FOREST NOTES

Forests Department Perth Western Australia

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EDITORIAL NOTE.

There has indeed, been a long delay since the last issue of Forest Notes; and for this we apologise. There are some very good reasons for the delay but there seems little point in labouring the point. Some other apologies would appear to be called for as well.

One or two articles have been deleted because the delay has dated them, while others that were considered humorous by their authors, were either of solely local interest or just too crude to be published.

Forest Notes is a semi-technical publication and while formal staff appointments are acceptable material, it is not seen as a vehicle for matrimonial advices.

The next issue is planned for late March 1977, and manuscripts should be addressed to

Forest Notes
Editorial Committee
c/- Extension Services
Institute of Forest Research
Hayman Road
COMO. W.A. 6152.

STOP PRESS! STOP PRESS! STOP PRESS!!!

The Department's exhibit at the 1976 Royal Show, Claremont, was awarded the Pennant for the best commercial exhibit in Zone A. Credit for this award must go to all the people, both at Head Office and in the Divisions that provided materials etc.

The theme chosen was multiple use management of forested catchments, and the external display area featured a waterwheel that supplied water to a ponded rocky stream and a stream gauging station. An abstract section of the Bibbulmun Track led over "stepping stones" of jarrah and marri, and over a rustic bridge to a caravan borrowed from Public Works (MRD).

The internal display was a photographic explanation of the Sunkland proposal. Special mention must be made of the physical efforts of Roger Edmiston, Dale Watkins and Cliff Briggs in converting 7 tonnes of granite rock into an award winning stream.

Editor.

The following article, which appeared in "Australian Parks", May 1972, is reprinted here with the kind permission of the Australian Institute of Parks and Recreation.

THE VALUE OF TREES

Transcribed from an article by Mr A. Raad in "Groen", April, 1970, and from information in the May, 1955, issue of "Trees".

The assistance of the Australian Institute of Horticulture is gratefully acknowledged for their translation of Mr Raad's paper.

The tree-value factors suggested in this article for local calculation in each country is a project that this Institute could undertake at some time. There are many situations where members would welcome such a professionally-backed guide to tree valuation. - Ed.

For a variety of reasons a value has, at times, to be placed on ornamental trees. Although the timber value of such trees may be high, it is the aesthetic value, in the case of ornamental trees, that has to be assessed. These values are required in order to estimate how much has to be claimed for trees damaged in traffic accidents, or in acts of vandalism, or when costly remedial treatment has to be carried out in order to save a particular tree either from damage by public utility services or in new road alingments.

Different methods have been adopted in various countries. Three of these will be described. They are

(a) the German method of Maurer-Hoffman,
(b) the Swiss method of the V.S.G.S., and
(c) the American method adopted at an International Shade Tree Conference.

A. THE GERMAN METHOD is based on the following values:

B stem diameter, (basic value) varies from 15 cm = 450 marks to 160 cm = 9770 marks.
G tree species, 4 groups.
S importance of tree, 6 classifications.
Z health of tree, 6 classifications.
L locality of tree, 5 classifications.

The value is calculated as follows:

B x G x S x Z x L = value of one tree in German marks.

The factors used are as follows:

B. Stem diameter cm	base value in German marks April 1970	Stem diameter cm	base value
15	450	90	5150
20	650	95	5480
25	900	100	5810
30	1190	105	6140
35	1520	110	6470
40	1850	115	6800
45	2180	120	7130
50	2510	125	7460
55	2840	130	7790
60	3170	135	8120
65	3500	140	8450
70	3830	145	8780
75	4160	150	9110
80	4490	155	9440
85	4820	160	9770

G - Tree species

Group 1:0.2 - 0.4

Alnus, Fraxinus exc., Populus. Salix. Sorbus auc., ets.

Group 11:0.4 - 0.6

Acer plat., Acer sacch. Acer pseudopl., Ailanthus alt., Betula, Robinia pseud., Sorbus area, Sorbus suecica, etc.

Group III: 0.6 - 0.8

Aesculus hipp., Crataegus, Fagus silv. Fraxinus ornus, Gleditsia intriac., Juglans, Platanus acerifolia, Quercus rubra, Tilia, Ulmus.

Group IV: 0.8 - 1

Acer camp., Aesulus carnea, Carpinus, Catalpa big., Corylus colurna, Liriodendron. Magnolia, Quercus ped., Sophora jap.

S - Importance of Tree

0.5 unimportant
0.6 too closely planted
0.7 sufficient room between trees
0.8 wide planting
0.9 groups or rows at regular intervals
1.0 solitary

Z - Health of Tree

0.5 valueless
0.6 diseased, weak
0.7 badly shaped
0.8 slow growing
0.9 growth - average
1.0 healthy and vigorous

L - Locality of Tree

Group A 0.25 undeveloped country
B 0.75 rural country
C 1.60 suburban area
D 2.55 city area
E 3.55 reserves and park development area.

B. SWISS METHOD

1. Species value - every tree is valued from 3 to 10.
2. Health of tree - 10 values
3. Locality of tree - 5 values
4. Stem circumference - 30 cm to 700 cm

The value is calculated as follows 1 x 2 x 3 x 4 = value of one tree in Swiss francs.

The factors used are as follows:

1. Species value (every species is given a value from 3 up to 10). Some examples are given.

Acer,
Campestre 5, negundo 4, platanoides 4, plat.globosum 6.

Aesculus
Carnea 5, hippocastanum 4,

Ailanthus
Altissima 5.

Alnus
Glutinosa 3.

Betula
Papyrifera 4, pendula (alba) 3.

Castanea
Sativa 8.

Fagus
Sylvat. pendula 9.

Abies
Pinsapo 10.

Cedrus
Atlantica 9.

2. Health of Trees

10 healthy, strong, good as single specimen.
9 healthy, strong, good in groups of 2 to 5, eye catching.
8 healthy, strong, good in groups or rows.
7 healthy, average growth, good as single specimen.
6 healthy, average growth, good in groups of 2 to 5.
5 healthy, average growth, good in groups or rows.
4 slow growing, old single specimen.
3 slow growing, in groups or badly shaped.
2 weak - diseased.
1 useless.

3. Locality of Tree

10 in the centre of the city
9 in suburban areas
8 in the outer suburbs
7 on the outside of the city
6 in rural areas

4. Stem Circumference

Circumf. cm	factor	Circumf. cm	factor	circumf. cm	factor
30	1	150	15	340	27
40	1.4	160	16	360	28
50	2	170	17	380	29
60	2.8	180	18	400	30
70	3.8	190	19	420	31
80	5	200	20	440	32
90	6.4	220	21	460	33
100	8	240	22	480	34
110	9.5	260	23	500	35
120	11	280	24	600	40
130	12.5	300	25	700	45
140	14	320	26		

C. AMERICAN METHOD

1. Area of stem taken from a cross section at chest height (4½ feet = 1.35 m) measured in square inches.

2. Unit price of $6 per square inch of the cross section according to the buying power of the dollar in 1957.

3. Condition of tree: 100% for a perfect specimen and respectively 80%, 60%, 40% and 20% for tree with varying degrees of defects.

4. Values classified according to species and varieties and their suitability in the area of the United States.

The value is calculated as follows:

Factor 1 x factor 2 x factor 3 x factor 4 = value of one tree in US dollars.

Trees are classified into States or Regions and the trees in each are given one of 5 classifications from class 1 (100%) to class 5 (20%) - much abbreviated example for only one region is given.

New England Region

Class 1 100%

Acer platanoides
"Erectrum" rubrum.
Betula papyrifera
Fagus sylvatica
Fraxinus americana
Gingko biloba
Liquid ambar styraciflua
Liriodendron tulipifera

Class 2 80%

Aesculus carnes.
Fraxinus nigra.
Picea pungens
"Glauca".
Platanus acerifolia
Quercua palustris
Sophora japonica

Class 3 60%

Acer pseudoplatanua
Aesculus hippocastanum
Gleditsia triacanthos
Picea glauca
Platanua occidentalis
Salix alba

Class 4 40%

Ailanthus altissima
Morus sp.
Populus alba
Prunus serotina
Robinia pseudoacacia
Ulmus americana

Class 5 20%

Acer negundo
Catalpa speciosa
Pinus rigida
Populus bolleana
Populus canadensis
Populus nigra
"Italica"

The layout of the work sheets could be as under. An example of a tree in poor condition in regional class 5 is given.

Species and variety - Acer negundo
Diameter of trunk in inches - 20
Square inches in cross section - 314
Basic value in dollars - 1884
Species and variety class 5: factor, 20%
Condition class 5: factor, 20%
Value of tree - $75.36 (i.e. $1,884 x 20% x 20%)

Instances will undoubtedly be encountered of such remarkable specimens that the basic value should be increased. This is a matter for the appraiser's judgment as is the determination of the Condition Class of any tree.

Any means or formula for evaluating shade trees must be flexible, and this is probably the most flexible formula of any kind ever devised. Always the judgment and opinions of the individual will be a large, if not the largest, factor.

In conclusion, it is suggested that the U.S.A. method (using the cross-sectional area) appears to be the most logical. It does not, however, take into account the locality or layout of the planting.

A method using the best of the above valuations could be a multiplication of the following factors.

Unit Value

Based on cross-sectional area.

Species value

100% except for selected species with inbuilt disabilities such as root aggressive poplars.

Locality

City centre	100%
Suburban	90%
Outer suburban	80%
Outside city	70%
Rural	60%

Health and Condition

100, 80, 60, 40, 20%

Planting Layout

Solitary	100%
Street tree	80%
Groups of 2-5	60%
Groups over 5	40%
In wooded areas	20%

Values applicable in various countries should be worked out by park administrators in conjunction with councils to suit local conditions.

Manjimup,
March 21, 1975.

The Editor
FOREST NOTES.

TREE VALUATION.

Your article on Tree Valuation (Forest Notes 12:3, December 1974) and later correspondence refers.

The formula for calculation of Tree Value cited may well apply to Melbourne City, but can greatly underestimate the value of certain trees in rural situations, as the following example for Gloucester Tree indicates.

Using the formula quoted,

$$V = T \times S \times A \times 4 \times L$$

where V = Tree Value, S = Species
T = Size, A = Aesthetic Value
H = Health, L = Locality

for Gloucester Tree, (diameter 220 cms).

T = $280 + $3320
S = 0.8 (Group III)
A = 1.0 (Specimen Tree)
H = 0.8 ('reasonable' health - some rot in crown)
L = 0.8 (rural area)

So, Value = 3320 x 0.8 x 1.0 x 0.8 x 0.75
= $1593.60

which you will agree is an absurdly low value for this particular tree.

Factors not taken into account in the case of Gloucester Tree, are:

(i) The tree is well-known Australia-wide and is a significant tourist attraction in its own right;

(ii) The tree is part of the "folklore" of the karri country, regarded with pride and affection by the people of the district.

(iii) The tree is a fire lookout tower, the replacement cost of which is about $30,000.

It therefore appears that in calculating the value of a tree there perhaps also needs to be account taken of historical, utilitarian and recreational values, all of which in the case of our karri fire lookout trees would involve huge multiplying factors.

R.J. UNDERWOOD.

Manjimup
October 9, 1975.

The Editor
FOREST NOTES.

TREE VALUATION - FOUR ACES

Your letter of 6.3.75 refers.

The Maurer-Hoffman method of tree valuation (Forest Notes 12:3) was applied to the Four Aces at Manjimup.

Using the following values for

S = 0.7
A = 1.0 (although an avenue, this makes the trees more valuable than a solitary specimen).
L = 0.75
H = 1.0, the values for each tree are:

Tree 1	-	$1,260
2	-	$1,260
3	-	$1,260
4	-	$1,690
Total	-	$5,470

It is interesting to compare the Royalty value of $525 and the sawn timber value of $8,000.

It seems to me that the system undervalues trees which are naturally occurring, which are unusual and which have special importance as tourist attractions in themselves. While the individual trees are not particularly spectacular, their unusual juxtaposition gives them considerable more value, though this cannot be reflected in the formula.

F.J. Bradshaw
S.D.F.O. (Planning).

Mundaring Weir

March 10, 1975.

The Editor
FOREST NOTES.

TREE VALUATION - OAK IN JACOBY PARK

In reply to your memo the Oak Tree is valued as shown.

T	157 cm approximately (Protected by wire mesh, allowance for this has been made).	=	$2,312.00
S	Quercus robur	=	1.0
A	Specimen Tree	=	1.0
H	Healthy Tree Healthy and vigorous	=	1.0
L	Locality - Park	=	2.50
T x S x L x H x A		=	$5,780.

B. Cowcher
D/FORESTER.

"WHAT'S IN A NAME?" - A REVIEW OF "DONNYBROOK SUNKLAND" TERMINOLOGY

I.G. Lennon

Introduction

Low Plateau, Blackwood Area, Blackwood Plateau or Bunbury Trough - these are all names that have been used for what we in the Forests Department call the Donnybrook Sunkland. In fact, of all these names, Donnybrook Sunkland is the one that is least well known outside the Department and, even worse, it is incorrect as it is applied.

A rather indistinct geomorphological unit is bounded by the Darling Scarp in the east, the Dunsborough Fault in the west, the Whicher Scarp in the north and the weak, broken scarp along the northern limit of the Scott Coastal Plain in the south. When members of the Forests Department refer to the Donnybrook Sunkland, it is this area that is in their minds, and although the two are almost coincident, it is usually the solid block of State Forest in this region that is being referred to (for example, see map, page 2, Forest Focus Number 16).

A petroleum exploration geologist standing on the Leeuwin-Naturaliste Ridge and looking east would certainly think of the area as a sunkland, or, more correctly, a graben (a geological structure resulting from the subsidence of a strip of country lying between two normal faults). A geomorphologist standing at Busselton and looking south-east would regard the area as a plateau (an extensive, level or mainly level area of elevated land). And herein lies the confusion - whether to describe the area in geological (or, more correctly, tectonic - attributable to earth movements) or geomorphological terminology. It cannot be wholly described only in one or the other because its boundaries consist of both tectonic and geomorphological features.

The western boundary of the area (see Fig. 1), the Dunsborough Fault, is a purely tectonic feature with no topographic expression except at its southern end, where it is marked by a small scarp extending a few miles. The northern (Whicher Scarp) and southern (un-named scarp) boundaries are purely geomorphological features resulting from marine erosion. The

Darling Scarp, forming the eastern boundary, is both a geomorphological and a tectonic feature, being the surface expression of the Darling Fault.

Brief descriptions of the tectonic and geomorphological histories of the area show how this situation has arisen.

Tectonic History

Because the northern and southern boundaries are only geomorphological features, tectonically the area is part of a much larger feature known as the Bunbury Trough, which in turn is part of the Perth Basin. The Bunbury Trough is a graben bounded by the Darling and Dunsborough Faults. In this graben, formed by subsidence of the Precambrian basement, a predominantly sandy sequence was deposited in a continuously continental environment from Lower Permian to Lower Cretaceous. Subsidence appears to have ended in the early Cretaceous. Geophysical surveys and deep boreholes, mainly prompted by oil exploration, indicate a maximum thickness of approximately 9 000 m of gently dipping or horizontal sedimentary rocks disrupted by several large faults. Figure 2 shows an east-west geological cross-section of the area; the position of the section is shown in Figure 1.

The Bunbury Basalt, which only rarely outcrops, probably represents a single lava flow which spread across the southern part of the Perth Basin. It possibly reached the surface by way of the Darling Fault, and its eruption in the Lower Cretaceous may have marked a period of movement on the fault.

Following the cessation of subsidence and deposition in the Trough, uplift and removal by erosion of some of the Lower Cretaceous strata occurred.

Geomorphological History

Most of the geomorphological features mentioned are shown in Figure 1.

The area now consists of undulating hills forming a laterized surface with a local variation in relief of the order of 10 to 20 m. The maximum elevation of 150 m is found in the Whicher Range, south of the Whicher Scarp. Laterization is post uplift, and dissection of the area has occurred simultaneously with continuing laterization. Deep dissection has been caused by the Saint John Brook - Saint Paul Brook - Mill Brook tributary system of the Blackwood River.

A systematic variation in the elevation of the semi-mature surface of the area suggests an uplift of middle to late Tertiary age. Generalized contours drawn on this surface (see Fig. 1) indicate an east-west axis (Jarrahwood Axis) of uplift with a gentle westward plunge. This axis was probably the prime control for the formation, by marine erosion during the Pleistocene, of the Whicher Scarp and probably also of the very dissected and poorly defined scarp separating the area from the Scott Coastal Plain.

Terminology

The confusion resulting from the possibility of naming the area either according to its tectonic or its geomorphological history is reflected in the various names that have in fact been used.

Despite statements to the contrary by Smith (1951) and Finkl (1971), neither Saint-Smith (1912) nor Jutson (1914) attributed any term to the area. In 1951, Gentilli and Fairbridge applied the term Donnybrook Sunkland to a "physiographic region" which included the area under discussion, the Swan Coastal Plain around Busselton and the Scott Coastal Plain; the Leeuwin-Naturaliste Ridge was recognized as a "subregion". Smith (1951) chose a contradiction in terms and referred to the area as a low plateau, but it took until 1960 for the term to be formalized by McArthur and Bettenay.

After mapping of the area by the Geological Survey, Lowry (1967) called it the "Blackwood Area", thereby avoiding both tectonic and geomorphological terminology. Finkl (1971) subsequently returned to the use of "Low Plateau", but in 1972 Cope cunningly combined the two terms and proposed the use of "Blackwood Plateau".

The recently published Memoir of the Geological Survey (1975) shows the area as being part of the Bunbury Trough, and this is used only in a tectonic sense. A Bulletin on the Perth Basin, soon to be published by the Geological Survey, will refer to the area as the Blackwood Plateau (pers. comm. R. Connolly, Geological Survey).

Conclusion

There are, therefore, two terms which can be applied to the area bounded by the Dunsborough and Darling Faults, the Whicher Scarp and the un-named scarp to the north of the Scott Coastal Plain. Tectonically it is part of the Bunbury Trough. Geomorphologically it is the Blackwood Plateau. The term

Donnybrook Sunkland is incorrect (in the sense used by the Forests Department) and out of date. It should be changed immediately and, as forestry is more concerned with geomorphology than it is with tectonics, the Forests Department should henceforth refer to the area as the Blackwood Plateau.

A change of name, however, would presuppose that the name would not be changed again by some future geomorphologist - and history shows this to be unlikely. In 40 years time the area may well be referred to as the Blackwood Pine Forest; so perhaps, after all, there is something to be said for keeping Donnybrook Sunkland, and anyway, as those inclined to bardolatry might well ask, "What's in a name?"

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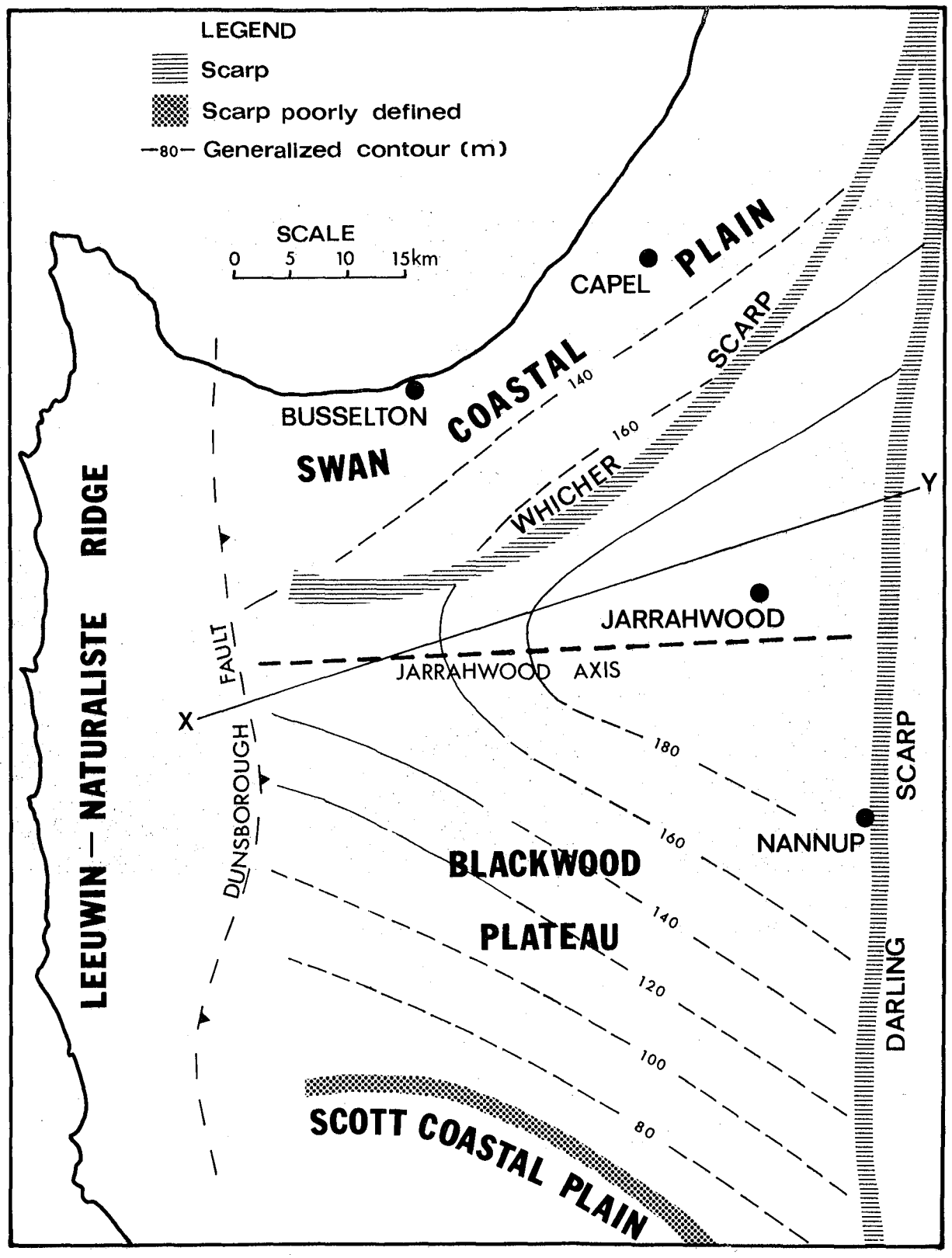

Figure 1

Geomorphological features of the Blackwood Plateau (after Cope, 1972).

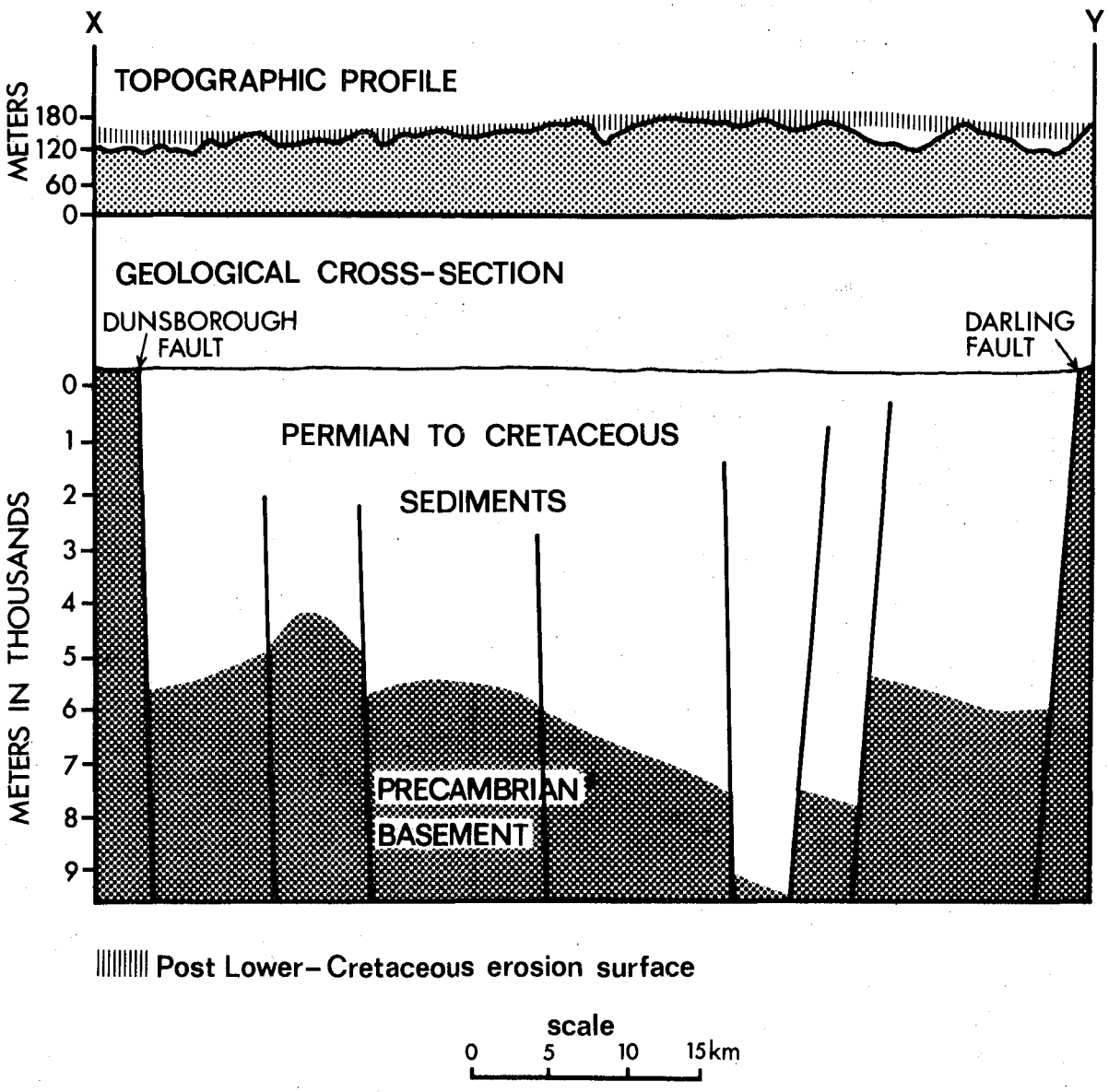

Figure 2

Topographic profile and geological cross-section of the Blackwood Plateau (after Cope, 1972).

FIELD STUDY CENTRE, JARRAHDALE.

At a special Arbor Day ceremony (July 7) the Minister for Town Planning, the Hon. Cyril Rushton, opened the Jarrahdale Field Study Centre.

Principals and students from twenty metropolitan senior high schools attended field exercises in nearby forests prior to a luncheon at Jarrahdale, and then gathered at House No. 380 for short address by the Minister, the Conservator and the Superintendent of Primary Education.

The Study Centre consists of a house on lease to the Education Department as the base for geography and biology exercises in such areas as virgin jarrah forest, dieback, bauxite mines, stream gauging etc. The project is a joint Education Department-Forests Department activity that should provide an excellent base for getting our side of the forest management story across to high school students. The centre is available for day use by schools on a 'first come, first serve' basis and is already booked until the end of the 1976 academic year.

P.N. HEWETT.

KIRUP REPORT - Works Programme

Pine planting was completed on August 28, 1976 with a nett area of 688 hectares. Casual pieceworkers from the local farming community were engaged and the duration of planting time was shortened despite two periods when planting stopped due to lack of rainfall. At the end of July our average rainfall was down by 159 mm. Considering we had recorded 216 mm at the end of April the months of May, June and July only produced 310 mm compared with an average of 576 mm for these three months. Had we not received 75 mm in January our progressive average would be down by 234 mm (9 inches).

The Grimwade Pine Mill is back in production after being closed down for twenty weeks from March to July. We are hoping orders will be forthcoming.

An airstrip has been constructed adjacent to Grimwade Section B & C. Apart from obvious uses it will reduce the cost of aerial supering of the old plantation. In April of this year aerial supering was carried out in Grimwade Section E and F. Superphosphate was applied at the rate of 750 kg/ha over 184 hectares for a unit cost of $51.70 per hectare.

Rabbit control has become a minor problem in the Blackwood Valley in contrast to the damage they caused in 1972 and 1973. However, rabbits do "keep on keeping on".

Grazing under pines was expanded considerably in parts of P.71 and P.74 in Kirup Section C and F and at present involves 602 hectares. Results are promising and the aim of reducing the high fire hazard will have been mostly achieved in the areas being grazed.

COMO.
October 27, 1975.

The Editor
"FOREST NOTES"

Dear Sir

The following extract from the 1974 Annual Report of the Kings Park Board may be of interest to "Forest Notes."

> "A blackboy 3.65 m tall was despatched from Yanchep to Dr Gillespie and Mr Robinson of the Radiocarbon Laboratory, Sydney University. The age of the oldest part of the blackboy, the bottom-most leaf bases, was determined as 375 years old. The actual age since germination is probably 450-500 years."

i.e. Here is proof that a large blackboy can be at least 375 years old.

Regards,

Sgd. Jim Williamson.

Editor's Note: The specimen was selected, extracted and transported from State Forest by Mr Roger Edmiston at the request of the Board.

HEAD OFFICE
June 20, 1975

The Editor
"FOREST NOTES"

Dear Sir

FOREST VALUES

Wood is a storage battery for solar energy. When burnt, a pound weight of wood releases 7,000 B.T.Us. of stored energy. At 2,205 lbs to the tonne this represents 15,435,000 B.T.Us. per tonne.

A recent survey of all sawmills in the State reveals some 604,000 tonnes of waste wood products are burnt annually.

In our Departmental prescribed burning programme we burn up a further 8 tonnes per hectare over 350,000 hectares annually. This is 2,800,000 tonnes of fuel per annum.

These two sources total 3,404,000 tonnes per annum from a total State Forest area of 1,850,000 ha or 1.84 tonnes per hectare per annum.

Collie coal releases 8,500 B.T.Us. per pound when burnt so our forests produce fuel equivalent of

$1.84 \times \frac{7,000}{8,500} = 1.52$ tonnes of Collie coal annually for every hectare of State Forest and this without interfering with timber production.

The Muja generating station produced 1,720,625,000 kilowatt/hours of electricity from 1,000,000 tonnes of Collie coal during 1973-74.

On this basis the forest fuel available would produce

$3,404,000 \times \frac{7,000}{8,500} \times \frac{1,720,625,000}{1,000,000}$ or 4,823,417,941

kilowatt/hours per annum.

The total power produced for the 1973-74 year by the S.E.C. was 3,253,499,730 kilowatt/hours or only 67% of the energy burnt by us each year.

What value the forest when oil, coal and uranium stocks are depleted?

P.N. SHEDLEY.

EDITORS' COMMENT

The following article on the same subject from the Sunday Times of 22/6/75 is reprinted with kind permission of the Editor.

SOLAR FUEL FROM PLANTS, SAYS EXPERT.

'TIMBER, CROPS STORE FUEL'

Solar energy stored in plants can be converted to synthetic fuels to help to solve the coming world energy crisis, according to an Australian scientist.

Timber, grain crops and sugar cane can contribute to Australia's future energy needs.

But the need for food and natural polymers would restrict the amount of land available for the production of energy crops.

These are conclusions made by Dr. G. Gartside, senior research scientist at CSIRO's Division of Chemical Technology, Melbourne.

Writing in the scientific magazine Search, he says a land area of about 150 million hectares would be needed to grow the crop for a steady power output of 90,000 MW, Australia's total power consumption.

This is 19 per cent of Australia's total land area.

SYNTHETIC

Three years ago Australia was using 22 million tonnes of petroleum fuels a year.

To replace this by synthetic fuels would require about 200 million tonnes of crops a year.

This would be equal to the annual production from forests but by the end of the century the supply of locally grown timber would be in balance with demand.

The tonnage would also exceed the current production of sugar cane, which has a highly efficient energy storage system.

On these figures, Dr. Gartside says the conversion of solar energy stored in photosynthetic materials (plants) to synthetic fuels can supply only a small fraction of the total Australian energy demand.

He points out that bigger populations and better standards of living will require greater production of food.

He forecasts an intense three-way competition in land use for the production of food consumer products, and synthetic fuel.

The importance of maintaining adequate supplies of food and consumer products will restrict supplies of synthetic fuel.

To overcome this problem he suggests the use of integrated land-use systems that can provide all three products - food, fibre and fuel.

Such systems could provide an economic means of producing fuel from plants in association with conventional products of farming and forestry.

CADET TRAINING 1975-6

by F. Pridham

Nineteen Forest Cadets of the General Division completed the second year of their cadetships in December, 1975, the graduation ceremony taking place at Como Auditorium on December 5th.

A distinctive feature of the course was its division into two groups, each alternating between the training schools at Dwellingup and Manjimup. Although the arrangement was attended by considerable administration problems it had the overriding advantage in that cadets benefitted from the experience and expertise of a large number of Departmental officers, especially those of Southern Divisions.

Special congratulations to Bill Hollingworth, of Denbarker, who was awarded the Keynes Memorial Prize for the "best all round" cadet of the course. The presentation was made by former Senior Forester Dick Perry, who is related to the donor of the bequest from which the Prize is financed. The Forests Department prize, presented by the Conservator of Forests, went to Peter Bidwell, who joined the course at the beginning of the second year and obtained high marks in all examinations and high assessments in all practicals. A full list of graduating cadets, together with their initial postings, follows:

R. Banks	Manjimup	F. Lindburg	Busselton
P. Bidwell	Nannup	P. Linney	Left for employment with a nursery enterprise
R. Bone	Nannup		
D. Boothey	Harvey		
C. Briggs	Busselton		
C. Cicchini	Wanneroo	D. McMillan	Walpole
B. Commins	Kirup	M. Pendlebury	Harvey
C. Downes	Dwellingup	C. Svanburg	Pemberton
G. Ellis-Smith	Dwellingup	W. Tiedemann	Manjimup
B. Hollingworth	Manjimup	P. White	Walpole
J. Kenbeek	Collie	M. Zwart	Pemberton

Seventeen first year cadets completed their Mt Lawley year in November 1975, and commenced their 2nd year at Dwellingup on January 5th, 1976.

Cadetships, to commence at Mt Lawley Technical College in February 1976 were advertised in September 1975 and attracted more than 150 applications, of which 85 were interviewed and short listed to 32. During the fortnight before Christmas selection schools were conducted at Dwellingup, as a result of which twelve cadetships were offered.

THE KARRI REGENERATION BURNING PROGRAMME

R.J. Underwood

During the 1975/6 summer, personnel in the karri area carried out a record regeneration burning programme. Over 2,000 ha were burnt, mainly in the North Walpole, Quinninup and Shannon areas. The coupes involved were those resulting from karri sawlog cutting since the last general seed year in 1972, although some chipwood was also removed from two coupes south of Quinninup. A total of 35 burns were involved, varying in size from 28 to 400 ha.

The task in preparing, burning, mop-up and control of this operation was a large and difficult one. The fact that eventually the programme was completed well inside the target deadline and with only one minor mishap (a small escape into flats in the Keystone area) was a credit to the officers and men involved.

Notable achievements and developments included:

1. The introduction of regional planning and operations, the resources of all three divisions being co-ordinated on a day-to-day and "job" basis rather than a territorial basis as in the past. This ensured tighter control and more efficient use of manpower than ever before.

2. The use of new techniques, notably Ric Sneeuwjagt's Moisture Prediction Tables and Paul Jones' electrical ignition system, both of which were outstandingly successful, allowing very accurate prediction of optimum time to burn and optimum use to be made of 'safe" days when a moisture differential existed between the cutover and surrounding forest fuels.

3. Introduction of the concept of "advance mop-up" (dozing scrub and logs 20 m in from burn perimeter before the day of the burn) which revolutionized edge control and comfort and safety for troops.

4. The use of aerial ignition for burns at Boorara and Swarbrick, giving rapid and effective ignition without the necessity for men to walk through slash and debris.

5. Completion of the entire programme without the occurrence of a single disabling injury.

These factors have generated confidence in the regeneration burning operation and represent, in my opinion, a classical demonstration of the successful co-operation of Research and Field staff producing effective, useful and interesting developments.

Regeneration surveys of the burnt areas are now virtually completed and indicate that the normal 80-90% success rate was achieved. Seedling stockings in most areas (e.g. Keystone, Weld, Dombakup and Grey) are magnificent. In the three main areas where results were poor, hand planting and some direct seeding has been programmed and will be completed by early August.

A similarly large programme of regeneration burning is proposed for 1976/7 summer. In most of these areas woodchip logs will have also been removed. This is expected to make the burns cheaper and easier to prepare (scrub-rolling will be no longer necessary in most of these areas) and burn (due to relative absence of large logs and cull trees which provide most of the problems of control and mop-up).

With an annual regeneration burning task of about 3,000 ha per annum forecast for the next few years the developments and innovations introduced last summer must stand us in good stead.

'TIGER TALES'

by D.A.B.

Here is a further report from Nannup, the centre of the Southwest set in the beautiful Blackwood Valley and surrounded by whispering pines. (When we find out who they're whispering about a further report will be made).

Once again, Nannup made front page news throughout the State, due to a visit from a group of free-wheeling tourists known as God's Garbage. These gentlemen apparently objected to the comments of a prominent local imbiber and proceeded to award him the order of the boot. He was saved from oblivion by some of the braver residents of the town including one lady who found a better than usual use for a bar stool by applying it to the opposite end for which it is intended.

Another front page item was the activity of a group of primary producers who are increasing in number in the district. These residents who have dropped out of the city scene for a life in the country are very conservation conscious. This group are against pine planting, tobacco, alcohol and work. They are for the dole, free love and pot. The conservation angle of their preferences must not be overlooked, the dole conserves energy, free love conserves on the number of women and last but most important growing their own marijuana conserves money and as one grower who was recently charged explained, this plant attacks and destroys P. cinnamomi thereby conserving our forest. Due to this new frontier in our knowledge it is suggested that Syd Shea might investigate it's potential and if correct, our Sunkland Scheme could be revised and 'pot' planted instead of pines. This could then result in a healthy Jarrah Forest and from the harvest the Department could once again return to those wonderful days when it supported itself. A side effect of the prevalence of pot planted in the area was a report from the spotter pilot that when flying over burns in the area he felt much higher than usual.

Various staff changes have occurred since my last report. Nannup is now a town without Beer who has flowed on to Manjimup and now covers the area that was previously Forrests. Another change is that Bill Tame after many years of soft talk and persuasion has finally been given his transfer to unofficial retirement in Busselton. The fact that Wes Forrest has also moved to Busselton since his

retirement could mean that, the quiet seaside resort will never be as quiet again.

Further staff moves into Nannup were two Forest guards ex the Dwellingup training school. Peter Bidwell and Russell Bone. Nannup also gained two professional officers Peter Beatty who is straight from University at Canberra and Chris Done who was previously in New Guinea's Forest Service.

Arthur Holland was also reclaimed from the sea at Margaret River, but due to a Quick promotion is now again submerged in the deep south at Pemberton.

How decisions on postings within the Department are made is not known to your correspondent, but though Nannup gained five and lost three the end result seems to be that, Manjimup got the Beer, Pemberton went Dutch, Busselton got Tame and Nannup got Done.

A further report was promised on the significance of Terry Maher's weekend and midweek trips to Pemberton. Terry insisted that he was only going to training. Now we know what he was training for! Terry was married in March and it is hoped the training is now paying off.

Another matrimonial event to report is that our happy young lady Lucy Dell'Agostino who always wanted a shorter name was also married in April and is now Lucy Cole and a merry little soul is she.

That's all for now folks, further reports will be made as significant events occur in this newly established centre of the hippy movement of Australia.

SAFETY AND ENVIRONMENTAL CONSIDERATIONS IN THE USE OF CHEMICAL FIRE RETARDANTS

R. Sneeuwjagt

INTRODUCTION

Chemical fire retardants are being used more and more widely in mop-up and wildfire situations in Western Australian forests. The benefits of these chemicals over water alone have been demonstrated by the U.S. Forest Service and other fire fighting authorities throughout the world. Some of the advantages of retardant chemicals are:

1. They multiply the effectiveness of water when used as a fire suppressant or as a mop-up agent.

2. They are still effective as retardants after the water has evaporated.

3. They can be used to quickly widen and reinforce control lines.

4. They can be used for both air and ground applications.

There are however some problems associated with chemical fire retardants which must be taken into account. Some of these include:

1. Their cost is much higher than water alone.

2. Increased logistics are needed for mixing, storage and distribution.

3. Additional equipment care and modifications are required to prevent corrosion.

4. They can be irritating to the eyes and respiratory system in certain circumstances.

5. They can be environmentally damaging if used in excess and concentrated on and near open water.

The possible effect of forest fire fighting chemicals on people and the environment has been of concern to forest managers since the retardant programme began in the United States in the 1950's. Research done in that nation on the interaction of retardant chemicals with the environment has recently been published, and it is the aim of this article to highlight some of the published results for the interested reader.

THE CHEMICALS

Fire retardants are chemicals that have the ability to inhibit the spread of flames through chemical reactions between the products of combustion and the applied chemicals. Water is used as a dispersing agent, however the chemicals remain effective as flame inhibitors after the water has evaporated. They are thus named long-term retardants.

These retardants contain relatively inexpensive fertilizer-grade ammonium phosphates or sulphate and are available in either a dry powder or liquid concentrate form. In addition other chemicals are added in low concentrations to increase the efficiency of the primary active retardant materials. These may include wetting agents, thickeners, corrosion and spoilage inhibitors, and colouring agents.

The widespread use of these chemicals in our forests raises questions about their possible effects on the environment and people. The following considers the influence retardant chemicals can have on people, animals, fish, plants and soils and outlines the precautions that must be followed to minimize harmful effects and safety hazards associated with the use of chemical retardants.

PEOPLE

Dust from ammonium compounds can be irritating to respiratory system and to the eyes. This effect was confirmed in tests on mice and rabbits which were fed up to 25,000 mg of diammonium phosphate (D.A.P.) per kilogram of body weight. The chemical was found to be a mild eye or skin irritant only and had no oral toxicity whatever.

Certain corrosion inhibitors such as sodium ferrocyanide may have some side effects if they are heated. In this case toxic fumes of cyanide are emitted, however, they are present in extremely low concentrations and thus do not represent a health hazard.

Strong ammonia fumes are emitted when retardant is applied directly to flames or burning logs. These fumes, although not toxic, can be discomforting to the hose operator if he should be working in a confined space where ventilation is limited. To overcome these irritations it is suggested that mixing crews wear goggles and suitable dust masks to minimize dust contamination. Hose operators should wear goggles for eye protection and use extended nozzle attachments or work upwind from the heat source to minimize respiratory discomfort.

Retardant spilled on arms, hands etc. should be thoroughly washed off with clean water. When hands and arms are in contact with liquid retardants for long periods, they become dry and chapped. Some type of allergic hand lotion should be made available to eliminate chapping.

If ammonium phosphate or sulphate are splashed in a persons eyes, they would be no more damaging than common table salt, but should be immediately flushed out with clean water to reduce irritation.

If a persons clothes are soaked they should be rinsed thoroughly before wearing again. The salt particles will chaff the skin if left in the clothing and worn during the work period.

LIVESTOCK

Fire retardants used in combating U.S. forest and range fires have been accused of killing livestock by nitrate poisoning. Ammonia-based retardants cannot cause nitrate poisoning directly. They must first enter the soil, be converted to nitrates, then be absorbed and accumulated by plants. This process apparently occurs only under special climatic conditions and requires two or three weeks. These conditions are low light intensity and high temperatures; or when drought occurs late in the growth cycle. Even when these special climatic conditions occur, trouble can be avoided by deferring grazing for three or four weeks after application so the plants can convert the extra nitrates into normal, harmless protein. The possibility of injury to livestock by ingestion from fire retardant materials is very slight - much less than that from a pasture fertilization programme.

PLANTS

Toxicity to plants has not been considered a problem with currently used materials. Ammonium phosphate and sulphate compounds do not usually create adverse effects to plants, since current materials are commonly used agricultural fertilizer. If applied in too heavy concentrations these chemicals can temporarily dessicate vegetation. The phenomenon can be observed when fertilizer is applied too heavily on green lawns and the grass is temporarily burned. To date, there are no reports of this being a real problem with brush or timber species.

FISH AND AQUATIC ORGANISMS

Chemical fire retardants can be toxic to fish and other organisms when present in heavy concentration in their aquatic environment. Ammonia is the major cause of the problem. All currently used retardants contain ammonia and are therefore potentially toxic agents. Ammonia is toxic up to a 200 000:1 dilution rate and dead fish will start coming to the surface within two to three minutes.

The sulphate components and dichromate (corrosion inhibitor) can be lethal for other aquatic organisms. The lethal dilution rate extends upwards to 1,000:1.

The following guidelines should be followed to minimize the entry of retardant chemicals into bodies of water.

1. Inform field personnel of the potential problem of fire retardants in streams or lakes.

2. Locate retardant mixing and loading points where natural water contact is minimal.

3. Exercise care in prevention of accidental or careless spills at mixing, loading and assembly areas, especially near live streams.

4. Avoid direct application of retardants into rivers or lake shores. Use alternative methods of fire suppression or fire line building.

5. Spills should be cleared up immediately. These should not be flushed down a drainage ditch or into a live stream, but rather be spread thinly over a land surface.

SOILS

No currently used fire retardants are known to produce a sterilizing effect at the presently used application rates. The nitrogen available in the ammonia compounds such as mono-ammonium phosphate, diammonium phosphate and ammonium sulphate are fertilizers, and sold as such commercially.

DOMESTIC WATER SUPPLIES

When retardants are used near domestic water supplies, the same precautions must be exercised as mentioned in the Fish and Aquatic section. Leave at least 40-60 metre buffer zone from the water line. Under normal conditions, plants and soil can absorb a majority of the chemicals before they wash or leach to the body of water. The exception would be an area with extreme surface erosion.

SUMMARY

Some precautions are necessary in the application of chemical fire retardants in the field. Hose operators should be provided with goggles for eye protection and position themselves upwind from the heat source. Similarly mixing crews should wear goggles and dust masks as protection from dust irritation.

Retardants should be kept away from live streams or ponds of water. Spills should be avoided and kept away from drainage ditches. Excessive application rates should be avoided. These could be toxic to plant life as would occur with any fertilizer.

REFERENCE

"Southern Guide for Using Fire Retardant Chemicals in Ground Tankers". U.S. Dept. of Agriculture, Forest Service, State and Private Forestry, Southeastern Area.

SAFETY NEWSLETTER

The end of June, 1976 not only completes an extremely successful 9 years of co-operative effort directed at reducing the incidence of accidents throughout the department, but also has resulted in the establishment of a record low frequency rate of 17.5. During the past 12 months an excellent level of safety performance has been maintained, and the record low total of 31 DIA sustained eclipses by 10 our previous best record of 41 for a frequency rate of 23, which was established in 1971-72.

Before the introduction of the accident prevention programme, an average annual total of 184 DIA were sustained resulting in a frequency rate of 105. Time lost as a result of these accidents totalled 3,244 mandays, which represents 15 men off work for a full year. When these figures are compared with those recorded for the 12 months ended June, 1976, of 31 DIA for a time loss of 383 mandays or 1½ man years, I feel sure that all will agree that the savings in both human suffering and the economic and side benefits derived by the department and all who work in it as a result of the accident prevention programme requires no stressing.

The following summary covering the past nine years, illustrates the success that has been achieved in the reduction of work-caused injuries. However, it also reveals that as already mentioned a record low accident rate was achieved in 1971-72 but an adverse trend immediately followed which continued till June, 1975, with a resultant increase in frequency rate to 31. As investigation of the accidents that occurred during this adverse trend revealed that there was no material difference between them and those that had occurred prior to 1971, and in fact are still occurring, being generally the slips and falls, Flying Objects, and manual handling - types of accidents which are expected in Forestry operations - it can only be assumed that a general feeling of complacency over our success during the years 1967-1971 was the major contributing cause for this decline in Safety performance. It is hoped that this will not re-occur, and that during the current year our record will be improved upon or at least maintained.

Year	M.H.W.	DIA	SIA	Total Acci-dents	DIA	F.R. SIA	F.R. DIA+ SIA	Man days lost	Dura-tion Rate	Sever-ity
1967/68	1 895 600	124	312	436	65	164	230	1701	14	900
1968/69	2 019 568	96	155	251	48	76	124	1738	18	860
1969/70	1 901 020	70	129	199	37	67	104	721	10	379
1970/71	1 808 406	48	158	206	27	76	110	458	9	253
1971/72	1 759 888	40	128	168	23	72	95	275	6	156
1972/73	1 728 577	45	112	157	26	64	90	414	9	239
1973/74	1 651 621	45	119	164	27	72	99	359	8	217
1974/75	1 748 219	55	127	182	31	72	104	634	11	362
1975/76	1 762 693	31	113	144	17.5	64	82	383	12	217

The key to the success of accident prevention programmes is considered to be the understanding of the basic principles of accident prevention and the persistence of the entire workforce, staff and employees, in the application of these principles. In short this means an acceptance by us all that accidents do not just happen - they are caused and they can be prevented.

The success portrayed in the above summary indicates that the entire workforce of staff and employees have demonstrated these characteristics and must be congratulated for their efforts to make a hazardous occupation a safe one in which to work.

SAFETY AWARDS

Following the implementation of the accident prevention programme in 1967 it was decided that safety awards would be presented to divisions on the achievement of 50 000, 100 000 and 250 000 manhours free of disabling injury accident. These awards were made available by the National Safety Council and consisted of an inscribed plaque for 50 000 or framed inscribed certificate and pennant for 100 000 and a further framed certificate and chevron pennant for 250 000 manhours, and were presented as a compliment for outstanding safety performance and to encourage further safety achievements.

The summary of award qualifiers once again indicates the contribution to the success of the safety programme made by all divisions.

During 1975 which proved to be the crest year of the adverse trend already referred to, the subject of the introduction of personal awards was discussed as a mechanism designed as an incentive to motivate the workforce towards renewed safety awareness and co-operation in the accident prevention programme which would, it was hoped, result in a termination of the prevailing unsatisfactory safety performance. The introduction of the award system which consists of the presentation to each member of a qualifying group of an item selected from a number made available at a cost of up to $5 was approved and has been in force for the past 18 months.

Whilst at this stage I am not prepared to claim that the success achieved during the past 12 months can be attributed entirely to this award system, I feel sure that it has played a part and look forward to voting it an unqualified success after all divisions qualify in the next 12 months.

Qualifiers to date for this award are Walpole, Dwellingup, Working Plans, Kelmscott, Pemberton, Busselton, Nannup, Research and Mundaring.

The contribution that these divisions and specialist sections have made to the continuing success of the programme requires no stressing. However, there are also those divisions who have achieved and are maintaining a very good level of safety performances but have just not been successful in achieving the full 12 months free of D.I.A. since the introduction of this award. Manjimup and Narrogin are within weeks of qualifying and it is confidently expected that they will, and that Harvey, Kirup and Collie will make the grade during the ensuing 12 months, also.

I am sure that the entire workforce will join me in offering congratulations to Walpole Division who have now established a departmental safety record by working a period of 5 years free of Disabling Injury Accident.

NATIONAL SAFETY COUNCIL AWARDS

Won by W.A. Forests Department Divisions

Divisions	Man Hours Worked without Disabling Injury		
	50 000	100 000	250 000
Mundaring	*	*	
Dwellingup	*	*	*
Collie	*	*	*
Kirup	*	*	
Manjimup	*	*	
Kelmscott	*	*	
Wanneroo	*	*	
Harvey	*	*	*
Pemberton	*	*	
Nannup	*	*	
Walpole	*	*	*
Busselton	*	*	
Collier-Somerville	*		
Total	13	12	4

Departmental record of accident free manhours worked -

Collie	400 000
Dwellingup	373 000
Harvey	300 000

Record Time Period -

Walpole	60 months (continuing)
Working Plans	50 months (continuing)

'FOREWARD'

From the feed back received after the first edition of 'INSIGHT' it would appear the publication is considered to be a success.

The need for contributions from everyone is stressed, there must be many incidents and points of interest occurring each day which could be included and would assist greatly in giving the Newsletter a local flavour.

Our most Notable achievement - Safety wise, since the beginning of the year has been attaining 12 months accident free and reaching 100,000 man hours free from D.I.A.'s for the second time.

Nannup is up with the leading divisions on safety performance - let's keep it that way.

EDITOR.

April, 1976.

'THE ORDER OF THE HAT'

Ron Sparrow has come up with an interesting article printed in the "Australian Worker" in 1962. Have Times Changed?

An order that is given when a workman doesn't suit, is called the "Marching Order" or the"Order of the Boot"

Now we have an order that differs far from that, it is known to the victims as the "Order of the Hat".

They have issued us with helmets (we work amongst the pine) And I have offered rude suggestions of what they can do with mine.

The hats will never fit the heads, the heads must fit the hat, some of the heads are fairly round while others are fairly flat.

The hats have been invented to save blows from limbs or sticks, but the average forest worker has a skull that's awful thick.

He tries out all the fittings by adjusting up the straps, and then stuffs in wads or paper to fill in all the gaps.

Should you suffer from a cold you remove your hat to cough for you know the slightest jerk will send it flying off.

When in the truck we hit a rut (there are many on our courses) all the hats go sailing off like a lot of flying saucers.

We'd like to help our benefactor and save his mind from strain for the "order of the Helmet" must have sorely taxed his brain.

So we discussed the matter deeply and we answered all the questions, now we humbly offer to our friend these helpful suggestions.

Our heads are now protected but our shin bones can go begging, so we suggest they give us now for each leg a leather legging. We think that gloves would be just right when scrubbing in thick patches, so should they issue these as well, it will save us many scratches.

And goggles would be handy too (especially when it's blowing) for bits of dirt get in our eyes and we can't see where we are going.

A coat of Mail would be the thing to save our flesh and bone, and to save this thing from slipping off it would be spot welded by Malone.

Now, when we were wearing all these things our boss would go beserk, for we'd be so weighed down with safety gear that we would really do no work.

The man should be rewarded, we all agree on that, who developed from his mighty brain the "Order of the Hat".

"THE MAYOR"

MAD MOTORISTS

The old western six gun often brought out the worst in people. So does a long game of Monopoly. Today's frantic car driving does the same. Some profoundly noxious and dandily deranged denizens have been spawned from behind steering wheels. Here are a few of the many tiresome but fireless types you'll recognise with the usual revulsion.

Here's hoping you don't find yourself amongst them.

Weaver

He careers from lane to lane, passing other cars right and left in a frantic and disdainful effort to get ahead of everybody. His grand moment is when he victoriously startles the stitches out of another driver. His lowest moment is when he tangles with another weaver who weaves him out of action.

Cutter-Inner

He likes to pass at high speed, jerk back to the left lane with only inches of clearance - and then slow down so much that the driver he has passed has to pass him. Not caring to be left behind, the cutter-inner then whizzes by again, jerks back into the left lane again - and so on and on until often somebody loses more than his temper in this highway game of lethal leapfrog.

Yakker

The driver who talks continuously to passengers. This is bad enough, but he feels that what he is saying is so important that he must constantly watch his victims to witness their reactions to his profound and witty utterances. If he and his passengers live to collect their pensions, it is only through merciful Providence.

Crawler

Here is the motorist who believes that very slow driving, even on expressways, is the only sane and safe way to conduct a car. Perhaps he would not even harm a fly or perhaps he's stubborn, but he fails to realise that his snail pace vehicle is a potential box of dynamite if some careless driver rams into it.

Tailgater

Almost as dangerous as the speeder. By following very close to the car ahead, especially at high speeds, he tries to prove that anyone ahead of him is going too slow, and should give up and get off the road. He can generally be recognised by his angrily indignant expression after he has plowed into the rear of the car ahead.

Speeder

Main maniac of the Mad Motorists, and the most dangerous, this driver feels that all other drivers are too stupid and/or too old to be driving and getting in his way. He has no regard for the safety of others. He gets his kicks out of showing off right down to the moment of fatal impact.

Road Hogger

He drives over the middle line to keep anyone from passing him from behind and to scare the scalps off drivers going in the opposite direction. He doesn't tire of his fun until he meets another of his kind on a sharp curve or on top of a hill.

What - no takers - I don't believe it!

MESSAGE FROM OFFICER IN CHARGE

Since the last newsletter in March we have had 4 accidents 1(serious injury - a dog bite to Tony Ashfold's leg, and 3 minor injuries). This is about on a par with our performance target and brings the total number of serious accidents since January 1st to 3. So if we do not sustain another serious injury accident in the coming month we will have achieved our aim for the first half year.

Man of the Month for May is MARION "SQUEAKER" DABROWA. Marion is the longest serving employee in Collie division and he has a colourful history to reveal.

Now that the wet weather is upon us, slippery, treacherous conditions will prevail in both pine and hardwood areas. Climbing over logs and rocks is a hazardous job and should be done with extreme caution.

We have included a pictorial segment on lifting and handling in this issue. Back injuries from improper lifting are very common and this segment should be read carefully by all.

Thanks to Keith Barrass and Tom Bell for contributions to this issue and to Ken MacLaren-Hall for the photo of Yabberup tower. Any more contributions will be gratefully received.

I received a very nice letter from Mrs Dot Vince saying how much she enjoyed reading the newsletter. She went on to say that she enjoys ripping up Ted's old clothes when he asks for them to be patched up. Dot reckons all the other wives should do the same.

No. 2 in the series "Know Your Trees" is Sandalwood - a goldfields tree which has an interesting history of exploitation and an interesting method of propagation.

You will all be interested to read the letter from the Conservator congratulating all personnel on achieving an all time low frequency rate of 22. Pat yourselves on the back, but keep up the good work.

A.W. WALKER.
COLLIE DIVISION.

THE FORGOTTEN CONSERVATOR

By L. Talbot

Mr C.E. Lane-Poole, who was responsible for the draughting of the Forests Act 1918, is generally considered to have been Western Australia's first Conservator of Forests. But that honour belongs to John Ednie-Brown, who joined the Western Australian Public Service as Conservator of Forests on March 16, 1895 - twenty-one years before Lane-Poole was appointed.

Ednie-Brown was one of Australia's most distinguished foresters. Before coming to Australia he had forestry experience in Scotland and Canada. According to one newspaper report he was for many years Conservator of Forests in the latter country. He was a fellow of the Linnaean Society; "a rank of considerable standing in those days."

In 1878 he became South Australia's first Conservator of Forests, a position he retained till 1890.

During those twelve years he staged Australia's first Arbor Day, wrote South Australia's first forest flora, wrote a series of excellent reports on early plantings in that State and established the first forester training scheme in Australia.

In 1890 he was induced by the Parkes Government to go to New South Wales as Director General of Forests. However, a change of Government during the depression of the 1890's was followed by severe cut-backs in the New South Wales Public Service and Ednie-Brown was among those retrenched.

In 1895 he joined the Western Australian Public Service, and when the Department of Woods and Forests was formed in 1896 he became its Conservator under the Minister for Lands.

He was a man of great energy and worked tirelessly to establish the new department. He travelled extensively throughout the timbered areas of the State inspecting and assessing the forests.

A map of his journeys shows that he criss-crossed the jarrah forest between the coast and the Great Southern Railway all the way down the forest belt. He travelled along the coast through the tuart forest and to the Quindalup and Karridale timber mills and forests. In the karri forest he travelled from Nannup to the Warren River, from Fly Brook to Dingup, from the head of the Warren to the Lower Gardiner River, from Deeside to the coast and from Broke Inlet to Lake Muir, as well as inspecting the Denmark and Nornalup forests. He travelled 1500 miles, mostly by horse, in one tour.

In the four and a half years he was Conservator, the annual value of timber exports from Western Australia leapt from £116,420 to £553,198 and Government revenue from timber increased from £2,280 in 1895 to £30,000 in 1898.

Prior to 1898 large tracts of forest - up to 250 000 acres - were leased to timber companies for an annual rental of as little as £200 to £400. Such leases gave the company sole rights to remove, sell or export timber upon them and in some cases protected the company from any Government duty on the sawn timber.

Ednie-Brown was responsible for the draughting of laws in 1898 which limited leases to 75 000 acres and set an annual rent of £20 per square mile. Also under the new laws, seedlings and saplings had to be protected and a minimum girth limit of 60" for jarrah and 90" for karri was set. Land from which the matured timber had been removed had to be surrended to the Government for conservation purposes.

He was responsible for the draughting of a Bushfires Act, A Forest Act and Regulations - included in the Lands Act of 1898 - and the establishment of a State Nursery at Hamel.

He strongly advocated the selection and dedication of State Forests and Forest Reserves:

> "So that they may be at once placed under a defined system of Conservation."

Today that would be considered just common sense, but in his time there was much opposition to anything that stood in the way of Land Settlement.

He proposed the inspection of export timber so that customers could be sure that timber products purchased from W.A. would be of the very finest quality and true to name.

He had plans for the establishment of softwood plantations, for he foresaw the probability that eventually the supplies of softwoods from overseas would become:

> "If not altogether exhausted, at least so impoverished as to become practically unable to supply our wants."

He considered that the humid districts of the south-west would be well suited for growing Pinus insignis. Of Pinus pinaster he wrote:

> "Delights in sandy soils and therefore a tree of considerable value for planting our coastal sand hills and sandy plains"

Some other quotes from his 1898 report underline his concern for the necessity to dedicate large areas of State Forest.

> "We want portions, at least, of some of the State Forest to have soil of the very best description, so that we may experiment with and probably successfully grow the softwoods of commerce."

> "The thirst for the opening up of the land, to the detriment of the forests, is not always productive of the natural good; and ought not therefore, to be always listened to. To my certain knowledge, it has been the ruination of some magnificent natural forest country in some of the other colonies."

> "There is plenty of land in the country, outside of the best forest areas, for settlement of all kinds, and to prostitute the former, with its exuberance of timber, to the varying and unstable requirements of ordinary settlement would be an unsound policy, to say the least."

> "I do not think there is any chance of a greater area being reserved than is necessary. The requirements of the country in this line are just as much as the country can afford to give."

> "- much of the forest land in this colony is unfit for cultivation. For ploughing and ordinary agriculture a large percentage is absolutely worthless; and although no doubt, this might be improved by ringbarking for pastoral purposes - the gain derived therefrom being the growing of a few more blades of grass - the loss to the State in the absolute destruction of the forest is

> a matter of grave responsibility to those who carry it out, or even countenance it in any way."
>
> "I claim therefore that the forest reserve question should not always be determined by that of the popular cry 'The settlement of the land'."

Perhaps had he lived longer he would have been listened to eventually, and then the story of forestry and land settlement in this State may have been very different. But unfortunately he died suddenly of a heart attack in November 1899 aged 49 years. Then W.A. was without a trained forester until the appointment of Lane-Poole in 1916.

The names of all other Western Australian Conservators of Forests have been bestowed upon various forest features but so far as I am aware the name of John Ednie-Brown has not been commemorated in this way; and in the Department's publication "50 Years of Forestry," although reference is made to the appointment of a Conservator in 1896, he is not mentioned by name. It would seem fair comment then, to say that he is the forgotten Conservator.

TREE SPECIES PERFORMANCE STUDY

A study has been made of the performance of a number of tree species with respect to their value in reforesting sites affected by jarrah dieback.

The tables that follow have been prepared to summarize the results to date in two respects.

The first set give detailed actual performance in plots examined in the four northern divisions of Mundaring, Kelmscott, Dwellingup and Harvey.

The expanded table embraces a wider range of species in relation to position in the dieback landscape and suitability for a number of specific applications such as commercial timber production, aesthetic effect, tolerance to salt etc.

The final diagram represents one way to apply the results of the investigations.

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SILVICULTURIST.

CODE

Site Suitability

1 - Ridge and Shallow Soil
2 - Ridge and Floaters = u/s
3 - Gravel Slopes M + L/S
4 - Flats and Valleys
5 - Sandy Soils
6 - Gravel Pits

Commercial Use

F = Firewood
Pl = Poles
Ps = Posts
R = Rails
Pe = Pergolas
L = Logs
S = Strainers
Th = Tool Handles
Tb = Tan Bark
C = Chips
Cw = Chipwood
Cb = Chipboard
Fr = Fence rails
Sc = Scantlings
Pw = Pulpwood

Aesthetic = Aes.

Recreation = Rec^{n}.

Fire Resistance =
L = Low
M = Moderate
H = High

Salt Tolerance =
L = Low
M = Medium
H = High

Flowering Periods

J = January
F = February
M = March
A = April
Ma = May
J = June
Ju = July
Au = August
S = September
O = October
N = November
D = December

Provenance Hybrids = put in full

Coppice Ability = Wk = Weak
F = Fair
M = Moderate
U = Unknown

Form - Good
Variable
Conical
Bushy

Comments - put in full

(H) Eucalyptus occidentalis not included above

* Good honey potential

SPECIES SUITABLE FOR DIEBACK REHABILITATION PLANTING

SPECIES & COMMON NAME	SITE SUITABILITY	COMMERCIAL USE	AESTHETIC RECREATION	FIRE RESISTANCE	SALT TOLERANCE	FLOWERING PERIODS	PROVENANCES HYBRIDS ETC	COPPICE ABILITY	FORM	COMMENTS
Acacia elata Cedar Leaf Wattle	2,3,5	F	✓	✓	-	D-J	-	Wk	Good	
Acacia decurrens Black Wattle	2,3,5	F	✓	-	-	S-O	-	F	Good	
Acacia pycnantha Golden Wattle	2,3,5	-	✓	-	-	S-N	-	M	Variable	
Angophora lanceolata Smooth barked Apple	2,3,5	F	✓	-	-	Ma-J	-	U	Good	Honey (?)
Agonis flexuosa W.A. Peppermint	3,4,5	-	✓	M	L	N-D,J	Dwarf variety occurs on coast	F	Variable	Strong flavoured honey
Cupressus arizonica Arizona Cypress	3,5	-	✓	-	-	J-M	-	-	Good	
Eucalyptus accedens * Powder Bark Wandoo	1,2,3,6	F	Aes. Recn.	-	-	D-A (P)	-	✓	Variable	Honey flow limited
Euc. botyroides * False Mahogany	1,2,3,4,5	F	Recn.	✓	✓	F-M	Var. lyneii more suited forest tree			To be confirmed or Willow Springs Arboretum
Euc. calophylla * Marri or Red Gum	2,3,4,5	Pl,Ps,R, Pe,L(?)	Recn.	✓	-	F-M (H) (P)	-	✓	Good	May be odd crossed with Mtn. Gum on Scarp (honey)
Euc. calophylla var. rosea. Pink Flowered Marri	2,3,4,5	R,Ps,Pc	Aes.	✓	-	F-M (H) (P)	-	✓	Good	Honey

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SPECIES & COMMON NAME	SITE SUITABILITY	COMMERCIAL USE	AESTHETIC RECREATION	FIRE RESISTANCE	SALT TOLERANCE	FLOWERING PERIODS	PROVENANCES HYBRIDS ETC	COPPICE ABILITY	FORM	COMMENTS
Eucalyptus citriodora Lemon Scented Gum	3,5	R,Ps,F	Aes.	-	-	J-Ju (H) (P)	Crosses with Euc. maculata readily	✓	Good	Not frost tolerant in U.S.A. (Texas).
Euc. camaldulensis* River Gum	3,4,5	Ps,R,F.	Aes. Rec^{n}.	L	H	S-J (H) (P)	Wide range of Provenance	✓	Variable	Arboretum provenances in Sthn.Cross. Not frost tolerant trees.
Euc. cladocalyx * Sugar Gum	1,2,3,6	Pl,R,Pe, F,L.	Rec^{n}.	-	-	J-F (H)	Port Lincoln			SEE ATTACHED (Honey)
Euc. diversicolor* Karri	2,3,4,5	Pl,R,F,S, Th.	✓	L-M	L	D-A (H) (P)	-	✓	Good	Honey
Euc. falcata White Mallet	1,2,3,5	R,Ps,Tb, Th.	Aes.	-	-	N-D (H)	-	✓	Conical	Honey
Euc. globulus Tasmanian Blue Gum	2,3,4,5	Pl,R,S, L,C	Aes. Rec^{n}.	-	-	S-N	-			Prolonged flowering at low intensity
Euc. gardneri Blue Mallet	1,2,3,5,6	Tb,F, Th.	Aes.	-	-	Mc-J (H)	-	✓	Conical	White honey flow
Euc. kruseana Kruse's Mallee	2,3,5	-	Aes.	-	-	A-J	-	✓	Conical	
Euc. laeliae Darling Range Ghost Gum	1,2,3,4	Th,F,Ps, R.	Aes. Rec^{n}.	L-M	L	D-A	-	U	Good	
Euc. maculata Spotted Gum	2,3,4,5, 6	Th,R,Pl, Cw,L,F,Pe	Aes. Rec^{n}.	L	-	Ju-S-O		SEE ATTACHED		Honey Flow. S. Africa

SPECIES SUITABLE FOR DIEBACK REHABILITATION PLANTING

SPECIES & COMMON NAME	SITE SUITABILITY	COMMERCIAL USE	AESTHETIC RECREATION	FIRE RESISTANCE	SALT TOLERANCE	FLOWERING PERIODS	PROVENANCES HYBRIDS ETC	COPPICE ABILITY	FORM	COMMENTS
Eucalyptus melliodora * Yellow Box	2,3,5	F,Ps,R,S.	√	√	-	N-F (H) (P)	-	√	Variable	Good Honey Flow
Euc. microcorys Tallow Wood	3,4,5	L,Pl,R, Ps,F,Th.	Rec$^{n.}$	√	-	Ju-N				
Euc. patens * W.A. Blackbutt	3,4,5,6	L,R,Pl,Ps, F,Th.	Rec$^{n.}$	√	√	N-F (P)	-	√	Good	Possibly same H.
Euc. platypus * Round Leafed Moort	1,2,3,4,5	-	Aes.	-	L-M	J-O (H) (P)	Red flowered varieties available	Wk	Variable	Var. heterophylla worked by as flowered in Jan. 76.
Euc. resinifera * Red Mahogany	1,2,3,4,5	F,R, Pl, Pc	Rec$^{n.}$	√	-	N-J	-			
Euc. robusta Swamp Mahogany	1,2,3,4,5	F,Cw	Rec$^{n.}$	√	H	N-M	-	√	Variable	
Euc. wandoo * Coastal Wandoo	2,3,4,6	F,L,R,Ps, S,Pl.	Rec$^{n.}$	L	L	M-J D-Ma (H)	-	√	Variable	Honey flows S.Afr.
Euc. saligna Sydney Blue Gum	3,4,5	L,Pl,R, F,Cw	Aes. Rec$^{n.}$	L	-	J-M				Honey flows S.Afr.
Euc. spathulata Swamp Mallet	3,4,5	F	Rec$^{n.}$	-	M-H	Ju (H)	-	√ Wk	Conical	Possibly similar to Euc. annulata

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SPECIES & COMMON NAME	SITE SUITABILITY	COMMERCIAL USE	AESTHETIC RECREATION	FIRE RESISTANCE	SALT TOLERANCE	FLOWERING PERIODS	PROVENANCES HYBRIDS ETC	COPPICE ABILITY	FORM	COMMENTS
Eucalyptus sideroxylon var. rosea Mugga Ironbark	2,3,5	F,Sc,R, Ps.	Aes. Recn.	√	-	Ma-J	-	U	Good	
Pinus pinaster Maritime Pine	1,2,3,4,5	Pw,Cb,Ps, Fr.	Recn.	L	-	J-F	Variety of provenances	√	Good	See clone orchards and seed orchards
Pinus elliottii Slash Pine	2,3,4,5	Pw,Cb,L, Ps,Fr.	Recn.	L	-	" M	" "	U	Good	See Arboretums
Pinus taeda Loblolly Pine	2,3,4,5	Pw,Cb,L, Ps.Fr.	Recn.	L	-	" "	" "	U	Good	See Arboretums