

# RESEARCH NEWS

The newsletter of the Research Division of the Department of Conservation and Land Management

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## EDITORIAL - Post Easter Edition

*Hi to everyone in the Research Division from your new Editor of Research News, Christine Farrell.*

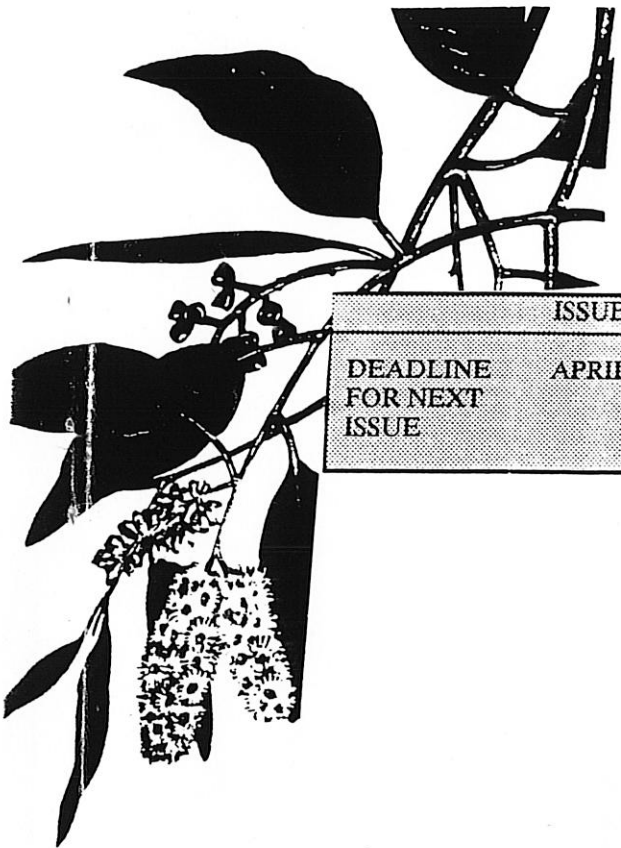
*Thankyou Jeanette from everyone in the Research Division for your professionalism as Editor of the Research News. We wish you every success in your new role at Crawley.*

*Life is one big experience and being Editor is a new experience for me and a new experience for you.*

*My first edition of Research News was to be an Easter Edition but panic started to set in fairly quickly when I realised what little material I had for this edition - hence a post Easter edition.*

*Being the great bunch that you are and begging calls from me, I was overwhelmed by your generosity. Thankyou everyone.*

Christine.



	ISSUE	DEADLINE	DISTRIBUTION
DEADLINE FOR NEXT ISSUE	APRIL '90	EARLY MAY	MID MAY

## Information from the Research Division Policy Group Meeting

The last meeting of the RDPG was held on the 22 March 1990 at the Manjimup Research Centre. The following is a summary of discussions from this meeting.

### Budget

With 69% of the financial year gone the Division is 62% spent.

### Technical Officer Overtime

Tony Start advised the RDPG that the draft minutes of the meeting with Technical Officers have now been circulated and reflect what was said. It will now be necessary for a new Commuted Overtime Agreement to be prepared. It was suggested by RDPG that a sub-committee be set up with at least one representative from each Research Centre.

### Research Computing Program Review

The Research Computing Program Review will be held on the 5 and 6 June 1990

### Country Seminars

Andrew Burbidge suggested holding seminars in the country following the RDPG meetings.

The first seminar on deserts will be given by Andrew at the Manjimup Research Centre following the RDPG meeting in September.

### Next Meeting

The next meeting of the RDPG will be held on the 30 May 1990 at the Como Research Centre.

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## RESEARCH METHODS NOTE 6:

By Matthew Williams

### Comparison of Treatment Means After an Analysis of Variance

Articles on this subject have appeared regularly over the last few years. All agree that there has been widespread misuse of mean comparison procedures (MCP's), following ANOVA in the biological literature. That these articles continue to be published suggests that the misuse of these techniques is still common.

A recent monograph by Day and Quinn (1989) should serve as a reference work for those who employ MCP's in their data analysis. Their conclusions (and of others, e.g. Mize and Schultz, 1985; Swallow, 1984) are worth repeating:

1. All MCP's were developed with a particular purpose in mind, i.e. for planned or unplanned pairwise comparisons, contrasts (comparisons of groups of one or more means), etc. Very few tests have general application, so care must be taken in selecting an MCP. (Those tests that do have general application (e.g. Scheffe's) are usually very conservative, so routine use of one of these would result in a high TYPE II error rate).

2. Pre-planned comparisons and contrasts have numerous advantages over unplanned comparisons.

3. When using an MCP, the most important consideration in testing whether a particular comparison is statistically significant, is the overall experimental (TYPE I) error rate (EER), not the per-comparison (TYPE I) error rate (CER). If you choose an EER of .05 or 5%, then the CER must be varied below .05 to achieve this EER. An example is set out below:

. EER = .05	; fixed by experimenter
. number of comparisons = 10;	fixed by experimenter- e.g. all pairwise comparisons in a 5 treatment one-way ANOVA, or comparison of ten treatments with a control.
. number of significant: provisional CER of 5% = 4	determined from the comparisons with experimental data

. EER =  $1 - (1 - CER)^n$ , where  
n = number of significant comparisons.

. Hence in this example, the CER should be set to approximately .01

4. As a consequence of point 3, those MCP's in which the EER is indeterminate (e.g. Duncan's multiple range test, Student-Newman-Keuls (SNK), Waller-Duncan k-ratio test) should in general be avoided.

In conclusion, planned comparisons or contrasts (preferably orthogonal, preferably single df) using an appropriate MCP should be considered during the planning stage of an ANOVA-type experiment.

### References

- Day, R.W. & Quinn, G.P. (1989). Comparison of treatments after an analysis of variance in ecology. *Ecol. Monog.* 59(4), 433-63.
- Mize, C.W. & Schultz, R.C. (1985). Comparing treatment means correctly and appropriately. *Can. J. For. Res.* 15, 1142-8.
- Swallow, W.H. (1984). Those overworked and oft-misused mean separation procedures- Duncan's, LSD, etc. *Plant Disease* 68(10), 919-21.

## AGROFORESTRY PART OF "HIGH-WATER USE FARMING SYSTEMS"

Findings from CALM's agroforestry research are to be incorporated into a new National Soil Conservation Program (NSCP) project. The NSCP project, entitled "High-water Use Farming Systems", aims to demonstrate how farming land can be managed to control salinity. Phil Scott, Research Officer with the Department of Agriculture, is project leader. The emphasis of the project is on integrating knowledge from several disciplines - forestry, agriculture and hydrology.

The appointment of a project officer for the 3 year project is imminent. Work has commenced to select 6 sub-catchments [10 to 50 ha. in size] on farms in the 500 to 700mm rainfall zone of the South-West. A best-bet treatment for each sub-catchment will be developed. The treatment will be a mixture of a number of strategies, including agroforestry, drainage, perennial pastures, fodder trees and woodlots, depending on such factors as rainfall, soils and farmer preferences. Piezometers will be installed in treated and untreated sub-catchments to monitor the effect on salinity.

**Richard Moore**

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## Thinking of cataloguing your reprints?

Did you know that CALM's "Admin" system includes a Library program which can be used to catalogue reprints and books? The "Admin" system was developed by Peter Walsh and Yvonne Woods for use at Manjimup for general records management and the library sub-system has recently been added by Bill Advic. It has been installed in at least 10 district offices.

The Library sub-system catalogues items by topic and also by author, title and publication date together with location. The location could be a person's name (for a research station) or section within an office. Each catalogued item is given a unique number which aids retrieval, and the library sub-system can be searched in the normal way.

The "Admin" system runs on any IBM compatible PC. It is available, free of charge, from Bill Advic (367 0264) or Hugh Clift (405 5132). The system is suitable for beginners and the user guide is in the disc. Could it help you?

**Elaine Davison**  
Senior Research Scientist

## Research Project Plans

The following have recently been approved.

- |                    |   |
|--------------------|---|
| No:                | 5/90  |
| Title:             | Impact of recent logging of Jarrah forest on the population density of jarrah Leafminer                     |
| Officer-in-Charge: | I Abbott  |
| No:                | 7/90  |
| Title:             | Assessment of Biological data of A Class Conservation Reserves considered for opening the Bailey procedures |
| Officer-in-Charge: | Neil Gibson   |
| No:                | 9/90  |
| Title:             | Investigation of the community of Kwongan vegetation  |
| Officer-in-Charge: | Neil Gibson   |
| No:                | 10/90   |
| Title:             | Development of a catalogue of the National Parks and Nature Reserves of Western Australia                   |
| Officer-in-Charge: | Neil Gibson   |
| No:                | 14/90   |
| Title:             | The costs and benefits of effective windbreaks  |
| Officer-in-charge: | R Moore   |
| No:                | 15/90   |
| Title:             | Field Testing of an Ultrasonic Moisture Meter   |
| Officer-in-Charge: | Brett Glossop   |
| No:                | 16/90   |
| Title:             | Treating <i>Eucalyptus globulus</i> (Tasmanian Blue Gum) fence posts using four timber preservatives        |
| Officer-in-Charge: | Gary Brennan  |



## Scientific and Technical Publications

The following have recently been approved for submission for publication.

- Author(s): I Abbott and M Williams  
 Title: What is the best measure of average damage caused by insects and fungi to leaves.  
 For submission to: Australian Journal of Ecology
- Author(s): G J Keighery  
 Title: A new species of *Platyscace* (Apiaceae) from north Australia  
 For submission to: Nuytsia
- Author(s): A R Chapman and B A Maslin  
 Title: A review of the *Acacia bivenosa* group  
 For submission to: Nuytsia
- Author(s): B A Maslin  
 Title: *Acacia* Miscellany - 6. Review of *Acacia victoriae* and related species  
 For submission to: Nuytsia
- Author(s): P Wilson  
 Title: *Philotheca citrina* (Rutaceae), a new species from Western Australia  
 For submission to: Nuytsia
- Author(s): A H Burbidge and J Woinarski  
 Title: Biogeographic patterns in rainforest birds of northern Australia  
 For submission to: International Ornithological Congress, New Zealand, December 1990.

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## Philosophy Corner

*Scientists are no more objective than other people; it is the use of scientific method that makes for objectivity.*

*A E Harper, distinguished biochemist*

*To maintain a belief while refusing to give due weight to reasonable and relevant objections is to show that you are more concerned to maintain that belief than really to know whether it or some other is, after all, true.*

*A Flew, U.K. philosopher*

*Absolute proof is difficult to obtain in any branch of science. As evidence accumulates, however, it often reaches the point of proof in an operational sense, even though proof in an absolute sense may be lacking. In law, proof beyond a reasonable doubt is generally accepted as a standard for making decisions and taking action.*

*US National Academy of Sciences Report*

*The standing of scientists now is not high with the public. The idea that there are two sides to every question and that each should be given equal weight has been accepted to the point where, in reports to the public on scientific issues by the media, no distinction is made between assertions based on untested or inadequately tested assumptions on the one hand and analyses based on critical evaluation of the evidence on the other.*

*A E Harper*

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## Let's Keep it Simple

Whilst having no wish to be a guru of English style, I am fed up with wasting time trying to decipher documents which appear to come from the pen of Sir Humphrey Appleby. For example, in Policy Statement No: 34 we are told:

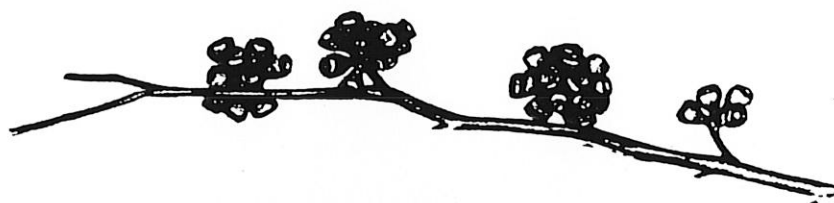
"Landscape management, or Visual Resource Management (VRM) as it is frequently termed, is the scientific discipline concerned with the management of land, vegetation and water resources so as to maintain or improve their visual quality.

The prime goal of visual resource management is to ensure that all uses and activities are planned and implemented so as to complement rather than detract from the inherent visual qualities of the environments in which they occur. Visual Resource Management is a positive and integral component in land use planning and management processes. It should not be regarded as a cosmetic exercise in which the results of careless planning and development are hidden from view, or superficially treated to make them more palatable to the viewing public." (123 words)

I think this means:

"Land management plans should include landscape design which strives to maintain or improve scenic beauty, or at least to avoid ugliness." (21 words)

**David Ward**



## SEMINAR

# MAMMAL RE-INTRODUCTION: A WESTERN AUSTRALIAN PERSPECTIVE

Presented by Dr Tony Friend

CALM estate comprises 7% of Western Australia and includes a good representation of the major natural systems of the state. However, the history of massive declines and extinctions of native mammals in many parts of W.A. has resulted in greatly depleted mammal faunas across this reserve system.

Ten species of native mammal recorded in post-european times in Western Australia are now extinct. At least 24 others have undergone serious decline, but populations still survive. Clearly, one of the options for improving the conservation status of the latter group of species is their re-establishment in parts of their former range now secured for conservation purposes.

Recent work on the effect of fox predation on populations of several native mammals in the south-west implicates foxes in some observed declines of mammals in Western Australia. The successful re-introduction of numbats to Boyagin Nature Reserve under a regime of fox exclusion offers hope for other re-introduction projects.

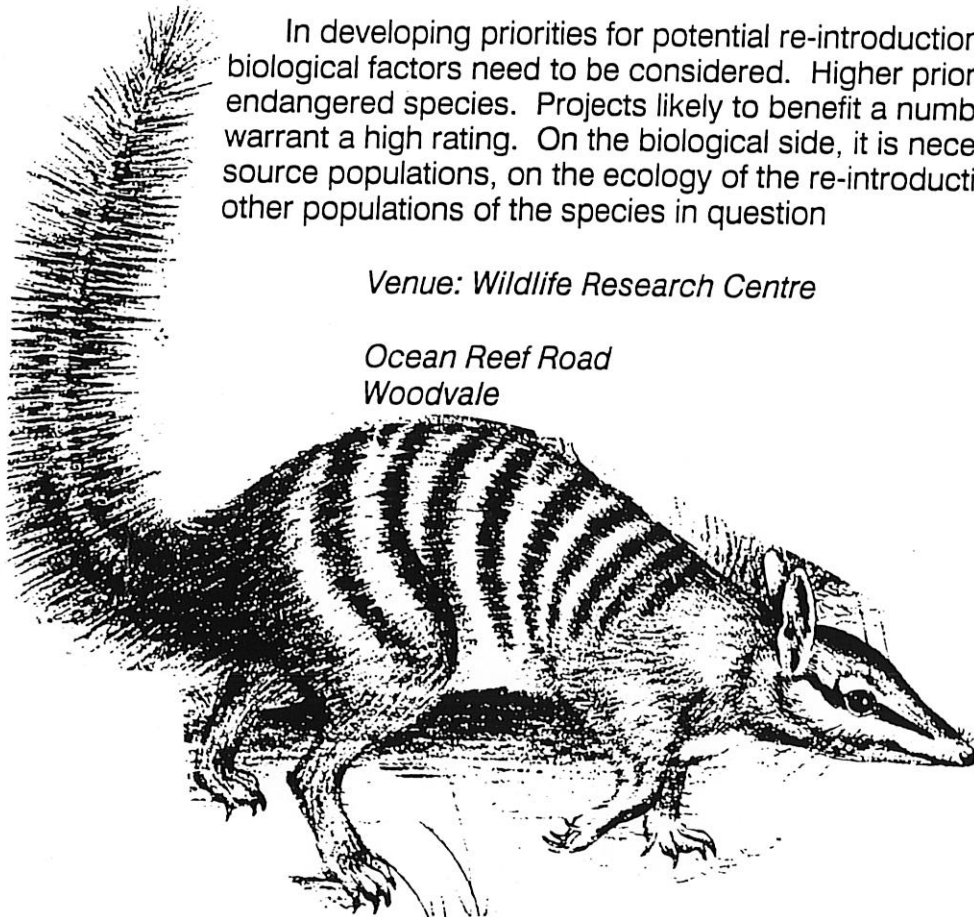
In developing priorities for potential re-introductions, both cost-benefit factors and biological factors need to be considered. Higher priority should be given to highly endangered species. Projects likely to benefit a number of endangered species also warrant a high rating. On the biological side, it is necessary to assess the likely effects on source populations, on the ecology of the re-introduction area, and possible effects on other populations of the species in question

*Venue: Wildlife Research Centre*

*Time 3.00pm*

*Ocean Reef Road  
Woodvale*

DATE ?





## SEMINAR

Thursday 17 May 1990

# IS FIRE NECESSARY FOR DESERT LIZARD ASSEMBLAGES?

Presented by David Pearson

The patch of mosaic-burning of spinifex grasslands has been widely touted as a desirable approach to the management of these areas for nature conservation. There is evidence that some "critical weight range" mammals may require the variety of seral plant communities that mosaic-burning promotes. However, for most of the spinifex biota, the benefits or otherwise of mosaic-burning are unknown.

In the nature reserves of the Great Victoria Desert there are few, if any, critical-weight mammals remaining. The management of these areas by mosaic-burning needs to be carefully evaluated to determine whether intervention in the current fire regime is beneficial for the existing biota.

The diversity of lizards in Australian deserts is exceptional, with up to 40 species co-existing in spinifex grassland. They are an important and conspicuous part of the desert biota and their relatively high abundance makes them an ideal group to study the impact of fire. This seminar reports on three years of research in Queen Victoria Spring Nature Reserve. Areas of spinifex grassland were subjected "mild" September and hot January fires. The response of lizards was monitored by mark-recapture trapping.

Mortality of some species was high during the fires and probably immediately afterwards. A pronounced species succession occurs post-fire and there is some evidence of niche switching amongst generalist species. In the absence of fire some lizard species are only present at very low densities.

*Venue: Training Centre  
CALM  
SOHQ  
50 Hayman Road Como*

*Time 3.00pm*





## RESEARCH DIVISION SEMINAR SERIES

JULY- DECEMBER 1990

The July to December timetable for CALM's Research Division Seminar Series has been formulated and appears below.

The seminars provide a forum at which scientists and interested persons both within and outside CALM can meet informally to discuss research within CALM.

Please note that seminars start at 3.00pm

Venues are the Training Centre, CALM State Operations Headquarters, 50 Hayman Road Como for Thursday seminars; and

Wildlife Research Centre, Ocean Reef Road, Woodvale for Friday seminars.

Date	Speaker	Venue	Title
6 July	Angas Hopkins	Woodvale	Regeneration strategies of vascular plants after disturbance
19 July	Patrick Pigott	Como	Degradation and remnant bushland on wheatbelt farms
3 August	Jim Lane	Woodvale	Management of duck hunting in Western Australia
16 August	Bruce Maslin	Como	<i>Acacia</i> : How many genera?
7 September	David Coates	Woodvale	Genetic diversity, population size and extinction
20 September	Penni Hewett	Como	Thinning regrowth karri - preliminary results
5 October	Sue Patrick	Woodvale	The role of CALM's Flora Information Program
18 October	Gary Brennan	Como	Utilisation of regrowth hardwoods
2 November	Per Christensen	Woodvale	Gibson Desert mammals and fire
15 November	Richard Mazanec	Como	Genetic parameters and potential gain from selection in Karri
7 December	David Algar	Woodvale	Fox control: an overview
13 December	Gillian Perry	Como	Nomenclatural stability and the Botanical Code

Note: Please check the abstracts that are circulated prior to the seminars for any variation to this program.

Any queries should be directed to Christine Farrell on (09) 4055105

## CHAOS, KING GEORGE AND THE THREE WISE MONKEYS

by David Ward

*"I hate all Boets and Bainters..." King George I (1660-1727)*

With a life spanning the seventeenth and eighteenth centuries, when people such as Rene Descartes and Isaac Newton gave promise of complete human understanding of a clockwork universe, it might have surprised King George to know that in the late twentieth century some scientists would begin to regard the universe as an intimate mixture of predictable order and unpredictable chaos, both being essential components.

King George possibly knew that the original three wise monkeys were Japanese macaques, but he could not have known that observations upon macaque society would show that while older, conservative males maintain order and have the highest status, new ideas and change probably come from the more radical females and young. An example is the discovery by a female called Imo that wheat mixed with sand can be separated by throwing it into water, when the sand sinks, leaving the wheat floating. This radical but useful behaviour has now been adopted by all the young, and most of the older monkeys - a good example of the transfer of research results to management.

In human society order and discipline are imposed by such august people as ministers, senior bureaucrats, heads of corporations, generals and police commissioners, and we tend to regard such people as "leaders", the equivalent of the older macaques, yet the adaptability and hence survival of humans may depend more upon the unsung imagination and mental creativity of the lower status members. In reality creativity is a cryptic form of leadership which is often overlooked because it does not usually involve overt power over others. However, neither Xerxes nor Napoleon Bonaparte have had as much influence on human history as the unknown inventor of the wheel.

In human organisations, from the nation down to the family, there is a need for an orderly framework, but within that framework a need for the disorderly type of thinking and behaviour which can lead to new ideas. We need both order and chaos, and by trying to be entirely mature and logical we endanger our own survival. Wherever scientists wander, they will find that a poet has been there before, and scientists of a hierarchical bent, who fret about pecking order and publication counts are showing signs of the elderly macaque syndrome. Despite the Hanoverian disdain for "boets and bainters", we may conclude that artists, poets, philosophers, cranks and even no-good-boycos do matter - in fact any one of them may contribute at least as much to human progress as did His Majesty King George I, or any three wise and elderly monkeys.

## Have You Heard!

- Gillian Perry from the Herbarium is proposing a study tour to the Field Museum of Natural History, Chicago and the University of Notre Dame USA 19-25 April 1990 to further her studies on the taxonomy of *Xanthium* in Australia. Gillian is working with Dr P W Michael, University of Sydney on the identification and nomenclature of *Xanthium*. We wish Gillian all the best for her study tour.

### CONGRATULATIONS TO:

- Paul Gioia and his wife on the arrival of their baby boy.
- Neil Thomas on his promotion to Level 3.
- Michael Choo on his promotion to Level 6.

### DID YOU KNOW THAT:

- Fax paper deteriorates over a period of time, so for record purposes file photocopies.

For out of olde felds, as men  
seyth,  
Cometh al this newe corn from  
yer to yere,  
And out of olde bokes, in good  
feyth,  
Cometh al this newe science that  
men lere...  
Geoffrey Chaucer  
The Parliament of Fowls

