

ANNUAL REPORT

1976-1977

DEPARTMENT OF FORESTRY

Presented To Parliament By Command

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The Honourable the Minister for Lands, Forestry, National Parks and Wildlife Service discussing policy with the Conservator of Forests and senior Departmental Officers.

PRINCIPAL OFFICERS

Conservator of Forests	W. BRYAN, B.Sc.(For.), Dip.For. (Canb.)
Deputy Conservator of Forests	T. F. RYLEY, B.Sc.(For.), Dip.For. (Canb.)
Director, Division of Technical Services	W. M. ROBINSON, B.Sc.(For.), Dip. For.(Canb.)
Director, Division of Operations	J. D. H. MUIR, B.Sc.(For.), Dip. For.(Canb.)
Director, Division of Marketing	T. F. YORKSTON, B.Sc.(For.), Dip. For.(Canb.)
Director, Division of Planning	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.

DISTRICT FORESTERS

Atherton	J. B. SCHAUMBERG, B.Sc.(For.), Dip.For. (Canb.)
Brisbane	T. RYAN, B.Sc.(For.), Dip.For.(Canb.)
Dalby	D. M. WILSON, B.Sc.(For.), Dip.For. (Canb.)
Gympie	R. E. PEGG, 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	P. T. CRANNY, B.Sc.(For.), Dip.For. (Canb.)
Rockhampton	J. E. DUUS, B.Sc.(For.), Dip.For.(Canb.)
Warwick	J. F. BARDSLEY, B.Sc.(For.), Dip.For. (Canb.)
Yarraman	W. A. GREASLEY, B.Sc.(For.), Dip.For. (Canb.)

PRINCIPAL STATISTICS

FOREST AREA

	Hectares
State Forest Reserve	3 399 308
Timber Reserve	623 638
Plantations	
Total Area (Net) at 31st March, 1977	106 808
Area Planted (Net) 1976-77	5 225

TIMBER CUT—CROWN LANDS 1976-77

	Cubic Metres	Cubic Metres
Sawlog:		
Native Forests		
Broad-leaved	335 906	
Coniferous	159 547	
		495 453
Plantations		
Broad-leaved	660	
Coniferous		
Native	82 061	
Exotic	66 586	
		149 307
Pulpwood		
Broad-leaved	12 484	
Coniferous		
Native	12 050	
Exotic	68 508	
		93 042
Total		737 802

FINANCIAL

RECEIPTS:

	\$	\$
Consolidated Revenue Fund		1,644
Loan Funds		410,403
Forestry and Lumbering Fund		
Opening balance	35,268	
Receipts	9,571,957	
		9,607,225
Reforestation Trust Fund		
Opening balance	717,043	
Receipts	14,016,606	
		14,733,649
		<u>\$24,752,921</u>

	\$	\$
EXPENDITURE:		
Consolidated Revenue Fund (including Salaries, etc.)		7,355,173
Loan Fund		111,097
Trust and Special Funds—		
Forestry and Lumbering Fund—		
Expenditure	9,564,422	
Closing balance	42,803	
	<hr/>	9,607,225
Reforestation Trust Fund—		
Expenditure	14,540,750	
Closing balance	192,899	
	<hr/>	14,733,649
		<hr/> \$31,807,144

REPORT OF THE CONSERVATOR OF FORESTS

For the Year ended 30 June 1977

To the Honourable the Minister for Lands, Forestry, National Parks and Wildlife Service

INTRODUCTION

The Organisational Development programme within the Department was continued during the year, with particular effort directed at the new Divisional structure and related management systems and procedures. This new structure is settling down well, and should provide much greater efficiency in work flow.

The new Forestry Training Centre now under construction at Gympie will be invaluable for management development programmes as well as for "in service" training and other uses.

Another staffing matter which calls for special mention is the Department's safety training programme. A reduction of 25 per cent in the disabling injury frequency achieved in 1975-76 has been followed by a further 18 per cent reduction this year.

The Minister's shield for the lowest accident frequency rate and the Conservator's shield for the most improved safety record were both won this year by Rockhampton District, and this is regarded as a very commendable effort.

There has been considerable staff disquiet at the overcrowding and unsatisfactory conditions in our present Head Office building. Approval given to move the Division of Technical Services elsewhere as a temporary measure is appreciated. This will considerably reduce congestion in the building, although as a contra it will introduce a most undesirable fragmentation of Departmental activities.

The Department has recognised the need to promote public awareness and understanding of its policies and practices and its public relations programme was stepped up during the year to meet this need.

In association with this, increasing emphasis is being placed on the provision and maintenance of recreation facilities and scenic drives in State Forests to cater for the rapidly growing demand.

These developments are entirely compatible with normal forest management practices and State Forests are meeting a very real public recreation need, quite complementary to National Parks and Environmental Parks.

The need for nett self sufficiency in timber and forest products for Australia has been widely accepted and is recognised in the report of the Forwood Conference, a recent Bureau of Agricultural Economics Report and the stated forest policy of the Australian Conservation Foundation.

Because of its location there are also sound economic reasons why Queensland should itself aim at nett self sufficiency within the Australian scene.

To achieve this by the end of the century or thereabouts, it will be essential to continue plantation establishment at least at the present rate, but this will not be possible if the effective level of loan funds available to the Department continues to reduce.

Good use has been made of special Commonwealth funds provided to boost employment following closure of sandmining operations on Fraser Island and also those provided to employ Aboriginal people.

However such special funds nowhere offset the reduction in assistance now being provided under the Softwood Forestry Agreement between the Commonwealth and the State.

An acceptable level of plantation establishment has been held only by a reduction in the proportion of trees pruned and some transfer of activity from small and higher cost centres to the very large exotic pine plantation centres, where there is a major supply-commitment to industry establishment.

Any further such movement related to effective fund reduction would have to be at the further expense of some of the small rural communities, now largely dependent on Departmental activity.

An extensive Aerial Prescribed Burning programme in native forest areas was under way at the end of the year, and this will prove a vital protective measure should dry conditions and the heavy build up of fuel lead to a period of serious fire hazard in spring and early summer.

Helicopters were tried in the programme for the first time and proved very successful in areas of rugged topography.

The total volume of Crown log timber harvested during the year was slightly greater than in 1975-76 but this is not a true reflection of demand because of the considerable build up of sawn stock at the end of this year. There was a very substantial drop in the cut of Crown hardwood, which would in part be due to changing construction trends which affect the flooring market.

For some years the policy of the Department has been to increase Crown log prices at intervals in accordance with movement in the Consumer Price Index.

An increase was due as at 30th June, 1976, but this was deferred because of difficult economic conditions, and a Stumpage Review Committee, comprising Departmental and Industry representatives with an independent Chairman, was set up to advise the Minister on the extent and timing of future increases.

This deferment has of course affected the earning capacity of the Department, and the range and extent of services provided to the timber industry by the Department will need to be reviewed.

The F.A.O.-I.U.F.R.O. Third World Consultation on Forest Tree Breeding was held in Canberra in March, 1977, with associated tours in north and south Queensland and a Workshop in Brisbane on genetic improvement of tropical species. The Department's tree breeding team is a world leader in this field, and our officers made a significant contribution to proceedings.

There have been two particularly interesting research studies carried out in Slash Pine planted on coastal lowland country, for which figures are now available, and both are reassuring in the planning of the Department's future activities.

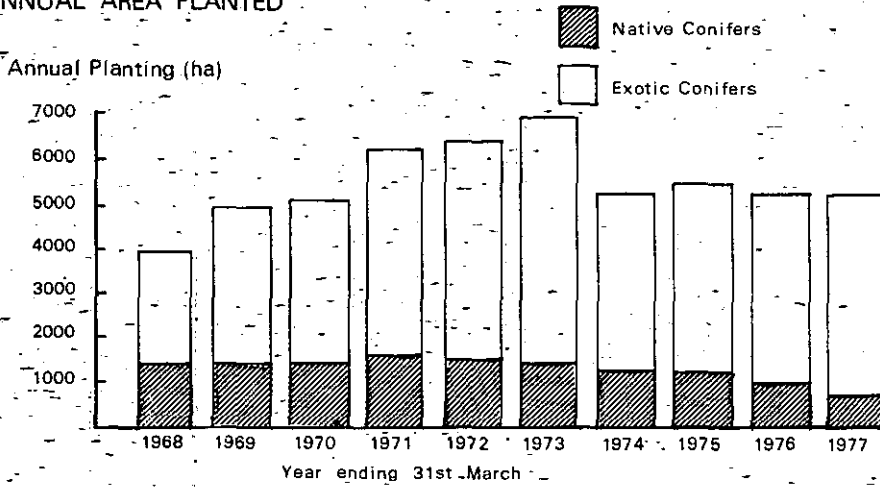
The first study indicates that productivity is not likely to decline in the second rotation of our Exotic plantations and the second indicates that in our coastal plantings sedimentation levels are well within acceptable limits once the initial establishment phase is passed, with no more sediment in the streams than from native eucalypt forest.

I would also like to take this opportunity to record my appreciation of the loyal and efficient service of all members of the staff during the past year.

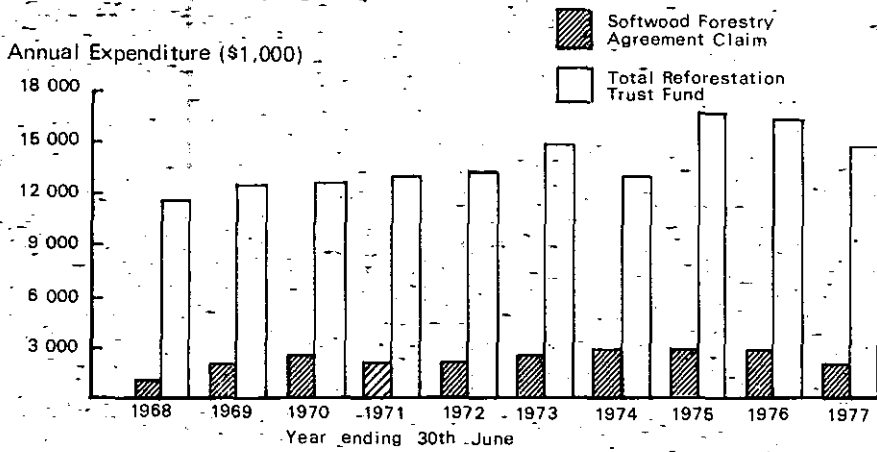
W. BRYAN,
Conservator of Forests.

REFORESTATION INDICATORS

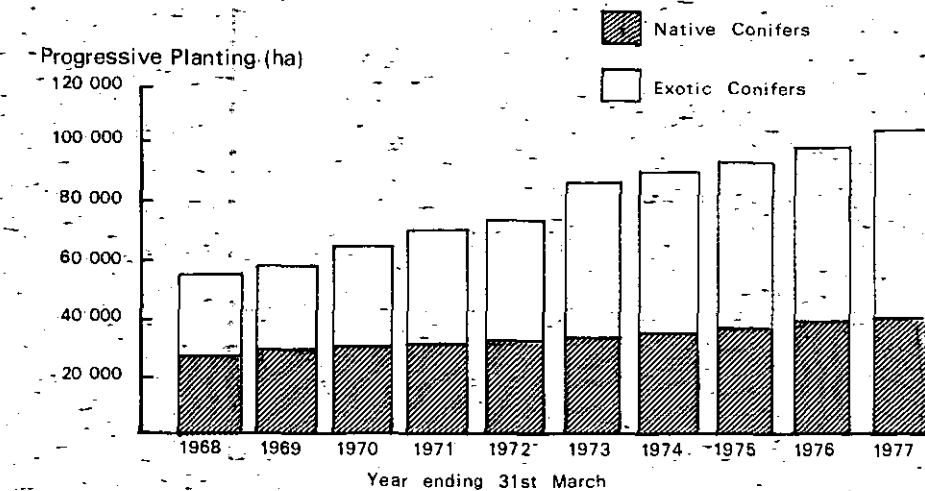
ANNUAL AREA PLANTED



REFORESTATION EXPENDITURE (1976/77 Money Values)



TOTAL AREA PLANTED



DIVISION OF OPERATIONS

General: The Division is responsible for the approval of projects and the allocation of funds on works programmes involving Silvicultural operations, road construction and maintenance, fire protection and communications, capital works including development of forest recreation parks, maintenance to capital improvements, purchase and maintenance of vehicles and heavy plant, and road subsidies to Shire Councils.

SILVICULTURE

Seed Collection: In addition to meeting its own seed requirements the Department also fulfilled outside seed orders. The main demand has been for Honduras Caribbean Pine seed. Routine collections from selected trees of good form were sufficient to meet all requests involving the sale of 280 kilograms. It will be several years before the supply of genetically improved seed of this species exceeds the Department's own requirements but production of Honduras Caribbean Pine seed for sale will increase with production from high quality stands at Byfield in Central Queensland and Kennedy in North Queensland which have been heavily thinned to promote seed production.

A mechanical tree shaker was tested this year in the collection of the Slash Pine cone crop. Considerable saving was effected. Seventy-five per cent of a tree's cone crop was removed in 20 seconds compared with 36 minutes to remove the crop by hand climbing methods.

Sales of eucalypt seed totalled 120 kilograms, including 21 kilograms of Rose Gum seed. Although enquiries were received from overseas for a larger quantity of the latter, the amount which can be obtained is restricted to that which can be collected from trees felled for logging and bearing mature seed at the time.

Nurseries: The exotic pine nurseries in South-East Queensland producing open root stock, largely of Slash Pine, have been increasingly mechanized to reduce the cost of production and improve the quality of planting stock. A new lateral root wrencher has improved the quality of open root Honduras Caribbean Pine stock; this vigorous species requires frequent root wrenching to ensure an adequate shoot-root ratio and to induce dormancy prior to planting. Mechanical topping of excessively tall stock with a rotary slasher has been tested as a means of producing hard stock when weather conditions favour abnormally high growth rates in the nursery. A lifting bar was also used to disturb the soil in the root zone to harden stock and restrict growth.

However those other nurseries which were designed for the production of tubed Hoop Pine are difficult to mechanize because of their layout and small size. The use of a mechanical bed former, a sawdust spreader for covering seed at sowing and a reciprocating root wrencher at the Kenilworth nursery has improved overall cost efficiency. As the use of open root Hoop Pine planting stock would effect very considerable savings compared to the high cost of tubing and handling tubed stock, trials continued of nursery production techniques to produce stock of this species suitable for open root planting.

The Caribbean Pine nurseries in Central and North Queensland were also designed initially for the production of tubed stock, while no consideration was given at the time to the need to produce Phytophthora free stock. Strict quarantine controls have now been instituted at the

two large exotic pine nurseries in South-East Queensland to ensure nurseries are not infected by Phytophthora. A change over to the use largely of open root Caribbean Pine in Central and North Queensland will also enable plans to proceed there for the establishment of new nurseries in locations enabling quarantine controls for the production of Phytophthora free stock and also for increased mechanisation of operations.

The new container nursery at Toolara is now producing Eucalyptus species for enrichment plantings of logged wet sclerophyll forests. The nursery, which features a fully automated water and nutrient supply system is also being used for trial production of Caribbean Pine in paper pots, mainly for use as refill stock.



Machine planting of exotic pines.

Plantation Establishment: A total area of 5 224 hectares of new softwood plantations was established during the year consisting of 4 517 hectares of exotic pines and 707 hectares of Hoop Pine.

Slash Pine remains the main exotic pine planted with 3 322 hectares planted this year compared with 3 470 hectares in 1975-76. Caribbean Pine plantings increased however from 575 hectares in 1975-76 to 1 061 hectares.

Honduras Caribbean Pine is assuming greater importance as a plantation species in South-East Queensland. 640 hectares were established in 1976-77 in South-East Queensland compared with 218 hectares in 1975-76. Greater use of Honduras Caribbean Pine on selected sites was possible through the development of techniques for production of improved open root stock. Considerable cost savings are effected with this use of open root stock. Results to date, particularly from machine plantings, are very satisfactory, and the use of Honduras Caribbean Pine in South-East Queensland plantings will increase as larger quantities of improved seed become available.

Over seventy per cent of the total exotic pine planting of 4517 hectares was made in the Tuan-Toolara area in pursuance of the aim of the Department to establish sufficient area of exotic pine plantations in this region of the State to provide raw material for a large new industrial complex, comprising both sawmilling and processed wood industries, which is already being developed.

Funds made available to the Department from the Commonwealth Government to provide employment in the Maryborough area following the cessation of sand mining on Fraser Island gave an impetus to planting in the Tuan-Toolara area. \$300,000 was made available in 1976-77, the majority of which was expended on plantation establishment.

In 1977-78 it is expected to commence the development of a new planting area to the north of Maryborough to supplement the Tuan and Toolara planting fronts.

Hoop Pine establishment on rain forest sites in the Yarraman, Murgon, Gympie, Maryborough and Monto Districts decreased from 986 hectares in 1975-76 to 707 hectares. The high cost of establishment of Hoop Pine plantations compared with exotic pine plantations has necessitated some revision of the Hoop Pine planting programme.

This year however saw wide scale plantings of genetically improved stock of Hoop Pine. With increased quantities of improved seed becoming available from the Department's Hoop Pine seed orchards, future out-plantings will comprise mostly stock from this source.

Considerable interest has been shown in establishment of private forest plots throughout the state as indicated by the increase in seedlings sold at forest plot rates from 141 000 in 1975-76 to 250 000. The Department supports and encourages these private plantings through its extension advisory service and by sale of seedlings at concessional rates, so that forest establishment by private landholders eventually will make a significant contribution to timber production.

Weed Control: Control of weed growth in Hoop Pine plantations continues to be a major cost factor to which the Department is constantly addressing its attention. Little scope exists for using alternative cultural practices in these areas due to the nature of the topography. The areas are dissected by frequent drainage lines and have slopes up to twenty-five degrees. Little use can be made of mechanization even for planting and therein lies the main difference between Hoop Pine and exotic pine establishment. Most operations in exotic pine plantation management can be mechanized including cultivation and slashing to control weed growth. In Hoop Pine areas, the use of herbicides is essential if the work is to be done economically.

Routine post plant misting with weedicides on young areas was introduced this year and has given very good results with no effect on the Hoop Pine plants. The technique involves the use of power knapsack misters and replaces selective hand spraying with knapsacks on

these areas. Significant cost savings up to \$30.00 per hectare for each operation have been achieved. New herbicides are also being tested and the introduction of pasture grasses in conjunction with grazing on new areas is also being tested to reduce the high cost of tending Hoop Pine in the early years of its establishment.

Lantana and groundsel infestation constitute the main weed problem in older exotic pine plantations but the practice of prescribed burning now being more widely adopted should largely overcome the problem in these areas.

Nutrition: The depauperate sandy soils of the Wallum are particularly deficient in minerals and it is essential to apply a general dressing of phosphorus to young exotic pine plantations. Routine practice in South-East Queensland is to apply a broadcast application of 600 kilograms per hectare of superphosphate following planting either aerially, manually or by tractor mounted spreader. Consideration is being given to the feasibility and cost of applying an initial starter dressing to be followed later by booster dressings as the trees develop.

A mixture of phosphorus, nitrogen and copper is applied on an individual tree basis to the fairly limited areas of groundwater podsol encountered.

Pruning: Several factors have made it desirable for the Department to review its pruning policy and practices.

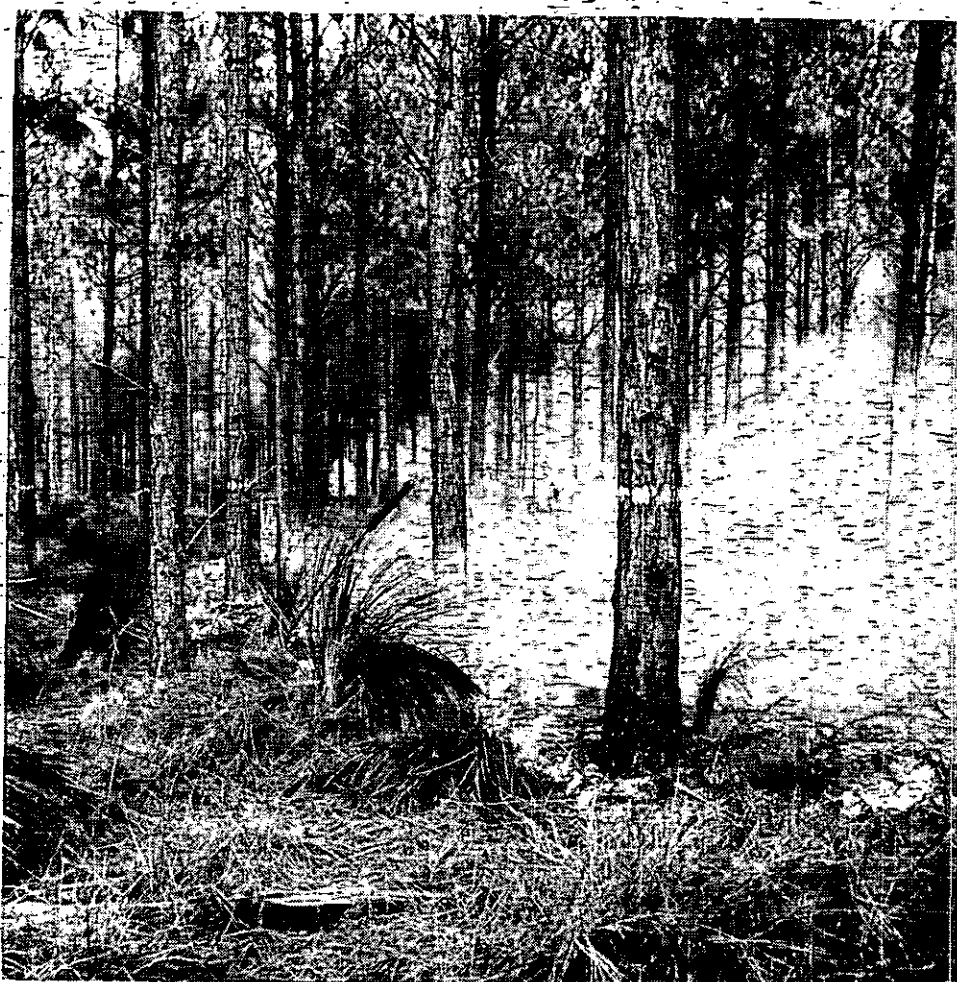
Some changes already made have involved reduction in pruning height to 5.2 metres, restriction of pruning to higher site indices and limiting the total area pruned. Pruning in the Tuan-Toolara exotic pine plantations has been limited to 800 hectares per annum.

To reduce cost, large scale trials have also been made of a single stage selection technique in exotic pine plantations. Instead of selecting stems for ground pruning followed by further selection for carry up pruning on crop stems, the crop stems are now selected in a single operation. Reports to date indicate the procedure is quite satisfactory and would effect considerable cost savings. It is also being tested in Hoop Pine plantations.

Present pruning practice is based on use of small chain saws for ground pruning to a height of 2.6 to 2.8 metres. The final lift to 5.2 metres is done with ladder and hand saw. Development work on a tractor mounted mechanical pruning head designed to prune to 6.5 metres has reached the stage where tenders can be called for the manufacture of a prototype unit.

Native Forests: Silvicultural operations in native forests in 1976-77 had to be reduced due to the reduction in funds available in real money terms and some shortage of suitable areas immediately available for treatment. Only 11 582 hectares of Eucalyptus, Cypress Pine, and Rain Forest types were treated in 1976-77 compared with 20 761 hectares in 1975-76. The main reduction was in Eucalyptus forest treated with 2 358 hectares treated in 1976-77 compared with 8 909 hectares in 1975-76.

For best results Eucalyptus forests should be logged prior to silvicultural treatment but the rate of logging has been adversely affected by the depressed condition of the building industry thus also restricting areas available for treatment.



Hazard reduction burning in exotic pine plantation—Brisbane District.

GENERAL OPERATIONS

Fire Protection: Only one serious fire occurred during the year. This fire in December 1976, originated on private lands in the Inglewood district, increased in intensity with deterioration in weather conditions, and burnt out 6 600 hectares of private land, 6 350 hectares of Crown land, and 4 450 hectares of State Forest. Damage was done to over 3 900 hectares of Cypress Pine forest including the complete destruction of 200 hectares silviculturally treated.

Though Cypress Pine forests in Western Queensland are protected by a system of roads around units of about 400 hectares and by external open firebreaks, under dry blow-up conditions control of a wild fire relies heavily on early detection and suppression. The creation of burnt buffer zones both on State Forests and adjoining private lands is also important to contain fires within zones where suppression action can be quickly effective.

The most serious plantation fire was at Tuan and burnt over 95.3 hectares but causing serious damage to patches of trees totalling only

about two hectares. Three fires threatening the exotic pine plantations in the Beerburum area were controlled with less than 0.1 hectares of plantation burnt and no serious damage being sustained.

In order to continually upgrade our protection policy and procedures, an intradepartmental committee has been set up to critically investigate serious fires. Particular stress is placed on measures to ensure reduction of fire hazard on adjoining private lands by joint action in co-operative burns, the burning of buffer zones on State Forests and the availability of heavy plant and fire fighting equipment.

Aerial burning is practised in native Eucalypt forests on a cyclic basis. Due to the shortage of funds to staff reserves the Department will have to rely more on reduction of fire hazard by prescribed burning at a time of year when the likelihood of a breakaway fire is minimal. The cheapest way of prescribed burning the large areas necessary is by lighting from aeroplanes or helicopters using incendiary capsules. The success of our aerial burning programme has already been well demonstrated.

A new and improved unit for priming and ejecting the incendiary capsules is being purchased. This unit will be much easier and safer to operate.



Controlled burning of native forest by aerial ignition—Maryborough District.

The construction of a new 45 metre high fire tower near Jimna is nearing completion. This tower, in conjunction with existing towers in the Jimna and Gallangowan areas, will improve the detection of wildfires likely to affect the extensive Hoop Pine plantations and native forests in the district.

Communications: The necessary reduction in manning of many of our State Forests will involve the implementation of new protection strategies and necessitate improvement in our communication systems so that most effective use can be made of available staff and plant. Funds available for the purchase of firefighting and radio equipment in 1976-77 however were insufficient to replace all necessary old equipment and did not permit purchase of any additional items to improve communications.

The year has therefore been largely devoted to consolidation and maintenance of the existing network and preparation for future projects. Land has been acquired for a radio base station at Atherton and construction will commence in the near future.

A further seven Very High Frequency and two Single Side Band bases are planned for other district centres.

Aerial prescribed burning communications have been improved by provision of air-ground and intercom facilities designed and produced by the Department.

Purchase of remote control equipment has been directed towards provision of multi-tone silent call and quiet line facilities. It is expected to progressively convert our system to this mode. Power supplies in the form of silicone solar cell modules are also being installed at remote bases.

New test equipment purchased includes an additional Locked Signal Generator and Spectrum Analyser.

Roads: Roads not only provide access for the extraction of timber and the general management and protection of State Forests but also facilitate public use of the forests for recreation and tourism. The increasing use of State Forests by the public will however necessitate the upgrading of many roads.

With the approaching completion of major access construction requirements into native forest areas, it should be possible to divert funds to upgrade the standard of those major roads in softwood plantations subject to heavy log traffic. Sawmillers committed to logging large quantities of plantation timbers are affected by disruption of log supplies and deterioration of logs if undue delays occur during wet weather. Important roads will have to be upgraded and reasonable all-weather access provided.

Improvement of the standard of roads used by the public for recreation will also be undertaken as funds allow. Recently funds were provided for upgrading the access road to Mt. Tinbeerwah on State Forest 959. This is a popular lookout near Tewantin.

There is a need to build up our road construction supervisory staff to ensure that proper supervision is given to construction standards and environmental requirements.

Road Subsidies: Payments to Shire Councils for road subsidies amounted to approximately \$75,000 in 1976-77.

The Department, in assessing stumpage, also makes an allowance to purchaser of Crown timber for payment of normal Road Maintenance Contribution in respect to the assessed route. These funds assist Local Authorities in meeting normal maintenance requirements.

Mechanical Equipment: Purchases of mechanical equipment during 1976-77 amounted to nearly \$2,000,000 due to a large carry-over from 1975-76.

for the purchase of 137 vehicles ordered but not supplied. Total purchases in 1976-77 were 217 vehicles, 5 rubber tyred 4WD tractors, 1 loader, backhoe and 13 dozers.

Devaluation caused considerable increases in the cost of the dozers purchased and will seriously affect future replacement of heavy plant.

When vehicles are being replaced attention is being given to possible use of smaller, lighter, cheaper vehicles particularly in centres with easier access or short daily runs.

Internal plant hire rates were increased by an average of about 20 per cent at the end of 1976-77 to cover increases in cost of plant, plant maintenance, wages and fuel.

Work has proceeded on the design and development of specialised silvicultural equipment such as planting machines, a tree shaker, a mechanised pruning head, herbicide trailer, cultivators, nursery equipment, etc. Other projects include development of a portable truck canopy and of specialised workshop equipment.

Training of maintenance staff improved during the year with courses in anti-pollution equipment as well as maintenance courses for both heavy and light equipment.

Capital Works: Worker accommodation requirements throughout the State are being reviewed to ensure they meet changing management needs and new provisions in industrial awards.

A major effort has been directed to improving the standard of barracks accommodation. More than 100 barracks are being improved. Facilities being provided include refrigerators, gas or electric stoves, hot water systems, septic toilets, floor coverings and insect screens. One new house is nearing completion, and field staff housing generally is being improved within the limit of available funds.

Recreation: To meet increasing public demand, a network of recreation facilities is being developed on State Forests throughout the State. Funds so far available for such facilities are limited and existing facilities need to be enlarged in size, and increased in number to meet the demand, and reduce overcrowding.

The new Glasshouse Mountains public lookout on Beerburrum State Forest was opened by the Minister for Lands, Forestry, National Parks and Wildlife Service, Mr Tomkins, M.L.A., in October, 1976. This lookout also incorporates an octagonal fire-lookout cabin on top of a 90 000 litre water tank. The public viewing balcony provides spectacular views of the Glasshouse Mountains, pine plantations and the coastline. Surveys indicate that this facility is visited by more than 20 000 people per year of whom 30 per cent are interstate tourists. Areas such as this provide an excellent opportunity to introduce visitors to the working forest.

The popular Bunyaville forest recreation area near Brisbane has been enlarged with the provision of additional tables, barbecues, toilets and parking facilities. Further expansion is planned for the coming year. Such is the demand for picnic sites in a forestry setting close to Brisbane, that any areas provided have quickly become over used.

A series of attractive forest drives is being developed in various Districts. These will be "self guiding" with points of interest highlighted in brochures also to be provided.

Operational Statistics	1976-77	1975-76
Total Reforestation Expenditure	\$14,540,750	\$14,126,656
Average Wages Staff levels (reforestation works)	1 032	1 275
Nursery Production (number)		
Hoop Pine		
Container	1 081 000	1 673 000
Open Root	80 000	
Caribbean Pine		
Container	827 000	900 000
Open Root	911 000	524 000
Slash Pine—Open Root	3 850 000	4 642 000
Radiata Pine		
Container	60 000	30 000
Open Root	243 000	175 000
Loblolly Pine	47 000	50 000
Patula Pine—Container	8 000	10 000
Eucalypts—Container	66 000	107 000
Plantation Establishment*	5 224 ha	5 218 ha
Weed Control		
Native Pine Plantation	36 559 ha	27 467 ha
Exotic Pine Plantation	8 650 ha	9 184 ha
Fertilizing	5 591 ha	6 900 ha
Pruning		
First Pruning	2 269 ha	1 993 ha
Second Pruning	2 870 ha	1 429 ha
Third Pruning	1 242 ha	1 892 ha
Native Forest Treated*	11 582 ha	20 761 ha
Seedlings Sold		
Number	393 220	406 241
Value	\$112,241.36	\$107,356.76
Seed Sold		
Value	\$109,361.22	\$83,325.64
Seedlings Sold at Forest Plot Rates	250 357	141 031
Fire Protection		
Areas Prescribed Burnt		
Natural forests	125 920 ha	50 000 ha
Exotic Plantations	4 038 ha	3 700 ha
Wild Fires		
Size 0-4 (ha)	32	14
5-40 (ha)	19	18
41-400 (ha)	26	9
401+ (ha)	21	3
Roads		
Logging Roads Constructed	92 km	75 km
Management Roads Constructed	185 km	142 km
Operative Plant as at 30th June		
Motor Vehicle and Trucks	469	469
Graders	34	34
Rubber Tyred Tractors and Loaders	93	87
Crawler Dozers	56	59

*Detail in Appendices F, G and H.

Major Items of Plant Purchased during the year included:

- 217 Replacement Motor Vehicles;
- 1 Additional Rubber Tyred Loader/Backhoe;
- 5 Additional Rubber Tyred Tractors;
- 13 Replacement crawler dozers including 4 large 180 hp units.

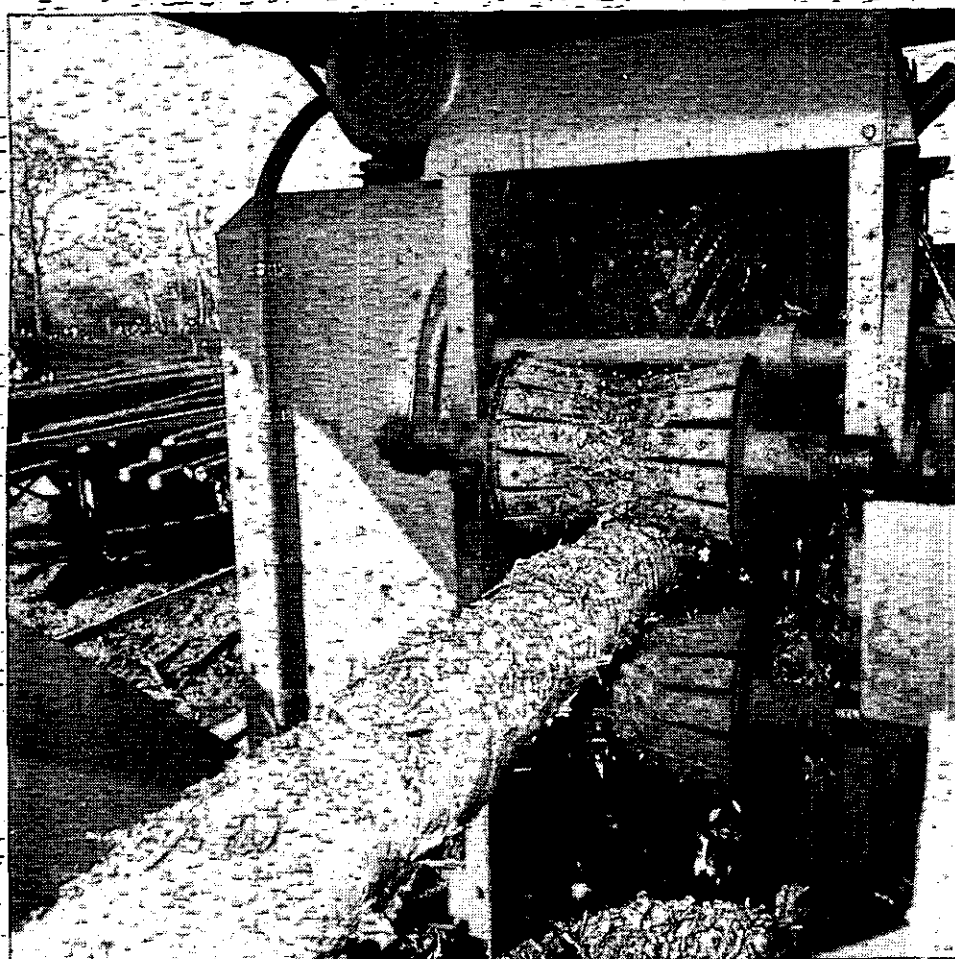
DIVISION OF MARKETING

General: Mill log yields from Crown and private lands during 1976-77 are shown in appendices to this report.

The cut from other than Crown sources showed an increase over last year, due mainly to an increased cut of private forest hardwoods and a slight rise in imported timbers.

Overall the Crown cut remained fairly stable. A decrease in the cut of forest hardwoods was balanced by increases in Cypress Pine and naturally-grown Hoop Pine. It was most unfortunate that deliveries of natural Hoop Pine logs under Departmental haulage contracts had to be suspended towards the end of the year due to the inability of the mills entitled to these supplies to accept further logs for various reasons.

Plantation timbers again comprised the greatest volume of any species group but was slightly below last year's record cut, due to adverse economic conditions. However, there can be no doubt that the predominance of plantation grown material will continue as availability increases.



Debarking plantation pine.

Trading conditions in the Industry as a whole have been difficult during the year. Sawm stocks at mills have accumulated particularly in sawn boards.

The sawn flooring market has been affected by trends to concrete slab construction and by increasing use of ply and particle board for floors. One result of this has been industry requests to the Department to temporarily suspend logging of board producing species such as Brush Box.

Due to the difficult economic conditions it was decided this year to defer the normal application of Consumer Price Index increases to Departmental log prices. While this provided some relief to industry, it adversely affected the earning capacity of the Department. There will be a significant leeway to make up in log prices when trading conditions return to normal.

During the latter part of the year a Stumpage Review Committee was set up comprising Departmental and Industry representatives. It will advise the Minister on the extent and timing of future movements in log timber stumpages.

A major new sawmill was completed during the year at Caboolture to process plantation thinnings from the Beerburum area.

MARKETING PROCEDURES

Allocation of Crown Log Timber: Allocations to mills of available supplies of Crown hardwoods and scrubwoods, calculated in accordance with the principles set out in last year's report, came into effect as from 1st October, 1976, in the south-eastern and northern areas of the State.

Boundaries of allocation zones for Cypress Pine have recently been determined in consultation with industry, and action is in hand to also allocate hardwoods in the Chinchilla and Inglewood areas and in Central Queensland.

Log Pricing: The regrouping of Mackay scrubwood species for pricing purposes, and modification of the basis used for hardwood log pricing, as forecast in the last report, were put into effect from 1st September, 1976. At the same time, log prices for all species were adjusted to take account of rail freight increases which had applied from November, 1975, and to restore depot price-relativity. These adjustments, together with minor alterations in minimum and optional class rates, produced an overall increase in stumpage of about 5 per cent.

A subsequent increase in rail freights from 1st November, 1976, also necessitated adjustment to log prices from 1st January, 1977. Allowance was also made at that time for increases which had occurred in logging costs. It was estimated that this adjustment would result in an overall increase in stumpage of about 2½ per cent.

Log Measuring: The reduction of log measuring costs by the simplification of current individual log and tree measuring methods is regarded as a priority means of reducing expenditure.

The introduction of simplified systems will be facilitated by acceptance by industry of methods which give both a fair return to the Department as seller and an equitable price to individual wood users.

Major work for the year has concentrated on a change from nett measurement of hardwood logs to gross measure and weight scaling of plantation timbers for pulpwood.

Weight scaling trials recently completed involved proposed sampling systems. Future work will be concentrated on the development of satisfactory procedures for the introduction of this system of log measurement to pulpmwood.



Snigging logs of Spotted Gum—Dalby District.

Gross Measure: In an effort to reduce the costs of marketing log timber from native hardwood and rain forest stands the Department is progressively introducing a system of log measurement based on gross log volume and a price incorporating allowances for average defect. The introduction of this is proposed in three stages.

Marketing on a gross volume basis commenced in the Mackay area on 1st September, 1976, and is operating satisfactorily. This followed on a general regrouping of species to conform with that applying in North Queensland. Computerisation of accounts to purchasers for log timber sold was also introduced from the same date.

Further statistics of log timber removals in South Queensland were collected during the year and numerous discussions held with the timber industry. In this area the Department proposes to adopt only one declared gross price for each locality. This price will be based on accumulated data relating to species-size class distributions and defect in logging operations over several years.

This new system is scheduled for implementation in the early part of this coming year.

Since the majority of log timber species in North Queensland are considerably less defective than those cut in South Queensland, no major changes are proposed to the existing price structure for that area. There will be several new individually priced species and a separate gross price list developed for each locality. It is proposed to implement the system in this area towards the end of 1977.

HARVESTING STUDIES

Three joint Departmental-Industry Committees have now been formed to carry out research into harvesting operations in Queensland Forests.

These are—

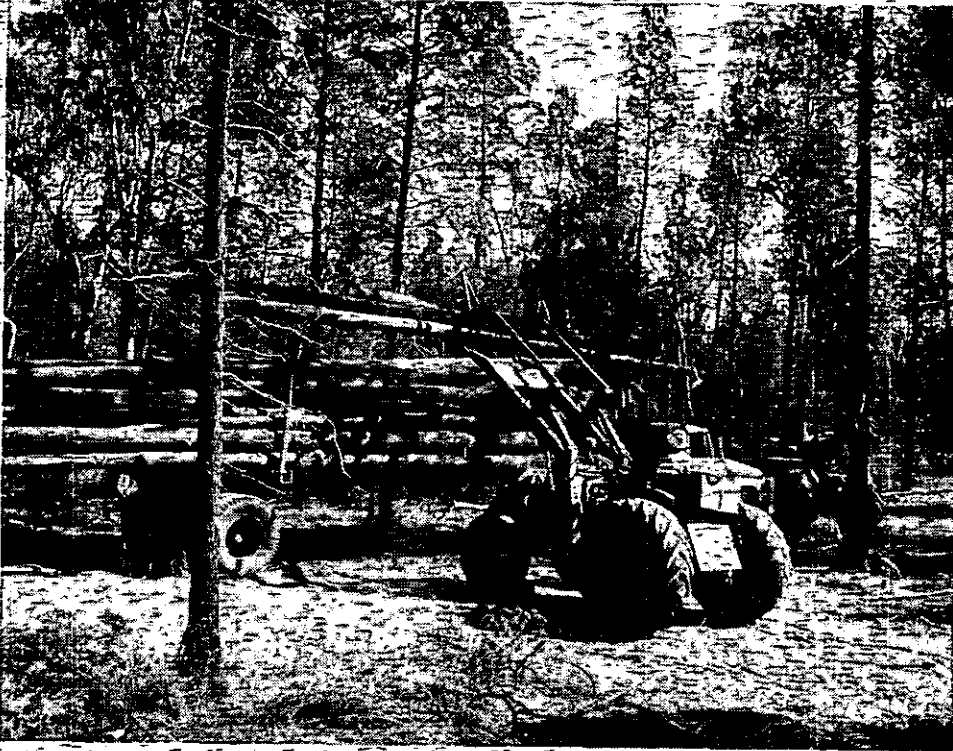
- (1) The Queensland Plantation Harvesting Research Committee;
- (2) The Cypress Pine Harvesting Research Committee;
- (3) The Hardwood Harvesting Research Committee.

The work of these committees and of similar committees in other States is co-ordinated by the Harvesting Research Working Group of the Australian Forestry Council. This Group met in Canberra in April, 1977, and an executive committee has prepared a report to the Forestry Council on work carried out by the various State Committees. This will facilitate the dissemination of the results of Harvesting Research throughout Australia to both State Forest services and industry.

The Queensland Plantation Harvesting Research Committee has now been working for almost two years and has produced worthwhile results from trials on the adaption of various logging machines and systems to Queensland. These include:

- (1) Feller-buncher with machine de-limbing in which selected rows are removed to facilitate access;
- (2) The use of sky-line systems in thinning operations on country too steep for access by tractor.

A Timberlift Skyline is operating in routine thinning on steep plantation areas in the Yarraman District and a Jones Mini-Alpine Skyline is also in use in the Mary Valley. The use of grapple skidders in plantations is also under investigation.



Loading Cypress Pine—Dalby District.

Preliminary work on the investigation of the relative improvement in productivity of existing machines by increasing access has been completed. Trials on this aspect will commence shortly.

The Hardwood Harvesting Research Committee was formed during the year and its initial work has been the definition of the major problems associated with this industry.

The Cypress Pine Harvesting Research Committee is the most recently formed of the three committees. The initial meeting was of the opinion that considerable benefits could be gained from the work already carried out in coastal exotic pine plantations. A field inspection of coastal exotic pine areas is being arranged in the latter part of 1977 to enable committee members to study logging practices in these areas.

SAWMILLS LICENSING

The number of licensed sawmills decreased by 13 during the year to 420. This total comprised 340 General Purpose Mills, 59 Other Than General Purpose Mills and 21 Portable Mills.

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

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

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

FOREST RESOURCES

Native Forest Inventory: Three survey camps were engaged part time during the year on inventory of native forests. An area of 545 000 hectares was assessed in the coastal and western hardwood regions. In addition, 46 detailed yield plots were established to obtain increment data. Logging studies were made on 7 plots.

There has been a major effort undertaken to modernize the system of forest inventory in native forests. The form that the revised system will take is illustrated in the adjacent diagram. Processing operations will be almost entirely computer based and will utilise data from field inventory, logging studies and increment records.

Field inventory will continue to utilise measured sample plots, but in the updated system information will be recorded on forms which facilitate direct conversion into computer code.

The effects of selective logging on yield are being monitored by studies in which three items being investigated are—

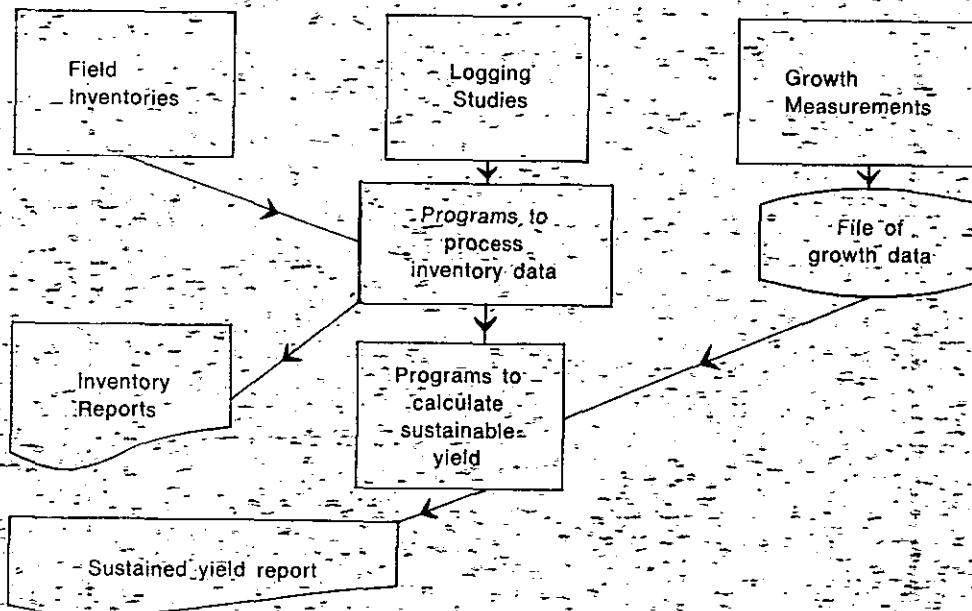
- (1) the stand composition before and after logging;
- (2) the percentages of defect volume and of completely useless trees by size classes;
- (3) the average volumes for trees of each size and species, used for construction of volume tables.

Increment data is progressively accumulated and held on a computer file in compact form. It is possible to quickly sort and extract all growth information relevant to a particular type of forest in a form suitable for use in yield calculations.

A suite of programmes is being written to receive both inventory and logging study information, for use in the production of inventory reports. Separate reports are produced which describe (i) the individual sample plots in the inventory, (ii) each of the forest types in the inventory and (iii) each State Forest in the inventory. Inventory information is also passed onto programmes which estimate sustainable yield.

Growth information is used in a forest simulator to project yields over a number of cutting cycles.

Processing System for Native-Forest Inventories:



Plantation Inventory: Field work in the Department's plantation areas involved collection of data for management purposes and the following inventory surveys were carried out:

Standing volume and diameter distribution assessment	5 300 ha
Site index assessment	2 580 ha
Determination of growth increment (by re-measurement of plots)	2 740 ha
Installation of new plots sampling younger plantations	2 280 ha

One full time and 4 part time camps were engaged on this work in various Districts of the State.

Plantation Yield Calculations: The plantation yield calculation system has been computerised for some years following the successful development and implementation of a basic yield simulation programme in 1967. From that time up to the present, the yield calculation system has been continually expanding to meet Departmental policy objectives. One important objective has been the endeavour to assist individual purchasers in the planning and organisation of their logging and marketing by providing them with advance information on compartments which will be operated in the coming 12-24 month period.

Over the past few years, an increasing number of purchasers have been supplied with this information as reliable yield calculations became available following inventories. It is expected that this information will be available to all purchasers during 1977-78.

The procedures followed in the process are:—

- (i) Inventory of all major plantations approximately every 5 years;
- (ii) These inventory data are fed into the yield calculation system and processed, giving a yield schedule by compartments after each remeasure. Calculations are updated annually;
- (iii) A logging and management plan is formulated for each District, and District staff and other Head Office Branches are encouraged to participate with Forest Resources Branch in the production of these plans;
- (iv) Individual compartments are allocated to the various purchasers, and each is informed in writing of the compartments that he is scheduled to log over the coming 1-2 years.

Valuation of Timber for Conversion of Tenure: Compared with 1975-76 there has been a slight increase this year in the number of applications for free-holding of Crown land involving timber valuation. Ninety-three applications were received in 1976-77 compared with 68 in 1975-76.

The overall situation is shown in the table below:—

**SUMMARY OF FORESTRY DEPARTMENT'S DEALINGS WITH APPLICATIONS FOR
CONVERSION OF TENURE
FROM 1960 up to 30-6-77**

	Number	Area (ha)
Applications being processed	118	532 000
Applications awaiting field assessment	71	192 000
Applications completed	3 221	10 041 000
Applications currently withdrawn	167	682 000
Total applications received	3 577	11 447 000

DIVISION OF PLANNING

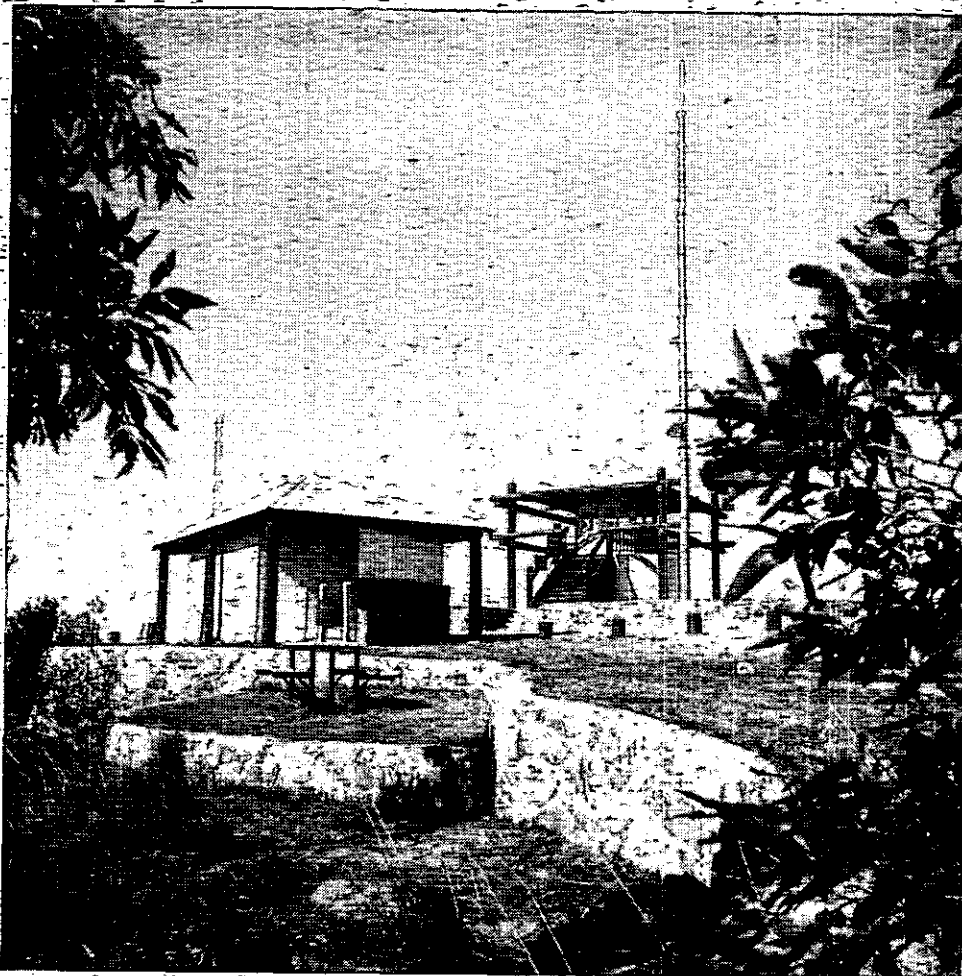
GENERAL PLANNING

Land Use Studies: Liaison has been maintained with other Government Departments and Local Authorities requiring input on Forestry matters to various local and regional land use studies.

Technical advice has been provided on Departmental land use matters, including Mining Lease applications on Forestry Reserves, State Forest revocation and reservation proposals.

Environmental Studies: The Section provides inputs to a variety of Departmental activities, including the formulation of environmental policies and guidelines, the preparation of reports and submissions, provision of an external advisory service and participation in developing a general planning framework.

One Environmental Impact Study (E.I.S.) is proceeding while preparatory work for further E.I.S. was initiated during the year.



Glasshouse Mountains Forest Lookout—Brisbane District.

Two Departmental zoologists are now engaged full time on a detailed survey of the vertebrate fauna of the coastal lowlands of southern Queensland. This survey is being conducted in close co-operation with the National Parks and Wildlife Service and will take several years to complete.

The projects associated with the survey are designed to provide valuable information for management purposes in this region where the Department's plantation establishment programme is concentrated. They are also contributing substantially to the core of scientific knowledge of the region.

ECONOMICS

Availability of Funds: Funds available to the Department in 1976-77 amounted to almost \$32.3 million and were derived from the following sources:—

Fund	\$,000
Consolidated Revenue	7,355
State Loan	13,198
Forestry and Lumbering Trust	9,587
Special Purpose Funds—	
Softwood Forestry Agreement Loan	1,547
Aboriginal Advancement Grant	235
Fraser Island Unemployment Relief	300
Flood and Cyclone Damage Restoration Grants	51
Total	<u>32,273</u>

Salaries and related administrative expenditure were the main items financed from the Consolidated Revenue Fund while the principal sources of finance for the Department's works programme were the State Loan and Special Purpose Funds.

The Forestry and Lumbering Trust Fund, which is funded mainly by revenue earned each year from the Department's timber sales activities, was used to finance expenditure on harvesting and marketing operations, maintenance of roads, plant and other capital improvements, and interest and redemption payments. The first payment of interest and redemption on funds borrowed from the Commonwealth under the Softwood Forestry Agreements was made during the year.

Softwood Forestry Agreements: The year 1976-77 proved to be one of restraint in terms of real growth in the Department's reforestation programme. Real expenditure (or expenditure expressed in constant money values) under the Reforestation Trust Fund was well down on that of the previous year and reflected the Commonwealth Government's curbs on public-sector spending generally as part of its anti-inflation policies.

Financial assistance under the Softwood Forestry Agreements was the main area affected. Under a further year's extension of the 1972 Softwood Forestry Agreements Act the area of new plantings assisted by the Commonwealth in Queensland was reduced to 822 hectares or half of the area assisted annually during the previous five years. A ceiling limit was also placed on the amount of financial assistance to be provided to each State with the maximum for Queensland set at \$1,469,000, almost \$1 million less than that provided in 1975-76.

The publication of a report on the Australian softwood products industry by the Bureau of Agricultural Economics was also an important contributing factor for this reduced level of assistance. Although the

report gave support to the concept of national self-sufficiency in wood products, it recommended a cutback in the nation's annual rate of softwood planting during the next five years. Since the report's release some doubts have arisen over the basis for estimating future sawlog requirements and it is possible that the recommended rate of planting may have been seriously under-estimated.

Fortunately, the total area planted in 1976-77 was not significantly affected by this reduced availability of funds, in spite of the much larger plantation estate that also had to be maintained. This pleasing result was achieved only by the provision of additional short term funds from the Commonwealth Government for Fraser Island unemployment relief.

It is anticipated that funding under a further 5-year Softwood Forestry Agreement will be limited to the maintenance of plantations established with Commonwealth financial assistance under past Agreements. Without further injections of funds from other sources, it will be impossible to sustain the present level of planting and current and long-term commitments to industry could be seriously affected.

Industries Assistance Commission's Inquiry into Timber and Timber Products: During the past year, the Industries Assistance Commission held an inquiry of major significance to the timber industry in this State. The primary purpose of the inquiry was to determine the nature and extent of any assistance to be granted to the industry, particularly in relation to measures designed to protect the industry against overseas imports. In its submission at the Brisbane hearings, the Department expressed concern over the possibility of changes to existing policy which might mitigate against the long-term potential of the industry to utilise available forest resources and which might also lead to harmful economic and social repercussions in many rural parts of the State dependent on forestry and timber activities.

Economic Studies: A comprehensive study of the potential benefits and costs to the Department of its Caribbean pine tree improvement programme was conducted jointly with the Department's tree breeding section during the year. The most significant feature to emerge was the potentially high rate of profitability (about 14 per cent) associated with this particular investment and confirms the importance of the Department's activity in this area.

ORGANISATIONAL SERVICES

Education and Training: Because of the increased number of students graduating in Forestry in recent years, the Department has terminated its policy of granting University scholarships. Staff in future years will be selected as required from new graduates.

The Forest Trainee and Adult Trainee Schemes have been terminated under the old format of field training supplemented by periodic schools of from one to two weeks duration.

In future all such training will be carried out at the Department's Forestry Training Centre now under construction at Gympie. The first stage of this complex is expected to be completed early in 1978. It will incorporate lecture rooms, a laboratory, a residence, a residential block for 40 students and kitchen and dining facilities.

It is intended that the centre be also used for Departmental in-service training and for joint training activities with the timber industry.

Organisation Development: The programme effort this year was directed at the new structure, especially to improve management systems, and procedures. Senior managers from Head Office and Districts attended a development programme designed to help them manage improvements in their areas of responsibility.

A more collaborative approach to management with an open communication system has started to materialise in the Department, and many new initiatives have been generated. One example is the implementation of budgeting by responsibility centres, designed to achieve the flexibility required for effective decentralised operation.

The project team has also been actively involved in review and redesign of procedures within sections in Head Office, involving direct participation of staff within these sections.

Intermediate improvements in efficiency and service levels have been achieved in Stores, Records, Marketing and Mechanical Equipment systems.

Team development activities have been conducted for several other work groups, with worthwhile results. An initial series of supervisory management seminars was conducted at Yarraman District. This series will lay the foundation for design of similar activities for remaining Districts.

An integrated training programme for staff in Head Office is presently being designed by Divisional Training Officers. This scheme will ensure balanced training related to work performance for all Head Office staff.

The new Gympie Forestry Training Centre will provide an ideal venue for elements of this programme, as well as training programmes for District Staff.

Job Safety: The lost-time frequency rate for the year was 69.9 compared with 85.7 for 1975-76 and 114.0 for 1974-75. This drop from 114.0 in 1974-75 to 69.9 in 1976-77 represents a 38.9 per cent reduction over the 2 years' period. Allowing for inflation in wages, the saving in direct Workers' Compensation payout over the same period was approximately \$80,000 and is indicative of the Department's active safety programme.

Ten Accident Prevention Courses were delivered to 90 Forestry supervisors and, since the new format of these courses was commenced in February, 1975, 42 of these courses involving 354 supervisors have been given. This first phase of the safety education programme has now been virtually completed.

The direct approach of lectures and films at workmen level was continued and 14 of these sessions were given at centres throughout the State. It is estimated that 75 per cent of this coverage has been achieved.

An innovation this year was a week's course in Brisbane for four Driver Instructors and one Plant Inspector to train these personnel to be motor cycle instructors in the districts. This measure was thought necessary because of the increasing Departmental use of motor cycles in off-road situations and the course was excellently presented by staff of the Road Safety Council.

Shields were presented to Districts with the lowest and the most improved accident frequency rates for the year.

Safety Committees operating at all major centres again made a valuable contribution to the improvement in the Departments Safety Record.

Forest Recreation: The Department has continued a policy of providing quality recreation facilities within State Forests.



Many forms of recreation are compatible with normal forest management.

During 1976 a number of staff attended a refresher school for foresters titled "Forests and People". The school centred on ways to meet the new demands for forest recreation. Staff has now been appointed to assist and co-ordinate the planning of recreation facilities throughout the State.

Public Relations: The Department has recognized there is a need to promote its policies and practices and is establishing a public relations programme to meet this need.

The programme aims at increasing the public's understanding of forestry activities and to present issues in a factual, rational manner.

SURVEY AND MAPPING

Surveys: Surveys associated with the plantation programme and native forest management in the ten forestry districts involved a total of 15 survey parties.

As part of the intra-departmental Forest Trainee Course, Survey instruction was given to 2 trainees, followed by three months practical training in Survey Camps.

Mapping: Four new State maps, scale 1:500 000, were published, including South East Queensland, South West Queensland, Central Queensland and Central Queensland East showing areas under Departmental control.

The new State map of Queensland, scale 1:2 000 000 was completed and is awaiting publication.

The following 1:50 00 Series maps were completed during the year:—

Map Name.	Sheet No.	Forestry District
Captains Mountain	9142—3	Dalby
Clewley's Gap	9149—3	Monto
Gore	9142—2	Warwick
Howard	9447—3	Maryborough
Kogan	9043—1	Dalby
Kroombit	9049—2	Monto and Rockhampton
Kumbarilla	9043—2	Dalby
Limevale	9140—4	Warwick
Mount Domville	9141—4	Warwick and Dalby
Whetstone	9041—2	Warwick
Wondul	9041—1	Warwick and Dalby
Wyaga	9041—4	Warwick
Yelarbon	9040—1	Warwick

A 1:50 000 map series of the Yuleba (Dalby Forestry District) complex of State Forests and State Forests in North Queensland District was commenced. Eleven 1:50 000 series maps were revised during the period.

Revision and metric conversion of project maps of plantation and coastal hardwood forests continued.

Some thirty-four map sheets were compiled or revised during the year.

Under the State Aerial Photography programme four (4) 1:100 000 map sheet areas were flown for this Department. All of these areas are in North Queensland Forestry District. The photographs will be used to assess the forest resource in these areas.

Colour photography of part of the Eungella area (Scale 1:10 000) was flown by contract for this Department, to assist in the identification of the spread of the disease *Phytophthora cinnamomi*.

Some experimental aerial surveying using a small format 35 mm camera, was carried out over the Beerburum State Forest. Trials have been successful and it is anticipated aerial photography will replace some ground surveys in coastal plantations in the near future.

Ninety interpretations from aerial photographs of forested areas were carried out in Survey and Mapping Section prior to field inspections by District staff. Most of these interpretations were connected with conversion of tenure actions.

During the year 6 038 maps valued at \$11,490 were sold to the public or to other Government Departments.

DIVISION OF TECHNICAL SERVICES

FOREST RESEARCH

The scope of work within the Forest Research Branch covers a wide variety of research fields associated with means of increasing productivity from our native and plantation forests. Highlights of the work carried out during the year are presented in this report. A separate Research Annual Report will also be published to cover in greater detail the major projects under investigation and current findings.

Softwood Plantation Silviculture: Species trials at Beerburum, Toolara and Tuan show that Honduras Caribbean Pine can have an advantage in volume productivity of 25-30 per cent over Slash Pine by age 20-22 years at those centres. The trials at Toolara which covered a wide range of sites also showed that the Honduras Caribbean Pine is very site sensitive. Investigations indicate that productivity is strongly related to soil brightness (chroma/value). On bright soils Honduras Caribbean Pine is vastly superior in growth to Slash Pine; on pale soils, which correspond to poorly drained sites, Slash Pine growth is better. However a number of experiments show that Honduras Caribbean Pine will outyield Slash Pine on poorly drained sites provided they are well mounded. Further experiments are proposed to determine optimum mound size and profile for both species.

A new growth model relating basal area increment to age, standing basal area, site index and predominant height was developed for Slash Pine. Preliminary tests show that the model should have wide application in thinning simulation, but a limitation is the central tendency of the data. With this in mind new spacing and thinning experiments are being designed to provide a broader data base for further growth model development.

Where nursery conditioning techniques developed from previous research were correctly applied, very satisfactory survivals in broad scale plantings of open-root seedlings of Honduras Caribbean Pine within the sub-tropics were achieved during the 1976 winter. Survivals in excess of 90 per cent were also obtained in two Honduras Caribbean Pine open-root planting experiments which were outplanted in tropical North Queensland, at Kennedy and Danbulla, at monthly intervals from January to April, 1977. These early results indicate that the nursery conditioning techniques which have been developed in sub-tropical areas can hopefully be extended to tropical areas.

The production of tubed Hoop Pine seedlings is expensive with current costs being of the order of \$230 per thousand of which tubing costs account for about \$85 per thousand. These high costs led to a renewal of efforts since 1974 to develop reliable techniques which will permit the production of open-root planting stock. Trials are being duplicated in the moister coastal environment at Imbil and in a drier colder environment at Yarraman. Variables being examined include nursery bed density, frequency and depth of root-wrenching, application of clay slurry root dips at lifting, topping, time of sowing and planting and method of planting. At Imbil survival of conditioned nursery stock planted at monthly intervals from December, 1974, have ranged normally from 80-100 per cent irrespective of the season of planting. However height growth of the late summer-autumn-winter plantings has been poor. The initial growth of spring to mid-summer plantings is however comparable with that of tubed stock. At Yarraman survivals from the initial trials have been less satisfactory, although results are sufficiently encouraging to warrant continuing investigations.

Native Forest Silviculture: Damage associated with logging in North Queensland rainforests is being assessed in a series of experiments. These aim to determine whether adequate growing stock in an undamaged condition is being retained to sustain future timber supplies, and whether ground disturbance can be reduced to acceptable limits. The preliminary findings indicate that (i) adequate stocking of commercial trees remain undamaged after logging even under current extraction methods, (ii) felling causes more damage than snigging, the former primarily as crown damage and the latter primarily as bark or wood damage to the lower bole, and (iii) the main stand parameters which are correlated with logging damage are volume, basal area, intensity of logging, snig track intensity and slope. These data were presented to a Workshop on "The Effects of Logging on all Values of Rainforests in North Queensland" held in Atherton in June, 1977, under the sponsorship of the Research Liaison Committee of the Queensland Regional Station of the C.S.I.R.O. Division of Forest Research.

A system of rating tree crowns in Spotted Gum-Ironbark forests has been developed, in which points are scored for crown position, crown size, crown density, occurrence of dead branches and occurrence of epicormic shoots. Both the individual and total scores have been found to correlate well with past diameter growth, and it is confidently expected that the system can be used as an indicator of future growth potential during logging and silvicultural treatment operations. It has been found that field staff can use the system to assess tree crowns accurately and consistently after a short period of instruction. A further study is being carried out to determine whether internal log defects can be correlated with external features.

One hundred and twenty detailed yield plots are maintained in the major Cypress Pine forests, with measurements commencing in 1937 in some cases. Following the most recent remeasure, a concentrated effort has been made to resolve anomalies in past measure records, convert data to metric units, and generate clean data files which conform to current standards. This is now virtually complete, and summaries of diameter increments by diameter classes and various other categories have been produced. The computer programme to produce final summaries of basal areas, volumes and standing values has been completed and tested, and now awaits the revision of volume and value equations. At the most recent measure, all stems were assessed for dieback status and crowns classified in terms of size and density. These data will be analysed in separate projects.

Tree Improvement: Genetic improvement of Slash Pine has reached the stage of culling the second clonal seed orchard (established in 1958-1963), and of progeny testing clones in the third improved seed orchard (established in 1975-76). Based on results of earlier progeny tests, four clones with relatively poor breeding values were removed from Seed Orchard No. 2. The first of a series of three open-pollinated progeny tests, covering in all the 100 clones in Seed Orchard No. 3, was planted on 4 sites through the range of Slash Pine in South-East Queensland. These tests incorporate trials of four different fertiliser regimes. Results of the tests will be used to identify clones for retention in the seed orchard, and parents for intraspecific and interspecific hybridisation.

Seed production in 1977 from selected clonal sources of Honduras Caribbean Pine exceeded 130 kg (including 54 kg from the Kennedy seed orchard). A further 55 kg of seed was secured from specially thinned seed stands. The great improvement of stem quality expected in stands derived from orchard seed is illustrated by the accompanying photographs of 13-year-old adjacent plots in a replicated trial of an imported seed batch (Figure 1) and a cross between superior trees selected in local stands (Figure 2). Progeny tests of numerous selected trees, including some clones



Figure 1. Straight-stemmed, windfirm trees of Honduras Caribbean Pine of a cross between local superior trees.



Figure 2. Relatively crooked and less windfirm trees from introduced seed of Honduras Caribbean Pine.

of section 1 of the Kennedy seed orchard have enabled identification of several parents whose progeny have rapid growth, good stem form and wide adaptability. Such good breeders, along with some second-generation selections, are to be established in Section 1 of a second seed orchard complex now being prepared for grafting in 1979-80.

Hybrids of Slash and Caribbean Pines continue to show great promise, especially on ill-drained sites in the southern coastal lowlands. Six-year-old hybrids in a trial duplicated at Byfield (23°S) and Beerburum (27°S) show extraordinary wind-firmness and good stem straightness (superior in both respects to Caribbean Pine), and excellent growth (superior to Slash Pine).

Appreciable amounts of hybrid seed are now being secured from a small clonal orchard of selected hybrids.

The Hoop Pine clonal seed orchard established in the Yarraman District in 1970-71 yielded more than 3 000 kg of seed in 1976-77. Although of generally low viability, this orchard seed can be sown by broadcasting and will produce enough stock for a significant area of routine plantation. Such plantations established in 1976-77 included 130 ha of a row-for-row mixture of orchard and routine stock, a considerably larger area than the previous substantial planting of orchard stock (27.5 ha in 1974-75). As part of a continuing programme of exploration, collection and testing of Hoop Pine gene resources for conservation purposes, several provenances from sources in Queensland and Papua New Guinea were established in routine plantations and in a replicated trial.

A review was made of several progeny trials of Radiata Pine. Results confirmed earlier indications that several introduced families and a few local ones have superior growth and adaptability in the limiting subtropical environments in plantation areas of the South-East Queensland highlands. Second-generation selections are being made for establishment of an improved clonal seed source.

Highlights of the year were the Food and Agriculture Organization—International Union of Forest Research Organizations (FAO—IUFRO) Third World Consultation in Forest Tree Breeding held at Canberra, its associated Tours, and the Brisbane Workshop of IUFRO Working Parties dealing with tree breeding in tropical species. Officers of the Section were involved in authorship of 8 papers for these meetings for which Proceedings are being prepared. They also prepared very comprehensive notes for the field tours associated with the Consultation. It was very gratifying to the Tour organisers to note the great interest and useful comments from the 20 visitors who participated in Tour No. 4 North and Central Queensland), and the 60 visitors of Tour No. 8 (South-East Queensland).

Forest Soils and Nutrition: A study was initiated at Beerwah in 1970 to investigate the productivity of second rotation Slash Pine. Information on nutrient removals in clear felling of the first rotation was collected and changes in soil/biomass nutrient status were monitored during the establishment of the second rotation. At harvest of the first rotation at age 32 years, quantities of nutrients removed from the site in wood and bark were: Nitrogen 182.2 kg/ha, Phosphorus 4.0 kg/ha, Potassium 60.6 kg/ha, Calcium 124.5 kg/ha and Magnesium 35.3 kg/ha.

Prior to establishment of the second rotation one half of the area was burnt, and the remaining area ploughed to 25 cm. Soil and litter samples were taken at the time of site preparation to allow estimates to be made of the nutrient changes associated with the site preparation. The area was replanted in July, 1970, with stock raised from seed collected from a range of first rotation trees. A short term fertilizer trial was installed to investigate the effects of site preparation, nitrogen, lime and phosphorus. This study has illustrated a significant response to site preparation with little response to lime, nitrogen or phosphorus.

Two permanent yield plots located on the area were relocated at establishment of the second rotation and form the basis of comparison between rotations. Comparison of growth data at age six years shows that the productivity of the second rotation is at least equal to that of the first rotation, and that there has been additional growth due to ploughing. It appears unlikely that there will be any future fall-off in productivity which cannot be corrected by normal fertilizer application.

A further study to investigate second rotation productivity in Hoop Pine is being planned for outplanting during 1978.

Forest Hydrology: A small project was initiated at Toolara in November 1975 to assess the impact of exotic pine plantation establishment on the sedimentation of streams in the area. Five catchments, each about 500 ha in area, were selected to represent a range of plantation ages and conditions; one of the catchments is being maintained in an undisturbed condition. Suspended sediment sampling data has so far been analysed for only a nine-month period after establishment. However sufficient information is available for general trends to become apparent. It seems that the critical years are between clearing and two to three years after planting—a total of three to five years. After this period there appears to be a very rapid return to pre-clearing conditions, i.e., as soon as a dense grass cover returns to the catchments and cultivation is reduced. The older more stable plantation catchments appear to produce no more sediment in the streams than the native eucalypt forest. A number of guidelines have been suggested which should assist in reducing stream sedimentation in future plantation areas.

Fire Research: Prescribed burning in coastal exotic pine plantations has been adopted as routine practice in plantation management. Fuel drying tables used in conjunction with prescribed burning operations were determined initially from Slash Pine plantation fuels at Toolara. To test the

validity of the current drying tables under a wide range of conditions fuel drying studies were extended during the year to cover Caribbean Pine plantations at Kennedy, Byfield and Gregory, Slash Pine plantations at Tuan and Beerburum and Radiata Pine plantations at Pechey and Passchendaele.

Mensuration and Biometrics: The use of weight scaling for estimating volumes of Caribbean Pine pulpwood was referred to in last year's report. Another trial, using Slash Pine, has been carried out at Gympie, with the co-operation of industry, to obtain estimates of variation and sample size requirements for this species. An overall conversion factor of 0.8933 m³/tonne was obtained, with a coefficient of variation of 4.0 per cent. The variation is somewhat less than for Caribbean Pine and well within the range recorded in U.S.A. and Britain, where weight scaling is extensively used. The sample size required would be relatively small, and for any large scale operation, a sample of 20 loads would be adequate for an estimate of the conversion factor with an accuracy of ± 2 per cent at the 95 per cent level of confidence. On this basis, weight scaling offers the possibility of major savings in measuring costs.

Over the past few years, complete summaries of experiment measure data, covering many years observations, have been produced by computer. These form an essential source of information for many purposes. Apart from problems of storage, a major difficulty has been to devise an efficient means of incorporating the results of remeasures to maintain the records in an up-to-date condition. A microfiche system now being introduced will provide an economical solution to these problems. All of the summaries for plantation silviculture experiments controlled by Beerwah Forest Research Station have been accommodated on eleven microfiche, which will be updated by producing a new set each year. Other experiment series will be incorporated into the system as summaries of past measures are finalized. It is anticipated that microfiche will find increasing use in similar applications in future.

TIMBER UTILISATION

General: The Branch consists of four basic working sections:—

- (i) Timber Conversion and Seasoning, and Timber Mechanics;
- (ii) Wood Structure and Utilisation;
- (iii) Wood Chemistry and Preservation;
- (iv) Timber Users' Protection Act.

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

The southern part of the State is serviced by personnel based in Brisbane while staff stationed in Atherton handle enquiries from North Queensland with occasional assistance from specialist staff.

Five officers represented the Department at the 18th Forest Products Research Conference, presenting the 9 papers prepared by them and other Departmental staff, and participating in Workshops in specialised fields.

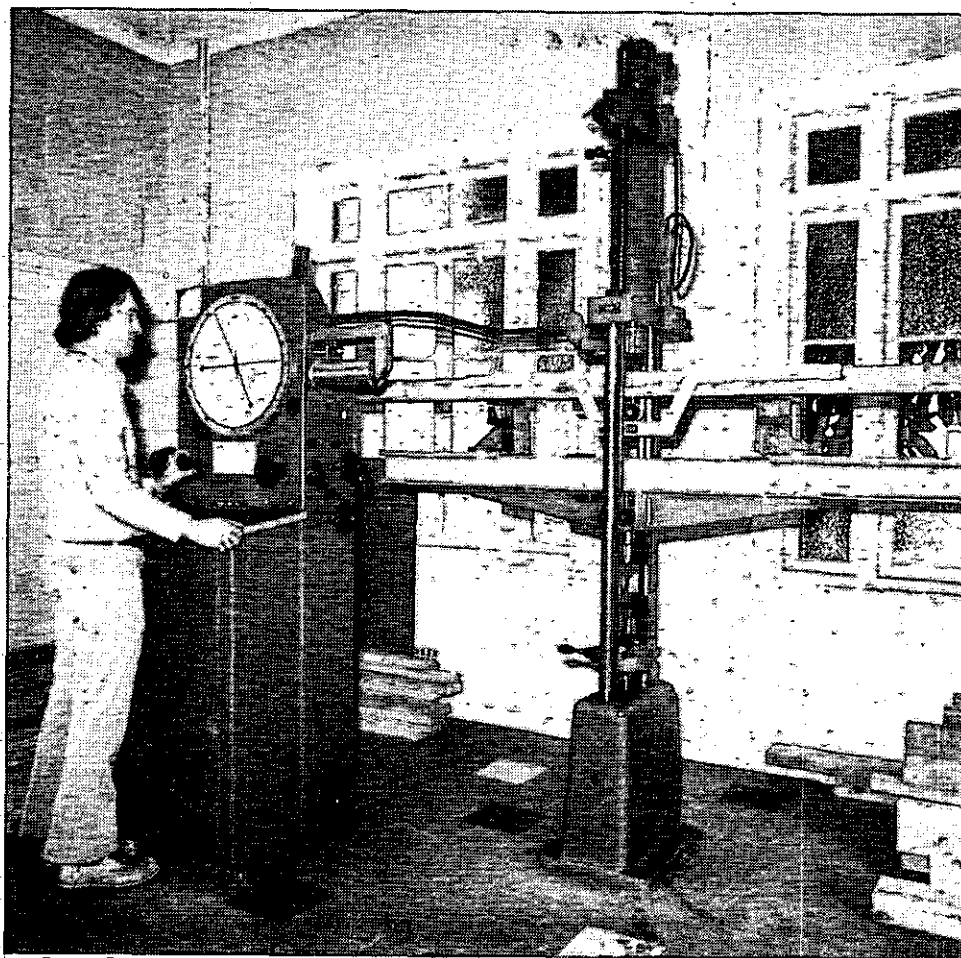
Officers serve on a number of Standards Association of Australia Committees involving timber and wood products. They participate in preparing new Standards and in revising existing Standards to keep abreast of progress in research and technology.

Staff have assisted the Department of Education, Timber Research and Development Advisory Council (T.R.A.D.A.C.) and other organisations by giving specialist lectures and by participating in training courses for industry personnel.

Timber Conversion and Seasoning: The Conversion and Seasoning Section carried out studies on the comparative sawn recoveries from pruned and unpruned stems of mature Hoop Pine. A study of recovery from plantation-grown West Indian Cedar was also made.

Sawing of material for drying studies was also done at the experimental sawmill. The accelerated drying studies of dense hardwoods continued, and a new kiln drying schedule, using higher humidities and temperatures than used previously, was developed in collaboration with a commercial timber firm. This schedule is being tested on different species having varying wood densities, and at varying initial moisture contents.

Other experiments included: (i) high temperature drying of Hoop Pine in framing sizes; (ii) high temperature drying of copper-chrome-arsenic-preservative treated Hoop and Honduras Caribbean Pine in both framing and board sizes; (iii) assessment of the drying properties of Candlenut from North Queensland; (iv) assessment of drying properties of timber of three "problem" Silky Oak species from North Queensland sawn to different breakdown patterns.



—Mechanical strength-testing of timber.

Extension services included advising on seasoning methods and kiln construction. The Department was again represented on the Joint Timber Seasoning Committee, which co-ordinates timber drying research in Australia. Reports on high temperature/high humidity drying were received with much interest by this Committee.

Timber Mechanics: The Timber Mechanics group has its testing laboratory registered with the National Association of Testing Authorities, Australia. A large strength testing programme for Cypress Pine commenced, in co-operation with T.R.A.D.A.C. to provide information for efficient use of this species in structures.

Testing of Douglas Fir (Oregon) imported from New Zealand confirmed that the species provided usable structural grades of timber. Mechanical properties of further rainforest species were assessed.

Studies continued on the effect of copper-chrome-arsenic preservative treatment on the strength of locally-grown pines, including pole-sized material. A decrease in bending strength was shown in tests on small clear specimens, indicating the need for tests on structural-sized timber.

Investigation of proof loading as an alternative method to mechanical stress grading was commenced, again in co-operation with T.R.A.D.A.C. It is anticipated that this method could particularly benefit firms with smaller scale operations.

Quality assurance testing for the commercial operators of mechanical stress grading machines continued. The Department's strength testing facilities were used regularly by industry.

Wood Structure and Utilisation: During the year 7 200 specimens of wood and wood products of local and overseas origin were identified for industry, government departments, and the general public, including 84 for use in consumer-protection procedures.

Studies continued on genetic and environmental effects on wood properties, yields and quality, providing data which assist management in selecting species, varieties, and geographic seed sources for particular localities, and in selecting individual trees for use in seed orchards. Wood quality was shown to be related to growth rate, tree straightness, crown features, and climatic features such as rainfall, hours of sunshine, temperature and evaporation.

Continuing assessments of trials over a wide range of localities and site qualities reaffirmed the value of Honduras Caribbean Pine as a high-yielding, general purpose softwood with good properties for sawn, veneered, chipped and pulped wood products. Locally-improved stock originating from a Belize (Mountain Pine Ridge) provenance tested at age 12 years has satisfactory wood properties while producing 19 per cent higher volume and 13 per cent higher dry wood weight per hectare than alternative strains tested.

Defects such as resin and bark pockets in exotic pine wood can indicate moisture stress in apparently thrifty growing stock when stands reach 15-20 years in some localities. Regular checks for these defects will permit more efficient management and marketing decisions related to this material.

Tree and wood growth patterns, particularly in Honduras Caribbean Pine, are being related to climatic factors in a continuing study at locations in North, Central and South Queensland, thus enabling prediction of yields and wood quality.

A statistical method was developed to combine numerous growth and wood quality factors into a single score to allow improved comparisons between populations or between individual trees.

Studies of the complex inter-relationships between tree growth, wood quality and the environment continued. An officer of the Section spent one month at the Commonwealth Forestry Institute at Oxford, studying the X-ray densitometric technique for tree ring analysis. Queensland-grown softwood samples were studied using the following data:—X-ray densitometric measurement from Oxford, beta-ray densitometric measurements from the New Zealand Forest Research Institute, and conventional measurements from the Department's laboratory. The results justified the Section's planned expansion in the field of densitometry.

Extension services to industry and consumers in the utilisation area involved over 800 technical enquiries, including those for arbitrational inspection. The demand for such inspections is taxing the Section's resources, and will increase with enforcement of the Queensland Building Act.

Assistance was given to T.R.A.D.A.C. directly and through membership of its Research and Development Committee. Information on timber utilisation trends was submitted to the Industries Assistance Commission Inquiry into timber and timber products.

The previous recommendation which was the basis for the Cabinet decision in 1959 to use only Australian-grown timbers in State Government financed works was reappraised and the recommendation was confirmed.

The Department of Local Government was assisted by expert advice in framing the timber provisions of the Queensland Building Act and its Appendices. Extension work, in collaboration with T.R.A.D.A.C., included assisting producers and builders to prepare for introduction of branding and grading under the Building Act.

The Section is co-ordinating a major study of strength, decay resistance and Lyctus-susceptibility of about 400 previously inadequately tested, or untested Queensland and imported timbers. Interim strength classifications based on prediction from wood density are presently being used.

Inspection showed termite-proofing of concrete slab-on-ground constructed houses was often inadequate, indicating a lack of compliance with Australian Standards and local building regulations. It is hoped to improve this situation by educational programmes.

Seasoned timber framing, particularly in conifers and rainforest timbers, is being used increasingly but Cypress Pine also has gained a large share of the market previously served by hardwood. Log cabin type structures are becoming more popular, and will provide an additional outlet for preservative-treated round timber.

Floor construction trials using the platform method were completed. The method generally cannot be recommended under local conditions when floors are left uncovered. It is satisfactory for covered use with the most commonly used strip and panel flooring materials, except for lower density timbers, some rainforest hardwoods, and urea-formaldehyde-bonded particleboard. Commonly used surface protection methods were found to be of little use. The sub-floor ventilation level required by the Building Act was found satisfactory.

Railway sleepers, bridge timbers, mining timbers, poles, piles and crossarms remained in high demand and problems in their use were generally avoided by regular liaison with authorities and industry and the provision of technical advice.

Landscaping contractors and materials suppliers were contacted regularly to assist in more efficient utilisation of timber, particularly in log retaining walls. Chipped pine bark remains a valuable processing residue in high demand.

Structural plywood and particleboard have become highly competitive with solid timber for flooring. Particleboard has become a staple furniture and joinery material, and timber-veneered panelling and furniture are regaining popularity. Timber and wood product usage in caravan construction was surveyed and information obtained on types and quantities used.

Pulpwood utilisation increased by 82 per cent to 93 000 m³ per annum over the past two years as local manufacturers raised their production. The Branch is involved in sap stain prevention studies aimed at eliminating possible degrade in high quality products.

Future market requirements for clearwood and wood free of defective knots are being estimated for use in formulating Departmental policies on pruning.

Field trials of Australian structural timber standards were made, and strength testing programmes organised to assist in improving them. One standard in preparation will amalgamate all existing sawn hardwood standards, and a current set of softwood standards has also been revised.

Resin production from Queensland-grown Slash and Caribbean Pines using stimulation techniques is being assessed in co-operation with industry. Pine oil, resins and related products imported into Australia last year cost approximately \$2,350,000.

Wood Chemistry and Preservation: A major function is provision of quality control for commercial timber preservation firms, by chemical analysis of both treatment solutions and treated wood samples. An advisory service is also provided to industry, other Departments and the public.

Field inspections and associated laboratory investigations were continued in the extensive study of "soft rot" attack on the sapwood of preserved hardwood transmission poles. The study involves relationships between pole species, areas of supply and of use, type of preservative, techniques used in treatment, climate, soils, and other localised environmental factors.

A study was commenced to assess treated softwoods as an alternative to hardwoods for in-ground service in co-operation with the State Electricity Commission, electricity supply authorities, and several timber preservation firms. The use of Lyctus-susceptible wood in mining timbers is also being assessed in conjunction with Departmental entomologists.

Papers were presented to the Institute of Physics, the Forest Products Research Conference and the Timber Preservation Committee. The Department was represented on the State electrical authorities' Wood Pole Committee and the national Timber Preservation Committee.

Timber Users' Protection Act: One hundred and thirty-two cases were investigated under the Timber Users' Protection Act (T.U.P.A.), including 67 initiated this year. Most complaints involved timber originating outside Queensland. Further inter-departmental discussions led towards more uniformity in provisions of the Queensland Act and the N.S.W. Timber Marketing Act, which will, it is hoped, result in decreased numbers of complaints.

Although the total number of complaints has decreased, a higher proportion involved timbers such as Meranti imported into Australia, and which contained Lyctus-susceptible sapwood.

Most complaints were resolved satisfactorily by the parties involved, while some were outside the jurisdiction of the Act. Two cases were set down for prosecution for alleged breaches of the Act.

Routine inspections were carried out on houses under construction. Extension work included visits to sawmills, timber suppliers and wood-working factories, mainly to explain the provisions of T.U.P.A. More than 3 000 samples were tested for either moisture content or preservation content for the Queensland Housing Commission, timber suppliers, builders, lending authorities, etc.

An additional officer was appointed to the Section during the year to assist the Inspector.

ENTOMOLOGY AND PATHOLOGY

Surveys during the year uncovered a major infestation of the West Indian Drywood Termite (*Cryptotermes brevis*) in public buildings in the heart of Brisbane. Whilst there are spot infestations elsewhere in Brisbane, associated with the movement of infested articles from the primary focus, it is considered the termite population is still essentially confined to a limited area. However, the large size of the buildings involved will make attempts at control or eradication very expensive. The control programme in the Maryborough-Bundaberg area is operating effectively. Two further infested buildings have been located, both well within the perimeter of previous infestations.

Investigations have revealed substantial populations of Auger Beetles (Bostrychidae) and Lyctid Beetles (*Lyctus brunneus*) in sapwood in mining timbers in service in the Ipswich area. A number of preservative treatments aimed at alleviating the problem are being tested.

Because of the high cost of weed control in forest areas great importance is attached to work directed at biological control. The Department is continuing its support of a programme to search for parasites of lantana in South and Central America. At the same time it is assisting in the spread of promising insects raised by the Department of Lands. In this regard the Hispines *Octotoma scabripennis* and *Uroplata girardi* have been released throughout the State Forests where lantana is a pest. Reports indicate the successful establishment of these insects over a wide area. Because initial releases of these insects were relatively small, the areas infested within particular reserves are not large when compared with the total expanse of lantana. However it is hoped that the degree of damage effected by these insects will increase significantly as populations build up. Large releases are planned. Another Hispine beetle *Octotoma championi* which operates successfully under shaded and high altitude conditions has recently been released.

Studies continued during the year on the rainforest patch deaths with which is associated the root-rotting fungus *Phytophthora cinnamomi*. This fungus is most active in shallow, poorly drained soils, and, in the rainforests of the Mackay, Ingham and Cardwell hinterlands it is associated with dead patches of rainforest on such sites. Preliminary surveys showed that the fungus is also present in some areas further north than Cardwell but the incidence of patch deaths is negligible. A number of study plots were established in patch death areas. Over the next few years these will provide information on spread of the patches and on the response of the various rainforest species. Other studies include aerial photography and a trial planting for site rehabilitation purposes.

DIVISION OF ADMINISTRATION

General: The administration framework of this Division includes four branches, viz., General Administration, Special (Operations) Administration, Accounts and Automatic Data Processing. Sections within this network of branches include Secretarial, Stores and Records, Staff and Industrial, Forest Estate, Leasing, Bills and Regulations, Revenue and Expenditure, Computer Systems and Data Processing. In all, this division employs around 100 salaried officers on administrative, accounting, clerical and computer systems duties.

GENERAL ADMINISTRATION

Office Accommodation: Staff in the metropolitan area are located at a number of points with the Chief Office remaining at the former Wills Building in Ann Street, Brisbane. Floor space in this building is now inadequate to meet the immediate needs of the Department and it is planned to transfer approximately forty-two staff of the Division of Technical Services and the Brisbane District Office to rented accommodation.

SPECIAL (OPERATIONS) ADMINISTRATION

Staff: At 30th June, 1977, the approved salaried staff establishment was 643, the same figure as for the previous year. Actual staff level at 30th June 1977, was: Salaried officers 621, wages employees 1334. Appendix I provides details of staff distribution.

During the year, forty-four salaried officers left the Department including two officers each of whom retired after more than forty years of meritorious service. The Officers who retired are

- Mr W. H. D. Constant, Record Clerk, General Administration Branch, Division of Administration, Brisbane, with 49 years service; and
- Mr G. F. B. Carter, Forest Ranger Division II, Brisbane, with 43 years service.

We wish these officers a long and happy retirement.

It is with deep regret that the deaths are recorded of Mr L. A. Grigg, Forest Ranger Division II, Ravenshoe, and Miss L. D. Faulks, Clerk-typist, Toolara. These officers had served the Department faithfully and efficiently during their periods of service and their untimely deaths will be greatly felt by all who had served with them. Deepest sympathy is extended to their bereaved families and friends.

Industrial Matters: During the year the Forestry Employees Award, State Government was updated and consolidated by consent of the parties to the Award. Major changes resulting from this updating and consolidation were in the areas of worker accommodation, reclassification of certain duties and increases in allowances for particular types of operations.

A flexible working hours scheme was introduced in the Chief Office on a trial basis in June, 1976, for officers working a 9 a.m.-5 p.m. day. The scheme has been welcomed by the majority of staff, and will be continued. Where practical it is now being implemented in other offices.

Forest Estate: During the year the net increase in area of State Forests and Timber Reserves was 50 155 hectares. The major portion of the land added became available through the surrender of parts of Crown grazing leases being converted to freehold under the Land Act. Revocation action involving the whole or parts of eight State Forests was undertaken, representing a loss of 806 hectares to the Forest Estate. The most significant of these actions made available 364 hectares of former State Forest for inclusion in a substantial National Park proposal adjacent to Bustard Bay to the south of Gladstone.

An amount of \$68,880.00 was expended during 1976-77 on the acquisition of land for Forestry purposes as follows:—

Purchase of Land	\$21,030.00
Survey Fees (including cost of survey of 13 blocks obtained by surrender from Crown Holdings)	\$47,004.94
Real Property Fees and Lands Department Charges	\$845.06
	<u>\$68,880.00</u>

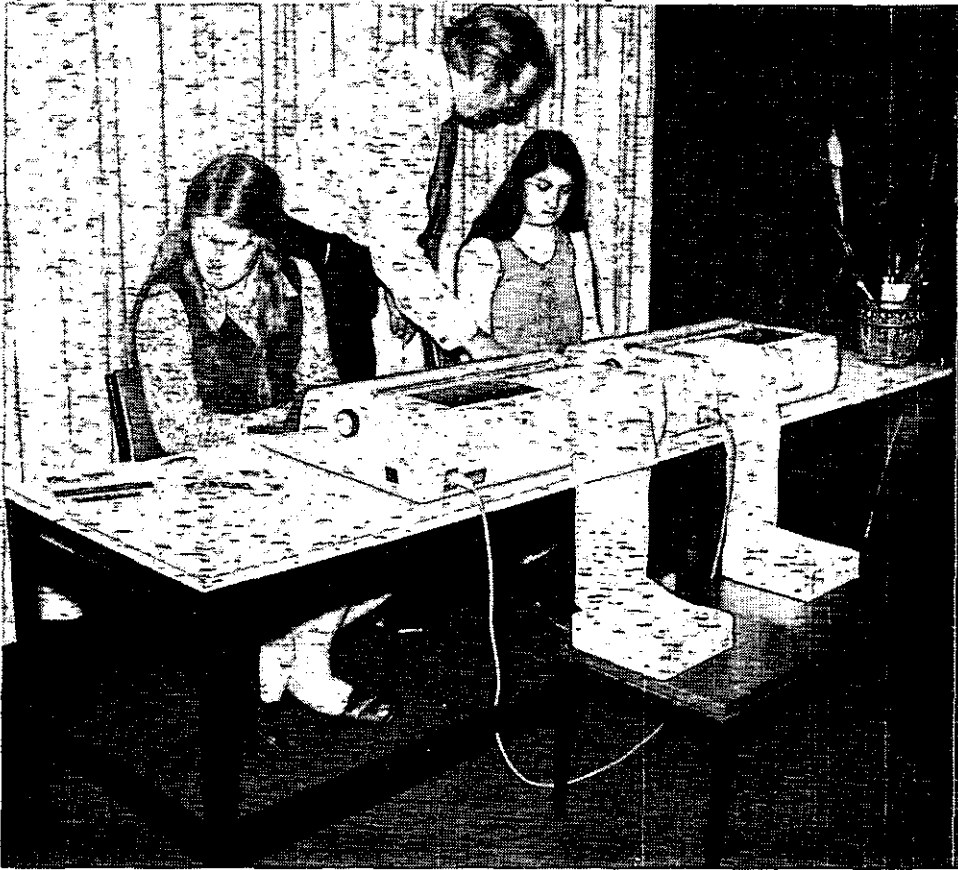
Legislation: Although a good deal of preparatory work has been done towards amending and recasting the Forestry Act and the Timber Users' Protection Act it will still be quite some time before draft Bills are available for consideration.

Legislation this year was restricted to a short Bill which increased the penalties prescribed for breaches of the Sawmills Licensing Act. Following assent to this Bill administrative action was taken to amend the penalties laid down in the Sawmills Regulations.

The Diseases in Timber Act assented to in 1975, to provide for the taking of appropriate measures for the extermination, prevention or control of any disease in timber resulting from an attack by an insect, fungus or other organism came into force as from 11th June, 1977.

Offences: During the year there were more than 110 reported breaches of Acts administered by this Department. This represents approximately two-thirds of the offences reported in the previous year. Fifty-four per cent of the cases reported were for alleged breaches of the Timber Users' Protection Act, 44 per cent the Forestry Act and 2 per cent the Sawmills Licensing Act. Prosecution proceedings were successfully instituted against four offenders and fines totalling \$190.00 were imposed. From action taken in cases involving unauthorised interference with timber and other forest products, a sum in excess of \$15,500 representing stumpage value and costs of investigations was recovered. In their capacity as Fire Wardens, Forest Officers also investigated two breaches of the Rural Fires Act.

ACCOUNTS



Operators receiving instruction on new accounting machines.

The Department has recently acquired two Data Saab D12/300 Electronic Accounting Systems to modernise the processing of Accounts Branch documents. These are the first of the Data Saab models to be supplied in Australia. A paper tape punch unit will be connected to these machines to store data for processing by the new UNIVAC Computer now being installed at the Treasury Department. The accounting reports obtained will provide a quick and efficient system of control and reporting devices for both Treasury and internal use.

AUTOMATIC DATA PROCESSING

The introduction of computer processing of Stumpage Accounts into the Mackay Sub-District and the completion of preparations for a similar introduction into North Queensland were major advances made in the area of data processing during the year. Extensive use of the power of the computer was made in providing the data and statistics to permit the adoption of a system of Hardwood-Gross Log Pricing. A comprehensive suite of computer programmes was developed by A.D.P. staff for this major project. Branch staff are presently engaged in an intensive re-training programme connected with the Queensland Government's purchase of a UNIVAC Model 1100/42 Computer System, and conversion of existing computer programmes to run on the UNIVAC Computer has commenced.

APPENDIX A
MILLING TIMBER REMOVALS FROM CROWN LANDS 1976-77

Species	North Qld.	Brisbane	Dalby	Gympie	Maryborough	Monto	Murgon	Rockhampton	Warwick	Yarraman	1976-77 Total	1975-76 Total
Forest Hardwood	12 147	23 902	18 127	18 477	30 900	13 800	27 737	30 558	3 355	6 478	185 481	218 517
Rain Forest Structural Timbers	65 655	665		243	282	35	946	10 172	1 515	227	79 740	76 815
Prime Cabinet Woods	30 684	21		12	28		38	171	13		30 967	30 145
Miscellaneous Cabinet Woods	35 020	486		146	171		468	1 917	1 415	95	39 718	35 366
Hoop, Bunya and Kauri	4 334	559		1 964	22 339	409	6 619	1 467	3 942	2 139	43 772	32 649
Native Plantation Conifers	707			32 684	185	6 516	12 083			29 886	82 061	88 619
Exotic Plantation Conifers		33 430		5 163	6 196		1 650	4 435	9 108	6 604	66 586	58 450
Plantation Non-conifers										660	660	138
Cypress		258	88 652		298			2 573	23 994		115 775	101 598
Total	148 547	59 321	106 779	58 689	60 399	20 760	49 541	51 293	43 342	46 089	644 760	642 297

APPENDIX A—continued
PULPWOOD REMOVALS FROM CROWN LANDS 1976-77

Species	North Qld	Brisbane	Dalby	Gympie	Maryborough	Monto	Murgon	Rock- hampton	Warwick	Yarraman	1976-77 Total	1975-76 Total
Native Conifer		154		797			3727			372	12 050	13 805
Exotic Conifer		20 914		18 168	27 045		140			2 241	68 508	77 045
Non-Conifer		2 632								9 852	12 484	13 990
Total		23 700		25 965	27 045		3 867			12 465	93 042	104 840

APPENDIX A—continued

MILLING TIMBER OPERATED FROM OTHER THAN CROWN LANDS, 1976-77

Species	North Qld.	Brisbane	Dalby	Gympie	Maryborough	Monto	Murgon	Rockhampton	Warwick	Yarraman	1976-77 Total	1975-76 Total
Hoop, Bunya and Kauri	20	1 088		818	962			336	1 422	185	4 831	5 379
Cypress		26	45 402	10	65				26 296	45	71 834	76 270
Other Pines	3	101			4			11	25		154	866
Forest Hardwoods	3 969	105 201	9 530	9 464	48 160	31 893	8 819	29 197	12 957	17 277	276 467	251 176
Rain Forest Structural Timbers	9 056	797		58	141			1 107	902	2	12 063	12 030
Prime Cabinetwoods	2 877	208						268			3 354	3 852
Miscellaneous Cabinetwoods	8 933	714						1 912	166	2	11 728	13 858
Native Plantation Conifers											186	182
Exotic Plantation Conifers	20	4 857		186				109	483	32	5 705	12 094
Plantations, Non-Conifer Imported		195		50	154						195	84
		9 242									9 242	7 145
Total (Estimated)	24 878	122 429	54 932	10 586	49 488	31 893	8 819	32 940	42 251	17 543	395 759	382 936

APPENDIX A—continued

MISCELLANEOUS REMOVALS FROM CROWN LANDS 1976-77

Sleepers—1.20 m	5 231 pieces
Sleepers—1.50 m	70 000 pieces
Sleepers—1.80 m	126 pieces
Sleepers—2.00 m	1 313 pieces
Sleepers—2.15 m	257 583 pieces
Transoms, crossings, headstocks, longitudinals, etc.	5 506 cubic metres
Girders, corbels, piles, sills, kerb logs, etc.	18 025 metres
Girder logs	610 cubic metres
Poles	17 286 metres
House blocks	948 metres
Fencing material—round	109 284 metres
Fencing material—Split	111 366 metres
Mining timbers—round	80 759 metres
Mining timbers—sawn	4 902 cubic metres
Off cuts—Pallet and short length sawn timber	543 cubic metres
Fuel	5 369 tonnes
Quarry Material—Sand, gravel, soil, etc.	467 641 cubic metres
Fibre, Bark, Dry Leaves, Reeds, etc.	27 bags
Flora	689 pieces
Peat	224 bags
Lawyer Cane	10 tonnes
Boat Knees	106 pieces
Bee Hives	5 hives
Black Wattle	260 pieces
Charcoal	36 tonnes
Trees and Plants (number)	393 220
Tea Tree Bark	5 tonnes
Freestone	89 cubic metres

APPENDIX B

TOTAL RECEIPTS, DEPARTMENT OF FORESTRY FOR THE YEAR ENDED 30th JUNE, 1977

RECEIPTS FROM DISTRICTS	Totals \$
Group 1—Brisbane, Gympie, Maryborough, Monto, Murgon and Yarraman Districts	3,342,930
Group 2—North Queensland District	1,327,593
Group 3—Dalby District	615,936
Group 4—Warwick District	397,368
Group 5—Rockhampton District	379,913
Revenue from Sales of Timber and Forest Products	\$6,063,740

OTHER RECEIPTS	\$
Forestry and Lumbering	690,279
Sale of Plants, Materials, etc.	220,228
Licenses	56,551
Rents	37,568
Grazing Dues	59,190
Miscellaneous (Salisbury Area Timber Account, Forfeited Wages, Expenditure Recoveries, etc.)	328,184
T.R.A.D.A.C.	182,494
Sale of U.S. Tractors, trucks, etc.	360,517
Plant Hire—	7,998,751
Charged to Works Projects	2,212,638
	\$10,211,389

The above receipts were disposed of as follows:—

	\$
Aboriginal Grants	234,920
To Consolidated Revenue Fund as repayment of previous expenditure	1,644
To Loan Fund—	
Repayment of previous expenditures	360,517
Surplus plant hire	49,886
	410,403
To Forestry and Lumbering Trust Fund as expenditure on marketing of log timber, maintenance of access roads, capital improvements, plant, T.R.A.D.A.C., etc.	6,195,518
As Interest and Redemption on Loans	3,368,904
	\$10,211,389

APPENDIX C

PROCEEDS OF SALES OF TIMBER, ETC.

For the period 1st July, 1973, to 30th June, 1977 (Financial Years)

Groups	1973-74	1974-75	1975-76	1976-77
	\$	\$	\$	\$
Group 1	2,345,146	2,446,876	2,754,891	3,342,930
Group 2	1,188,709	1,388,030	1,271,615	1,327,593
Group 3	442,894	522,306	603,181	615,936
Group 4	245,077	254,714	407,935	397,368
Group 5	230,635	272,574	308,318	379,913
Timber Research and Development Advisory Council	4,452,461	4,884,500	5,345,940	6,063,740
	161,336	167,509	171,750	182,494
	\$ 4,613,797	5,052,009	5,517,690	6,246,234
Receipts—Forestry and Lumbering	427,287	624,831	781,723	690,279
Sale of Plants, Materials, etc.	82,339	107,882	192,717	220,228
Licenses	32,879	36,740	55,149	56,551
Rents and Grazing dues	96,909	98,627	107,037	96,758
Miscellaneous (Salisbury area Timber Account, Forfeited Wages, Expenditure Recoveries, etc.)	40,779	410,718	1,188,533	328,184
Sale of Tractor, Trucks, etc.	313,146	228,274	290,171	410,403
	\$ 5,607,136	6,559,081	8,123,020	8,048,637

APPENDIX D

LOGGING

The table below shows the quantities of log timber hauled during 1976-77, by contractors to the Department and payments made to them for this work—

Class	Quantities	Payments
SOUTH QUEENSLAND—	cubic metres	\$
Hoop and Bunya Pine	33 839 471	406 141 42
Forest Hardwoods	Nil	
Scrub Hardwoods	238 717	
Miscellaneous	619 913	
Red Cedar	26 287	
	34 724 388	406 141 42
NORTH QUEENSLAND—		
Cabinet Woods	1 139 824	22 566 44
Totals	35 864 212	428 707 86

APPENDIX E
COMPARATIVE STATEMENT OF EXPENDITURE BY FUNDS
FOR YEARS 1975-76 AND 1976-77

	1975-76	1976-77
CONSOLIDATED REVENUE FUND—		
Salaries	\$ 5,740,881	\$ 6,597,197
Cryptotermes Brevis Investigation	8,385	5,149
Fares, Printing and Stores	24,422	28,600
Travelling Expenses and Incidentals	465,632	634,324
Recreation Facilities—State Forests		10,655
Cash Equivalent of Long Service Leave	89,663	79,248
	6,328,983	7,355,173
LOAN FUND—		
Recreation Facilities—State Forests	61,041	76,097
Amount to be credited to Reforestation Trust Fund	11,366,000	12,370,000
Acquisition of Airstrip—Fraser Island		35,000
	11,427,041	12,481,097
TRUST AND SPECIAL FUNDS—		
Forestry and Lumbering Fund—		
Interest and Redemption on Loans	3,059,544	3,368,904
Hardwood Supplies to Department of Railways and Others	724,954	628,101
Harvesting and Marketing Timber	2,310,717	2,661,338
Access Roads—Maintenance and Subsidies	439,662	548,693
Maintenance of Plant	1,721,882	1,941,488
Maintenance of Capital Improvements	254,999	233,404
Expenses—Timber Research and Development Advisory Councils	176,700	182,494
	8,688,458	9,564,422
Reforestation Trust Fund—		
Reforestation	12,354,981	11,680,614
Land Acquisition	55,930	68,880
Purchase of Plant	916,196	1,999,614
Access Roads	774,584	709,939
Purchase of Radio and Firefighting Equipment	24,965	81,703
	14,126,656	14,540,750

APPENDIX F
NET AREA OF SOFTWOOD PLANTATION ESTABLISHED 1st APRIL, 1976, TO 31st MARCH, 1977

Species	Brisbane	Gympie	Rockhampton	Maryborough	Monto	Murgon	Nth. Qld.	Warwick	Yarraman	Totals
A. Native Conifers—										
Hoop Pine	41.8	177.6		58.9	46.1	187.3	10.3		178.7	700.7
Kauri Pine				1. Conifers		6.7				6.7
Bunya Pine										
Other Native Conifers										
Total—Native Conifers	41.8	177.6		58.9	46.1	194.0	10.3		178.7	707.4
B. Exotic Conifers—										
Slash Pine	426.0	1 595.7		1 301.1						3 322.8
Loblolly Pine		34.0								34.0
Patula Pine	253.2	126.1	182.1	230.9			238.8		30.0	1 061.1
Caribbean Pine				4.4	0.7			45.2	33.6	78.8
Radiata Pine	15.4							0.2		20.7
Other Exotic Conifers										
Total—Exotic Conifers	694.6	1 755.8	182.1	1 536.4	0.7		238.8	45.4	63.6	4 517.4
Total—Conifers	736.4	1 933.4	182.1	1 595.3	46.8	194.0	249.1	45.4	242.3	5 224.8

APPENDIX G
NET AREA OF EFFECTIVE PLANTATION CLASSIFIED INTO FORESTRY DISTRICTS TO 31st MARCH, 1977

Species	Brisbane	Gympie	Rockhampton	Maryborough	Monto	Murgon	Nth. Qld.	Warwick	Yarraman	Totals
	ha	ha	ha	ha	ha	ha	ha	ha	ha	ha
A. Native Conifers—				1. Conifers						
Hoop Pine	1 282.5	11 012.2	262.1	1 437.5	2 555.9	7 158.1	1 066.0	13.0	12 984.1	37 771.4
Kauri Pine	2.5	33.7	0.7	28.2	1.4	1.3	118.1	0.3	3.0	189.2
Bunya Pine	6.4	230.7		0.4	0.5	118.5	1.3	4.0	111.2	473.0
Other Native Conifers	2.0	3.2	0.4	0.7			6.2	0.4	0.2	13.1
Total—Native Conifers	1 293.4	11 279.8	263.2	1 466.8	2 557.8	7 277.9	1 191.6	17.7	13 098.5	38 446.7
B. Exotic Conifers—										
Slash Pine	11 758.4	18 249.3	1 008.4	18 705.6	21.9	0.6	5.1	329.3	438.1	50 516.7
Loblolly Pine	1 776.7	236.3	4.1	22.6	0.9	3.4	5.7	98.7	16.7	2 165.1
Patula Pine	2.5	7.6	3.6	3.3	9.1	36.2	14.1	196.7	1 391.1	1 664.2
Caribbean Pine	543.5	447.6	3 964.9	1 943.3	2.5	0.3	1 981.8	129.3	129.3	9 013.2
Radiata Pine	0.3					4.5		1 921.7	560.5	2 487.0
Longleaf Pine	98.8	1.0	2.2	0.7	2.7			3.4	0.8	106.9
Other Exotic Conifers	52.0	16.9	47.9	16.0		2.2	34.0	19.2	33.5	224.4
Total—Exotic Conifers	14 232.2	18 958.7	5 031.1	20 691.5	37.1	47.2	2 040.7	2 569.0	2 570.1	66 177.5
Total—Conifers	15 525.6	30 238.5	5 294.3	22 158.3	2 594.9	7 325.1	3 232.3	2 586.7	15 668.5	104 624.2

APPENDIX G—continued

Species	Brisbane	Gympie	Rockhampton	Maryborough	Monto	Murgon	Nth. Qld.	Warwick	Yarraman	Totals
2. Broadleaved Species										
A. Native Forest Hardwoods—										
Rose Gum	124.8	537.7	0.1	0.2	0.2	7.8	0.7		71.4	742.7
Grey Ironbark	86.1	156.1				5.8	15.3		170.5	433.8
Tallowood	41.0	13.1	0.1	0.2		0.2	11.7		2.0	68.3
Blackbutt	95.8	106.6		47.6		3.5	0.1		0.2	253.8
Gympie Messmate	4.2	109.7								109.7
Others	4.2	38.4	0.5	0.7	0.2		4.7		2.3	51.0
Total—Native Forest Hardwoods	351.9	961.6	0.7	48.5	0.4	17.3	32.5		246.4	1 659.3
B. Other Broadleaved Species—										
Silky Oak		33.4				9.4			144.6	197.8
Queensland Maple		26.1	0.2	0.2			10.2			120.1
Red Cedar		0.8					93.8			13.6
Others	1.4	31.3	0.6	0.3	0.2		18.4		0.7	52.9
Total—Other Broadleaved Species	1.4	91.6	0.8	0.5	0.2	9.4	135.2		145.3	384.4
Total—Broadleaved Species	353.3	1 053.2	1.5	49.0	0.6	26.7	167.7		391.7	2 043.7
Miscellaneous Experimental	28.1	9.2	4.5	38.7			12.6	9.6	36.3	139.7
Total—All Species	15 907.0	31 300.9	5 300.3	22 246.0	2 595.5	7 352.5	3 412.6	2 596.3	16 096.5	106 807.6

APPENDIX H

AREAS OF NATURAL FOREST TREATED 1976-77

Sub-District	Eucalyptus	Cypress Pine	Cypress Pine and Eucalypt Mixed Forest	Rainforest
	ha	ha	ha	ha
Beerburum	225			
Brisbane	40			
Dalby-Chinchilla-Roma	60	7 246	82	
Gympie	585			
Imbil	25			
Mackay-Emerald-Rockhampton	40			
Maryborough	583			
Bundaberg				
Fraser Island	161			
Monto	236			
Murgon-Jimna	403			
Atherton				21
Ingham				
Warwick				
Inglewood		1 875		
Yarraman				
Benarkin				
Totals	2 358	9 121	82	21

APPENDIX I

STATE FORESTS AND TIMBER RESERVES LISTED BY DISTRICTS AND SUB-DISTRICTS AT 30th JUNE 1977

District	Sub-District	No. of Reservations	State Forests Areas hectares	No. of Reservations	Timber Reserves Areas hectares
Brisbane	Beerburum	26	52 626 776	2	256 518
	Brisbane	26	50 025 713	8	4 724 3291
	Total	52	102 652 489	10	4 980 8471
Dalby	Chinchilla	17	361 726 660	1	5 768 00
	Barakula	12	225 352 325	2	150 2033
	Dalby	35	222 259 278	2	19 750 08
	Roma				
Total	64	809 338 263	5	25 668 2833	
Gympie	Gympie	30	95 615 024	1	514 00
	Imbil	9	58 476 00	1	0 2094
	Total	39	154 091 024	2	514 2094
Maryborough	Bundaberg	18	108 019 756	17	21 135 221
	Maryborough	35	276 339 699	12	10 838 354
	Total	53	384 359 455	29	31 973 575
Monto	Kalpowar	7	21 121 766	10	20 527 2899
	Monto	41	279 770 727	9	9 962 452
	Total	48	300 892 493	19	30 489 7419
Murgon	Jimna	4	47 426 00		
	Murgon	21	80 389 743	6	5 610 4983
	Total	25	127 815 743	6	5 610 4983
North Queensland	Atherton	31	353 984 957	32	326 755 2986
	Ingham	18	236 956 234	2	798 40
	Total	49	590 941 191	34	327 553 6986
Rockhampton	Emerald	9	76 597 671	10	106 927 8
	Mackay	12	79 161 921	17	40 456 22
	Rockhampton	37	442 072 259	7	36 575 57
	Total	58	597 831 851	34	183 959 59
Warwick	Inglewood	30	202 980 609	1	69 59
	Warwick	18	46 362 786	4	2 230 997
	Total	48	249 253 395	5	2 300 587
Yarraman	Benarkin	4	28 732 00	3	1 798 324
	Yarraman	20	53 400 5	10	8 788 298
	Total	24	82 132 5	13	10 586 622
State Totals		460	3 399 308 404	157	623 637 6526

APPENDIX J

RESERVATION FIGURES 1st JULY, 1976, TO 30th JUNE, 1977

	No. of Reservations	Area
STATE FORESTS		
hectares		
As at 30th June, 1976	457	3 337 628·897
Declared	+ 10	+ 22 388·950
Declared and added to existing S.F.'s	+ 10	+ 27 049·140
Amalgamation of existing S.F.'s	- 10	
Timber Reserves declared S.F.'s	+ 5	+ 5 344·9
Timber Reserves declared S.F.'s and amalgamated with existing S.F.'s	+ 1	+ 7 565·9
State Forests revoked	- 2	- 365·819
State Forests partially revoked		- 1 510·103
Areas released		- 861·6524
Recomputation of boundary		+ 2 068·1914
Total as at 30th June, 1977	460	3 399 308·4040
TIMBER RESERVES		
As at 30th June, 1976	168	635 161·7526
Declared	+ 1	+ 828·0
Declared and added to existing T.R.'s	+ 1	+ 878·308
Amalgamation of existing T.R.'s	- 2	
Timber Reserves declared S.F.'s and amalgamated with existing S.F.'s	- 4	- 7 565·9
Timber Reserves declared S.F.'s	- 5	- 5 344·9
Timber Reserves revoked	1	230·7
Timber Reserves partially revoked		- 121·0
Recomputation of boundary		+ 32·092
Total as at 30th June, 1977	157	623 637·6526

APPENDIX K
VOLUME OF LOG TIMBER PROCESSED BY SAWMILLS OPERATING DURING 1976-77 BY VOLUME GROUPINGS

	Less than 500 m ³	501 m ³ - 1 000 m ³	1 001 m ³ - 5 000 m ³	5 001 m ³ - 10 000 m ³	10 001 m ³ - 20 000 m ³	Greater than 20 001 m ³	Total
No. of Mills	Volume Processed m ³	No. of Mills	Volume Processed m ³	No. of Mills	Volume Processed m ³	No. of Mills	Volume Processed m ³
122	22 778	64	39 106	136	320 534	37	263 439
				18	221 772	6	215 665
							383
							1 083 294

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

APPENDIX L

DISTRIBUTION OF PERSONNEL 30th JUNE, 1977

	Metropolitan	Districts	Total
Salaried Officers—			
Graduate	58	69	127
Technical	79	29	108
Field Supervisory	9	101	110
Clerical	141	122	263
Miscellaneous (Drawing Office Aides, General, and Laboratory Assistants, etc.)	12	1	13
Sub-Total	299	322	621
Wages Staff—			
Reforestation Works	12	978	990
Marketing and Resources	17	167	184
Road Construction and Maintenance		75	75
Maintenance of Plant	8	77	85
Sub-Total	37	1 297	1 334
Total	336	1 619	1 955

APPENDIX M

BOTANICAL NAMES

A. NATIVE CONIFERS

Bunya Pine	<i>Araucaria bidwilli</i>
Cypress Pine	<i>Callitris columellaris</i> syn. <i>glauca</i>
Hoop Pine	<i>Araucaria cunninghamii</i>
Kauri Pine	<i>Agathis robusta</i>

B. EXOTIC CONIFERS

Caribbean Pine	<i>Pinus caribaea</i>
Douglas Fir (Oregon)	<i>Psuedotsuga menziesii</i>
Honduras Caribbean Pine	<i>Pinus caribaea</i> var. <i>hondurensis</i>
Loblolly Pine	<i>Pinus taeda</i>
Longleaf Pine	<i>Pinus palustris</i>
Patula Pine	<i>Pinus patula</i>
Radiata Pine	<i>Pinus radiata</i>
Slash Pine	<i>Pinus elliottii</i> var. <i>elliottii</i>

C. EUCALYPTUS

Blackbutt	<i>Eucalyptus pilularis</i>
Grey Ironbark	<i>Eucalyptus drepanophylla</i>
Gympie Messmate	<i>Eucalyptus cloeziana</i>
Narrow Leafed Ironbark	<i>Eucalyptus crebra</i>
Rose Gum	<i>Eucalyptus grandis</i>
Spotted Gum	<i>Eucalyptus maculata</i>
Tallowwood	<i>Eucalyptus microcorys</i>

APPENDIX M—continued

D. OTHER BROADLEAF SPECIES

Brush Box	<i>Tristania conferta</i>
Candlenut	<i>Aleurites moluccana</i>
Meranti	<i>Shorea</i> spp.
Queensland Maple	<i>Flindersia-brayleyana</i>
Red Cedar	<i>Toona ciliata</i> var. <i>australis</i>
Silky Oak	<i>Grevillia robusta</i>
West Indian Cedar	<i>Cedrela odorata</i>

E. WEEDS, GRASSES, ETC.

Lantana	<i>Lantana camara</i>
Groundsel	<i>Baccharis halimifolia</i>