field prescription now in use results in a cheaper operation of equivalent efficiency with less herbicide. New equipment and training in field application is improving field efficiency. In established plantations, use of cut stump operations is replacing basal spray techniques with substantial savings in material cost and volume of herbicide used. Cut stump involves application of a water-based herbicide to severed stems.

The Department is conducting experiments into alternative methods of weed control. These experiments are included in the Forest Research Section of this report.

In older plantations, trials are continuing on a reduced intensity of lantana control with the periodic use of fosamine to maintain access.

Trials with second rotation plantings indicate a potentially serious weed problem. Heavy weed development occurs after clear-felling, and previous practice has been to use mechanical site preparation. Trials are under way testing the use of residual herbicides in this situation, and this system may prove to be lower in cost than mechanical methods.

**Nutrition:** The aerial refertilizing programme continued during the year, with 4 289 hectares being treated with additional phosphorus at the rate of 40 kilograms per hectare in south Queensland. The backlog of refertilizing has now been completed, and the necessity for future work will be determined by programmed foliar sampling of stands as they attain 10 years of age.

**Nurseries:** The Department raises seedlings in its nurseries for its own use as well as for forest plot plantings by private individuals. The principal species are exotic pines, with over 7 million being raised in the three major nurseries in south Queensland. The abnormally dry seasons have caused watering problems, and action is being taken to upgrade the water supply and irrigation system at each nursery. The system at the Toolara nursery has been reconstructed to service an area of 16 hectares.

The increasing planting programme in north Queensland, together with the demand for private woodlot stock, has severely tested the nursery capacity in the region. A new nursery is currently being established at Ingham which will service the anticipated requirements of the Cardwell-Ingham area. The nursery will be fully quarantined and have a high performance irrigation capability.

**Pruning:** The plywood industry has relied on logs from natural rainforests using both scrubwoods and native conifers such as hoop pine, bunya pine and kauri pine. The industry has declined with the decreasing availability of ply logs from natural stands.

The naturally grown logs are over 50 cm diameter. Though the Department commenced pruning in its hoop pine plantations about 50 years ago, the size of the plantation-pruned material at clear-felling will be generally smaller than the naturally grown hoop pine. The use of plantation logs would necessitate considerable redesign of existing ply mills.

The objective of pruning was to provide logs with clear wood over a knotty core of about 15 cm diameter for both peeling and joinery. The amount of clear wood produced over the knotty core is dependent on growth of species, site quality, thinning regimes and length of rotation.

Until recently, it had been Departmental policy to prune all stands which met certain site quality standards.





Radio Technician, Bruce Urquhart, repairing a mobile radio.

A task force was appointed recently to review the Departmental pruning policy for all plantations throughout the State. Pending completion of the report, priority is being given to pruning hoop pine stands and limiting pruning in exotic pine stands.

A mechanical pruning unit, consisting of a front-mounted head on a four-wheel drive articulated tractor, was developed to the operational trial stage during the year. Its practical application will be assessed during 1980-81 on a variety of sites, including high mounded sites.

**Weather Conditions:** Severe damage was caused by hail on 25-year-old slash pine at Tuan; subsequent *Diplodia pinea* fungal infestation has necessitated clear-felling of the most severely damaged area of almost 400 hectares. Replanting action on this will be the subject of combined investigation with the Forest Research Branch covering a range of site preparation techniques and species.

Damage at Byfield from cyclone Simon was fairly severe and widespread, particularly in the older plantations. Salvage action is still current in these areas. There is considerable interest in the effect of the two major cyclones, David in 1976

and the more recent Simon, where the superiority of the coastal provenances of Honduras Caribbean pine in stem straightness and wind-firmness has been clearly demonstrated. The Forest Research Branch is investigating the possibility of importation of pollen from superior trees in natural stands of the coastal provenances. This material will be used in crossing with the best local stock to develop a broader population of straighter, more windfirm fast-growing trees from which to choose superior trees for seed orchards.

**Seed Collection:** Seed collected included 552 kilograms of Honduras Caribbean pine, 509 kilograms of slash pine and 38 kilograms of loblolly pine, as well as a variety of miscellaneous species. The improved genetic grades of these species are used for Departmental plantings and any surplus is available for sale. In the case of Honduras Caribbean pine, however, the availability does not even meet Departmental demand and, despite widespread overseas interest, sales of this species have to be limited at present to unimproved grades.

A forced draft kiln was purchased to be used for seed extraction at Beerwah in order to upgrade seed processing and, hopefully, seed quality.

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Departmental usage of seed in 1979 was:—

	kilograms
Honduras Caribbean pine .....	205
Caribbean pine .....	16
Slash pine .....	368
Loblolly pine .....	4
Radiata pine .....	10
	-----
	603
Hoop pine .....	2 271
	-----
Total .....	2 874

Sales this year totalled 431 kilograms with a value of \$55,000. Approximately 230 kilograms were sold overseas.

In addition to conifers, there is a continued interest in the seed of eucalypt species, particularly those provenances of rose gum, forest red gum and river red gum which have demonstrated good performance in overseas plantings, as well as brown salwood which is not in sufficient quantities to meet demand.

The supply of hoop pine seed on hand was adequate from previous collections, and no new collection was undertaken. The latest findings from the 1971-72 plantings of the second series of provenance trials indicate the continued superiority of seed from some areas, particularly Goodnight Scrub, Coen and Jimna over a wide latitudinal range of outplantings.

As time progresses and trends become clearer, action will be taken to utilize the findings as far as practicable in seed collection as a supplement to the present inadequate yields from the seed orchards.

**NATIVE FORESTS**

**Treatment:** The total area of State Forest is 3 715 823 hectares. This comprises very considerable areas of wet and dry sclerophyll forests of eucalyptus and other myrtaceous species and cypress pine, as well as rainforest areas. Large areas of each type of forest are logged over each year but, due to the commitment to maintain plantation establishment of fast growth softwood species, and the limitation of funds available, native forest treatment has been gradually reduced and streamlined. Present staffing has reached levels based on the minimum required for fire protection purposes. Except for areas being converted to plantations, all native forests being logged are treemarked by a forest officer.

Apart from ensuring proper utilization of merchantable trees and providing for a viable harvesting operation, treemarking is an excellent silvicultural operation in removing mature, over-mature and defective trees, and thinning dense

stands. But follow-up silvicultural treatment of logged forests is still very necessary to destroy useless and unwanted species, to promote regeneration of favoured species and to promote the growth of selected future crop stems within dense stands of regeneration.

The principal concentration of work remains in the Inglewood, Western Creek, Barakula and Yuleba cypress pine forests where 8 249 hectares were treated. The use of funds provided by the Commonwealth in the employment of Aborigines in central Queensland spotted gum stands continued, with 423 hectares being treated.

Where possible, coastal wet sclerophyll forests with unsatisfactory regeneration are subjected to enrichment planting, with blackbutt the main species used. No rainforests are receiving supplementary silvicultural treatment at present.

Recent trials indicate that glyphosate or hexazinone applied by injection may be an alternative to Tordon 105 for hardwood treatment.

**PROTECTION**

**Fire Damage:** The 1979-80 season was particularly severe following a mild season the previous year. Extremely dry conditions were experienced in most parts of the State, and serious fires were recorded in most districts. Two hundred and six fires were reported through the State, with 21 occurring in pine plantations.

The most serious outbreak was a series of fires caused by lightning at Dunmore State Forest in the Dalby District, which burned 4 800 hectares of natural forest including some areas of cypress pine which suffered severe damage. Suppression of these fires cost some \$60,000 and involved the resources of a number of Forestry Districts, Shire Councils and neighbouring landholders.

A fire started by lightning at Toolara State Forest burned 100 hectares of slash pine plantation aged seven to nine years. It caused losses estimated at about \$60,000 and is the largest fire recorded in pine plantations on the coastal lowlands.

**Prescribed Burning:** Prescribed burning carried out in natural forests and plantations greatly reduces the risk of loss to wildfire and makes possible major savings in expenditure on fire fighting. Lighting is effected by hand-held torches or incendiary capsules dropped from aircraft.

Two new devices for the priming and dropping of incendiaries went into service during the year. They can be operated from helicopters as well as from fixed wing aircraft, and replace an ageing device which was suitable for use only in fixed wing aircraft.



Mr W. Bryan, Conservator of Forests, and Mr R. Grimes, Officer in Charge, Organisational Services Branch, inspecting one of the Department's new fire fighting tankers.

The areas burnt for hazard reduction during the year comprised 7 800 hectares of plantation, including 1 356 hectares lit from helicopter, and 107 000 hectares of natural forest.

**General:** A five-day conference of Departmental officers with major fire protection responsibilities was held during the year. Guidelines and recommendations were prepared for developments in many aspects of fire protection including prescribed burning, fire protection planning, fire-fighting equipment, detection, and the integration of the Department's fire protection effort with the activities of other public bodies. This was the first conference of its kind since 1958, and it is anticipated its findings will provide a basis for continuing improvement of fire protection practices.

A five-day course of training in fire protection conducted by Departmental Officers was attended by 30 officers. In addition, 24 officers received instruction in aerial ignition. Two officers attended an advanced course in fire control in Victoria conducted by the Victorian Forest Commission.

**Communications:** The progressive improvement of the Department's radio-communications network was continued during the year.

New remote-controlled, very high frequency bases were brought into service at Atherton, Ingham and Kalpowar. A new high frequency base was installed at Inglewood which services the outlying State Forests in that area. Radio base equipment was removed from premises vacated at Ingham, Gympie and Bundaberg, and relocated in new premises occupied at those centres.

A further improvement has been made possible by the recent allocation to the Department of six very high frequency channels in replacement of three previously allotted. Equipment in six of the 10 Forestry Districts had been converted to the new frequencies by the end of the year.

## CAPITAL WORKS AND EQUIPMENT

**Mechanical Plant:** Expenditure on the purchase of mechanical plant during the year was approximately \$1,650,000 and involved principally 143 motor vehicles, two crawler-tractor dozers, five rubber-tyred tractors and two workshop cranes.

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Further progress was made during the year in improving passenger accommodation on vehicles used for the transport of employees to and from the field. Vehicles which went into service during the year included two twelve-seater buses, 10 one-tonne crew-cab trucks, and 13 two and a-half tonne crew-cab trucks.

Three 120 kilowatt class four-wheel-drive rubber-tyred tractors with air-conditioned cabins were purchased for use in site preparation in exotic pine areas. The larger tractors are capable of pulling two of the heavy duty stump jump disc ploughs, and the indications are that worthwhile savings in cost will result from their introduction.

Four fire tankers, built to a new design developed by the Department on seven tonne four-wheel-drive chassis, were completed. The 3'600 litre tanks are of fibre glass construction using fire-resistant resins, and incorporate lockers for the storage of hoses and all the necessary ancillary equipment. They are adapted primarily to early first attack on plantation fires, and each has a high performance pump as well as a stand-by pump. They are to go into service in the exotic pine plantation areas; two at Beerburum and one each at Toolara and Cardwell.

A seven metre boat, the Korawinga II, of twin-hull fibreglass construction powered by twin outboards, was purchased for use in conjunction with charter aircraft for the rapid transport of men and equipment between Fraser Island and Maryborough.

Expenditure on the operation of mechanical plant, inclusive of fuel and repair costs but exclusive of operators' wages, was approximately \$3,261,000 compared with \$2,643,000 in the previous year. The rapid increase in these costs was contributed to by large increases in the price of fuel and spare parts.

Periodic analysis of samples of lubricating oil taken from the larger machines was commenced on a trial basis during the year. This analysis for foreign matter in lubricants is an aid to the detection of imminent failure and to the prevention of major failures. The benefits of this practice will be evaluated during 1980-81, but early indications are that significant savings will result.

In a number of cases, the entry of a potentially serious amount of dust into engines was detected and corrected before serious damage occurred.

**Roads:** The road construction programme is aimed at providing economical access on State Forests for logging, management, fire protection and public recreation. New roads are required each year to serve plantations being established and, to a lesser extent, to provide new access for the logging of natural forest. The upgrading of arterial roads is necessary to provide all-weather

access for the rapid haulage of plantation timbers. Continuing replacement is necessary of the older timber culverts and bridges as they reach the end of their useful life.

A number of techniques was introduced during the year: Modern formwork was used for the pouring *in situ* of reinforced concrete culverts; new pavements were compacted to reduce the need for maintenance, using the recently acquired vibrating roller; engineering fabric was used to stabilize swamp crossings in exotic pine plantations and to reduce soil erosion at the outlets of pipes and culverts; hired elevating scrapers were used for earthworks and for the cartage of gravel. It is expected significant savings will result from these practices.

Standards were adopted for roads in hoop pine plantations which are based on the management use for which they are required. Bitumen sealing of selected arterial roads in the exotic pine plantations at Beerburum was continued.

**Fire Towers:** A new 37 metre tower of timber construction was completed at Benarkin during the year. This tower makes possible improved detection of fires which may affect hoop pine plantations in the Yarraman District. There has been a continuing programme of construction of major fire towers in timber during the past 15 years to replace original structures and to serve new plantation areas. During this period, 16 towers have been constructed, nearly all over 30 metres high.

**Buildings:** Buildings are constructed as necessary to meet new requirements and to replace existing buildings which are no longer satisfactory.

Single men's quarters to accommodate six men in single rooms were constructed at Imbil Forest Station in conjunction with the closure of the out-camp at Stirlings Crossing.

A contract was let for the construction of a house for occupation by the Overseer resident at Bunyaville State Forest on the northern outskirts of Brisbane City. This State Forest is extensively used for public recreation and is the site of a Departmental Communications Centre and nursery.

A replacement building was erected at Beerburum nursery in Brisbane District for the handling of nursery stock, the storage of fertilizers and nursery equipment, and for employees' amenities.

A supply of electricity from the South-East Queensland Electricity Board was connected to Jimna Township and Forest Station, and this enabled the Department to cease generating electricity at Jimna.



The stark landscape resulting from a wild fire in the Dunmore State Forest in December, 1979.

## COMMUNITY USE OF FORESTS

**State Forest Parks:** The forest environment has a magic touch—able to turn the most ordinary activity—walking, cooking or just relaxing into a memorable event. This special attraction of the forest, together with the growing number of State Forest Parks and Forest Drives available for use, has seen the public's use of State Forests continue to grow during the past year.

During the year, new State Forest Parks were constructed at Goldsborough Valley near Gordonvale, Coochin Creek near Beerwah, Cedar Grove near Gympie, and at Peach Trees near Jimna. All of these Parks cater for camping as well as day visitors.

Surveys carried out at Easter showed that nearly all the State Forest Parks close to Brisbane were fully utilized. In particular, the group of Parks near Kenilworth received very heavy use with over 1 000 people camping during the holiday period. A similar number camped at other State Forest Parks in the south-east region.

This popularity is by no means restricted to areas close to Brisbane. In north Queensland, Parks in the Danbulla State Forest catered for

12 000 day visitors and 1 500 campers during the year, and Parks at Byfield State Forest near Rockhampton were also full to capacity each long week-end.

The community interest in the Parks, and forestry in general, is reflected in the growing number of enquiries being received. To meet this interest, a set of brochures was produced during the year outlining the various opportunities available to visit and enjoy State Forests.

It is rewarding to see the Department's programme to promote and cater for community use of State Forests being so well received, and the Department will continue to provide for this important need.

**Beauty Spots:** Particular areas of ecological or landscape value are retained in a natural condition in State Forests, and termed beauty spots. To date, 95 have been declared throughout Queensland, and these occupy a total area of 3 328 hectares. Forest types included are wet and dry sclerophyll, and wet and dry rainforest. Large trees, caves, waterfalls and lakes are features of many beauty spots.

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### OTHER USES

**Watershed Management:** Watersheds of many State Forests serve as catchments for a large number of water storage projects developed by the Water Resources Commission and Local Authorities throughout the State. For example, in north Queensland there are the Tinaroo and Koombooloomba dams and the Copperlode Falls dam which supplies water for the Cairns area; the Broken River dam in central Queensland and the Borumba and Cooloolabin dams in the south.

During the year, 1 917 hectares were revoked from State Forest to provide water storage areas for the Copperlode Falls dam, the Awonga dam for Gladstone water supply and the Cressbrook dam for Toowoomba water supply. Logging and other operations in dam catchments are strictly controlled for water quality control.

**Fauna and Flora Habitats:** State Forests totalling some 3.7 million hectares are sanctuaries but represent only about 2 per cent of the State's total area. National Parks and State Forests are largely the only areas where wildlife habitats are fully protected as there are no controls over the destruction of forest on private lands.

Only about 50 per cent of the native forests on State Forests are loggable due either to the lack of commercial species in the various vegetation types or their being too steep or rugged to log.

Within the loggable types, provision is made for the retention of representative types as Scientific Areas. Special guidelines have been issued for the management and use of Scientific Areas.

Permits are issued to particular authorities to make limited collections of fauna and flora for research purposes.

**Leasing:** Most of the available land on State Forests suitable for grazing is under some form of grazing lease or permit. Grazing, however, is generally not intensive because the Department's priority given to wood production militates against grass growth. Departmental management techniques such as prescribed burning also play a part in limiting extensive grazing.

Nevertheless, grazing of open forest types and hoop pine plantation areas is encouraged to reduce wildfire risk and to lower weed control costs.

**Apiculture:** Apiculture is an important industry in State Forests, particularly in the ironbark and box areas of western Queensland. The Department recognizes the need to preserve valuable honey-producing species like yellow box and to retain a forest cover over most of its State Forest area.

Permits are issued to apiarists for sites based largely on traditional use of areas with sites located at least 800 metres apart.

# Forest Planning



Water supply for Jimna on Little Yabba Creek in Jimna State Forest.

## LONG-RANGE DEVELOPMENT PLANNING

**General:** State Forests represent the only form of public land set aside permanently for forestry purposes. Much of Queensland's future forestry development will occur on State Forests. The primary aim of the Department is to manage State Forests for the optimum benefit of the people of Queensland in perpetuity and in accordance with Government policy.

Development of State Forests is designed to satisfy the anticipated increased demands for timber and forest recreation. However, the importance of conserving the integrity of the forest environment and ensuring the proper protection of soils and water quality is also recognized.

State Forests are in effect being managed for a variety of uses, some of which may at times be in conflict with other uses. Careful planning is therefore vital to their effective management. Because of the long-term nature of forestry, planning must of necessity be long-range, often

extending over several decades. Only through such planning can conflicts be resolved and the best overall use of State Forests be achieved.

The Department has long recognized the limited capacity of the native forests and the need to supplement production from these forests. A small softwood planting programme was initiated in the 1920's, but it was not until the mid-1960's that the annual planting rate could be expanded to a level considered necessary to satisfy the shortfall in Queensland's timber requirements. Initially, hoop pine, a native species, was mainly planted, but exotic pines have now for some years dominated the State's planting programme. The stage has now been reached where these plantations will soon take over the major role in producing timber. Dramatic increases in production are anticipated from these plantations over the next decade.

The primary objective of the Department's softwood planting programme is to meet the shortfall between the anticipated future demand for wood products, other than pulp and paper, and the available supply from native forests, privately-owned plantations and competitive interstate and

overseas imports by the year 2000. However, the programme is also designed to achieve important decentralization objectives:—

- Location of plantations close to major market centres within the State
- Development of a large-scale, integrated wood-using industry in the Gympie-Maryborough region, including a pulp/paper mill
- In the longer term, expansion of existing wood using projects or commencement of new projects in central and north Queensland.

Establishment of over 200 000 hectares of softwood plantations is considered necessary on State Forests to achieve these objectives, desirably over the next 10 years. The bulk of these plantations will be located between Bundaberg and Brisbane, but other major centres will be situated around Rockhampton and Ingham.

Special task forces have been set up to undertake planning projects of major significance to the management of these plantations:—

- Pruning policy
- Initial spacing in exotic pine plantations
- Clearfelling policy.

**Land Use:** The Department continues to make important contributions to various inter-Departmental and Local Authority land use committees, particularly:—

- Cooktown to Daintree study
- Proposed plantations in the Ingham-Cardwell area
- Cairns Hillslopes study.

Information was also provided for the Wide Bay-Burnett land use investigations and the Far North Queensland resources booklet. Discussions were held with the New South Wales Forestry Commission and the National Parks and Wildlife Service on forest management matters relating to the Scenic Rim-Border Ranges Region. Advice was given on proposals listed by the Australian Heritage Commission for the National Estate Register affecting State Forests and other lands of interest to the Department. Negotiations were continued with the National Parks and Wildlife Service on the availability of certain forestry lands considered suitable as National Parks.

Land use planning is an integral part of the Department's operation and was not confined to proposals instigated by outside bodies and organizations. Short-term logging and fire management plans are being prepared for several Districts in the State. As a longer term project, a formalized multiple use plan was commenced for

Reserves in the Conondale Range complex, and further plans of this nature are likely to be compiled for other areas of environmental and socio-economic significance. To assist long-term planning of this kind, the establishment of a forest resources data base is being investigated.

**Forestry Environment:** In addition to its direct responsibilities in this area under the Forestry Act, the Department has a two-fold responsibility in safeguarding the forest environment under the *State Development and Public Works Organisation Act 1971-1978*, firstly, as an "advisory body" to other developers and secondly as a "responsible authority" in relation to its own operations.

In its role as an advisory body, the Department has commented on several major proposals of potential environmental significance, particularly the *Proserpine River dam site*, the *Rundle oil shale proposal*, the proposed aluminium smelter at Gladstone, major transmission lines associated with the Tarong Power Station, the water supply pipeline for the Tarong Power Station feasibility study, the Upper Dawson River dam site investigations, the South-East Queensland pulpmill proposal and the *Pumicestone Passage planning study*.

More formalised control of logging operations to minimize damage to the environment is envisaged by incorporating general conditions in sale agreements relating to creek crossings, road, snig track and ramp locations and drainage. The Department supports the principles expressed in the CSIRO publication "Environmental Considerations for Forest Harvesting". In areas where exceptional environmental hazards exist, such as the Conondale Range, special logging guidelines have already been formulated.

Monitoring the effects of the Department's management activities on the forest environment is an ongoing function. Scientific Areas are used as bench marks with which modified environments are compared.

Second stage planning of the Department's hoop pine plantations has commenced as the older plantations reach maturity. The impact of clear-felling on the forest environment can be minimized by establishing suitable guidelines on the future of scrub breaks, the siting of roads, the possible retention of mature plantation with its well developed scrubby understorey along creeks and on very steep slopes. The size, shape and distribution of retained vegetation for the second rotation plantations and the type and extent of site preparation necessary for second rotation establishment will also be investigated. It is anticipated that design guidelines for hoop pine plantations will be issued to complement existing guidelines for exotic pine on the coastal lowlands.

A booklet is being prepared on Wildlife Regulation on State Forests and Timber Reserves to consolidate various policies currently found in





Kangaroos grazing in a firebreak in the Beerburrum State Forest.

numerous Departmental records. The objective is to provide a highly structured, quick access, information document dealing with the full range of wildlife regulation on lands under the control of this Department.

**Forest Recreation:** Recreation is generally regarded as the fastest growing avenue of use in Queensland and Australian forests. State Forests are anticipated to play a major role in satisfying this demand, particularly in providing the community with opportunities for enjoying and relaxing out-of-doors. State Forests also represent the largest remaining natural areas available to the Queensland public. With adequate planning, they can be managed to provide for a wide range of recreational activities without significantly reducing their ability to satisfy demands for other uses of the forests.

Planning for recreation involves forecasting likely usage levels for recreation, both in the short and long term, identifying forest areas with potential for recreation development, designing parks and forest drives, liaising with community groups and other Government Departments and ensuring that greatest benefit is gained from the funds available.

During the year, the design of two major new parks was commenced at Daisy Hill near Brisbane and at Bellthorpe near Woodford. Construction of Daisy Hill State Forest Park started late in the year and will be completed by the end of 1980. Bellthorpe State Forest Park will be the largest project of this type yet undertaken by the Department.

## CAPITAL REQUIREMENTS AND FUNDING

**General:** Funds expended by the Department originate from several sources:—

- State Consolidated Revenue Fund
- State Loan Fund
- State Trust and Special Funds
- Commonwealth Grants and Agreements.

Details on the availability and expenditure of the various sources are presented in Appendices to this Report.

The availability of State Loan funds each year is always a matter of concern to the Department, since it can have a major impact on the establishment of large plantation resources in key areas of

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the State. The planting programme constitutes the major activity of the Department in terms of expenditure, and is the largest employer of Departmental staff and other services.

In order to achieve the Department's objectives, it is desirable that overall funding of the reforestation programme should rise at a faster rate than costs generally, at least for the next decade or so. Funds would thus be adequate to finance—

- a relatively constant level of expenditure on the desired plantation establishment programme, and on the effective management of native forests, particularly their protection;
- increasing expenditure on the maintenance and protection of plantations as the overall size of the resource expands.

Inadequate or uncertain funding of the reforestation programme can lead to reductions in Departmental employment and can also indirectly delay the establishment of important wood-based industries at country centres where such development is urgently needed.

The Department is aware of the need to plan well ahead so as to seek to ensure adequate funds are made available. Planning of funding for its works programme is based on 5-year rolling plans which are re-examined annually. These plans form the basis for annual District and Divisional Budgets, and are tied into longer term planning studies of the Department's programmes.

The Department's responsibility as a major employer in many country centres rates highly among considerations in the programming of its works for the 5-year plans. In spite of this, employment on reforestation works has decreased progressively in recent years, due largely to the necessity to hold costs by increasing mechanization of operations during a period of rapid inflation. The workforce has now almost reached the minimum level considered necessary to protect the large capital investment in the State's forests.

Any further reductions could therefore not only have a direct impact on rural employment, but could place the forest estate at risk during high fire danger periods.

Unlike most other resource-based development projects, timber-using projects have the capacity to be managed in perpetuity and to support decentralized rural activity. It is also desirable that the resource be built up steadily to permit its most effective utilization. Both of these aspects are significant in assessing the need for funds.

The Government has clearly recognized these needs in the past. However, in view of a gradual decrease in the overall availability of loan funds in recent years and the cessation of the special grant for Fraser Island unemployment relief, the Department is facing a period when competition for funds is likely to increase. There would be considerable advantage in some form of funding ensuring at least a base level of finance on a longer term basis to facilitate forward planning of our operations.

**Economic Conditions:** Compared with the previous year, the year ending 30th June, 1980, was much brighter for the sawmilling industry, particularly in South-East Queensland where sawmills have been operating at full or near full capacity for most of the year.

This trend is reflected by the generally healthy state of the building industry. Preliminary estimates of new dwelling approvals for 1979-80 in Queensland show a 10.4 per cent increase over 1978-79 figures which were 13.1 per cent up on the previous year. The slight reduction in activity indicated here was not evident in the sawn timber market by the end of the year.

Costs to the Department continued to rise strongly during the year by as much as 20 per cent in some instances. Wage rates under the Forestry Employees Award increased by 9.5 per cent (weighted average basis) during the year, while the general level of prices, as measured by the Consumer Price Index (all groups Brisbane), rose by 9.7 per cent.

## Forestry Research



Laboratory Technician Robin Davis testing samples in an atomic absorption spectrophotometer.

## GENERAL

**Organization:** The Departmental research programmes cover work in the forest situation and work on forest products. The Department encourages communication between workers in both these areas, and also with forest and industry managers.

Over the years, links have been forged between research workers of the Department and other research organizations. Co-operative research projects with CSIRO Divisions of Forest Research, Soils and Building Research, the Universities of New England, Queensland and North Queensland and other research institutions located in Australia have been initiated. In addition, the Tree Breeding Section has taken the leadership in three series of international co-operative progeny studies of Honduras Caribbean pine, now established in 14 countries.

Routine/Research conferences have proven an effective means of communicating research findings to forestry practitioners. The 1979 Routine/Research Conference titled "The Planning, Establishment and Management of Hoop Pine Plantations" led to the development of a number of far-reaching recommendations, many of which have since been implemented.

Brief details of the Department's research programmes and results are provided, but complete details of the Department's research work are reported in "Research Report", a biennial publication, the next issue of which is due for publication at the end of 1980.

## PLANTATION RESEARCH

**Silviculture:** A trial extending over several years was initiated in 1978 to determine the time of cone collection in Honduras Caribbean pine plantations which gives maximum yield of viable seed. Results to date indicate that collections should be made towards the end of the third week in January at Kennedy and during the second week in February at Byfield.

Various fallow crops have been tested in the Toolara nursery. Autumn sown crops have not proved successful, but some of the spring sown legumes may be able to successfully replace the currently used Gatton panic.

Cultivation of sites prior to field outplanting of exotic pines is routine practice. On the poorly drained soils, mounding is also carried out. Several trials at age six years indicate that large mounds are superior to small mounds for

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Honduras Caribbean pine. This is not always the case for slash pine. Several experiments have recently been established to determine optimum mound sizes. The early growth in particular of Honduras Caribbean pine in these trials has been very impressive.

Several spacing trials have been established to test the effects of locality, site, initial spacing and thinning regime on the growth of Honduras Caribbean pine. In addition to these trials, wide-scale routine plantings have been established at a range of spacings to provide suitable material for future assessments such as estimation of extraction costs.

A seminar paper on pre-commercial thinning in Honduras Caribbean pine plantations highlighted the small volume loss incurred by non-commercial thinning to 750 stems per hectare before age four years. This loss is mainly in the small-size classes of lowest unit value. The cost of the thinning is more than recouped in the increased value of the stand, larger tree size, reduced extraction and processing costs, as well as improved wind stability after the stand recovers from thinning.

Greater use of machinery in commercial thinning operations within plantations has led to a widespread adoption of row-thinning regimes in which entire rows of trees at defined intervals are removed to facilitate extraction of thinned stems. Current investigations to determine the effect of row thinning on the long-term productivity of slash pine stands have indicated that where stands are reduced to the same basal area, there is little if any loss of growth compared with thinning of individually selected stems.

Research information to date indicates that value production in hoop pine is optimized with minimal loss of volume and other desirable tree characteristics by planting at much wider spacings than have been traditionally used. Wider spacings have been generally adopted on a routine basis. However, to fully evaluate all the implications, broadscale spacing trials over a number of centres have been established. Detailed records of all operations and costs are being kept. The data will be used to generate models to enable economic evaluation of the various spacings. Detailed studies of the responses of hoop pine trees to the spacings will be initiated, as will studies on the behaviour of weeds and rainforest regeneration.

Several plots have been established in hail-affected plantations of slash pine at Tuan in order to permit assessments of damage and monitoring of recovery and growth loss. In addition, advantage will be taken of the areas being clear-felled to initiate a large second rotation establishment trial.

**Tree Breeding:** The principal breeding programmes cover Honduras Caribbean pine, slash pine, hybrids of these two species, and the native

hoop pine. The Honduras Caribbean pine programme includes several major projects, the principal on-going one being the genetic improvement of the base population introduced from Belize, Mountain Pine Ridge. This is carried out through selection of superior individual trees, establishment of clonal seed orchards, and breeding the selected parents, both to progeny test those included in the orchards and to develop a superior second-generation base population. The principal activities within this project comprised the beginning of grafting in the Department's second major orchard complex at Cardwell and Byfield. This complex will supply seed requirements during 1987 to 2004.

Another major project of the Honduras Caribbean pine breeding programme is the study in multi-site trials of relative performance and breeding potential of populations throughout the range of the species. Data collected between ages 5.5 and 7.5 years covered information on growth, stem quality, windfirmness and wood properties. Preliminary results indicate that coastal sources have considerable genetic potential for rapid improvement of stem straightness and windfirmness. Attention is being given, therefore, to modification of current breeding strategy in order to take advantage of the promising attributes of the coastal populations. Pollen importation is one approach being considered.

During the year, a co-operative breeding project was established with A.P.M. Forests Pty. Ltd. aimed at accelerating the slash-Caribbean pine hybrid development programme.

More than 2 kilograms of F<sub>1</sub> hybrid seed, produced by means of mass pollination within the young, third slash pine seed orchard in which no pollen was produced, was obtained and prepared for sowing in the winter of 1980.

The hoop pine clonal seed orchards at Imbil and Taromeo flowered more heavily than ever before during the 1979-80 season. In this season, the flowering was delayed, probably due to the drought conditions earlier. It is not known whether the heavy flowering in the Imbil orchard this year was due to the thinning carried out in August, 1979, the drought, the ageing of the trees or other factors.

Most orchard clones produced a considerable amount of pollen, though not yet enough for adequate natural pollination of all female flowers. Therefore, supplementary mass pollination was carried out again in both orchards. Some 45 litres of pollen were applied to receptive female flowers using a gun and compressed air from a truck-mounted ladder. Trials were carried out using an elevating platform extending to 17 metres, and this proved highly satisfactory. A yield of 4 700 kilograms of dry seed (about 4 000 seeds per kilogram) is anticipated for the December, 1981 collection.



Technical Assistant Jennifer Smout taking a core sample of slash pine.

Exploration of and seed collection from possibly endangered occurrences of hoop pine and klinki pine continued in Queensland and Papua New Guinea. Additional plots were planted for *ex situ* conservation.

A survey of the occurrences of brown salwood in North Queensland was made, and a report was prepared which will be used as a basis for determining any action necessary for conservation of the genetic resources of this species, which has become of considerable importance for reforestation in some tropical countries.

The Tree Breeding Section is involved with joint research projects on studies of selected hoop pine progeny lines for variation of form; phenology of Caribbean pine provenances (both with the Australian National University); organ culture of hoop pine (with University of Queensland); and the supervision of a Departmental Ph.D. student working at the University of New England, Armidale.

**Soils and Nutrition:** Foliar analysis is now an accepted diagnostic tool to determine nutrient requirements of pines and has now been adopted on an operational basis for assessing any need for refertilizing established stands. During the year, about 10 000 hectares of slash pine plantations

aged between 10 and 22 years were sampled at Beerburrum, Toolara and Tuan; the need for refertilizing was established for some 4 000 hectares which will be fertilized during 1980 and 1981. The aim is to sample at about age 10 years which will involve some 4 000 hectares per year, i.e. roughly equivalent to the annual rate of planting in those age classes.

Field trials to define the optimum NPK requirements of Caribbean pine on three representative soils on the new planting front at Byfield have been established. These aim to confirm indications from glasshouse work and earlier field trials that multiple deficiencies of these same nutrients will need to be overcome for adequate growth in this area. Similar field work is being planned for the Lannercost–Abergowie area near Ingham; pot trials are currently screening a range of soils from this potentially important area for nutrient requirements.

Early growth following intensive site preparation and NP fertilizing at Wongi is most promising. However, 6 year-old trial plots in this area are now exhibiting multiple deficiency symptoms confirmed by foliar analysis. Glasshouse trials testing Wongi soils are just completed, and field fertilizer trials are being planned to sample the range of soil conditions present in this marginal, though strategically important area.

Over the last two years, salinity has been recognized as a problem for pine establishment on poorly drained shallow soils at Boonooroo, Elliott River and Byfield. It has become apparent that the salt tolerance of the major species, slash and Caribbean pines, is much lower than that of agricultural crops. Current work aims at defining the level of tolerance more precisely and relating this to identification of areas of potential hazard. These may be excluded from planting until ameliorative procedures are developed. New planting areas are now assessed for likely hazard based on soil conductivity readings, ahead of clearing operations.

Second rotation studies of hoop pine are now well established at Imbil. Growth on clean tended areas of both first and second rotation has been excellent—up to 1.5 metres in 18 months—with no response to added N or NP fertilizers. However, in the absence of clean tending, indications 18 months from planting are that second rotation stands have lower growth rates than first rotation stands, particularly where the site has been prepared. Grass competition would appear to be a major factor involved.

The first year's data are now available from a three-year comparative study of litter fall in an age series of hoop pine plantations and adjacent rainforests. These demonstrate that the productivity of the rainforests is at least as variable as that of the plantations, while litter fall in plantations tends to stabilize at around 20 years. This would indicate that canopy development has also stabilized at about that time with no further immobilization of nutrients. These studies perform a key role in measuring the long-term productivity of hoop pine plantations at Imbil and Yarraman and will be extended to encompass other aspects of nutrient and energy flow as staffing permits.

## NATIVE FOREST RESEARCH

**Rainforests:** Prediction of future yields from forests is critical for the long-term regulation of timber harvesting. The inherent complexities of rainforests, especially the large numbers of commercial tree species, pose difficulties for many aspects of their management, including yield prediction. Considerable research effort is being directed towards gathering an adequate data base for the projection of future yields from logged forests. Particular aspects receiving close attention include:—

- analysis of increments so that species can be grouped by meaningful "increment classes", which need to be related to the range of site and stand conditions commonly encountered;
- allowances for mortality, and for loss and log degrade associated with logging damage;

- improving the estimates of harvestable volume of standing trees from volume tables.

Long-term productivity of rainforests can be adversely affected by damage caused to retained trees by selective logging. Various methods of marking for logging are being investigated as a means of reducing damage.

Other trials are continuing to investigate damage from all phases of logging operations. Co-operative studies with CSIRO Divisions of Soils and Forest Research are investigating the effects of logging on soils and soil nutrients. Initial results show no measurable loss of nutrients, but rather a redistribution near disturbed areas.

**Hardwood Forests:** An impending shortage of round timbers has given impetus to research on eucalypt plantings on a range of environments in Queensland. At the same time, attention is being given to improving the level of resource information of the native hardwood forests.

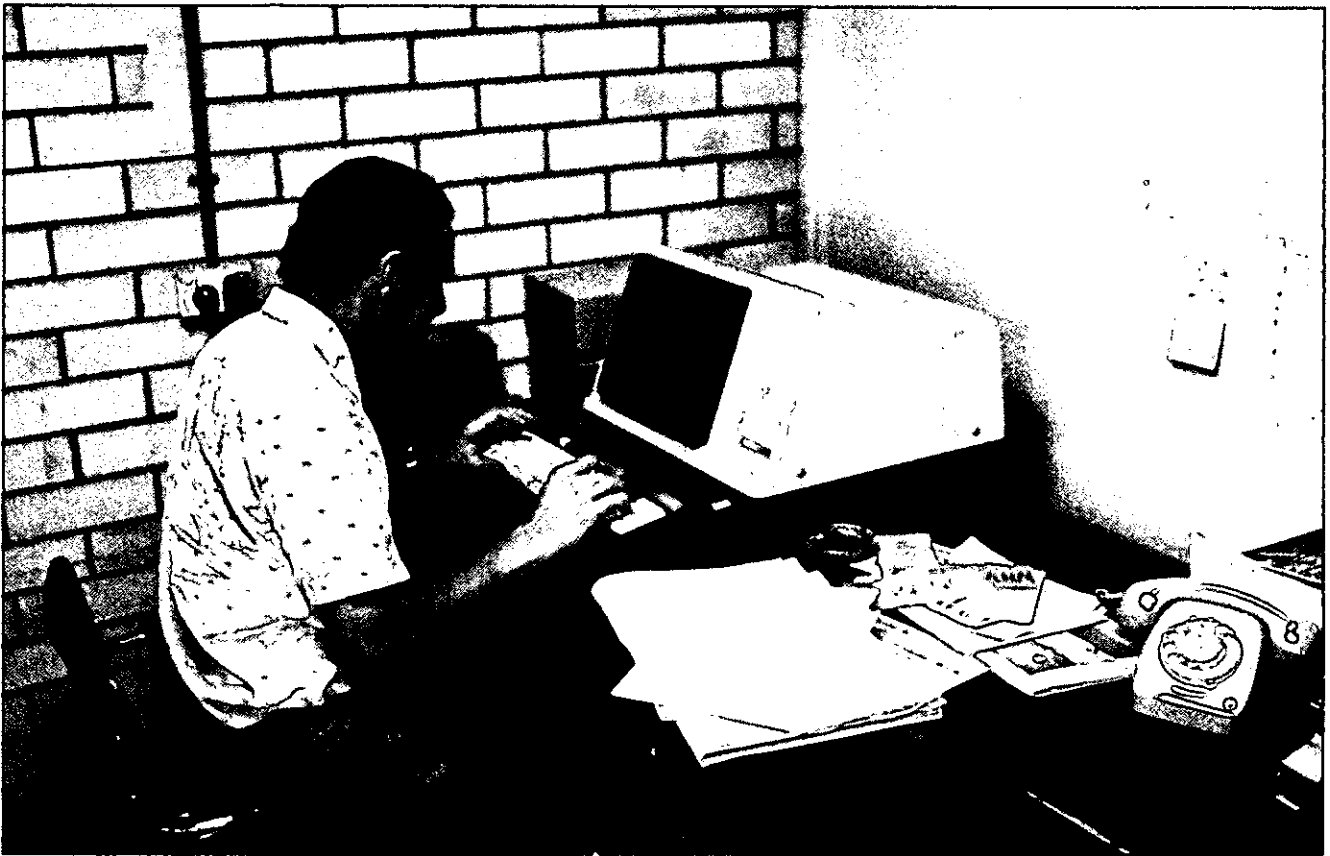
Concern over inadequate stockings of Sydney blue gum regeneration in areas being logged on the Calliope Range north of Monto has prompted new research in this area. Seed traps have been set up so that the timing and quantity of seedfall for that species can be determined. The information collected will assist in determining the most suitable method of regenerating the Sydney blue gum forest types. This may be achieved through timing logging and regeneration burning with seedfall or enrichment planting, to ensure the future productivity of these forests. An enrichment planting trial is planned for the coming year.

A general remeasure of hardwood detailed yield plots and experiments in Monto District was undertaken during the year. Information collected will be more appropriate to local requirements and will also be used in growth modelling work.

Improved pasture under a thinned spotted gum forest in a timber/pasture experiment at Neerdie near Gympie is continuing to show excellent growth despite dry conditions. Trees in the improved pasture block are displaying a 40 per cent advantage in diameter growth over that of trees in the thinned native pasture block.

Results of enrichment planting trials in logged satinay/brush box forests on Fraser Island show that survival and height growth of planted blackbutt, satinay and tallowwood 15 months after planting are excellent. Height growth of each species has shown a response to the addition of 100 gram/tree of an NPK fertilizer.

**Cypress Pine Forests:** Logs from cypress pine trees killed by wildfires in December, 1979, are being used in a study to determine the feasibility of using wet storage of logs to prevent degrade, a serious problem in salvage operations of this nature. Logs harvested at different times after the fire are being kept wet or dry (control) and will be sawn after set periods in storage.



Forester Neil Henry, Forest Research Branch, operating a remote computer terminal.

## PROTECTION RESEARCH

**Fire Protection:** Predictive modelling of fire behaviour and fuel dryness in exotic pine plantations based on data collected over a number of years is being attempted. The models, when finalized, will allow the prediction of fire rates of spread and flame heights from an input of such variables as moisture content of fine fuels, relative humidity, temperature, wind strength, rainfall and the length of time since rainfall.

**Forest Entomology:** Assessment of the impact of eucalypt dieback in South-East Queensland has been a major objective during the year. A detailed questionnaire, the initial basis of assessment, was widely circulated to landholders and other concerned individuals. The response has been extremely satisfactory and will give a picture of the extent of the problem and perhaps the causal agents.

A co-operative project with the Botany Department, University of Queensland, is examining possible relationships between water stress, insect damage and foliar nutrient concentrations in dieback-affected eucalypts. Monitoring of these variables has commenced for both dieback-affected and healthy trees on sites in native forest and on pastoral land.

Mite infestations in *Pinus* plantations in South-East Queensland have persisted at lower levels than in the previous year. No tree death has occurred, and investigations into their effect on growth rates are continuing.

Attempts to improve the impact of bio-control agents on noxious weeds have continued. The most promising results have been with a mealy bug attacking harrisia cactus.

**Forest Pathology:** Study plots, each containing about 140 trees, established in the *Armillariella* infected area at Toolara showed infections from 16.5 to 32.6 per cent for slash pine, and from 7.9 to 11.0 for Honduras Caribbean pine just 2½ years after planting.

Further inoculation studies have confirmed the high susceptibility of all three Caribbean pines to *Dothistroma septospora* and the low susceptibility of slash pine. Some slash and Caribbean pine hybrids were intermediate in susceptibility to the parental species, with one hybrid showing low susceptibility. Trials were undertaken on the timing of application of copper fungicide for control of *Dothistroma*, but final assessments will be completed in 1980-81. However, it is obvious that

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the comparatively dry summer in South-East Queensland was responsible for marked decrease in *Dothistroma* activity.

Studies on *Phytophthora cinnamomi* in tropical rainforests showed continuing increase in affected forests. A major review of this work is planned for 1980-81.

**Hydrology:** Hydrology research work has continued in both native forests and exotic pine plantations.

During the past 12 months, the focus of work in exotic pine plantations has shifted from Toolara to the Kuranda and Cardwell planting fronts.

At Kuranda, the combination of highly erodible soils and intense rainfall conditions has led to severe gully erosion at the time of establishment. Field work commenced during the 1979-80 wet season to investigate the impact of different site establishment techniques on reducing erosion generation and to determine the persistence of accelerated erosion following the development of the plantation stands and a grassy understorey.

At Cardwell, a number of small catchments covering a range of plantation age classes has been instrumented with rising stage sediment samplers to monitor the extent of any accelerated erosion and stream sedimentation associated with the plantation programme.

Native forest research has continued at the Wyvuri experimental catchments. The final stages of field work associated with the streamflow generation process studies were undertaken during the 1979-80 wet season. All field work in these catchments will be finalized by the end of 1980. The 10 years' work in these catchments has made a significant contribution to our understanding of the hydrology of rainforest ecosystems. With the widespread clearing of tropical rainforests in many areas of the world, the publication of results from these catchments continues to raise considerable international interest amongst hydrologists and land use planners.

**Environmental Research:** The Soils and Nutrition Section has accepted a low-key extension role in rehabilitation of area subjected to open-cut mining and related fields as far as tree establishment is concerned. Good liaison is now maintained with a number of industry groups in this area.

The selection and testing of ornamental and amenity species for drier inland areas continued with a further planting being undertaken at an arboretum at Mitchell. The harsh climatic conditions and soil type had resulted in low survival rates in earlier plantings of tubed stock, and, in the latest planting, advanced stock was used in an attempt to overcome the establishment problem encountered in dry inland areas.

A total of 26 Scientific Areas have now been designated on Queensland State Forests, while a much greater number of proposals is being evaluated. At this stage, most emphasis is being given to the incorporation of communities subject to modification by either the Department or lessees. Some of the more important proposals under consideration include—an excellent example of the very restricted western Queensland white gum; a substantial area of microphyll vine forest near Monto; complexes of rainforest communities in South and North Queensland; several examples of araucarian vine forests; a range of brigalow and brigalow-belah associations; the habitat of an isolated northern colony of fluffy gliders; a small area of wallum which has remained unburnt for more than 50 years and which includes the rare *Podocarpus spinulosus*, and a number of samples of coastal lowland communities at Wongi, Elliott River and Byfield.

There has been an increasing level of interest in Scientific Areas by external institutions, both in active formulation of proposals and continuing use of certain of the areas for scientific studies.

## FOREST PRODUCTS RESEARCH

**Timber Mechanics:** A programme testing a number of North Queensland rain forest timbers, presently regarded as "secondary" species in accordance with STEC guidelines to obtain strength property data, is continuing. This will allow the allocation of stress grades, thus facilitating the marketing of these timbers for building purposes.

A project was conducted to determine any effect of high temperature drying and vacuum pressure impregnation with C.C.A. salts on the bending strength properties of small clear specimens of Honduras Caribbean pine. The results show that C.C.A. treatment and high temperature drying do reduce the modulus of rupture and modulus of elasticity by small but significant amounts. The point is made that the same reduction may not be observed in structural sizes containing defects. This aspect is to be investigated.

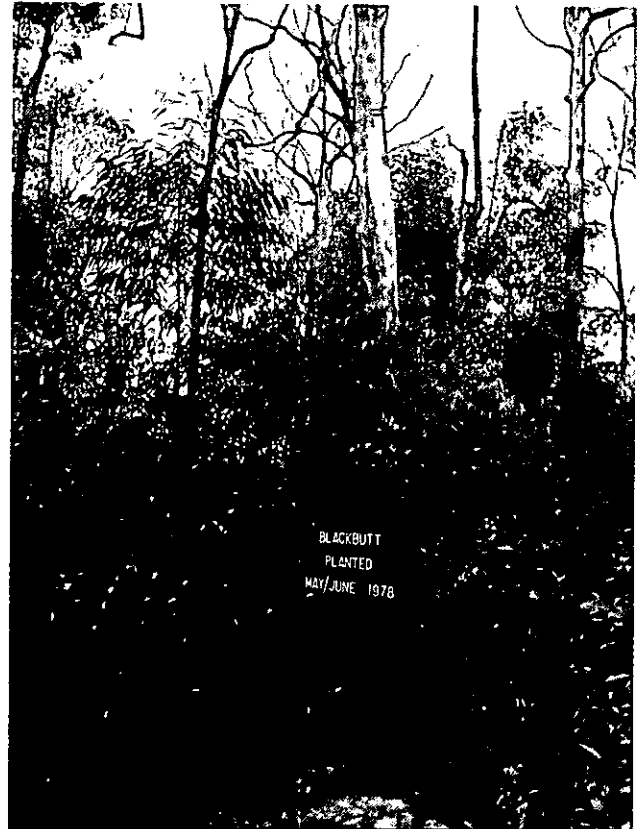
Data on the strength properties of Honduras Caribbean pine have been obtained from small clears in material ranging in age from 16 to 25 years. Further sampling and testing will be necessary before strength groups can be allocated with confidence.

Modulus of elasticity tests on cypress pine studs taken when green, and again when air dried, showed a small but significant increase in stiffness with drying. This could be of some importance in design of structures for use in higher wind loading situations.





An area of western white gum being considered for a Scientific Area.



Excellent development of blackbutt enrichment planting on Fraser Island.

**Wood Structure and Utilization:** Variation in basic density per cent latewood and extractives has been studied for six pulpwood logging fractions of slash pine from two major planting localities in South-East Queensland in relation to their effect on the internal bonding strength and on other characteristics of manufactured particleboard. The information derived from a collaborative study between the Department and a major manufacturer will assist in the quality control procedures of the process and in evaluation of the utilization potential of the softwood resource for reconstituted wood products.

The inheritance of wood characteristics in slash pine has been further investigated. Phenotypic and genotypic correlations for wood and some morphological characteristics have been calculated, and the response to individual tree, family and combined family/individual selection has been estimated.

One hundred and ten slash pine candidate trees, preselected on the basis of superior vigour, form and branching characteristics for inclusion in the Woodford seed orchard have been screened for acceptable wood quality features in a continuing tree improvement programme.

Further investigations have been undertaken of the wood quality of the hybrid stock of slash

pine and Cuban and Honduras Caribbean pines, together with the pure parental strains of these taxa taken from a 13-year-old planting on a well-drained site at Beerburrum. The wood of the hybrids was superior in texture and uniformity to that of slash pine.

Within-clone and between-clone variations in some important wood properties have been established for clones in the Imbil hoop pine seed orchard, providing an indication of their inheritance and potential for modification through breeding.

A collaborative study with A.N.U. of the phenology of vegetative and reproductive shoot development and growth in Honduras Caribbean pine at Beerburrum and Byfield is continuing. The phenology of wood development is being studied simultaneously by the Department.

Timber utilization trends in the Queensland building industry were continually monitored and new construction techniques or strong moves toward the use of certain building materials reported to industry through our Timber Utilization Newsletter.

The performance of C.C.A. treated softwood cladding and the platform flooring technique of building is being followed in the field. Our findings

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to date have influenced both ourselves and industry in our approach to grading, maintenance and utilization in these areas.

**Conversion and Seasoning:** Reports covering the graded sawn recovery of material from plantation grown slash pine and hoop pine at or near rotation age have been completed. The studies were undertaken in industry mills. They covered a wide range of stem sizes and included pruned and unpruned stems. The information will be useful in evaluating and modifying silviculture management techniques and will also provide indications of market values for the final crop stems of these species.

A similar study has been completed on younger Honduras Caribbean pine, grown at a range of basal areas. This should be useful in forecasting the timber quality that can be expected from this species. Computer analysis of the data is in progress.

Working plans have been finalized for recovery studies in candlenut, a common North Queensland rainforest species considered to be difficult to saw and season, cypress pine because of the change from a board to a framing market and slash pine in the Granite Belt where it shows a high incidence of resin streak and resin shake.

Solar kiln drying trials have continued in the Department's demonstration solar timber kiln. The kiln is operating quite successfully. One has been built by a local timber processor and others are planned. Considerable interest has been received from overseas—Papua New Guinea, Malaysia and New Zealand.

**Wood Chemistry and Preservation:** Hardwood stub trials in which various selections of preservatives and species were field tested for biological effectiveness have been completed. A complementary softwood pole stub trial conducted throughout Queensland has been initiated with the co-operation of commercial timber preservers, the State Electricity Commission and Electricity Boards.

Soft rot occurrence in treated hardwood poles in ground contact continues to command much of

the research activity of this section. The need for a suitable preservative for this situation is now recognized internationally.

The C.C.A. preservatives have been found to be ineffective against soft rot attack in Queensland although they give good protection against other fungi in out-of-ground situations. Unfortunately, some preservatives known to be effective against soft rot are not environmentally acceptable.

**Wood Entomology:** Laboratory studies into the susceptibility of Queensland timbers to the West Indian drywood termite and the powder post beetle are continuing. This work will be expanded to include the lyctids *Minthea rugicollis* and *Tristaria gromellei* and the exotic bostrychid *Heterobostrychus aequalis*.

## HARVESTING RESEARCH

**Harvesting:** Harvesting trials have continued in the exotic pine plantations south of Maryborough and at Beerburrum. The hoop pine centres of Yarraman and Imbil have also conducted trials.

A major trial in the exotic pines compared various outrow extraction systems with and without selective bay thinnings. As expected, straight out-row systems proved to be the cheapest extraction methods.

A Tree Extractor was trialed at Maryborough and Beerburrum to test the potential of removing and using pine stumps and roots from exotic pine plantations. The equipment was effective on sandy soils, but production rates were low. Initial indications are that the pulp produced was slightly inferior to that from normal log sections of the tree.

Following the Forest Industries Machinery Exposition in early 1980, a logging system was trialed at Beerburrum with a hydrostatically driven prime-mover incorporating quick change attachments for felling and delimiting. This equipment produced very high production rates for felling and delimiting, with acceptable delimiting standards achieved for entry to a pulp mill.

# Support and Extension Services



Inspector G. McDonald, Division of Technical Services, taking wood samples for lyctus susceptibility testing.

## SUPPORT SERVICES

**Electronic Data Processing:** Electronic Data Processing (EDP) activity in the Department is centered in Head Office and divided between commercial and technical interests. In general, commercial systems are developed and maintained by EDP staff in the Division of Administration, whilst technical systems are developed and maintained by EDP staff in the technical Divisions of Planning, Marketing and Technical Services.

**Commercial:** Activity throughout the year centered primarily on the development of two commercial systems—Plant Accounting and General Accounting. Stage 1 of the Plant Accounting system, plant hire expenditure, is nearing completion and design of Stage 2, maintenance of plant costs reporting, is proceeding.

**Technical:** Significant developments during the year included:—

### MANAGEMENT

- plantation management system—  
Enhancements to the yield prediction and reporting subsystems

Development of a management strategy economic analysis subsystem

Investigation and preliminary development of short and long term management planning subsystems using optimisation techniques to define plantation management strategies satisfying specified objectives

- Specific plantation projects—  
Definition of optimal plantation space-  
ment  
Definition of optimal pruning strategy

### MARKETING

- Redesign of the plantation inventory system
- Development of a rainforest inventory system
- Redesign and development of hardwood inventory and yield prediction systems
- Plantation timber pricing—  
Development of a stumpage pricing model for sawlogs  
Development of a cost of production pricing model for sawlogs and pulp-  
wood

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### RESEARCH

- The assemblage of computer files as a basis for increment functions and subsequent growth models for a range of native forests
- The revision of the site index table for rose gum as a preliminary step in the development of a growth model for this species
- A provisional one-way volume table for use in coastal hardwood forests, and major progress towards local one-way tables for cypress pine
- Correction tables which allow for the frequent stem defects in marketing of radiata pine
- Validation of the accuracy of an electronic log scanner installed at a large slash pine sawmill
- A programme for the design of randomized planting within seed orchards
- Upgrading of computer output for several major research programmes.

**Library:** During the year, the library has continued to provide services to both the staff of the Department and to the general public.

Current awareness was maintained by fortnightly issues of the "Contents List of Journals" to District centres, and the monthly "Library Accessions List"—two publications which inform staff regularly of all new items received in the library.

A new Library was established at the Gympie Research Centre with the amalgamation of collections from Beerwah, Imbil and Gympie Research Stations.

The use of the library and its facilities continued to increase—542 inter-library loans were obtained in addition to 6001 Head Office loans. Journal circulation amounted to 20 666 transactions and 12 bibliographies were compiled. The library answered over 1 000 requests for project material and information from school children.

**Survey and Mapping:** Field surveys carried out by the Department provide field markings and measurements for mapping and aerial photography control, plantation establishment, re-establishment of boundaries and Forest Entitlement Areas. Four Forest Entitlement Areas were surveyed during the period.

Other survey work undertaken included the assessment of forest products on areas subject to Conversion of Tenure applications and the gathering of plantation and native forest resource information. Sixteen survey parties operated during the year.

Mapping from aerial photographs will increase with the purchase of four 70 millimetre cameras. The 70 millimetre aerial cameras will largely replace the 35 millimetre cameras which have been used to gather forest information from centres at Brisbane, Maryborough and Ingham. Information which has been collected by aerial methods includes that relating to—clearing contracts; plantation establishment; roading; vegetation classification; damage by natural disasters; disease; land acquisition; and cultural features

A seminar entitled "Use of Small Format Photography in Forest Management" attended by senior Departmental staff, officers from the Public Service Board and other Departments, was held in April, 1980, to explain the use of 70 millimetre equipment for aerial surveys. These cameras will improve the quality of photography and allow larger areas of forest to be photographed.

Map revision work has increased since the introduction of low-level aerial photography, which provides forest information not previously recognized or recorded.

Sheet mapping series on the National grid system at scales 1:25 000 and 1:50 000 were continued during the year. Details of maps published by the Department appear in the "Pictorial Index of Survey and Mapping Activities" prepared by the Department of Mapping and Surveying.

FTY plans, which are the Department's official plans of gazettal of State Forests and Timber Reserves are prepared by the Department of Mapping and Surveying and lodged in the Office of the Conservator of Forests. Fifty-seven plans were proclaimed during the year.

The official naming of State Forests is also being undertaken. Seventeen names were assigned to State Forests under "The Queensland Place Names Act of 1958".

Throughout the year, 2 405 maps valued at \$5,940 were sold to the public or to other Government authorities from Head Office.

### EXTENSION SERVICES

**Biological Services:** Over the past year, there has been a dramatic rise in the number of enquiries received by the Biology Laboratory at Indooroopilly for information regarding insect pests and diseases of trees and timber. A total of 1 790 enquiries was recorded for the year, compared with 666 for the previous year. These figures do not include enquiries regarding the West Indian drywood termite, but no doubt increased public awareness generated by publicity given to this pest has been mostly responsible for the increase. While most enquiries can be adequately handled from the Laboratory, field



Forester Ray Robinson inspecting plants at Bunya Amenity Nursery.

inspections are carried out when considered warranted. Data collected through extension activities are of value in supplying information on the distribution of local insect pests and diseases and the introduction of exotic insects.

**Utilization and Timber Mechanics:** The Timber Utilization Branch has continued its investigative and supportive role in the timber industry, with many of the staff being closely associated at State and National Committee levels with the revision of existing standards and the preparation of new ones relating to wood and wood-based products.

Technical advice and assistance have been given to the public, industry, Government and semi-Government organizations regarding timber utilization; for example, assisting with problems associated with the use of large wooden cooling towers in power generating stations.

The sale of timber hand samples increased sharply this year to over 3 000, reflecting public interest in Queensland woods.

The day-to-day quality assurance strength testing service to industry has been maintained. This aspect is likely to increase in importance if compulsory grade branding is introduced as a requirement under the *Building Act 1975*.

**Wood Entomology:** The West Indian drywood termite eradication campaign is continuing and during the year, the fumigation of the major focus of infestation in the City of Brisbane was completed. Advertising campaigns to encourage public awareness during the past summer resulted in over 2 000 enquiries being processed. Some 40 suburban dwelling fumigations and the destruction or treatment of many pieces of infested furniture resulted from this campaign.

Renovative work in Parliament House after fumigation has proven that the treatment was totally effective and has also illustrated the severity of damage caused by the termite. There is no longer any doubt that it is a dangerous structural pest under local conditions.

**Timber Users' Protection Act:** The number of complaints involving T.U.P.A. has decreased proportionally when compared with the State building figures. Generally, however, there has been a genuine effort to comply with the Act. Inspectors based at Brisbane, Rockhampton and Atherton have been involved in extension services, seminars and displays in a concerted effort to improve consumer knowledge and to help not only the home owner but also the builder, merchant and sawmiller to avoid costly rectification problems.

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Timbers from interstate and overseas have been involved in nearly all T.U.P.A. complaints involving Lyctus susceptible timber.

Reports and complaints concerning unseasoned material have decreased. However, this area still presents greater economic problems than Lyctid attack because of the greater cost of rectification. It can readily lead to user prejudice against wood.

**Silvicultural Services:** An important function of the Department is the involvement with the general public in relation to advice sought on silvicultural matters, either in written or telephonic communication or by personal contact in the office. Information is also sought on remedial action to be taken in regard to sick and dying trees, destruction of dangerous trees, insect and fungal damage and control of forest weeds.

The Department offers ornamental and commercial plants for sale to the general public from its amenity nurseries, and regular advice is sought on selection of the most suitable species to be grown depending on localities, purpose for which trees are required, soil types, etc.

Advisory services are also offered in regard to sales of seed locally and overseas, relating to availability and suitability.

The Department has available a forest plot planting scheme to encourage the growing of trees on a commercial basis. Under this scheme, plants are supplied at concessional rates and information is provided on general management of the forest in regard to site preparation, fertilizing, weeding, protection, etc. The scheme applies to both plantation establishment and enrichment planting of native forests.

Another aspect of extension services provided by officers of the Department centres around talks given to schools and other bodies on tree propagation and related silvicultural aspects, and the arrangement of visits to Forestry nurseries and other forest areas of interest. There is an increasing use of the Student Work Experience programme, where selected school students are afforded the opportunity to work for a week with forestry personnel in a field of their choice.

The interest in the extension and advisory services mentioned above is evidenced by the increasing number of enquiries received from the general public.

## Administration



Forester Dave Jermyn conducting visitors on a forest walk at the Mt Mee Open Day in June.

## LEGISLATION

**Act Amendments:** Some minor amendments to the Sawmills Licensing Act were made during the year. These amendments provided for the maximum productive capacity to be expressed as a gross volume figure and for the formalization of the administrative procedure in regard to the replacement of licence documents or certificates of exemption which have been lost or destroyed.

A Departmental committee is undertaking a complete revision of "*The Timber Users' Protection Act of 1949*". This Committee is an advisory body which will present its findings to the Conservator. It was considered desirable that discussions be held with representatives from the Timber Industry and Timber User groups to exchange views on topics relating to the revision. These discussions have clarified some points and will assist the Committee in drafting its recommendations for the changes in the Act.

The Forestry Act is presently being reviewed, particularly in regard to multiple use of State Forests.

**Offences:** A total of 145 cases involving reported breaches of the Acts administered by the Department were investigated. Ninety of these cases were for alleged breaches of the Timber

Users' Protection Act, with the balance being alleged breaches of the Forestry Act, the majority of which were for unauthorized interference with marketable timber and other forest products.

Prosecution action has been initiated in nine cases, of which three have been finalized, two for unauthorized interference with epiphytes on State Forests and one for the unauthorized cutting and removal of round timbers on a Crown holding. The three offenders were convicted and fined a total of \$550.

In other cases, where it was considered there had been no deliberate attempt to defraud the Crown, or where there was insufficient evidence to sustain a prosecution, demands were made on the offenders for reimbursement of the Department's investigation costs and assessed loss of royalty value. A total of \$18,877 was recovered by way of those demands.

In addition to the abovementioned cases, Forest Officers also investigated three breaches of the Rural Fires Act.

## ACCOUNTING

**Procedures:** The Branch has updated cheque-drawing procedures, appropriation accounting and receipting systems with the acquisition of Data-Saab Electronic Accounting Systems.

The updating of the Department's Management Accounting system has been partially completed with the recent purchase of a second paper tape punch machine which will be used to run data from cheque drawings to provide information for management.

In conjunction with the management accounting system, information will be supplied to the budget system to give timely and meaningful information to managers in the field.

**Budgeting:** Budget control has to be exercised over all aspects of expenditure in regard to the various votes approved under the Consolidated Revenue, Loan, Forestry and Lumbering and Forestry Development Funds. Total expenditure in all funds in 1979-80 was \$44,347,000 against appropriations of \$45,237,000.

The Budget Committee is responsible for reviewing proposed expenditure and making allocations to Districts and Divisions under the various votes. Each District or Division is then responsible for the control and supervision of expenditure under its particular budget allocation.

The budget control system introduced has continued to be a very useful aid to management at both District and Head Office level. This is of particular importance in these times with limitation of available funds.

Because of the more accurate and timely information available, it has been possible to organize priority works confident that drastic curtailment would not be required at the end of the financial year because of shortfalls in the funds. Refinement of the job-costing code continues to improve the information available.

## PUBLIC RELATIONS

**Communication:** Because of the significant though mainly short-term visual impact of some of the Department's operations on the environment, good communications and relations with the public are essential to ensure understanding of its aims and objectives. For example, use of prescribed burning in both native forests and plantations carried out under mild weather conditions to reduce the fire hazard has been of tremendous value to the reduction of wildlife damage, but its use could easily be misunderstood by the public.

Apart from the media, contact is made through talks and discussions with schools, teachers and interested public and conservation groups, as well as the holding of open days and displays at both country and city shows.

The proposed appointment of an Information Officer will further assist the production of brochures and information sheets, which also are widely used to inform the public on the Department's operations and achievements.

**Visits to State Forests:** The community is encouraged to make greater use of State Forests for recreation, education, research, etc. Very successful open days were held at Mount Mee and Beerwah near Brisbane, which involved picnicking, sporting activities and conducted tours with forest officers through the forest to see some of the Department's operations and results.

Further afield, open days were conducted by Departmental staff at Atherton and Bundaberg. Thousands of people attended the days and were given a better appreciation of the Department's activities.

The community's use of forests for recreation is also encouraged through the establishment of State Forest Recreational Parks and Forest Drives. High quality facilities are provided at Recreational Parks for picnicking and camping, as well as on self-guided Forest Drives. Annual visitations are increasing by about 15 per cent.

A field week-end was held in State Forests of the Conondale Range and attended by members of several conservation groups, National Parks and Wildlife Service, local timber industry and this Department. The purpose of the week-end was to provide opportunity for interest groups to comment on and discuss management proposals for the Conondale State Forests and National Parks. The week-end brought together the various groups for the first time and proved a most rewarding experience for those who attended. As a result, there is much better understanding by the various groups of the future management intended for this important area.

**Displays:** As part of Timber Week '80, a lunch-time display of wood-working skills was held in Brisbane's King George Square. Many people were able to see for the first time the uses of a broad axe, adze and cross-cut saws. The Department is involved with displays in many country shows such as Warwick, Dalby, Chinchilla, Murgon, Monto, Rockhampton, Cairns, Atherton and the Royal National Association Exhibition in Brisbane. These displays proved to be very valuable in communicating with the public on the role of the Department.



## Personnel



North Queensland District field staff undertaking instruction in resuscitation techniques.

## STAFF DEVELOPMENT

**Staff Establishment:** As at 30th June, 1980, the Department's approved salaried staff establishment was 645. Actual staff level at 30th June, 1980, was 632 salaried officers and 1 192 wages employees. Appendix 16 provides details of staff levels, and the high proportion of technical and graduate staff, totalling 245, is noteworthy.

Fifty-nine salaried officers left the Department during the year, including eight officers who retired after lengthy periods of meritorious service.

During the year, 11 officers from the Department were appointed to positions in other Departments, with nine officers from other Departments being appointed to positions within the Department. This movement across the Service has no doubt been stimulated by the recent extension of right of appeal for certain classifications. Whilst there were some misgivings initially with the scheme, it is obviously now well accepted, with the staff and the Service benefiting in the long term.

Approval was granted to create the following specialist positions:—Timber Research Officer; Economist; Budget Officer; and Information Officer.

These positions were offset against vacant positions which were considered to be of lower priority.

These specialist-type officers are needed to meet the changing workloads within the Department and the increased complexity of administration.

**Work Environment:** Head Office staff were relocated into Mineral House near the start of the financial year. The greatly improved facilities are contributing considerably to efficiency and effectiveness.

New premises were rented at Bundaberg and Ingham to provide improved working conditions for staff.

When the idea of a Forestry Complex at Gympie was conceived many years ago, it envisaged the construction of a Forestry Training Centre, District Forestry Office, Forestry Research Centre, a mechanical workshop and a Forestry Museum on the one site.

The Forestry Training Centre, which was completed and opened by the Honourable the Premier in 1978, is now well established. The workshop was completed during 1979.

The close of the current financial year saw the completion of the second stage of the Gympie complex with the official opening on 20th June, 1980, of the new District Forestry Office and Forestry Research Centre by the Honourable N. E. Hewitt, M.M., A.F.M., M.L.A., Minister for Lands, Forestry and Water Resources.

The District Office caters for staff formerly located in Channon Street, Gympie, and includes accommodation for the library, conference room, staff room and a large foyer to feature timber displays.

The Research Centre will co-ordinate the many aspects of forest research on a regional basis for the whole of coastal Queensland.

The Complex, which will provide for a staff of approximately 65, is already attracting widespread attention both in Queensland and elsewhere as being the most outstanding combined forestry training, research and administrative concept in Australia.

Improvement is still required for particular sections of the Department. The use of temporary accommodation for several sections of the Timber Utilization Branch staff located in Brisbane has resulted in fragmentation of the branch, with consequent difficulties in communication and in provision of public services. It is hoped that the construction of the proposed Indooroopilly Laboratory to house all Brisbane based research staff will ultimately help considerably in overcoming this problem.

**Education and Training:** The Department supports and encourages its staff in the area of education and training.

It is particularly pleasing to note that 54 officers are currently undertaking formal education courses under the State Public Service Study Assistance Scheme. The past year has seen five officers satisfactorily complete their courses and a further 15 officers commence new courses.

Of particular note is the increasing number of clerical staff undertaking voluntary part-time study. Of the 15 officers starting new courses in 1980, nine were clerical officers.

The nature of voluntary courses being undertaken varies from Senior Matriculation through to Diploma in Industrial Relations, Bachelor Degrees in Management, Accounting, Computing and Science and Masters Degrees in Science and Environmental Studies.

In addition, many officers are undertaking obligatory studies as part of their technical training and progression. Examples of these are Cadets Cartographic Drafting and Laboratory, Technical Assistants, Technicians and Drawing Office Aids.

A number of officers have recently been awarded higher degrees:—G. Bacon and J. J. Reilly, both Ph.D.s from the Australian National University, Canberra; A. R. Don, Master of Environmental Studies, University of Adelaide; W. J. Fisher, Master of Natural Resources, University of New England, Armidale; and J. Norton, post-graduate Diploma in Business Administration, Queensland Institute of Technology, Brisbane.

Various external training courses and workshops have been attended by some of our staff. These courses have been run mainly by the Australian Institute of Management and the Queensland Institute of Technology, with some of our officers attending specific short courses on Interviewing and Public Speaking.

Internally, priority has been given to inservice training and improvement in communication. Departmental seminars and workshops undertaken during the year include Harvesting and Marketing Seminars, Research Schools, Survey and Mapping Seminars, and schools for fire protection and weed control. These seminars undoubtedly have assisted with the development of a greater level of technical skill and understanding in Departmental staff.

The Management Services Branch has been of particular assistance in organizing and assisting with the development of courses not only for existing staff, but also for inducting new appointees.

It is presently developing a comprehensive State-wide course on *Written Communication* to operate during the coming year.

**Forestry Training Centre:** The Training Centre was set up mainly to provide the Department's technical training requirements for wages and sub-professional staff for the Department's field and research operations.

The course covers four semesters over two years at the Centre which has residential accommodation and is completely funded and conducted by the Department and its staff.

The first 20 forest trainees began their formal instruction at the Centre in August, 1979. Two semesters have now been completed and the following subjects presented:—

Botany	Ecology/Dendrology
Geology	Meteorology
Utilization 1	Marketing Practices I
Surveying	Fire Protection
Mensuration	Forest Administration
Communications	

As forestry is by nature largely a field operation, the course is heavily field oriented with at least half of the available time devoted to practical exercises. Particular emphasis has been



Head Office staff competing in an annual raft race on the Brisbane River.

placed on developing leadership qualities amongst the trainees, as this is considered critical for their eventual success as supervisors.

Trainees graduating from the course are appointed Overseer III but, with promotion, can progress to technician and ranger level.

The Board of Studies for the Training Centre, consisting of three officers each from the Technical and Further Education (TAFE) Section of the Department of Education and the Department of Forestry, is determining a basis for accreditation of trainees who successfully complete the course in 1981.

Tentative enquiries have already been received from Fiji and Sudan and also from the Australian Development Assistance Bureau (A.D.A.B.) about the willingness of the Department to conduct short-term courses for students from various developing countries. The extent of this interest is very gratifying and reflects the limited global training facilities available for tropical forestry whilst recognizing the Department's expertise, particularly in the field of plantation management. Though the cost of such training would be borne by the countries concerned, it would require additional forestry teaching staff.

Apart from regular use of the Training Centre also for Departmental short-term in-service training courses for both wages and salaried staff, requests to use the Centre's facilities by outside organizations and Departments has continued to grow and has exceeded all expectations.

During the year, further Management Development Courses were run at the Centre by the Public Service Board, and the Local Government association conducted an inaugural workshop.

Other users included the Timber Industry Training Committee with a Hardwood Tree Fellers Course and other Government Departments and instrumentalities.

**Overseas Travel:** W. J. Smith, Officer in Charge, Wood Structure and Utilization, Division of Technical Services, visited Brazil, northern Argentina and Belize in October–November, 1979. As nominee of Division V of I.U.F.R.O. (Forest Products), he presented an Invited Position Paper on "The Utilization Potential of the Araucarias", and other papers by Queensland colleagues to a I.U.F.R.O. meeting on "Problems of Araucaria Silviculture" in Curitiba, Brazil. He also inspected plantations, research establishments and wood processing and utilization plants and practices in Brazil, Argentina (Misiones) and Belize. This tour was subsidized by F.A.O. and two Brazilian Universities.

Mr P. Hawkins, Director of Marketing Division, visited New Zealand during May under the New Zealand/Australia Forest Officer exchange scheme. Whilst in New Zealand, he inspected forest operations in both the North and South Islands, with particular reference to the harvesting and marketing aspects and the wood-processing industries.

F.A.O. Fellow Wasito Hadi of the Indonesian Directorate of Forestry was attached to Tree Breeding Section for six months on-job training and study of tree-breeding techniques and strategies.

**Safety:** The improvement in the Lost Time Injury Rate for the year reflects the efforts of our Safety Committees, the dedication of many officers throughout the State and the conscientious efforts of our workmen. North Queensland District is

commended for maintaining a decrease in its injury rate over 6 consecutive years and, with a Lost Time Injury Rate of 48 this year, has won the Minister's Safety Shield.

It is very pleasing to report that the largest District, Gympie, achieved a 31 per cent improvement in its safety performance to win the Conservator's Shield.

The value of personal protective apparel has been demonstrated again this year, with three more workmen escaping serious injury or death through the wearing of safety helmets. Other reports clearly justify the value of safety footwear and eye protection.

First Aid and Defensive Driving Courses have continued throughout the year, and short courses on Manual Handling and Resuscitation have been conducted in a number of Districts.

Improvements to the safety programme are envisaged through the use of a safety manual, further training of District Safety Officers and Supervisors, with emphasis on safety analysis of work tasks and techniques of instructing.

## ORGANIZATION

**Structure:** The Department's overall structure consists basically of five Head Office Divisions, 10 Forestry Districts which are divided into Sub-Districts, the new Forestry Research Centre at Gympie, and various Research Stations at Atherton, Byfield, Dalby and Yarraman.

The only major organizational change effected during the year concerned the amalgamation and relocation of the research staff from the Beerwah, Yarraman and Imbil Forestry Research Stations at the Gympie Forestry Research Centre. Several

specialist positions, such as the Information Officer, Economist, etc., were created by offsetting to cope with the changing workload requirements of the Department.

Improvement in silvicultural and harvesting techniques, alteration of silvicultural work programmes, amalgamation of work centres, together with the varying availability of funds, all involve changing workloads throughout the Districts and within Head Office, necessitating regular revision of the Department's organization. These reviews have resulted in several vacancies being used to offset the creation of new positions.

**New Development:** The Department's Development Committee, which is comprised of representatives from each Division and District and the Gympie Forestry Research Centre and works closely with officers of the Management Services Branch, made a special study in each representative's area of the need for Personnel Services. The report of the Development Committee strongly recommended the creation of a Personnel Services Section, and this is currently being considered for possible implementation.

It is particularly pleasing for me to report a continuation of the growth and achievements during the year with the knowledge that the increased efficiency has been substantially due to the loyal and efficient service of staff members. I sincerely thank all those involved and acknowledge and record my appreciation.

To all those officers who retired during the year after many years of dedicated service, I wish you a long and happy retirement.

W. BRYAN,  
Conservator of Forests.

## Appendices

## APPENDIX 1

STATE FORESTS AND TIMBER RESERVES LISTED BY DISTRICTS AND  
SUB-DISTRICTS AT 30th JUNE, 1980

District	Sub-District	No. of Reservations	State Forest Areas (hectares)	No. of Reservations	Timber Reserve Areas (hectares)
Brisbane	Beerburum Brisbane	23	53 741.924 7	2	256.518
		26	50 024.713	6	4 577.419 1
	Total	49	103 766.637 7	8	4 833.937 1
Dalby	Chinchilla- Barakula Dalby Roma	18	450 923.792	1	5 768
		12	225 684.325	2	150.203 3
		39	298 092.323	2	19 750.08
	Total	69	974 700.44	5	25 668.283 3
Gympie	Gympie Imbil Toolara	25	33 940.074	..	..
		9	57 604	1	0.209 4
		5	63 380.35	..	..
Total	39	154 924.424	1	0.209 4	
Maryborough	Bundaberg Maryborough Tuan	17	113 167.25	14	20 041.546
		24	222 571.299	7	9 427.6
		6	64 776.3	2	24.909 9
Total	47	400 514.849	23	29 494.055 9	
Monto	Kalpowar Monto	8	28 140.453	9	18 198.374 9
		39	300 340.971	7	7 466.852
		Total	47	328 481.424	16
Murgon	Jimna Murgon	4	46 242	1	2 000
		21	91 591.511	6	5 610.498 3
	Total	25	137 833.511	7	7 610.498 3
North Queensland	Atherton Ingham	31	367 436.257	26	311 313.198 6
		17	237 132.234	2	798.4
	Total	48	604 568.491	28	312 111.598 6
Rockhampton	Emerald Mackay Rockhampton	12	109 981.18	8	117 817.1
		19	95 508.721	12	28 923.92
		36	480 250.282	7	38 423.318
	Total	67	685 740.183	27	185 164.338
Warwick	Inglewood Warwick	30	203 535.647	..	..
		18	43 312.54	1	129
	Total	48	246 848.187	1	129
Yarraman	Benarkin Yarraman	4	30 873	1	5.124
		20	47 571.689	6	4 641.698
	Total	24	78 444.689	7	4 646.822
State Total . . . . .		463	3 715 822.835 7	123	595 323.969 5

APPENDIX 2

RESERVATION FIGURES FOR THE YEAR ENDING 30th JUNE, 1980

Reservation	No. of Reservations	Area (Hectares)
<b>STATE FORESTS</b>		
Adjusted figures as at 1st July, 1979 .....	462	3 609 652.451 7
Declared .....	+ 8	+ 18 221.674
Declared and added to existing State Forests .....	..	+ 87 457.200 4
Timber Reserves declared State Forest .....	+ 1	+ 240.7
Timber Reserves declared State Forest and amalgamated with existing State Forests .....	..	+ 1 525.5
Recomputation of boundaries .....	..	+ 844.396 6
Amalgamation of existing State Forests .....	- 8	..
Parts of State Forests released for other purposes (National Parks, road openings, etc.) .....	..	- 2 119.087
<b>Total as at 30th June, 1980 .....</b>	<b>463</b>	<b>3 715 822.835 7</b>
<b>TIMBER RESERVES</b>		
Adjusted figures as at 1st July, 1979 .....	130	589 206.399 5
Declared State Forest .....	- 1	- 240.7
Declared and added to existing Timber Reserves .....	..	+ 12 957
Amalgamation of existing Timber Reserves .....	- 2	..
Declared State Forest and amalgamated with existing State Forest .....	- 1	- 1 525.5
Timber Reserves released for other purposes .....	- 3	- 4 390.6
Parts of Timber Reserves released for other purposes ..	..	- 632.63
Recomputation of boundaries .....	..	- 50
<b>Total as at 30th June, 1980 .....</b>	<b>123</b>	<b>595 323.969 5</b>

APPENDIX 3

NET AREA OF NEW SOFTWOOD PLANTATION ESTABLISHED

1st APRIL, 1979 to 31st MARCH, 1980

— Hectares —

District	Native Conifers			Exotic Conifers				Total Conifers
	Hoop Pine	Bunya Pine	Total Native	Slash Pine	Caribbean Pine	Other Exotic Conifers	Total Exotic	
Erisbane .....	47	..	47	557	95	14	666	713
Gympie .....	279	..	279	496	75	88	659	938
Maryborough .....	..	..	..	2 795	1 619	193	4 607	4 607
Monto .....	53	..	53	..	..	..	..	53
Murgon .....	275	..	275	..	..	..	..	275
North Queensland .....	..	..	..	..	660	24	684	684
Rockhampton .....	..	..	..	..	145	..	145	145
Warwick .....	..	12	12	..	..	19	19	31
Yarraman .....	254	..	254	..	75	..	75	329
<b>Total .....</b>	<b>908</b>	<b>12</b>	<b>920</b>	<b>3 848</b>	<b>2 669</b>	<b>338</b>	<b>6 855</b>	<b>7 775</b>

APPENDIX 4

\*NET AREA OF EFFECTIVE SOFTWOOD PLANTATION AS AT 31st MARCH, 1980

— Hectares —

District	Native Conifers				Exotic Conifers				Total Conifers
	Hoop Pine	Bunya Pine	Other Native Conifers	Total Native	Slash Pine	Caribbean Pine	Other Exotic Conifers	Total Exotic	
Brisbane .....	1 396	7	4	1 407	13 298	1 004	1 947	16 249	17 656
Gympie .....	11 760	231	36	12 027	21 925	1 125	367	23 417	35 444
Maryborough .....	1 481	3	29	1 513	25 289	4 387	267	29 943	31 456
Monto .....	2 677	1	1	2 679	22	3	13	38	2 717
Murgon .....	7 790	128	1	7 919	..	..	46	46	7 965
North Queensland .....	1 035	1	117	1 153	5	3 438	139	3 582	4 735
Rockhampton .....	262	..	1	263	1 010	4 534	58	5 602	5 865
Warwick .....	13	13	1	27	339	..	2 334	2 673	2 700
Yarraman .....	13 880	126	4	14 010	535	361	1 893	2 789	16 799
Total .....	40 294	510	194	40 998	62 423	14 852	7 064	84 339	125 337

\* Previous figures corrected for write-offs, boundary recomputation and re-checks.

APPENDIX 5

\* NET AREA OF EFFECTIVE BROADLEAVED PLANTATION AS AT 31st MARCH, 1980

— Hectares —

District	Native Forest Hardwoods					Other Broadleaved Species	Miscellaneous Experimental Species	Total
	Rose Gum	Grey Ironbark	Blackbutt	Other Native Forest Hardwoods	Total Native Forest Hardwoods			
Brisbane .....	130	84	93	42	349	..	24	373
Gympie .....	531	157	111	165	964	89	11	1 064
Maryborough .....	..	..	48	1	49	2	40	91
Murgon .....	8	6	4	..	18	9	1	28
Rockhampton .....	..	..	..	1	1	1	5	7
North Queensland .....	1	14	..	15	30	134	12	176
Warwick .....	..	..	..	..	..	1	10	11
Yarraman .....	70	133	..	4	207	84	33	324
Total .....	740	394	256	228	1 618	320	136	2 074

\* Previous figures corrected for write-offs, boundary recomputation and re-checks.

APPENDIX 6  
OPERATIONAL STATISTICS

Operational Statistics	1978-79	1979-80
Nursery Stock Produced for Departmental Plantation Establishment Purposes (number)		
Hoop Pine—		
Container .....	856 000	1 046 600
Caribbean Pines—		
Container .....	1 046 000	688 000
Open Root .....	1 042 000	2 848 500
Ocote Pine—		
Container .....	63 000	2 600
Slash Pine—		
Open Root .....	5 574 000	6 304 500
Radiata Pine—		
Open Root .....	139 207	23 700
Loblolly Pine—		
Open Root .....	11 000	61 300
Slash/Caribbean Hybrid—		
Open Root .....	Nil	266 000
Eucalypts—Container .....	*71 266	66 900
Plantation Establishment .....	6 827 ha	7 775 ha
Seedlings Sold (Forest Plots)—		
Number .....	275 695	225 070
Seedlings Sold (amenity Stock) Number.....	142 566	174 898
Total value of seedlings sold.....	\$141,398	\$138,618
Seed Sold—		
Value .....	\$35,471	\$55,219
Weed Control—		
Native Pine Plantation .....	22 549 ha	17 151 ha
Exotic Pine Plantation.....	11 695 ha	14 092 ha
Fertilizing—		
New Areas Fertilized.....	7 235 ha	5 312 ha
Old Areas Refertilized.....	2 509 ha	4 289 ha
Pruning—		
First .....	1 632 ha	1 754 ha
Second .....	2 149 ha	1 839 ha
Operative Plant as at 30 June—		
Motor Vehicle and Trucks.....	459	457
Graders .....	23	20
Rubber-Tyred Tractors and Loaders.....	88	87
Crawler Dozers.....	49	46

\* Corrected figure.

APPENDIX 7  
AREAS OF NATURAL FOREST TREATED 1979-80  
— Hectares —

District	Eucalyptus Forest	Cypress Pine Forest	Total
Brisbane .....	104	..	104
Dalby .....	..	6 534	6 534
Gympie .....	17	..	17
Maryborough .....	417	..	417
Monto .....	220	..	220
Warwick .....	..	1 715	1 715
Rockhampton .....	423	..	423
Total .....	1 181	8 249	9 430



APPENDIX 8  
MILLING TIMBER REMOVALS FROM \*CROWN LAND

— Cubic Metres Gross Measure —

a—1979-80  
b—1978-79

District	Native Forests										Plantations				
	Forest H'woods	Rainforest Structural Timbers	Prime Cabinet Woods	Misc. Cabinet Woods	Hoop, Bunya, Kauri, Pines	Cypress Pine	Other Pines	Total Native Forests	Native Conifers	Exotic Conifers	Non-Conifers	Total Plantations	Total		
Brisbane	a	28 787	103	18	85	192	217	29 402	..	45 676	..	45 676	75 078		
	b	30 681	68	..	68	575	109	31 501	..	49 859	..	49 859	81 360		
Dalby	a	23 182	..	..	..	..	105 414	128 596	..	..	..	..	128 596		
	b	27 016	..	..	..	..	99 411	126 427	..	..	..	..	126 427		
Gympie	a	27 130	1 364	10	1 056	2 500	..	32 060	37 095	4 814	..	41 909	73 969		
	b	23 832	1 201	1	944	1 965	..	27 943	32 307	7 858	120	40 285	68 228		
Maryborough	a	55 092	72	29	8	18 766	574	74 541	..	28 798	..	28 798	103 339		
	b	43 700	189	34	19	18 483	..	62 425	204	9 423	..	9 627	72 052		
Monto	a	29 767	108	11	6	13 344	..	43 236	5 798	..	..	5 798	49 034		
	b	19 503	90	1	1	9 043	..	28 638	3 666	..	..	3 666	32 304		
Murgon	a	32 181	314	1	65	5 016	..	37 577	10 030	136	..	10 166	47 743		
	b	28 930	955	10	342	5 804	..	36 041	7 328	440	..	7 768	43 809		
North Qld	a	10 954	67 322	38 400	59 086	10 354	..	187 476	155	..	..	155	187 631		
	b	9 810	53 773	36 655	47 779	6 026	..	155 271	269	..	..	269	155 540		
Rockhampton	a	46 259	10 034	250	2 172	1 049	1 310	61 079	..	6 283	..	6 283	67 362		
	b	38 634	8 931	210	980	1 300	2 177	52 253	..	1 655	..	1 655	53 908		
Warwick	a	5 781	2 160	..	..	589	24 460	32 900	..	7 214	..	7 214	40 204		
	b	3 914	2 436	..	..	..	24 436	30 786	..	7 055	..	7 055	37 841		
Yarraman	a	5 576	448	..	100	3 257	..	9 381	33 239	17 946	88	51 273	60 654		
	b	6 803	287	4	53	3 603	..	10 750	29 683	13 466	187	43 336	54 086		
Total	a	264 709	81 925	38 719	62 578	55 067	131 975	636 338	86 317	110 867	88	197 272	833 610		
	b	232 823	67 930	36 915	50 186	46 799	126 133	562 035	73 457	89 756	307	163 520	725 555		

\* Including State Forests and Timber Reserves.

APPENDIX 9

PULPWOOD REMOVALS FROM \*CROWN LAND

— Cubic Metres Gross Measure —

a—1979-80  
b—1978-79

Forest	Species		District					Total
			Brisbane	Gympie	Maryborough	Murgon	Yarraman	
Plantation	Native	a	..	8 983	..	2 358	35	11 376
	Conifers	b	..	8 230	133	2 766	58	11 187
Plantation	Exotic	a	31 469	15 625	26 704	..	2 134	75 932
	Conifers	b	18 258	15 264	18 386	20	2 774	54 702
Native Forest	Non-	a	..	..	..	..	1 070	1 070
	Conifers	b	..	..	..	..	5 300	5 300
TOTAL		a	31 469	24 608	26 704	2 358	3 239	88 378
		b	18 258	23 494	18 519	2 786	8 132	71 189

\* Includes State Forests and Timber Reserves.

APPENDIX 10

MISCELLANEOUS REMOVALS FROM \* CROWN LANDS

1978-79	Product	1979-80	Unit
207	Sleepers—		
44 743	1.2 metres	1 150	pieces
400	1.5 "	89 231	"
2 114	1.8 "	360	"
215 119	2.0 "	12 485	"
	2.15 "	209 925	"
	2.3 "	56	"
5 725	2.4 "	14 661	"
	2.5 "	500	"
692	Transoms, headstocks, crossings, etc. ....	873	cubic metres
22 000	Girders, Corbels, Piles and sills .....	21 444	metres
91 380	Poles .....	127 401	metres
34	House Blocks .....	37	metres
84 741	Fencing material—round .....	102 894	metres
135 527	Fencing material—split .....	255 788	pieces
92 488	Mining timbers—round .....	94 247	metres
292	Mining timbers—sawn .....	412	cubic metres
4 462	Mining timbers—others .....	5 090	pieces
462	Offcuts .....	698	cubic metres
525	Head and limb logs .....	412	cubic metres
4 729	Fuelwood .....	3 280	tonnes
702 683	Quarry material (sand, gravel, soil, etc.) ..	926 860	cubic metres
..	Bridge timbers .....	227	cubic metres
..	Turnout timbers .....	134	cubic metres
222	Black wattle .....	7	pieces
49	Freestone .....	50	cubic metres
311 bags	Peat .....	16	tonnes
..	Leaf mould .....	11	bags
66	Tea tree bark .....	56	cubic metres
..	Ironbark bark .....	42	bags
..	Other bark .....	6	tonnes
29	Charcoal .....	61	tonnes
33	Beehives .....	22	hives
..	Pot containers from a hollow log .....	4	pieces
7.5	Lawyer cane .....	8	tonnes
..	Shale .....	55	cubic metres
..	Slate .....	3	cubic metres
7	Crows nest .....	8	tonnes
..	Orchids .....	1 506	pieces
8 604	Flora (epiphytes) .....	7 168	pieces

\* Including State Forests and Timber Reserves.

APPENDIX 11

MILLING TIMBER REMOVALS UNDER HAULAGE CONTRACT

This table shows the quantities hauled and payments made for the haulage of milling timber during 1979-80 by Contractors to the Department. The quantities shown are also included in Appendix No. 8.

— Cubic Metres Gross Measure —

	South Queensland					North Queensland			Total	
	Forest Hardwood	Rainforest Structural Timbers	Prime Cabinet Woods	Misc. Cabinet Woods	Total Volume	Payments Made	Prime Cabinet Woods	Payments Made	Volume	Payments Made
25 106	4	117	41	118	25 386	\$ 577,588	556	\$ 12,220	25 942	\$ 589,808

APPENDIX 12

MILLING TIMBER REMOVALS FROM PRIVATE LANDS 1979-80

— Cubic Metres Gross Measure —

*Total 1978-79	Species	North Qld.	Brisbane	Dalby	Gympie	Maryborough	Monto	Murgon	Rockhampton	Warwick	Yarraman	Total 1979-80
4 899	Hoop, Bunya and Kauri Pine	20	2 151	..	40	954	..	134	713	390	80	4 482
63 341	Cypress Pine .....	..	..	43 788	..	..	..	..	799	21 751	20	66 358
340	Other Pines .....	3	182	..	40	..	..	..	2	9	..	236
252 549	Forest Hardwoods .....	6 620	70 542	7 617	12 810	56 868	27 541	10 978	34 509	12 755	19 961	260 201
12 587	Rain Forest Structural Timbers	6 537	235	..	6	..	..	..	385	380	..	7 543
2 271	Prime Cabinetwoods .....	1 935	51	..	..	..	..	..	90	10	..	2 086
8 123	Miscellaneous Cabinetwoods	5 675	1 284	..	..	..	..	..	863	..	..	7 842
7 550	Plantations, Exotic Conifer .....	25	1 039	..	..	60	..	..	..	363	..	1 487
3 667	Imported .....	..	2 000	..	..	..	..	..	..	..	..	2 000
355 327	Total (Est.) .....	20 815	77 484	51 405	12 895	57 882	27 541	11 112	37 381	35 658	20 061	352 235

N.B. Volumes shown in the above Table have been estimated due to incomplete Statistics being available at time of compilation.

\* Corrected Figures.

APPENDIX 13

COMPARATIVE STATEMENT OF RECEIPTS BY FUNDS  
FOR THE YEARS 1978-79 AND 1979-80

1978-79		1979-80
\$		\$
2,005	CONSOLIDATED REVENUE FUND— Miscellaneous .....	10,982
	LOAN FUND— Sale of Motor Vehicles and Plant .....	395,883
586,470	Plant Hire .....	5,600
578,639	Repay Temporary Loan Fund Advance .....	..
675,400		
1,840,509		401,483
	FORESTRY AND LUMBERING FUND— Opening Balance .....	261,824
270,348	Log Timber Receipts from Districts .....	8,560,121
6,906,869	Forestry and Lumbering .....	877,218
866,112	Plant Hire .....	3,563,755
2,858,282	Other Receipts .....	526,663
483,421	T.R.A.D.A.C. ....	339,210
192,154	Grants— Flood Relief .....	79,720
	Aboriginal Advancement .....	8,853
	Displaced Sandminers from Fraser Island .....	213,459
11,577,186		14,430,823
261,824	Less Balance Carried Forward .....	126,889
11,315,362		14,303,934
	FORESTRY DEVELOPMENT FUND— Opening Balance .....	216,102
31,502	Commonwealth Grant for Aboriginal Advancement .....	250,234
230,000	Commonwealth Forestry Softwood Agreement .....	977,311
1,485,400	Loan Fund Contribution .....	*16,930,000
14,880,000	Special Projects Fund .....	2,000,000
500,000	Grant for displaced Sandminers from Fraser Island .....	1,068,465
17,126,902		21,442,112
216,102	Less Balance Carried Forward .....	*2,176,704
16,910,800		19,265,408
\$30,068,676	Total All Funds .....	\$33,981,807

\* Includes \$2,000,000 advanced towards the end 1979-80 from 1980-81 Loan Fund Allocation.

DISPOSAL OF RECEIPTS

\$		\$
2,005	The above receipts were disposed of as follows:— To Consolidated Revenue Fund as repayment of Expenditure	10,982
	To Loan Fund— Repayment of Previous Expenditure .....	395,883
586,470	Excess Plant Hire .....	5,600
578,639	Repay Temporary Loan Fund Advance .....	
675,400		
1,840,509		401,483
	To Forestry and Lumbering Fund— Expenditure on Marketing, Maintenance of Roads, Capital Improvements, Plant and T.R.A.D.A.C. ....	8,576,730
7,208,011	Interest and Redemption on Loans .....	5,727,204
4,107,351		
11,315,362		14,303,934
	To Forestry Development Fund— Expenditure on Reforestation, Land Acquisition, Plant Purchase, Road Construction and Working Equipment	19,265,408
16,410,800	Total All Funds .....	\$33,981,807
\$29,568,676		

## APPENDIX 14

COMPARATIVE STATEMENT OF EXPENDITURE BY FUNDS  
FOR YEARS 1978-79 AND 1979-80

1978-79		1979-80
\$		\$
7,757,251	CONSOLIDATED REVENUE FUND—	
227,034	Salaries .....	8,616,912
66,213	Termite Eradication .....	573,513
972,263	Fares, Printing and Stores .....	77,391
85,686	Travelling Expenses and Incidentals .....	1,031,180
232,873	Recreation Facilities—Maintenance .....	119,436
	Cash Equivalent of Long Service Leave .....	135,312
9,341,320		10,553,744
	Less Expenditure credited for Grants from Brisbane Forest Park Trust and Displaced Sandminers from Fraser Island .....	33,369
14,774		
9,326,546		10,520,375
	LOAN FUND—	
341,846	Recreation Facilities—Construction .....	440,517
14,880,000	Amount to be credited to Forestry Development Fund .....	16,930,000
15,221,846		17,370,517
	Less Expenditure credited for Grants from Brisbane Forest Park Trust and Displaced Sandminers from Fraser Island .....	183,206
121,958		
15,099,888		17,187,311
	TRUST AND SPECIAL FUNDS—	
	Forestry and Lumbering Fund—	
4,107,351	Interest and Redemption on Loans .....	5,727,204
828,085	Railway Timber Supplies .....	785,188
2,981,923	Marketing .....	3,283,017
933,487	Roads—Maintenance and Subsidies .....	799,636
2,643,884	Maintenance of Plant .....	3,261,890
290,891	Maintenance of Capital Improvements .....	332,571
176,255	Expenses—Timber Research and Development Advisory Councils .....	275,218
11,961,876		14,464,724
	Less Expenditure credited for Apprentice Training and Miscellaneous .....	160,790
646,514		
11,315,362		14,303,934
	FORESTRY DEVELOPMENT FUND—	
13,582,329	Reforestation .....	15,115,661
907,533	Land Acquisition .....	1,009,738
1,408,535	Purchase of Plant .....	1,650,262
1,045,270	Roads—Construction .....	1,204,334
157,967	Purchase of Working Equipment .....	329,460
675,400	Repayment of Temporary Loan Fund Advance .....	..
17,777,034		19,309,455
1,366,234	Less Expenditure credited for Miscellaneous .....	44,047
\$16,410,800		\$19,265,408

APPENDIX 15

STATEMENT OF AVAILABILITY AND APPLICATION OF FUNDS  
FOR YEARS 1978-79 AND 1979-80

1978-79			1979-80
\$'000		\$'000	\$'000
	<b>AVAILABILITY OF FUNDS—</b>		
9,831	Consolidated Revenue Fund .....		10,832
8,608	Forestry and Lumbering Fund .....	14,858	11,651
	Less Maintenance of Plant .....	3,207	
15,132	State Loan Fund .....		17,200
500	Special Project Fund—Unemployment Relief .....	2,000	
810	Commonwealth Softwood Forestry Agreement .....	977	
230	Aboriginal Advancement Grant .....	250	
1,000	Displaced Sandminers—Fraser Island .....	1,069	
446	Flood and Cyclone Damage Restoration .....	213	
70	Apprenticeship Training Scheme .....	35	4,544
36,627	<b>TOTAL—All Sources .....</b>		<b>44,227</b>
	<b>APPLICATION OF FUNDS—</b>		
9,029	Consolidated Revenue Fund—		
227	Administration (Salaries, etc.) .....	9,861	
85	Termite Eradication .....	574	10,554
	Maintenance of Recreation Facilities .....	119	
	Forestry and Lumbering Fund—		
	Marketing and Logging, Maintenance of roads, buildings, plant, financial		
	charges and miscellaneous .....	14,465	
	Plus balance carried forward .....	127	
		14,592	
9,285	Less Maintenance of Plant included in Plant Hire Charges .....	3,262	11,330
	Forestry Development Fund		
	Reforestation Works, Acquisition of Land and Purchase of Plant	19,309	
17,318	Plus balance carried forward .....	2,177	21,486
247	Construction of Recreation Facilities .....		281
36,191			43,651
436	Lapsed Funds .....		576
\$36,627	<b>TOTAL—All Uses .....</b>		<b>\$44,227</b>

APPENDIX 16

DISTRIBUTION OF PERSONNEL 30th JUNE, 1980

Staff	Metropolitan	District	Total
<b>SALARY—</b>			
Graduate .....	67	70	137
Technical .....	79	29	108
Field Supervisory .....	5	104	109
Clerical .....	133	132	265
Miscellaneous (Drawing Office Aides, General and Laboratory Assistants, etc.) .....	12	1	13
Sub-total .....	296	336	632
<b>WAGES—</b>			
Reforestation .....	13	812	825
Marketing and Resources .....	17	141	158
Road Construction and Maintenance .....		68	68
Maintenance of Plant and Capital Improve- ments .....	14	94	108
Recreation Facilities—			
Construction and Maintenance .....	1	30	31
Miscellaneous .....		2	2
Sub-total .....	45	1 147	1 192
<b>Total .....</b>	<b>341</b>	<b>1 483</b>	<b>1 824</b>

## APPENDIX 17

## DEPARTMENTAL PUBLICATIONS 1979-80

## RESEARCH NOTES

- |   |   |
|---|---|
| 27. Van Altena, A.C. and Harvey,<br>A.M. 1979 | Control of stinging trees (Dendrocnide SPP.:<br>Urticaceae in North Queensland rainforests by<br>high-volume foliar spraying. 7p. |
| 28. Van Altena, A. C. 1979                    | Growth comparisons of slash pine and Honduras<br>Caribbean pine at Toolara. 5p.   |
| 29. Siemon, G. R. 1979                        | Bending strength of C.C.A.-treated slash pine<br>poles. 6p.   |
| 30. Siemon, G. R. 1979                        | Bending strength and specific gravity of four<br>exotic pines grown in South-East Queensland.<br>5p.                              |

## RESEARCH PAPERS

- |                       |  |
|-----------------------|--|
| 12. Bacon, G. J. 1979 | Investigations into radiata pine establishment on<br>the Queensland Granite Belt. A review of<br>findings and the literature. 75p. |
|-----------------------|--|

## TECHNICAL PAPERS

- |   |   |
|---|---|
| 17. Grimes, R. F. and Pegg, R. E.<br>1979 | Growth data for a spotted gum-ironbark forest in<br>South-East Queensland. 30p. |
| 18. Norton, J. 1979                       | The leaching of copper-chrome-arsenic salts from<br>spotted gum. 17p.           |
| 19. Wylie, F. R. and Yule, R. A. 1979     | Tree death and decline in native vegetation of<br>South-East Queensland. 9p.    |

## INFORMATION SHEETS

- No. 10 Fraser Island-History
- No. 11 Fraser Island-Geography
- No. 12 Fraser Island-Wildlife
- No. 13 Fraser Island-Forestry
- No. 14 Cypress Pine Forests

## BROCHURES

## State Forest Parks—

- Wongi State Forest Park
- Waterpark Creek State Forest Park
- Coochin Creek State Forest Park
- Downfall Creek State Forest Park
- Fong-On Bay State Forest Park
- Goldsborough Valley State Forest Park
- Kauri Park State Forest Park
- Murray Falls State Forest Park
- Curtain Fig Tree State Forest Park
- Goomburra State Forest Park
- Upper Stony State Forest Park
- Mother Mountain State Forest Park

## Forest Drives—

- Licuala Forest Drive

## Forest Recreation—South-East Queensland

APPENDIX 18  
BOTANICAL NAMES

<b>A. NATIVE CONIFERS</b>	
Bunya Pine .....	<i>Araucaria bidwillii</i>
Cypress Pine .....	<i>Callitris columellaris</i> Syn. <i>Callitris glauca</i>
Hoop Pine .....	<i>Araucaria cunninghamii</i>
Kauri Pine .....	<i>Agathis robusta</i> <i>Agathis palmerstonii</i>
<b>B. EXOTIC CONIFERS</b>	
Caribbean Pine .....	<i>Pinus caribaea</i>
Honduras Caribbean Pine .....	<i>Pinus caribaea</i> var. <i>hondurensis</i>
Cuban Pine .....	<i>Pinus caribaea</i> var. <i>caribaea</i>
Loblolly Pine .....	<i>Pinus taeda</i>
Patula Pine .....	<i>Pinus patula</i>
Radiata Pine .....	<i>Pinus radiata</i>
Slash Pine .....	<i>Pinus elliotii</i> var. <i>elliottii</i>
Ocote Pine .....	<i>Pinus oocarpa</i>
Klinki Pine .....	<i>Araucaria hunsteinii</i>
Douglas Fir .....	<i>Pseudotsuga menziesii</i>
<b>C. EUCALYPTUS</b>	
Blackbutt .....	<i>Eucalyptus pilularis</i>
Grey Ironbark .....	<i>Eucalyptus drepanophylla</i>
Forest Red Gum .....	<i>Eucalyptus tereticornis</i>
River Red Gum .....	<i>Eucalyptus camaldulensis</i>
Rose Gum .....	<i>Eucalyptus grandis</i>
Spotted Gum .....	<i>Eucalyptus maculata</i> <i>Eucalyptus citriodora</i>
Western White Gum .....	<i>Eucalyptus argophloia</i>
White Mahogany .....	<i>Eucalyptus acmenioides</i>
Tallowwood .....	<i>Eucalyptus microcorys</i>
Sydney Blue Gum .....	<i>Eucalyptus saligna</i>
Yellow Box .....	<i>Eucalyptus melliodora</i>
<b>D. OTHER BROADLEAF SPECIES</b>	
Brown Salwood .....	<i>Acacia mangium</i>
Brush Box .....	<i>Tristania conferta</i>
Satinay .....	<i>Syncarpia hillii</i>
Turpentine .....	<i>Syncarpia glomulifera</i>
Candlenut .....	<i>Aleurites moluccana</i>
<b>E. WEEDS, GRASSES, ETC.</b>	
Lantana .....	<i>Lantana camara</i>
Gatton Panic .....	<i>Panicum maximum</i>
Harrisia Cactus .....	<i>Eriocereus tortuosus</i>
<b>F. MAMMALS</b>	
Fluffy Glider .....	<i>Petaurus australis</i>