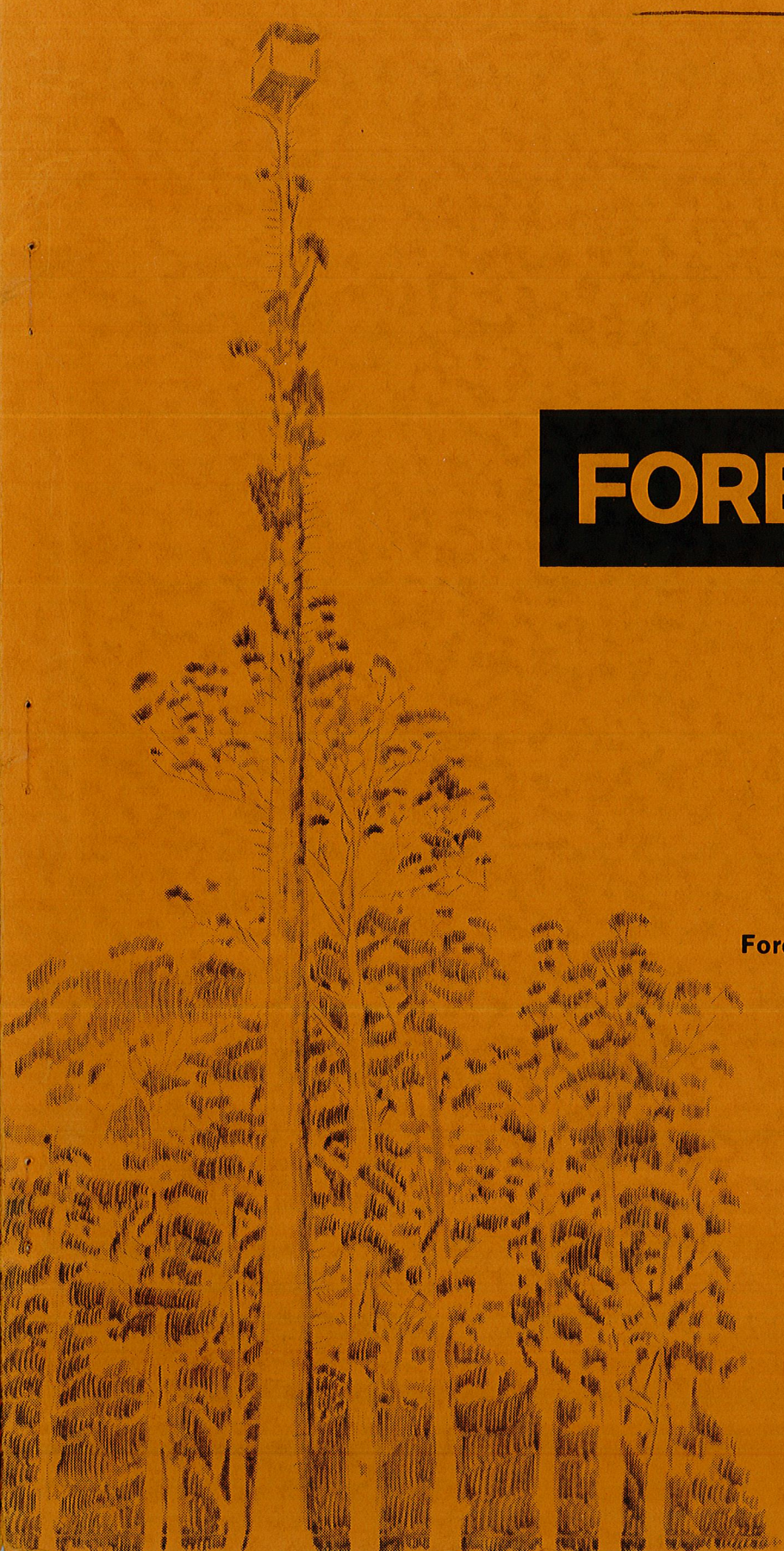


FOREST NOTES

Forests Department Perth Western Australia

VOL 9 NUMBER 1

F O R E S T N O T E S

Volume 9 - Number 1

June 1971

Editor: R. J. Underwood

TABLE OF CONTENTS

26 Egham Road,
VICTORIA PARK. 6100

The Editor,
"Forest Notes",
PEMBERTON

Dear Sir,

It is well known that there has been a serious depletion in the number of native animals inhabiting our South West since the coming of the European to this country. Destruction of the habitat and interference with the environment has been an important factor in this depletion, but it is far from being the whole story. This letter is written in the hope that it will lead to further contributions which may throw some light on this matter.

My own thoughts, which have been refined by discussion with other interested bushmen and foresters, are that a very critical period for our native fauna occurred sometime between the years 1927 or 1928 and 1938. Prior to 1927, possums, woilies, quokkas and tammars were common throughout the South West of this State and sometime during the following ten years they declined drastically. The period mentioned above coincides with the intrusion into this region of the European fox and this has been put forward as a reason for the disappearance of these small marsupials. It is now becoming evident however that the fox was not the prime cause of this decline in numbers, as despite its continued presence such animals as the possum and quokka at least, are becoming more numerous. This recovery is being made in the face of predation by foxes and feral cats, offset to some extent perhaps by the elimination of the dingo.

It would appear that sometime during the ten year period mentioned by me, some disastrous event decimated the smaller marsupials of the south west. What it was remains to be determined but while many of the people who lived during this period in this region are still alive, it may be possible to get some clues. Perhaps the period of ten years mentioned by me

can be narrowed down considerably. Might I suggest that farmers, timberworkers, mill hands and bushmen who lived in this region at this time could be interviewed and perhaps some light thrown on the matter.

Yours etc,

D.H. Perry.

Forests Department
Western Australia

The Editor,
"Forest Notes",
PEMBERTON.

Dear Sir,

I read with interest, your article in the December 1970 issue of Forest Notes by F. Batini and J. Cameron regarding extension services.

At Busselton Office, we also receive numerous enquiries, and in future a log will be kept to indicate their diversity and complexity.

Our largest inquiry exceeds by far than that mentioned by Messrs. Batini and Cameron. A woman recently called at this office and requested the geological history of the South West with particular reference to the changes in the course of the Blackwood River. She seemed very disappointed when local staff were unable to furnish her with precise information.

From the nature of the requests, it appears that Foresters must be expected to possess general knowledge far in excess of that normally obtainable in any training scheme.

Yours etc,

D.J. Keene.

Forests Department
Western Australia

The Editor,
"Forest Notes",
PEMBERTON.

Dear Sir,

An old file was recently discovered at Ludlow which contained several interesting letters. One of these concerns a certain A.C. Harris and is reprinted for your interest.

"

17th January, 1923
H.O. Ref. 1245/22

A/Forester Banfield,
LUDLOW.

Will you please arrange to pay Mr.A.C. Harris now stationed at Ludlow by Cash Order. Mr. Harris commenced work on the 18th ultimo and his wages will be at the rate of £3-10-0 per week. Any holidays not worked will of course be deducted.

S.L. Kessell
ACTING CONSERVATOR OF FORESTS"

Yours etc,

D.J. Keene.

THE PRESENT AIMS OF THE FIRE ECOLOGY PROGRAMME IN THE LOWER SOUTH WEST

by

P. Christensen

INTRODUCTION

The general aims of the fire ecology programme have not been outlined as yet. Since it is difficult, if not impossible, to plan worthwhile investigations without having a proper objective, an attempt at defining the aims of the programme has to be made. This is, of course, difficult with the limited information available at present. Nevertheless certain observations allow us to develop some hypotheses which can be used as a basis on which to formulate the present aims of the programme.

THE PROBLEM

There are essentially three main dominant scrub species in and around karri forest areas. These listed in order of importance are:

(i) Bossiaea aquifolium (netic)

(ii) Acacia pentadenia (karri wattle)

(iii) Trymalium spathulatum (hazel)

Other dominant species, but ones of lesser importance are:

Acacia urophylla, Acacia strigosa, Acacia pulchella and Acacia descipiens.

They are all species which germinate prolifically after fire if seed is present. Undoubtedly they have always been important constituents of the understorey,

but it seems unlikely that they have always been quite so widespread or prolific as they are at present. Five to six years after burning a community dominated by either of the three major species, the area will be covered by a dense almost impenetrable stand of that species. Apart from the fire hazard that such stands represent, these very dense communities dominated by one or two major species exclude many minor plant species. Recent studies indicate that whereas a netic dominated community at age 3 contained some 50 plant species, the same community at age 8-9 years contained approximately 30 plant species. In some stands that have remained unburnt for 25 years or more the netic remains only as scattered large bushes, and the site is dominated by scattered large hazel. Although this community is more open there is still little development of the minor species due mainly to the heavy accumulation of litter. Such communities contain only about 20 scrub species, but the birds and smaller animals appear especially abundant.

Thus it appears that we are dealing with scrub communities of 50 or more plant species, which after fire undergo a rapid succession. If one of the major species is present it rapidly assumes total dominance resulting in the exclusion of many minor species. Later the stand may open up but many species still cannot survive in the heavy litter which has accumulated. Fire then is necessary to 'release' these minor species from time to time before the reproductive capacity of their seeds, bulbs, rootstocks etc. is depleted.

It has often been demonstrated that many types of Australian scrub communities are able to withstand fire treatment. It is clear that not only is this the case with the communities in question but they actually need to be burnt at intervals in order to realize their full potential. However, what is not clear is <u>how</u> they should be burned.

The present system of controlled burning prescribes systematic mild burns at 5-7 year intervals. It has been clearly demonstrated that control burning is necessary in order to prevent a dangerous build-up of litter. That

this is essential for the safety of both public and our timber resources is not in doubt. However, the present system of burning appears to result in vast areas of dense scrub dominated by a few major species. This is a situation which poses problems for controlled burning, may endanger other scrub species and is also uninteresting to drive through. We have then a situation which can be improved both from the safety and conservation angle, and at the same time made more aesthetically pleasing.

What then should be considered the ideal situation and how is this achieved? In considering the first problem it is obvious that opinions will vary greatly depending largely on a persons special interests. It is necessary however, to try to take as many factors as possible into account so that the resulting forest can truly be said to represent the ultimate in application of our maxim, multiple use.

To describe such a situation in detail is impossible considering our present very limited knowledge of fire ecology. However, some attempt should be made in order that we may have some objective on which to base future research.

The ideal forest is one in which the understory scrub is composed of a mixed community of low growing species representing a maximum development of the flora and a minimum fire hazard. This community should be stable under a practical burning routine, i.e. one that is similar if not identical to that in current use. Isolated large scrubs could be scattered about but these should not be so numerous that they can spread and cover large areas with impenetrable bush leading to the present situation. Further, since frequent regular burning appears to be detrimental to much of the bird life and other small fauna of the karri forest especially, patches of unburned forest should be left at intervals throughout the entire forest area. This situation already exists to a degree, as the scrub adjacent to streams and watercourses often survives several burns due to the moistness of these sites. These areas should be enlarged so that small 'reserves' or islands of unburnt forest exists in places along many of the major watercourses. These

refuges will serve as protection for small birds and animals and from which they can radiate to occupy burnt country. It is appreciated that from time to time one or more of these refuges will burn, and since the great accumulation of litter will result in very hot fires these areas would be best located in areas of poor timber potential.

To achieve this ideal situation two main lines of research are necessary.

1. Investigation of major scrub communities with a view to discovering some way in which the major problem species can be eliminated or greatly reduced. This has to be done by manipulation of fire intensity, frequency and season of burning. It seems reasonable to assume that some sort of 'formula' can be worked out which will enable elimination of the problem species over a number of years, then allowing a return to the normal routine. It may of course be necessary to repeat the 'formula' from time to time to ensure that the species in question do not build up to problem proportions again.

   One of the major problems facing such a programme is that because frequent burning will probably be necessary enough fuel to carry out the burns may not have had time to accumulate. Studies will have to include investigations of the effects of fire intensity, frequency and season of burning on major scrub communities. Such studies should include all the species present if possible so that if a 'formula' for the elimination of the problem species is found then we also know its effects on other scrub species. Information on the seeding habits of many of the major scrub and wildflower species will also be needed and experiments involving the effect of fire on their seed would also be necessary.

2. Regarding the second line of research, this would mainly involve fauna and would entail a smaller programme. First of all we need to determine whether in fact control burning has the detrimental effect on small mammals and birds that it appears to have. If results indicate that it is detrimental then we need to investigate more precisely the nature of such effects. Precise knowledge of the species involved, their occurrence, habits, habitat etc. is also required in order to be able to specify the areas to be set aside as refuges. We have to be able to specify the sort of habitats to be preserved, their size and location. This work would involve investigations of the effects of burning on an area that has not been burnt for a long time. The small mammals inhabiting the area would need identifying, estimates of numbers made, and information regarding their habits and requirements collected. The same should be done for the birds in the area.

Apart from these two major avenues of research there will always be isolated special cases which require individual treatment, e.g. certain wildflower species and rarer animals of restricted habitats. Some species of Boronia and the numbat are examples of this.

CONCLUSION

This is a large programme which may well enlarge as we get down to detailed planning. However, if we are to investigate fire ecology then there must be some purpose other than pure publicity. We must have some ideal capable of partial or complete realization in practice, on completion of the work. It is also realized that our conception of the ideal may, and indeed must alter with time, but this should not deter us from attempting to formulate it even at this early stage. Progress in research is made by formulating hypotheses which are subsequently substantiated or refuted by the results of further investigations. Such hypotheses are constantly altered to conform with new information or rejected altogether and new ones are formulated to take their place.

NOTES ON THE HISTORY OF SUN SCOLD IN PINUS RADIATA AT MUNDARING WEIR

by

A. B. Selkirk

It is worth while going back into our short history of pine plantations, sometimes as a check on various changes being implemented in our pruning practices of the present day.

In the compartments of our earliest plantings, no pruning was permitted until the lower branches were dry. This occurred after the canopy of crowns had closed.

The outside rows exposed to the sun were not pruned at any stage. The reason for this being to avoid sun scold and damper down the in-rush of air if a fire was started in the body of the compartment. Our first thinnings in these compartments were very light.

Apart from removing suppressed trees and sufficient subdominant and malformed stems to make a commercial thinning an economical operation and to maintain a reasonable increment rate, it was considered desirable to deny the undergrowth sunlight to complete its suppression and assist in the breakdown of accumulated needle litter and slash. In the higher quality radiata stands of a well managed plantation, it was common to obtain a complete carpet of decomposing litter.

Sun scold in such areas was unknown and even in the open partly failed stands the competing eucalyptus regrowth shaded the poorly clad radiata boles.

When need come to raise the wall of the weir and the water level swallowed up a few hundred acres of radiata, the areas were clear felled to the high water level. On northern aspects mature radiata boles were exposed for the first time to direct sunrays. The effect of the sun was to kill the cambium layer from the ground to the shaded area on the perimeter trees and also to a lesser degree, on the internal trees not shaded by their associates.

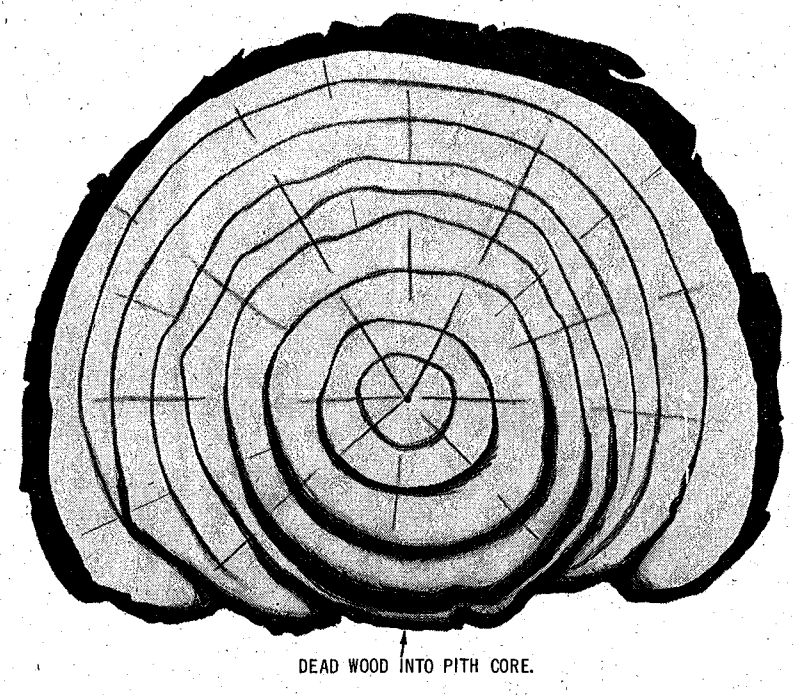


FIG. 1 SUN DAMAGED RADIATA STEM - END SECTION.

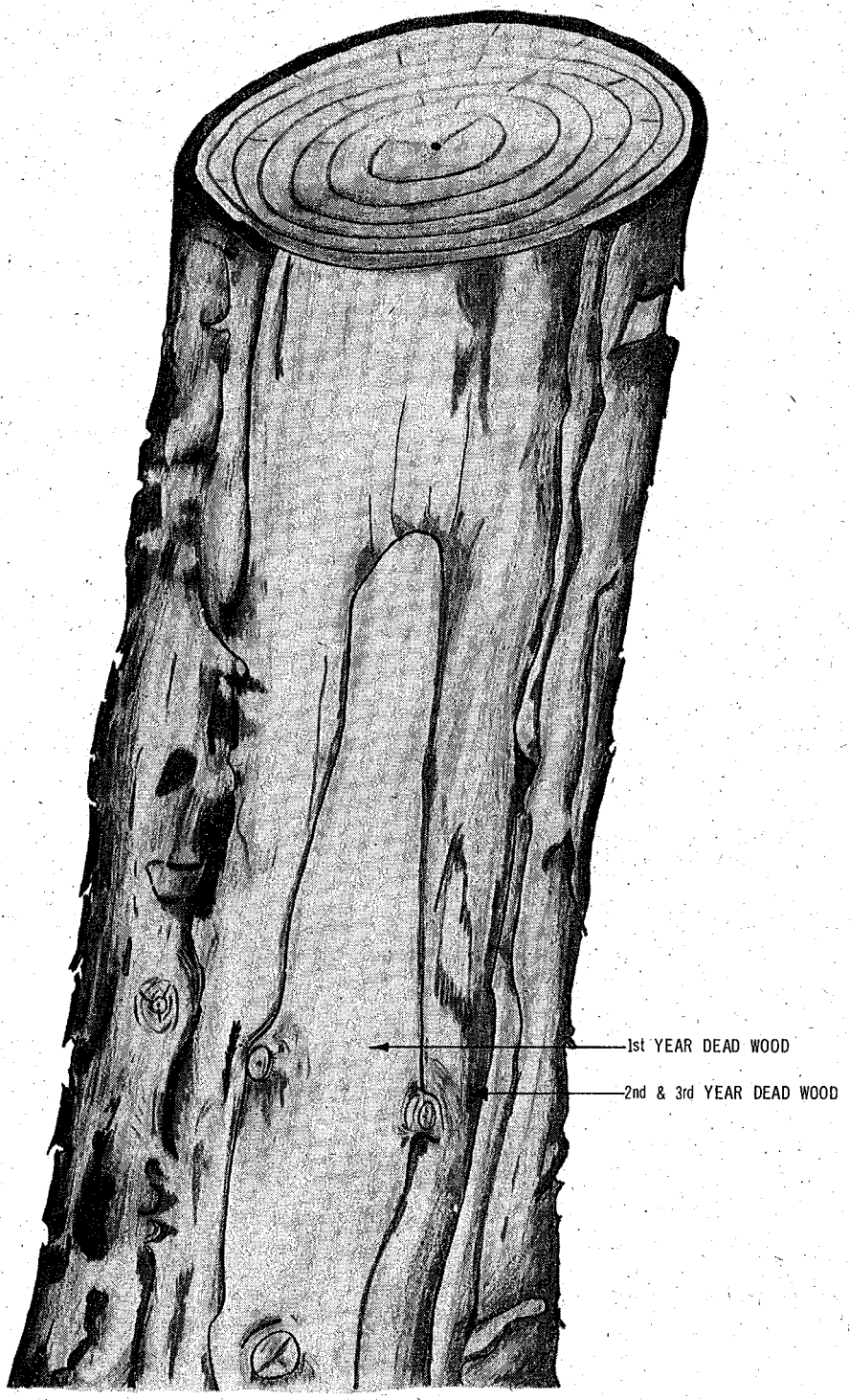


FIG. 2 SUN DAMAGED RADIATA BOLE – SIDE VIEW.

In the thinning operations these damaged trees were removed over the years. If left the bark eventually parted from the wood and fell away, the tree later being attacked by termites. Only the well defined south and south eastern aspects escaped damage.

Those mature stems receiving partial shade on the perimeter eventually thickened up their bark and produced epicormic shoots, remaining today majestic in their vistas.

More intensive thinnings were implemented in the years that followed the neglect of the war years.

In these actions however, the intensity of the thinnings had to be tempered with the consideration of bole support in the delayed thinning sections, as wind could be disasterous in a compartment of slender boles derived of their neighbours' support.

In the early 1960's slicer veneer stimulated the thought for a high grade knot free log outside a 4 in. diameter core and some green pruning was introduced. Faults derived from this practice were multiple epicormic growth on partly shaded vigorous trees and sun scold on the exposed and poorer quality stands.

In some sections having a northerly aspect, this severe sun scold occurred as a seasonal damage into the second and third year of spring overgrowth, after green pruning had been completed to 7 ft. in height if the damaged stems were not progressively removed by thinning.

Damage is usually broad and deep up to 20% of the wood being killed into the pith core as shown in Fig. 1 and Fig. 2. This means a down grading of all damaged logs if trees are not removed in the first and second thinnings. If this tree remained and the rapid growth covers the wound, there is always the possibility of decay internally at a later age.

These faults have been present since green pruning was implemented in the northern plantation of radiata. Pruning is generally done from 6 years onwards, with

thinning commencing after ten years. There has generally been sufficient numbers of undamaged trees to retain the necessary stocking after doing a commercial first thinning.

After first commercial thinnings, of course, the crown development is sufficient to give most boles shade and by this time, considerable thickening and hardening of bark tissues gives the trees protection from heat.

Since considerable sun scold damage can occur after low pruning on exposed aspects, it is suggested that caution and research is necessary before extending very far into our present proposals of non commercial thinning in conjunction with low pruning of radiata.

It may be a better economical proposition to establish radiata on mediocre soils with intensive fertilising practice to produce a shorter rotation with perhaps the retention of only the high stratum sections for the production of high grade peeler and saw logs.

The selection of undulating country and gentle slopes would seem to be the ideal to aim for in visualising the mechanical form of harvesting that could be applied to short term rotation of radiata.

FAUNA COUNTING

by

P. N. Hewett

The recent announcement that ALWEST do not at present have plans to mine bauxite on the Boyagin Reserve or Dryandra State Forest co-incided with the release of Vincent Serventy's book "Dryandra - The Story of an Australian Forest", and there have been some interesting sidelights.

John Humphreys has had a marked increased in visitors to the Narrogin nursery - not to see the plants, but to complain that, having read Serventy's book, they called at the Tourist Bureau seeking road guides to get them to Dryandra. The Tourist Bureau had allegedly never heard of the place but did help the tourists find their way to Narrogin. However, when the tourists arrived at and travelled through the Dryandra forest they found absolutely nought, in lieu of the abundant numbats, woilee's and so on in Serventy's book. Their main complaint to John Humphreys has been along the lines

"What have you done with all the animals?"

Of course it is fairly widely known that most native mammals are nocturnal and the following account follows two nocturnal cruises in State Forest, accompanied by personnel from the Wildlife Management section of the Fisteries and Fauna Department.

DRYANDRA - January 19, 1971

On a calm clear night a spotlight traverse was conducted from 8.00 p.m. to midnight. The Fisheries and Fauna Department was represented by Andrew Burbidge, Trevor Evans and John Ingram, the Forests Department by John Robley and P. Hewett. We journeyed through both natural inland wandoo and planted mallet areas using a long wheel base Land Rover with trapdoor roof and pack rack and a 40 watt spotlight.

Animals seen were :-

Feral rabbit (Oryctolagus cuniculus)	P.P. grassland	1
Tawny frogmouth (Podargus strigoides)	planted mallet	2
Brush tail Possum (Trichosurus vulpecula)	open wandoo	4
Tammar (Macropus eugenii)	open wandoo	4
Blackglove wallaby (Macropus irma)	arboretum	8
Grey Kangaroo (Macropus fuliginosus)	mainly in arboretum	16

KELMSCOTT - Russell Block

On the evening of February 25, a party comprising Andrew Burbidge, Trevor Evans, Norman McKenzie, Don Spriggins and P. Hewett conducted a similar spotlight traverse of virgin wandoo in the eastern part of Kelmscott Division. On this occasion the weather was cool and calm and two spotlights were used viz: a 40 watt quartz-halide and a 100 watt tungsten (it is probable that animals so illuminated are still suffering from sore eyes).

The route covered part perimeter and part of the internal portions of a spring 1970 aeroburn and animals seen were :

Feral cat	Felis catus	1
Feral rabbit	O. cuniculus	1
Marsupial mouse	Sminthopsis sp.	1
Tawny frogmouth	P. strigoides	2
Bats possibly	Chalinolobus gouldii	4
Grey Kangaroo	M. fuliginosa	21
Blackglove Wallaby	M. irma	35

When one considers the results of the traverses with respect to criticism of exotic plantations (at Dryandra) and aerial control burning (at Kelmscott) and their effects on floraand fauna, they suggest that current Departmental practice is not <u>all</u> bad.

In fact since most of Dryandra's animals were seen in the arboretum it seems that if Russell block had a bit of plantation the tally would have been even higher.

SHELTERBELT PLANTING IN THE PILBARA REGION OF WESTERN AUSTRALIA

by

F. Batini

INTRODUCTION

The Pilbara is one of the most highly mineralised regions on earth. The key mineral in the dramatic development of this region in recent years is iron ore and, by early 1970, exports were worth some $400 million per year. Reserves of 120,000 million tons of iron ore have been estimated and long term contracts already signed cover the sale of some $4,000 million worth of ore, mainly to Japan.

One result of this massive development has been that towns which previously had populations only numbered by a few score or hundred are rapidly growing into towns of several thousand people. In addition, a few new centres are being established. These towns are of two types, the "company" town and the "open" towns developed under normal Government guidance and administered by a Local Authority.

The more important of these "open" towns are the developments at South Hedland and at Karratha. A few years ago, Port Hedland was a small port with a population of a few hundred people. Now, as the port for the ore from both the Newman and Goldsworthy operations, it has grown to about 7,000 inhabitants. It is estimated that a population of 25,000 to 30,000 will be achieved by 1980. Almost all of this new development will be confined to the satellite township of South Hedland.

Karratha is situated near Roebourne and the erection of the first homes was commenced in 1969. It is estimated that its ultimate population is likely to approach 25,000 people. It is envisaged that whereas Port Hedland will become the industrial centre of the Pilbara, Karratha will become its administrative centre. Both towns are being developed largely by the State Housing Commission.

In this semi arid region, trees and shrubs play an important role in providing shade and shelter, in improving the aesthetic appeal of residential and recreational areas and in assisting in the control of wind blown dust. The "North West tree scheme" commenced in 1964 with the appointment of a Tree Adviser whose specific task has been to encourage Local Authorities and individual residents to plant suitable trees in streets, reserves and home gardens.

During 1970, the Chairman of the North West Planning Authority requested advice from the Conservator of Forests with respect to the establishment of shelter-belts around the towns of Karratha and South Hedland. During September of that year, two officers of the Forest Department, Messrs. W.H. Eastman and F.E. Batini visited the Pilbara region accompanied by the current tree adviser, Mr. F. Lullfitz. In that week, the following localities were visited: Port Hedland, Mt. Newman, Roebourne, Cape Lambert, Karratha, Dampier and Mill Stream.

CLIMATE

The area south of Port Hedland is in the arid zone with the exception of a small area at the highest altitudes. The annual rainfall is low, 8 to 11 inches, and the variability of the rainfall is the highest in Australia.

The mean rainfall at Port Hedland (68 years) is 12.28 inches on a mean of 21 rain days. The bulk of this rain (10.81 inches) falls in the months from January to June. Potential evaporation from a free water surface is between 90 and 105 inches a year, indicating a theoretical deficiency of some 80 to 90 inches a year. Combined with low rainfall and high evaporation are very high temperatures. The coastal towns have mean maxima of the hottest month of about 95°F, whilst inland temperatures are often much higher. The mean maximum in even the coolest month is around 80°F.

In these areas, the rain is often associated with thunderstorm activity and the heaviest falls are often associated with tropical cyclones. The most likely region for these cyclones to move inland is between Derby and Carnarvon. The storms are extremely violent (winds in excess of 120 miles per hour have been measured), and some towns have been completely wrecked by them. One cyclone in 1939 almost destroyed Port Hedland. The average number of cyclones is two to three a year, usually in the period November to April. Experienced local residents indicated that the prevailing winds in both Karratha and South Hedland were strong easterlies and westerlies. Both can cause considerable dust problems. The westerlies tend to predominate in the summer and the easterlies in the winter months.

VEGETATION

The flat plain around South Hedland is dominated by spinifex (Triodia species). Wattles (Acacia sp.) form a minor component of the ground and shrub layer. On the sandy ridges which cross this plain, wattles and native walnut (Owenia reticulata) are present. Other species include Hakeas and Codonocarpus (native poplars).

In the shallow depressions, E.camaldulensis (river gum), E.microtheca (blackheart) and E. clavigera occur. Cajeput (Melaleuca leucadendron), corkbark (Sesbania grandiflora) and river gums are found in the dry beds of the Turner and Yule rivers.

Karratha presents a very similar picture to Port Hedland. If anything, the vegetation in this area was rather more depleted by grazing. In the "crab hole" areas susceptible to subsidence, buffel grass replaced spinifex as the dominant ground flora. Some scattered bloodwoods (E. dichromophloia), Kurrajongs (Brachichyton sp.) and species of Terminalia grow in the hills which form a backdrop to this town.

SOIL

The soils at both localities can be described as "Pindan" sands. The profile consists of a red to reddish brown sandy loam overlying a reddish clayey hardpan at

a depth of 18" to 36". These soils are relatively infertile, very low in organic matter and the clayey nature of the subsoil may compound salt problems if watering with saline bore water is carried out.

WATER SUPPLIES

The provision of water supplies to the "open" towns is under the control of the Public Works Department. "Company" towns make their own provision for adequate supplies. At present, Port Hedland is supplied with water pumped from the bed of the Turner River and an extension to the Yule River is planned. Karratha will be supplied from the large acquifer at Millstream. Provision of adequate supplies is vital to the development of this area.

Alternative supplies of water which were considered were bore water and sewage effluent. Salt levels in the former are very high by most standards and there is also great variability between bores depending on their proximity to the main drainage lines. Figures provided by the M.W.S. indicate that a town of 25,000 people could provide some 1,000,000 gallons of treated effluent per day.

EXISTING PLANTINGS

Within the existing towns, various degrees of tree planting have been carried out. The best examples were seen at Dampier and at the Port Hedland Caravan Park. In the former case, the trees and shrubs are provided free of charge to the householder and the weekly rent of $6 covers all water used. Naturally, the householders are not loathe to use copious amounts on their trees and lawns. Planting is strongly encouraged by the Company. In the latter case, the planted trees provide good amenity value to the rather permanent residents of the caravan park. As such, their value is expressed in tangible terms to the owner and he is naturally keen to ensure their continued success.

At the extreme opposite are the plantings carried out by the local Shires and residents of S.H.C. homes at Port Hedland. To the Shire and householders these trees represent an appreciable cost for an intangible amenity. As such, trees have to compete with other amenities - roads, swimming pools and sports grounds in the case of the Shire and air conditioning, swimming pools and holidays in the case of the householder. The local water costs 40 cents/1000 gallons and most seedlings have to be purchased - often at inflated prices. These problems are not insurmountable, but are very real. Both the Shire and the householder are making some efforts, but their reticence can be readily appreciated.

Under normal conditions, growth rates are quite rapid particularly with species such as E. camaldulensis (12 to 16 feet in 2 years) and S. grandiflora (9 to 12 feet in 18 months).

PROPOSALS

The growing of trees on the areas surrounding the towns of Karratha and South Hedland would provide a dust barrier and a visual amelioration of the harsh landscape. They would not provide shade for the town area and would not be grown for the commercial production of timber or forest products. Due to the direction of the prevailing winds, the belts should be orientated in a north-south direction. A shelterbelt should be provided both to the east and to the west of each of the proposed townsites. Each of the four main shelterbelt areas should be between 2 and 2½ miles in length to provide adequate protection. At a later stage, plantings to the north and south of South Hedland should also be considered. These could take the form of shorter shelterbelts and group or clump plantings on the more suitable sites.

Since the shelterbelts are needed to ameliorate the dust problem, they will necessarily have to be relatively broad (at least 40 chains to 80 chains). This does not mean that a dense tree cover is necessary over all of this area, in fact, vegetative cover could be provided by four main species types.

(1.) ground cover: a low ground cover some 12-18" in height can be adequately provided by the existing spinifex (Triodia sp.). In fact, regeneration of spinifex and other such species should be encouraged within the shelterbelt areas and these areas should thus be fenced to exclude both stock and vermin.

(11) existing semi-prostrate species of wattle can provide a slightly higher cover (1-3 feet in height and 8 feet spread). This species was only patchily distributed in the South Hedland area and its regeneration in the shelterbelts should be encouraged by ripping and seeding where necessary.

(111) existing species of wattle occur at both Hedland and Karratha and could provide an adequate shrub understorey of some 6 to 9 feet in height. In both sites specimens of these species were rather scattered but vigorous germination of wattles was observed in areas which had received some disturbance. These species should be encouraged to establish in the shelterbelt areas by ripping and hand seeding where necessary. Seed could probably be collected by native labour on a contract basis. At least three species of Acacia and one species each of Hakea and Codonocarpus should be suitable.

(1V) multiple tree belts should be planted within the main shelterbelt areas. Assuming a top height of about 35 feet and an adequate reduction in wind speed to 15H, the distance between shelterbelts would then be approximately 8 chains. This would then indicate 4 to 5 belts of trees for a 40 chain shelterbelt and possibly 9 or 10 for a belt 80 chains wide. Two or three rows of trees could constitute each belt and these could be planted at about 30' spacing.

Number of trees/mile of belt would vary from 1408 (2 rows x 4 belts) to 5280 (3 rows x 10 belts). The total number of trees to be established in the four shelterbelts could thus range from approximately 14,000 to 53,000.

Although trials should be commencing at the earliest opportunity to test the type of watering regimes which are required, the shelterbelts should be planned on the assumption that the trees will require relatively heavy waterings at regular periods throughout their lives.

During the early establishment of trees at Woomera, the annual supply of water provided was of the order of 400 gallons/tree/year. After considerable experimental work, this was subsequently reduced to approximately 160 gallons in twenty two equal waterings. If water to the Pilbara plantings were to be supplied at the rate of about 500 gallons/tree/year the total consumption of water for either Karratha or South Headland would range from approximately 3,500,000 to 13,000,000 gallons/year. A town of some 25,000 people can produce some 1,000,000 gallons of sewage effluent per day and could very readily cope with this watering problem. The balance of the supply could be used to water trees and lawns within the town boundaries. If "shandying" with bore water is used, the supply from sewage effluent could easily be increased by between 50 and 100 percent. The main problem in this case would thus appear to be not so much the availability of water as perhaps the cost of tending and watering of these shelterbelts.

The manual cost component could be greatly reduced by the use of the trickle system of irrigation and trials into the feasibility of this system have been commenced at both localities.

The species chosen for the shelterbelt plantings should be those recommended by the tree adviser as being the most suitable for the site. At the same time, it would be desirable to establish some large arboreta in the Karratha and South Hedland sites in order to test the potential of a much wider range of species.

Probably the best examples of successful tree planting and shelterbelt schemes in the arid region of Australia were those carried out at Woomera and at Broken Hill. These stand before us as examples of what

can be done if the responsible parties have the vision to foresee the benefits, the willingness to undertake the problem and the money to finance the venture. In the former case, the necessary moneys were paid by the Commonwealth and in the latter by a private company. Surely the same vision, willingness and financial resources are available within the State Government of Western Australia.

BRUSHCUTTER FOR NONCOMMERCIAL PINE THINNING

by
D.R. Lejeune

PURPOSE OF TRIAL

With the advent of a new silvicultural regime there will be extensive areas of this thinning in most divisions and particularly at Wanneroo. To this stage the only tools tried had been the axe and chain saw. It was hoped to find a more efficient and safer method.

THE BRUSHCUTTER

The machine uses a Mac 250 motor with an enclosed drive shaft projecting in front of the motor. A circular saw 10" diameter or a slasher as required is attached to the forward end of the drive shaft. Above the saw is an arm extending diametrically across the saw. This arm assists the operator to keep the saw in place against the stem.

A webbing harness goes over the shoulders and is attached to the drive shaft. This and a handlebar arrangement make it almost impossible for the operator to come in contact with the saw. Overall weight is approximately 40 lb. and price to the Government is $315.63.

TRIAL

6 year old P. pinaster was chosen for the trial with codominant height about 20 feet and butt diameters ranging from 1" to 5".

Four different operators had some practice with the machine and then rough time studies were made for about 5 minute periods.

RESULTS

Where butt diameters were less than about $2\frac{1}{2}$" the machine worked efficiently with an average time of 20 seconds per tree including movement from tree to tree. However on larger stems up to 5", times from 40 to 75 seconds per tree were normal. It appeared that there is not enough power for the larger trees and the saw blade overheated.

CONCLUSIONS

In previous trials with axe and chain saw it was found that these two tools had similar production rates of about 30 second per tree including all size classes. Using Forests Department costing of chain saws, the cost of running the saw is approximately equal to the wage rate of the operator. It is assumed that the brushcutter would have a similar operating cost. Therefore to equal the cost of the job done by an axeman, the operator with either chain saw or brushcutter must work at approximately twice the speed: viz 15 seconds per tree.

Considering economics alone it appears that even allowing for improved skill of the operator, the brush-cutter could not compete with the axe.

However a more important aspect is operator fatigue. We found it very tiring carrying the machine and holding the saw into the cut. After 5 minutes every operator was ready to hand it to someone else. Even the salesman was quite convinced that this was not the machine for the job and we had not even discussed the economics.

FAUNA SURVEY

by
F.E. Batini

On the evening of October 13, 1970, a road survey of fauna within State Forests was conducted between the hours of 5.00 p.m. and 7.00 p.m. The main purpose was to obtain some indication of the relative numbers of grey kangaroos (Macropus fuliginosus) and western brush wallaby (Macropus irma) within the forest area. A total of 76 crews consisting of 180 volunteers took part in the survey and 1,652 miles of road were covered. The 13th of October was a fine warm day with clear skies and light winds.

709 grey kangaroos and 277 brush wallabies were sighted. Some of the crews also recorded other animals and birds, but no unusual sightings were made. The grey kangaroo predominantly occurred either singly or in small family groups of two or three individuals. The few larger mobs were invariably associated with pasture or trial plot areas. The wallaby most commonly occurred singly and, more rarely, in pairs.

Sixty three and Seventy six percent of the kangaroos and brush respectively were sighted either on, or within 1½ chains of a road. The number of sightings reached a peak in the period between 6.00 and 6.30 p.m. and fell off very rapidly around dusk. The sightings of the brush wallaby were much more uniform with respect to time than were those for the grey kangaroo.

Most of the animals were observed in vegetation which was typical of the type of forest in which they occurred. However the grey kangaroo did appear to have a distinct preference for pasture and trial plot areas. The numbers observed per 100 miles of travel are shown for a range of forest types (Table 1). The data indicates that considerable differences between forest types are likely, both in the total number of animals observed and in the relative abundance of the two species. Further sampling will be necessary to confirm these trends.

Brush and kangaroo numbers were much greater in the more recently burnt areas and the numbers fell off steeply as the period since burning increased (Fig. 1). This relationship assumes that there were approximately equal areas of fuel, aged from one to five years, within the areas surveyed. In the northern jarrah forest, the burning season had commenced prior to the survey and this accounts for the fuel age given as zero. The lower numbers of animals in this fuel category is due to both its smaller area and to the temporary destruction of forage as the result of the burn.

Discussions with zoologists indicate that there is often great variability between the results of successive animal censuses, for the degree of activity of these animals is strongly controlled by a number of environmental factors. An estimate of the sampling error of the original survey is being obtained by additional resurveys along selected routes.

Probably the most interesting facet of the survey is the apparent correlation between the number of kangaroo and brush and the age of the burn. More intensive studies into this aspect are indicated. The use of fire as a tool to manage vegetation to the advantage of wildlife (and domestic stock) is not new. Thus controlled burning may be an important tool in the management and conservation of kangaroo and brush populations within the State Forests of Western Australia.

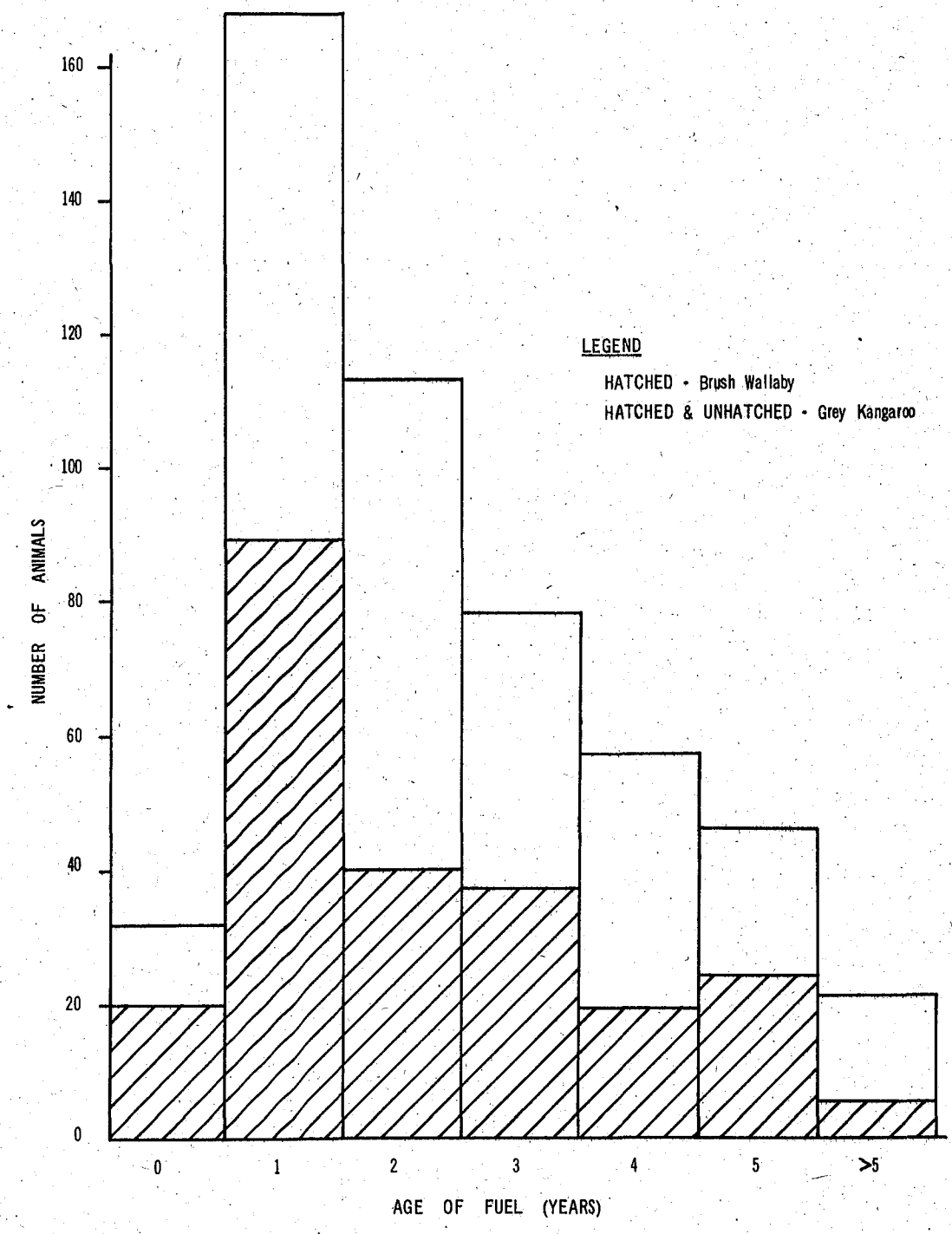
TABLE 1

ANIMAL SIGHTINGS BY FOREST TYPE

(This is expressed as the number of animals observed per 100 miles of travel. Forest types with poor coverage have been excluded from this Table. Data for jarrah forest north of Collie includes an additional 250 miles of "reruns" in the Dwellingup, Harvey and Collie Divisions.)

Forest Type	Miles Travelled	No. of Animals/100 Miles		
		Kangaroo	Brush	Total
Coastal heaths and *P. pinaster* Plantations	99	49	5	54
Jarrah Forests North of Collie	683	22	13	35
Mixed Jarrah-Wandoo Forest North of Collie	411	22	25	47
Jarrah Forest, Sunklands	126	35	7	42
Jarrah Forest South of Collie (Western portion)	109	51	15	66
Jarrah Forest South of Collie (Eastern portion)	104	87	23	110
Karri Forest	211	26	1	27

NUMBER OF ANIMALS WITH RELATION TO FUEL AGE
(OBSERVATIONS IN PLANTATIONS & PASTURE AREAS ARE EXCLUDED)



A NEW FIRE TRAINING SCHEME

by

C.Y. Nickal

The unqualified success of the "Fire Gang Competition" for Departmental gangs in recent years has led many officers to consider extension of this valuable training technique into other fields and to other personnel. The "Staff Fire Control Competitions" held last summer in a number of Divisions are good examples of how this can be done.

Originally designed to assist officers in countering the boredom of long periods of inaction during the Prohibited Period, these competitions have produced a number of other unexpected benefits: officer morale, efficiency and appearance has improved; extensive areas of forest have been burnt. Indeed, results to date have been so good, that senior officers are considering the introduction of annual staff competitions between regional "champions" including Head Office and perhaps even Como.

The Staff Competition is closely modelled on the familiar fire gang competition. A Divisional "team" consists of the D.F.O. and three of his officers. Each team undergoes a series of tests related to normal fire control activities. A panel of independent judges, many of whom carry stopwatches and are quite experienced in fire control, prepare "scoresheet" for each team.

The events and possible scores are:

Event 1: Inspection

At the sound of a sharp blast of a whistle from the senior judge, the D.F.O. leads his team on to the field and stands them to attention. The judges then closely inspect each man and marks are awarded or deducted for certain features of their presentation. For instance, if each man is wearing safety headgear and foorwear, 5 marks are automatically gained; if

the D.F.O. is wearing a tie, a mark is lost.

Possible Score: 10 points

Event 2: Fire Weather

The team is drawn up at a line marked on the ground at a distance of 100 metres from a standard met. station. At the striking of a gong by the No. 2 judge, stopwatches are commenced. The team is required to travel to the Met. Station by the quickest (not necessarily the shortest) route, where weather readings are taken. Timing stops when the D.F.O. hands the senior judge a sheet on which the local fire danger for jarrah and pine are written. All calculations must be shown.

Points are awarded on the basis of neatness, accuracy and speed.

Possible Score: 20 points

Event 3: Fire Equipment

A gang truck, a heavy duty, a chainsaw and a rakehoe are displayed at a simulated "Major Fire Control Point" on the field. A leading Plant Inspector has rendered each inoperable prior to commencement of the event. At the simple command "Go" shouted by the No. 3 judge, the stopwatches are started. They are stopped when the D.F.O. can announce that his team has each unit again in fire fighting condition. Points are deducted for unseemly language, for the use of the incorrect tool for the job and for running on into the second day.

Possible Score: 20 points

Event 4: Fire Co-ordination and Despatch

The team commences this event seated in standard office chairs in a standard office. Timing with the stopwatches commences when the No. 4 judge stamps his foot and hands the D.F.O. a sheet of paper carrying tower bearings and smoke descriptions. The team must plot the bearings, consult fire history plans, calculate fire dangers and initiate all despatches and records, decide on strategy and set up appropriate organization.

The following diversions are sent in at inappropriate moments during the exercise:

(i) A Chief of Division anxious to discuss an increase in Fire Duties Allowance,

(ii) The Plant and Maintenance Engineer,

(iii) The Pine Mill Overseer to report a near-fatal accident to the benchman.

Points are awarded on the basis of speed, accuracy and procedural correctness in handling the fire, and tact and intelligence in handling the diversions.

Possible Score: 20 Points

5. Major Fire Organization

The most junior judge is stationed in the field in an area of heavy fuel. At the appropriate moment he lights a major fire. Again operating from the standard office, the team is expected to cope with this actual fire situation. Marking is on the basis of:

(i) Procedure,

(ii) Cost,

(iii) Final fire size,

(iv) Number of days required to complete suppression.

Possible Score: 30 points

TOTAL POSSIBLE: 100 points

It is felt by those who have taken part that the staff Fire Competition is a great success; and that it will only be a matter of time before staff competitions in other fields are introduced.

REGIONAL NOTES

METRO REGION

Fire Control

The Summer of 1970/71 saw a sharp rise in the incidence of repeated "nuisance" fires. At Somerville plantation some 20 uncontrolled fires were suppressed, including one of about 30 acres.

Kelmscott too has had an active fire bug with some 16 fires lit along the scenic road between Araluen and the Canning Dam exit to Albany Highway.

Plantation Deaths

The long dry summer took its toll in northern plantations and at Yanchep the deaths in 1970 planting are more severe than usual, although well below the need for refilling next winter.

Staff Changes

Bevan Forster transferred from Dwellingup to Mundaring.

Jo Lenzo took up a posting of Forest Guard at Mundaring.

Ted de Jong has resigned from Gnangara.

David Lejeune has just returned from a couple of months at Surfers Paradise, but without a meter maid.

Plywood Logs

The production of P. pinaster mill logs for plywood veneer has now commenced at Somerville plantation. Current supply is at the rate of only 1,000 loads a year but it is a starting point.

HARVEY REGION

Resignations and Appointments

C.R.V. Slotemaker de Bruine resigned in March 1971.

G. McArthur was appointed A.D.F.O. Harvey in November, 1970.

3 Forest Guards, R.A. Selkirk, L.H. Brown and A.S. McIntyre were appointed to Collie, Harvey and Hamel respectively.

Transfers

F/R Bevan Forster was transferred from Dwellingup to Mundaring in January, 1971.

F/G Max Campbell transferred from Collie to Walpole also in January, 1971.

Training

The final of the first interdivisional Fire Gang Competition in the Northern region was held at Dwellingup in December, 1970. The finalists were Wanneroo and Dwellingup. In a close fought competition, the honours went to Dwellingup by a narrow margin, the result being in doubt up to the final hose run.

Social

Brighter cricket has been the keynote of 3 games played this season. Dwellingup has played Harvey twice and won on each occasion.

Head Office, however, proved too young and fit for Dwellingup and won by 15 runs.

Harvey, although failing to win a game this season, has proved to be a vastly improved side after the first 5 gallons.

COMO RESEARCH

Forest Fauna

The Department has decided to extend its knowledge of the fauna of the State Forest and a sum of $1,500 has been made available from Treasury to finance part of this work.

Mr. Harry Butler, a well known local naturalist has been contracted to prepare lists of the fauna for each of the major forest regions. It is anticipated that copies of these lists will be distributed widely within the Department.

Two five day schools for Departmental officers were held at Manjimup and at Dwellingup during March, 1971. These were organised by Mr. Butler with the objective of training some officers in faunal census, trapping and

identification procedures. A total of sixteen officers attended these schools.

Aspects covered at the Manjimup school included trapping techniques (live and killer traps, mist nets), bird identification (87 species were observed), preservation of specimens, spot-lighting, and the collection of specimens from fire areas, rivers, rock outcrops, swamps and blackboy flats. Field work was supported by lectures on aspects of animal taxonomy and behaviour, and the programme was well illustrated with colour slides of various marsupials, birds, and reptiles.

An "Open night" for field officers and their wives and families packed the lecture hut to capacity and was thoroughly appreciated by all.

One of the more notable events was the live capture of a marsupial mouse (Smithopsis murina) in a dead blackboy an event which pleased Per Christensen no end! The other was the capture of a live tiger snake by the tail. Contrary to misleading reports circulating around Manjimup, this reptile was NOT caught by B.J. White. Lack of suitable snakes prevented Mr. White and other eager pupils from emulating their teacher's example!

A Minor Forest Product

Towards the middle of May, 1970 the extraction of seed from local supplies of cones commenced at the Como Research centre where a cone drier, dewinger, grader and storage facilities are available. To December, 184 lbs. of seed (primarily P. radiata from Grimwade) had been extracted.

The open, dried cones were initially trucked to the rubbish dump. As it was considered wasteful to continue this practice, the local branch of the Pensioners' League was approached and the names of several pensioners living in close proximity to the Research centre were obtained. Since then, approximately 1,500 lbs. of dried cones have been delivered free of charge. A small, but not insignificant, minor forest product.

Resignation

T/A Grade I, John L. Cameron is resigning from the Research Branch to go on a year's world tour. Over the past 20 months, John has worked in various fields including - Jarrah dieback, seed pelleting trials, seed store, extension work and data processing. We wish him and his wife a pleasant and enjoyable trip.

SOUTHERN REGION

Cricket

The B.J. Beggs Trophy again produced some fine competitive cricket during the 1970/71 season. In the preliminary match, Pemberton met Walpole on the Shannon ground. With an all-round team effort, Pemberton emerged easy winners. The final between Pemberton and Manjimup was held at Dingup during February. In an exciting match, Pemberton 8-149 were defeated when Manjimup reached this total with three wickets in hand and 3 overs remaining. Highlights were a fine 52 not out by Bill Buchanan, a phenomenal catch in the gully by Ron "Fingers" Kitson to dismiss "Fiery" Fred Skeet and the keg and barbeque which followed the match.

Treemarking

Current treemarking volumes in the Pemberton Division must constitute something of a record for their sheer magnitude at present. The daily cut in the Division is close to 750 loads and is made up as follows -

Pemberton Permit	200	loads per day (karri only)
Shannon Permit	100	loads per day (karri and jarrah)
Quininup Permit	200	loads per day (karri and jarrah)
Northcliffe Permit	120	loads per day (karri only)
Barmells	130	loads per day (karri, jarrah and marri)
	750	

The treemarking is handled by 5 officers.

Forest Giants

Two prime examples of forest giants have emerged recently. On the Shannon permit, near the Deeside Road a karri log was cut with the following dimensions - length 115' and CGUB 23'1", giving a millable volume of over 96 loads! The treemarker was Jim Shugg, height 5'6" and centre girth 36"!

The other example was a bracken fern found growing near the Warren River in Dombakup Block. It was over 14' tall.

Staff

New Forest Guards from the cadet course, P. Tomlinson and S. Gorton have commenced work at Walpole and Glenoran, respectively.

Other Staff movements -

Bill Buchanan from Nannup to Manjimup.

Rod Simmonds from Margaret River to Walpole.

Frank Pridham, Manjimup to Nannup.

Max Campbell from Collie to Walpole.

Roger Burke has resigned.

SAFETY NEWSLETTER

At the end of the eight months period July 1970 - February 1971, thirty-four (34) disabling injury accidents occurred for the loss of 248 man-days.

These figures compare very favourably with forty-seven (47) disabling injury accidents for the loss of six hundred and twenty-eight (628) man-days during the corresponding period last year.

However, although considerable satisfaction can be derived from the knowledge that we are at present enjoying an all time low disabling injury accident rate let's not fool ourselves that we have the problem beaten.

The problem of accident prevention is never beaten it is with us all the time and requires never ending vigilance on the part of every individual to remain free from injury.

We all know that a frequency rate calculated from man-hours worked and disabling injury accidents sustained is used to measure the effectiveness of an accident prevention programme. However, in actual fact this does not give a true overall picture, as numerous accidents occur which necessitate medical attention, but do not result in lost time and are not taken into account.

For instance our present D.I.A. frequency rate is 28 but our all injury frequency rate - that is all accidents which require medical attention is 100.

A divisional summary of D.I.A. versus serious injury accidents appears on page 34.

These figures support the generally accepted theory in the international safety field that industrial safety efforts are focused on the major injury that causes loss of time or medical attention, rather than on positive corrective action to eliminate or minimise the contributing causes of all accidents.

It therefore appears reasonable to assume that accidents must continue if we continue to chip at the apex and not the broad base of the pyramid. Renewed efforts are therefore required to isolate and investigate accident causes before they become injuries if we are to succeed in reducing our all-injury frequency rate.

Since the last safety newsletter Kirup division has qualified for the 50,000 manhours accident free award, bringing the total divisional award winners to eleven (11).

Congratulations are extended to the officers and employees of Kirup, who having now joined the award winners are confident of continuing their excellent safety performance to the coveted 100,000 manhours goal.

In the last newsletter a list of award winning divisions was published and due to a typing error Walpole was omitted. The error is regretted and apologies are extended.

SUMMARY OF ACCIDENTS REQUIRING MEDICAL ATTENTION JULY 1970 - FEBRUARY 1971

DIVISION	D.I.A.	S.I.A.
Busselton	3	10
Mundaring	4	5
Dwellingup	1	7
Collie	2	4
Kirup	3	5
Manjimup	3	1
Narrogin	Nil	Nil
Kelmscott	1	4
Collier-Somerville	1	1
Wanneroo	4	15
Harvey	2	25
Pemberton	2	5
Nannup	Nil	3
Walpole	4	4
Research	1	Nil
Working Plans	3	Nil
Trainees	Nil	1
	34	90

TOTAL INJURY ACCIDENTS = 124

TOTAL MANHOURS WORKED = 1,233,618

FREQUENCY RATE = 100

ACCIDENT PRONENESS

In any period, a small proportion of the work-force will be over-represented in the injury statistics and this over-representation will be greater than can reasonably be accounted for by any mathematical theory of chance. This population used to be considered to be "accident prone" for, until recently, it was thought that the same persons were responsible for this phenomenon in successive time periods and that these persons should be defined as "accident prone". It was therefore suggested that identification of the accident prone population, followed by their removal from hazardous jobs, would greatly reduce the accident rate. The aim was laudable and a considerable amount of effort was devoted in the second quarter of this century to the identification of personality traits of the permanently accident prone. The purpose was to identify the accident prone segment of a given population, remove it from the areas of risk and thereby produce a significantly lower accident rate in the following period.

NO SUCH SUCCESS HAS EVER BEEN REPORTED

On the other hand, a South African research worker (4) examined the accident records of railway shunters for three consecutive years. He showed that, if the 10% with the highest accident rate in the first year were considered separately and if the accident rate of the remaining 90% was calculated not only for the first year, but also for the second and third years, this rate went up and not down. In other words, the effect of removing the "accident prone" 10% was to increase the accident rate of the remaining 90% in succeeding years!

Other workers confirmed this result and in 1953 a very long paper by two other research workers (5) effectively demolished the concept on logical and theoretical grounds. The belief in accident proneness, as previously stated, was finally removed by the publication of a book written by an American doctor (6) who reviewed the 35,000 accident cases that he had treated in his clinical practice during his working

life. His records showed that there was no instance of a person who repeatedly incurred accidental injury over the total period of many years. Instead, he noted that the majority of accidents were isolated incidents and that the person concerned did not re-appear for many years if at all. However, in any short period of time, a small group of patients did provide a disproportionate number of injuries as they re-appeared two, three or even four times before eventually disappearing. Membership of this group was not stable for some persons were dropping out and others were coming in and this process was operating continuously.

He suggested that the effects of stress could be a cause of the temporarily increased susceptibility of these persons and this view has now taken the place of the old "accident proneness" idea.

This is thought to be a considerable step forward. Under the old concept, if a manager stated that an employee was accident prone, he implied that the employee would have been injured whatever the conditions of the environment. He further implied that, in the circumstances, there was no point in suggesting improvements or extra safeguards.

Under the new concept, the investigator looks for the mechanical or environmental causes and does what he can to remove them. Thereafter, he considers any personal factors that were present in the causal sequence. If these include operator error, he attempts to determine the ergonomic considerations that contributed to the error and also attempts to discover whether there was excessive stress in either the physical or psychological environment. We now know the effects of noise, extremes of temperature, poor illumination and other adverse factors in the physical environment, but do not yet know the effects of any but the most obvious adverse factors (e.g. sarcastic supervision) in the psychological environment.

A great deal of research is now being carried out in this general area and this author believes that in the next quarter century, i.e. in the working life of persons currently in training, the ergonomist will contribute significantly to the techniques of accident

prevention and further suggests that this contribution will play an important role in tackling the problems of "residual accidents", i.e. those accidents that continue to occur even when all the mechanical and environmental dangers have been removed.

SPECIAL NOTE

An accident rarely has only one cause. Usually an accident is the culmination of a series of events, all of which were present and which combined to produce an injury.

Accident prevention is concerned with identifying those events or those points in the sequence where remedies can be applied.

The methodology of accident prevention has an exact parallel in the methodology of public health problems in our society. Whether the problem be an epidemic of one of the infectious diseases or an outbreak of food poisoning, the sequence is the same. The problem is first recognised by diagnosis, the causal sequence identified and the remedy applied.

SELECTION AND APPLICATION OF THE REMEDY

There is a logical sequence of remedies which should be considered whenever there is a need to solve a safety problem. This sequence is so important that the whole of the next paper will be devoted to it.

GET UP TO SCRATCH ... CHECK YOURSELF OUT IN THIS A.B.C.

Experimentation and development surround us at an ever increasing rate, however, the task of driving a motor vehicle is still one that remains largely in the HANDS, the FEET, and the MIND, of the driver. It's as important to us as the A.B.C.

Your driving may have deteriorated since you received your driving licence. Check yourself out on this simple ABC

Ability_____ The full application of specialised knowledge and skill by a motorist to the driving task. It is being able to anticipate and so avoid an accident situation. To maintain control, not only of the vehicle, but also a variety of personal emotions.

Do YOU have this ability?

Behaviour_____ As a society we have attempted to legislate for acceptable behaviour on the highways through the enactment of traffic laws. As a deterrent to those who do not accept these guide lines, the law provides penalties. Driving behaviour is determined by knowledge, attitude, judgment, experience, and foresight.

What about YOUR driving behaviour?

Concentration_____ Most traffic accidents are caused by the failure of one or more drivers to concentrate on the driving task. Day to day driving is beset by many distractions, such as looking for a parking space, street numbers, road signs, passengers, pedestrians. Other distractions include boredom, financial worries, work problems, irritation with other drivers.

DO YOU concentrate?

WHY WEAR EYE PROTECTION

During the period July 1970 to January 1971 inclusive, one hundred and twenty-two (122) injury accidents occurred which necessitated medical attention.

Eye injuries represented 25% of this total.

The wearing of correct eye protection would have saved all these eye injuries and all the suffering.

Some workers would not be without eye protection. These are the ones who know the job. Others do not wear eye protection and put forward various reasons.

What are these reasons? Do they make sense?

1. "Eye protection means that I cannot see as clearly as I can without it"

True, you can't see quite as clearly, though you could see better if you cleaned your eye protection regularly. Of course dirty, dusty eye protection will interfere with your vision.

Still, it is agreed you could see slightly better without it. But at what a cost! Blindness or serious eye injury. You can see through glass much better than through a black patch.

2. "Eye protection fogs up"

True again - but this is easy to cure. Wash the inside of your lenses with soapy water or one of the anti-mist fluids. In hot weather, or if you sweat a lot, use your handkerchief as a sweatband. To be safe from blindness is worth a little effort.

3. "Eye protection is uncomfortable".

True again, but probably it doesn't fit well. Take a little time - use a little energy - to adjust it. When it fits, you will soon forget you are wearing eye protection.

4. "I forgot to put it on".

This is the commonest, real reason. We all forget at times. But that one time when you leave your eye protection in your pocket, or on your bench, or even on your forehead, can be the most costly bit of forgetfulness you'll ever have in your life.

So get the habit of eye protection at all times.
Better wear a glass over your eye than wear a glass eye.

DON'T SHELVE IT

The smooth flat top of the dashboard of many cars is used as a convenient shelf for books, clip-boards and similar items.

The benefits of padding and a black non-reflective surface are appreciably reduced by this habit.

The following incident illustrates a potentially dangerous situation arising from such a practice.

A passenger in the front seat placed his clip-board carrying a pad of notes on the dashboard in front of him.

As the well-loaded car swung into a drive across a cattle grid, the clipboard skidded across and a hectic moment ensued as it touched the windscreen and then dropped into, and jammed, the steering wheel while the car was cirtually on full lock.

Fortunately, the board was freed just in time, and no accident resulted, but the incident could have been duplicated in many circumstances where there was less room for error and where vehicles are travelling at a higher speed.

Don't shelve potential missiles on either the dashboard or rear window shelf.

Extract from The Master Builder, July 1970.

THERE IS NO POINT IN DRIVING FAST.

• • •

INSTRUCT YOUR TRANSPORT SECTION TO DRIVE WITHIN REASONABLE LIMITS

• • •

Every motorist has had the experience -- you're late, you've got to make up time, so you put your foot down. This means accelerating harder out of bends, looking for every opportunity to overtake, and hoofing down on the brakes later and harder before corners.

You make up time, but how much?

A series of astounding tests carried out in West Germany has confirmed that when you drive to the limit the time you save is so small that it's not worth the effort - or the danger.

To discover the answer to the question that has always been in the back of minds of motorists like you and me, a tyre company and a precision instrument maker decided to sponsor an experiment:

	Emergency Braking	Other Braking	Cars Overtaken	Overtaken	Time
Fast Car	4	1,335	2,004	13	20 hrs. 12 min.
Slow Car	Nil	652	645	142	20 hrs. 43 mins.

Hamburg to Rimini - 1,000 miles.

They took two 1,500 c.c. BMW sedans and fitted them with instruments which registered every driving detail during a trip.

The devices told them how often the driver braked, and how hard; how many overtook him; and the total driving time.

The cars set out from Hamburg to Rimini, almost 1,000 miles away on the Italian coast (almost equivalent from Melbourne to Brisbane.)

More than half the distance was travelled over autobahns and autostradas - the German and Italian versions of Australian expressways.

One driver was told to do what we all do when we're in a hurry - overtake whenever it's safe, and take bends at the maximum speed the car and our own ability will allow.

The second driver made the trip in relaxed style, avoiding any risk and moving as the traffic flow permitted.

The astonishing result: After almost 1,000 miles the speedhog finished only 31 minutes ahead of the easy-does-it driver.

The fast driver, taking every advantage, averaged less than 50 m.p.h. He was behind the wheel 20 hours and 12 minutes and used his brakes 1,339 times, including four "emergency" stops.

He overtook 2004 vehicles - far more than any Australian motorist would in a comparable distance. He was overtaken by only 13 cars.

The slow driver braked only 652 times, and was overtaken by 142 vehicles. His driving time was 20 hours 43 minutes.

Experienced drivers from A.D.A.C., the biggest West German motoring club, were sceptical, so they organised a test of their own - an 800 mile run from Cologne to Brenner Pass, via Munich, and back.

The first car took 16 hours 52 minutes after a harum-scarum drive.

The easy-does-it driver in the second car took a mere 21 minutes longer.

The faster driver braked 701 times, including 12 emergency stops, while the slower driver braked only 328 times.

The overtaking ratio was again wide - 1493 to 15.

The speedster has almost 2½ times as many swerves, stomps on the accelerator and "here-I-go--hope-I-make-it" bursts on the wrong side of the road.

In both tests the faster driver used about 10 gallons more petrol than his competitor. The added wear and tear on the hard driver's brake-linings, suspension and engine was obvious.

On Australian highways with approximate equal distance between towns, and a smaller volume of traffic, there would probably be a greater variance in the time factor between the fast driver and the slow-coach.

Unless your wife is about to give birth to a baby, you'll be doing yourself and your car a good turn by slowing down, and you'll lose only a few minutes in the process.

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