

*Forestry*  
IN  
WESTERN AUSTRALIA



CHAPTER VI  
FOREST MANAGEMENT IN  
WESTERN AUSTRALIA

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## CHAPTER VI

# FOREST MANAGEMENT IN WESTERN AUSTRALIA

### *Introduction.*

Forest management is the business activity necessary to carry out the policy of the owner of the forest, and as this policy may vary within wide limits, there is no hard and fast system of management.

Management and policy go hand in hand, for only poor management could result from a poor policy.

In State owned forests, such as exist in Western Australia for which the policy, having as its aim the continuity of production from a fixed area of forest, is clearly defined in an Act of Parliament, management has clear-cut objectives.

All foresters look upon State Forest, not as a great reserve in which trees should be hoarded for the future, but as a productive unit from which the annual growth can be cut for public use, replaced, and ultimately increased by good management.

The business of management uses many arts and sciences towards its goal; these will be apparent to the reader through the steps which are being taken to bring the forest into a productive capacity. A natural forest, such as is found in Western Australian jarrah and karri areas, is non-productive and may be likened to a capital asset which is static and earning no interest.

While the greater part of forest management deals directly with the production of timber, there are other less important, but nevertheless, essential aspects of management. These include management for the purposes of recreation and parks, scenic value, preservation of wildlife, for soil erosion control, and flood and river regulation.

### *The Building up of Management in Western Australia.*

The forests of Western Australia are limited to a few commercial hardwood species. The timbers of these, however, are in valuable mature stands, and consist principally of jarrah and karri in mixture with marri. Less important, but still valuable timbers, are wandoo, tuart and tingle tingle which are located in limited areas of the State.

In the early stages the forest consists of a large unmapped and trackless area for which the first essentials are to have a stocktaking, maps and access, and when this information is to hand, a plan of the steps to be taken to introduce sawmilling and other forms of utilisation in such a way as to ensure that the harvesting of the crop goes hand in hand with the protection, regeneration and improvement of the forest.

This designing of the future of the forest results in a written document known as a "Working Plan," and under the Forests Act it has the effect of a law governing operations on an area.



### *Use of Aerial Photographs.*

The collection of information or "assessment" plays a very important part in forestry, and in Western Australia during the first decade of forestry, 1920-1930, most of this work had to be done on foot when about four and a half million acres were assessed by parties running sample lines at a distance of half a mile apart, as there were very few aids to the work in this period. It has been estimated that over 100,000 man miles were walked in this initial stocktaking which formed the basis of the first working plans.

Since 1930 this work has become more highly developed and improved through various stages, to the system in use today. This system consists in the first instance of studying the forest from the air by means of photographs. From these photographs skilled interpreters are able to separate the various forest types according to timber species, the various densities of the timber, and the various height classes. Further, the interpreter is able to indicate areas which have been subjected to fires and the extent of the damage caused, and is also able to show immediately the location and extent of regeneration. This analysis of photographs is called Air Photo Interpretation or A.P.I.

Not only has this application of modern methods made work much cheaper, but it is also more accurate and has reduced the time factor. This is most important when information for large areas is required in a short time.

Air photos play an increasingly important role in all forest management, for not only are they used in assessment, but play an important part in the design and selection of suitable roads and engineering works. In the matter of making topographical maps they also play a part, for from them all features such as hills and creeks and existing tracks can be mapped. Where necessary, contour plans can be made of areas where development is to take place, such as plantation areas and forest village centres. Highly specialised equipment is used today in order to obtain the utmost value from the air photographs.

### *Stocktaking.*

The method of sampling the forest, or assessment as it is more commonly termed, is carried out by crews of men trained for this type of work. Under the direction of the photo interpreter the assessor moves into the field with the object of securing information for the various recognised forest types.

Here, although the form of assessment has not varied materially from the system of the early days, the quantity of work involved has been greatly reduced, for, with the forest already classified from aerial photographs it is necessary for the assessor to obtain information only for each forest type and sufficient to test the uniformity of each of these types.

The method of assessment used is quite simple and consists of running a line along a compass bearing and carefully measuring every tree for half a chain on each side of this line. The details of the trees are entered in a field book and for each ten chains along the line information for one acre is available. Then, as the assessment proceeds, so further "acre information" is obtained.



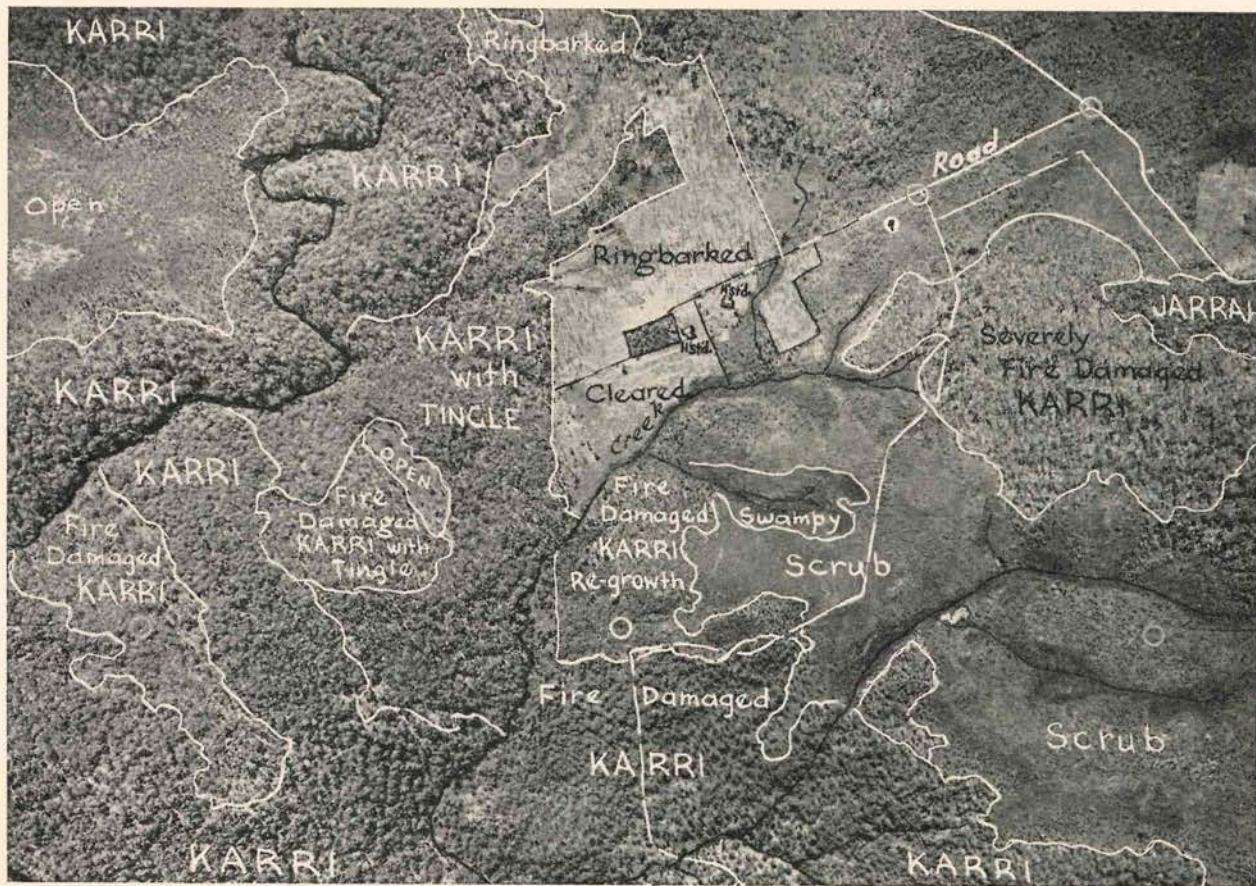


Plate 43.

The first steps in map construction from aerial photographs. The photo is marked to show the different forest types, clearings, topography, etc., as seen through the stereoscope. These markings are later transposed to a map.



### *Working Plans Office.*

Information obtained by the assessment crew is made available to the Working Plans offices. There are two such offices in Western Australia, one situated at Dwellingup which deals with the northern areas of the State, and the other at Manjimup which uses information secured for the southern areas.

With the plans prepared from the aerial photographs the areas of each forest type are determined, and application of the assessment information enables a total forest volume to be determined. This information then provides the basis of the Working Plan.

### *The Working Plan.*

The Working Plan, or prescribed manner of management, is built up of a series of diverse operations, but all of which are of importance in contributing to the final plan.

With four million acres of State Forest in Western Australia there is a considerable variation of forest types, and together with climatic and topographic differences it is obvious that some division into workable units is necessary. This is done by the formation of individual working plan areas, each varying to suit local conditions and ranging from about 30,000 acres to 100,000 acres. In Western Australia there are approximately 100 Working Plan areas.

With the knowledge of the volume of timber available in the various areas, proposals are put forward for the erection of sawmills to utilise the timber in perpetuity. It is the purpose of the Working Plan to define an annual cut equal to the increment which the forest is capable of yielding for ever. This aims at the provision of a stabilised permanent forest community.

The concept of this permanent forest community is most important, for, with it must be considered the regular employment of mill workers and the continuity of supplies of timber to the public. As well as these points, the establishment of the mill and the associated housing and public works must be considered for they are most expensive, and unless a guarantee of permanency can be given, their construction could lead to over-capitalisation and excessive costs leading to economic failure of the project.

The general method of approach to the introduction of management into new Working Plan areas consists firstly of dividing it by roads into units of about 5,000 or 6,000 acres, thus introducing the first step towards protection by controlled burning and the prevention of disastrous fires. Following this step the forest village is built to house a permanent working gang, and this would normally go hand in hand with the introduction of sawmilling to the area.

In a country where forestry practice is relatively new, Working Plans, must, of necessity, retain a certain flexibility, and must be made for only short periods of 5-10 years, for, with every year that passes, more accurate information on which to improve the plan becomes available.

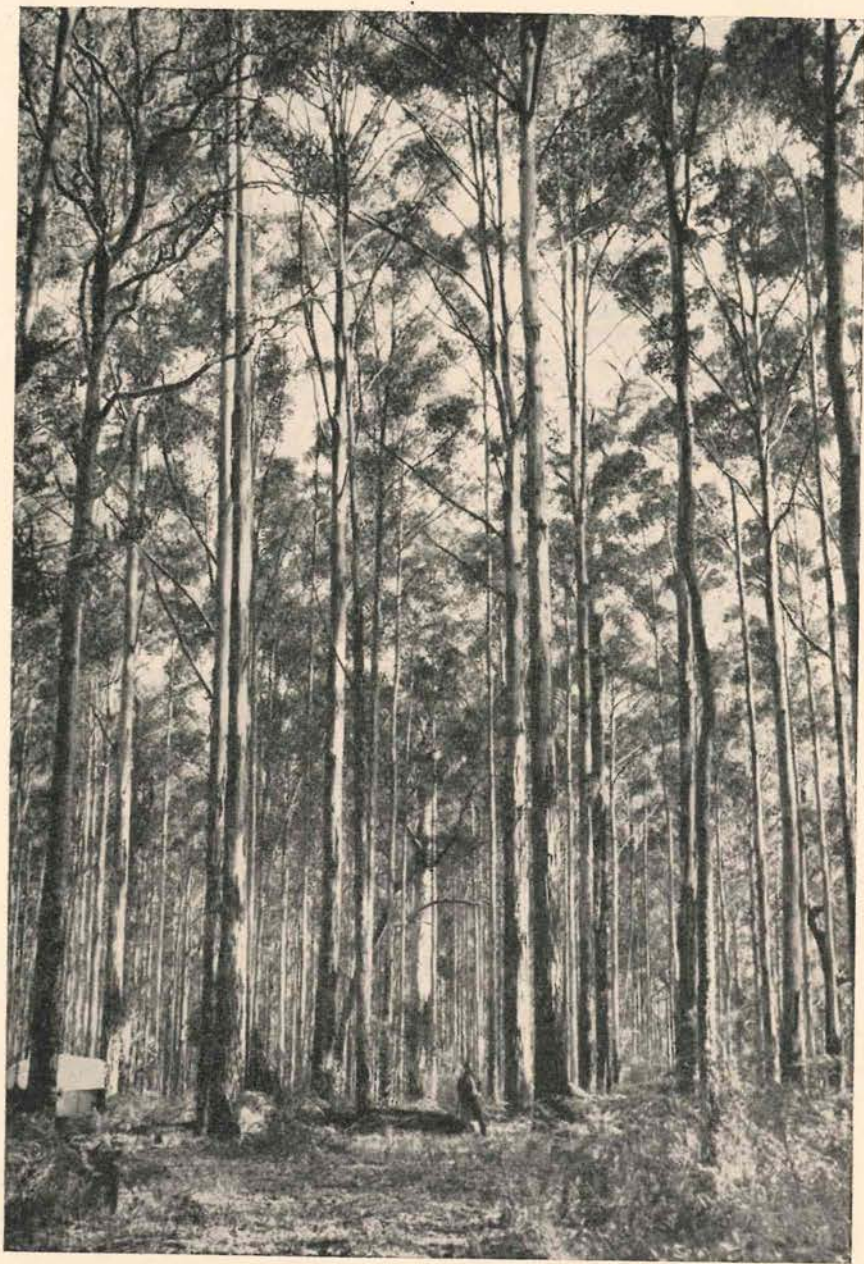


Plate 44.

A 68 year old karri regrowth stand at Lefroy Brook.



### *The Economic Aspects of Management.*

Although the general principles of forest management are laid down in the Working Plan, the implementing of any such proposals is governed by the finances available from year to year. A Working Plan must be sufficiently flexible to allow for an annual preparation of a programme of work based on the amount of money which may be available. The economic consideration is the governing factor limiting such activities as forest protection, silviculture, roading and housing.

### *Present Management in Western Australia.*

Since the passing of the Forests Act in 1918, progress in management in Western Australia has been most satisfactory, and although to the present time intensive utilisation has been confined to the northern areas of the forest, management of two million acres of State Forest and Timber Reserves South-east of Manjimup and Pemberton is in hand. Until recently these areas had remained in their natural state.

To provide local administration, the forest area of Western Australia has been divided into eleven areas or divisions, which in turn are divided into smaller units or districts. It is through these divisions and districts that the many aspects of management are carried out.

The divisional headquarters are located in the more important towns and are situated between Mundaring in the north and Pemberton in the south. The district headquarters are located in forest settlements some distance from the divisional headquarters, and usually are in the centre of the forest.

The first consideration of all forest divisions is the provision of timber. This is brought about by the issuing of permits or licenses. The more important is the permit system where, following the recommendations laid down in the Working Plan, the sawmill is granted an annual permit to cut a specified quantity of timber. It is then the duty of the forester to provide this timber from the forest in such a way as to ensure that a future crop will be available and that no uncontrolled cutting of the forest is made.

The control of this cutting is by a system known as treemarking. In this the timber that can be safely taken is marked by the forester with a distinctive brand, and only these marked trees may be removed. It is by this system that protection of the immature and vigorous trees is assured. Where timber is required for purposes other than sawmilling, such as mining timber, poles, piles and firewood, the same manner of regulation is applied ensuring no destruction of young trees occurs.

All timber that is removed from the forest is subject to a fee or "royalty," and because of this, records are carefully kept. A return of logs taken from the forest is submitted by the sawmiller, and payment for these is made.

Following the cutting of an area of forest, steps must be taken to ensure that the area will, in time, provide a further crop of trees. The debris that results from logging must be removed to allow regrowth to occur, and an operation known as top disposal takes place. Here, gangs of men heap the debris from the fallen trees and when conditions are satisfactory a fire is run through the bush. In this operation care must be exercised to ensure that the remaining trees are not damaged by the fire.



A final step is taken in the cut-over bush when an assessment of the remaining trees is made. This quarterly assessment, as it is termed, is most important, for it forms the basis of plans for the future treatment and yield of the forest.

To provide access to the forest area, a road system has been developed, and in each division a network of roads and tracks has been constructed. According to their use, so has the standard of construction varied. Arterial all-weather roads provide the major system followed by sub-arterial roads, forest tracks and firelines. The greater the development in any area, the more intensive has been the road system.

As the utilisation of the forest has extended, so has the construction of roads, and at the present time there are 13,600 miles of roads and tracks in the forest areas of Western Australia. To keep pace with new road construction and maintenance of existing roads, a fleet of machines is maintained.

The pattern of forest roads aims at a breakdown of large areas to small blocks or compartments. Apart from facilitating logging, the advantages obtained in forest protection are obvious, for in fire control, access is a most important consideration.

Following road construction, the production of maps becomes essential, and to provide the information for their compilation, survey teams are continuously in the field. Here, accurate surveying of the arterial roads is carried out by theodolite, while forest tracks and firelines are surveyed by means of compass which is more rapid but rather less accurate.

The production of maps is carried out by a drafting office, the work being continuous, for, with information coming to hand week by week, existing plans must be added to and new plans prepared. At the present time, maps have been prepared for all those forest areas in Western Australia that have been developed to any extent.

As forest utilisation has taken place, so has the development of the divisions and districts. The construction of houses has been most important, for, with the large number of employees necessary for satisfactory forest management, suitable housing is essential. Up to the present time, 380 houses have been constructed. This number is being increased annually.

As well as house construction, other buildings such as garages and workshops have been erected for the large number of machines used in road building must be properly serviced and maintained.

#### *The Co-ordination of Management.*

The Forest organisation in Western Australia is spread over a wide area, and because of this a central co-ordinating office has been established. This office, or management branch, has as its function the preparation of an annual programme of work, the allocation of finances to meet this programme, and finally, the recording of this work as it is carried out.



Perhaps the most important function of the management branch is the allocation of finances to enable the objects set out in the working plan to be achieved. It is the first duty of management to set out proposals of the work that is to be carried out each year in each forest division in such a manner that will enable the most use to be made of the finances available.

The money available for forest management is derived from the income of sale of timber from the forests together with Government grants for additional works such as special road construction or pine plantation establishment.

To enable records of expenditure to be kept and thereby remain within the specified limits, it is necessary that each division provide monthly reports of works' progress and expenditure.

As well as expenditure reports, records of forest treatment must be kept. Areas of bush that have been cut, assessment information, top disposal, road construction, and the many other forest activities must be recorded, for it is through this that a complete summary of forest management in Western Australia can be kept.