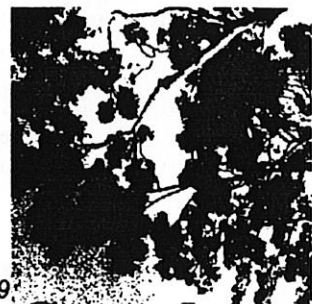


RESEARCH NEWS

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

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No. 5/89

May 1989

SEMINAR

Thursday 15 June 1989

The impact of Phytophthora cinnamomi in the Stirling Range National Park

Presented by Ray Wills



Field work to assess the effects of dieback on the plant communities of the Stirling Range were carried out between December 1988 and April 1989. During this time, 520 plant species were collected. The Myrtaceae and the Proteaceae were the two largest families in the study region. Of the 281 species examined for susceptibility to dieback, one third were recorded as being affected by the disease, with 30% of these highly sensitive to the pathogen. Species susceptibility paralleled species phylogeny with the result that some families had large numbers of susceptible species while others were apparently unaffected by the pathogen. Notably, 80% of proteaceous species assessed for susceptibility to dieback were at least partially affected by the disease. Proteaceous elements contributed substantially to projective foliage cover in healthy plant communities, but were less important at sites which had been invaded by dieback. In contrast, species which showed low levels of susceptibility to dieback, such as some monocotyledonous species, were found to have a greater relative abundance at diseased sites. Changes in the floristic structure of plant communities may influence the composition of associated animal communities.

While some areas of healthy vegetation still remain within the park, no one section of the Stirling Range is free from dieback. Despite having had knowledge of how the disease is dispersed for almost two decades, man is still the major vector of dieback. Education of land managers and researchers from all fields as well as the public is urgently required to prevent the further spread of the disease. Any under-estimate of the importance of this problem will ensure the loss of significant components of the flora and associated fauna of the south west of Western Australia.

Venue: Training Centre
CALM SOHQ
50 Hayman Road
Como

Time 3.00pm

Information from the Research Division Policy Group Meeting

The 22nd meeting of the RDPG was held at the Wildlife Research Centre, Woodvale on 25 May 1989. The following is a brief summary of the meeting.

Five Year Research Plan - 3rd edition

Program Leaders are currently updating their sections of the Five Year Plan. SPRSs and PRSs have been asked to review goals of their positions in line with new RDPG structure.

Overseas Travel

In most cases overseas travel applications will be vetted by the Divisional Manager only prior to being forwarded to the General Manager and Executive Director for approval. Costs in the main will be met from the Program with some money being contributed from the contingency fund.

Synthesis of research into conservation and land management in Western Australia

Ian Abbott presented to the meeting some initial ideas for the development of a book, directed at the lay person on nature conservation. It was thought the target audience should be upper high school/first year university. The concept needed more development before any decision would be made as to whether to pursue the idea.

Budget

Tony Start presented latest expenditure figures. With 88% of the year gone (ie to 16 May) the Division was 83.4% spent. Most Programs had their remaining funds committed and it was expected that the Division would spend 98 to 99% of total budget.

Tony Start was thanked for his close supervision of the budget.

Performance Appraisals

It was felt that not enough use of comments made in these was being utilized by management. Appraisals from the last twelve months will be evaluated to see if any common themes are present.

Research Grant Applications

All Research Grant Applications should be channelled through the relevant SPRS for the Research Scientists program.

The next meeting of the RDPG will be held at the Herbarium on 29 June 1989. This will be followed by a meeting with Program Leaders.

Publication of scientific and technical papers in external journals and books

Ian Abbott

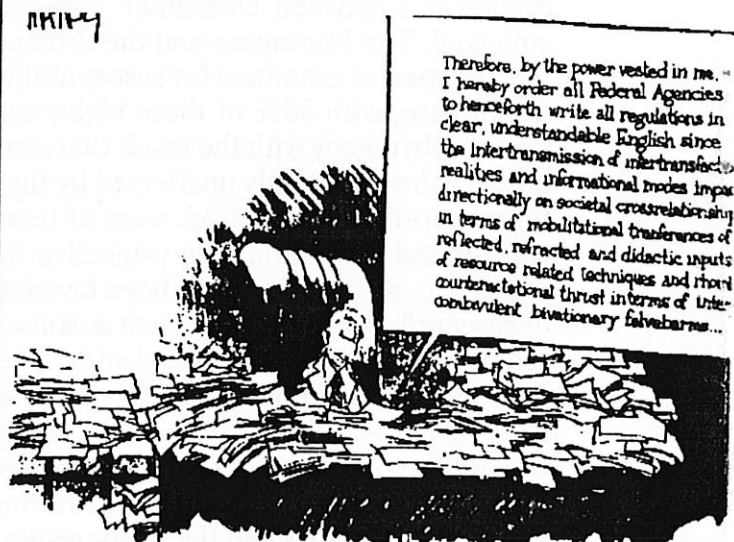
Chairman, SPEC

A recent request by the Executive Director for a list of titles of all scientific and technical publications by CALM staff over the past 18 months proved difficult to respond to because many authors have not ordered nor provided 150 extra reprints to the Scientific Editor. The latter was a standard requirement stipulated on the Research Division Publication Form.

At its March meeting, SPEC discussed this problem and resolved to tackle it in a new way. In future, no extra reprints will be paid for by Research Division from the Scientific and Technical Publications Account. Authors may order extra reprints but must pay for them from their own research account.

To ensure that all interested CALM staff are aware of publication of papers in external journals and books, authors must provide the Library with three reprints and the Scientific Editor and Divisional Administrative Assistant with one reprint each as soon as they become available. SPEC will ensure that all titles and a plain English synopsis of each paper are submitted to CALM News for publication. Authors will be requested to provide such a synopsis to the Scientific Editor along with reprints of each article published.

New publication proformas detailing the new system have been sent to each Research Centre. Please discard any old forms and use the new one from now on.



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from "How to Write and Publish a Scientific Paper"

by Robert A. Day

PLEA

WESTERN AUSTRALIAN PLANTS - AT HOME OVERSEAS

Landscape is planning a feature article on the above topic, highlighting the good (and bad) gifts that Western Australian plants have given the world.

We have a considerable range of subjects and written material but few photographs of the plants *in situ*. Since many CALM staff retain their job interests when on holidays, do any of you have photographs of the following topics?

- 1) Trees being used as plantations for timber, pulp or firewood.
- 2) Native plants being used for reclamation (stop soil erosion or desert encroachment), fodder (*Acacia* species) or other agricultural uses.
- 3) Horticultural uses - e.g. *Eucalyptus ficifolia* (Red flowering gums being used as street trees); *Banksia* plantations, Geraldton Wax in Israel, Freeway plantings in USA, Brown Boronia (in Victoria; well almost overseas) etc.
- 4) Weeds - e.g. Florida : *Acacias* and Paperbarks, South Africa - *Acacia saligna*.
- 5) Private garden flowers - both historical and current (i.e. seed collections sent).

Any material, ranging from photos, official trip notes (no excuses for not sending these) to anecdotes gratefully received, copied and returned. Anything used will be fully acknowledged.

Please deluge me at the address below:

GREG KEIGHERY
Wildlife Research Centre
PO Box 51
WANNEROO WA 6065

Radio Callsigns

Rarely have I come across an issue more likely to cause research staff to leap to writing memos and making phone calls. How I wish a few more important issues generated as much interest!

After much discussion and dissent it has been decided that Research Division staff will use one unified simple system. No longer will we have Manjimup Research 6 and Wildlife Research 19 both calling Kalgoorlie base from the same camp.

In order to keep some local identity I have developed a new system where each Research Centre is allocated a block of numbers, eg Dwellingup staff will have numbers between 50 and 79 and Woodvale will have numbers between 150 and 199. Short-term contract and temporary staff will be added onto the end with numbers from 200 onwards.

There are sufficient unallocated numbers to add new people and prevent everyone having their callsigns changed too frequently.

Callsign numbers will be preceded with only one word, ie "Research".

A circular is being prepared so everyone knows what is going on. No further debate will be entertained.

ANDREW BURBIDGE.



Report on Agroforestry Conference

In Victoria, many farmers are forming "Farm Tree Groups". Their primary concern is land degradation and they see trees integrated with farming as an essential part of land care. In some areas these groups have gained such strong support from their local farming community that they are able to tackle land degradation on a catchment basis. For example, near Coleraine, in western Victoria, farmers are co-operating to establish corridors of native vegetation which criss-cross farms from one side of a catchment to the other. These blocks and strips of bush are seen as protecting soil from erosion, improving water quality and providing wildlife habitat.

The "Third Agroforestry Conference", held recently in Morwell, Victoria, provided a useful focus for those interested in these developments. It was noteworthy that more than 80 percent of the 275 delegates at the conference were farmers. The practical experience of several leading tree farmers was complemented by talks from agroforestry scientists. As Western Australia's agroforestry research program is generally regarded as the most advanced in Australia, Geoff Anderson (CSIRO) and Richard Moore (CALM) were invited to outline the latest findings on productivity and economics of farming systems with trees.

In summary, the conference was an enthusiastic exchange of ideas and information and provided a strong stimulus to agroforestry research and development. A copy of the Conference Proceedings is held in CALM's library at Woodvale.

RICHARD MOORE

SEMINAR

Friday 7 July 1989

Habitat preferences of Ground Parrots : implications for conservation

Presented by Allan Burbidge

The Ground Parrot has undergone a drastic decline in numbers and range in Western Australia but until recently, there have been few data available concerning the basic biology and habitat requirements of the species in this State. Recent work has shown that Western Australian Ground Parrots

- 1) are at much lower densities than in eastern Australia,
- 2) occur in species rich low heaths,
- 3) prefer long unburnt heaths; and
- 4) breed much earlier than was previously thought.

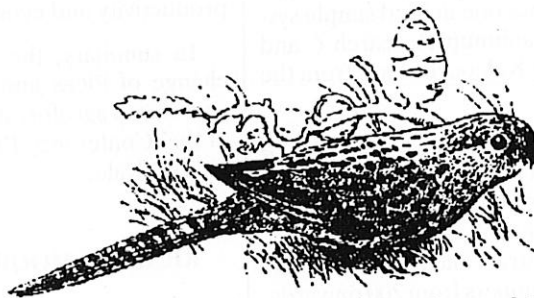
Only about six groups of birds are known - one in Cape Arid National Park and about five in Fitzgerald River National Park.

The major approach for management of Ground Parrots in W.A. at the present time must be one of total fire exclusion from known habitat. All areas known to be occupied by Ground Parrots should be managed primarily for this species.

Venue:

Wildlife Research Centre
Ocean Reef Road
WOODVALE

Time 3.00pm



National Workshop on Commercially Managed Honeybees in the Australian Environment

Last month it was reported that Steve Hopper had attended the above Workshop in late April. The workshop was convened by the Honey Research Council to "establish what research needs to be done to establish the nature of the interaction between the Honeybee, *Apis mellifera* and the Australian environment". We have since caught up with Steve and provide the following report of the workshop.

The first day was devoted to background information by way of two overview papers followed by reports on the current situation in each State by a beekeeper and a land manager.

Day two divided participants up initially into working groups of beekeepers, scientists, land managers and apiary officers/inspectors. Each of these groups dealt with questions posed to them and reported back to the workshop. The afternoon of the second day was devoted to delegates from each State discussing issues and future research directions.

For W.A., agreement was reached on four main points:

- (1) Top priority should go towards publication of a report on the monthly geographical distribution of apiarists and hive numbers throughout the State.
- (2) A revised research proposal would be submitted to the Honey Research Council. The proposal would address resource utilization, native fauna, feral bees and hive bees, and aim to provide information of direct benefit to beekeepers and to CALM. Outside funding sources such as ANPWS would be investigated.
- (3) Professor Brian Collins (Curtin University) should be invited to join the Beekeepers Consultative Group and its Research Working Group.
- (4) The beekeepers would like discussions with Government on possible ways of managing beekeeping in the face of declining resources in W.A.

The final session of the Workshop had the following take home messages;

- Beekeeper consultative groups should be established in each state.
- Statistics should be published on beekeeper resource usage in each state
- Land managers should identify particularly sensitive areas regarding access to beekeepers and in the context of setting priorities for research
- Beekeepers should arrange a State workshop before 1990 to identify common areas of concern and list priorities.
- The Honey Research Council will draw up its own priorities for action in its 5 year plan by November 1989.

Although the workshop did not achieve an agreed list of research priorities, the mechanisms for establishing this list on a State by State basis were developed.



Comment

The Insidious Conservation Crises

The recent seminar by Elaine Davison and Bryan Shearer served to highlight what could well be the most important nature conservation crisis in the State - the impact of increasing levels of *Phytophthora* infection throughout the south west.

So far, *Phytophthora cinnamomi* has been isolated from sites ranging from Eneabba in the northern kwongan through to Cape Arid on the south coast. At least two other species of *Phytophthora* which have similar devastating impacts also occur in the region and all species are expanding both locally and regionally. It is probable that all areas with rainfall 800 mm pa together with the northern and southern coastal plains are at risk.

Considerable effort has been devoted to mapping the distribution of *Phytophthora* throughout the forests and on selected parks and reserves. Lists of susceptible plant species have been produced for some of these areas. But what do we know of the impacts of *Phytophthora* on the plant and animal communities that we are trying to conserve?

For the plants it is possible to make the following generalizations:

- i) a large proportion of species at any one site can be affected. Studies of *Phytophthora cinnamomi* impacts in the Otway Ranges show that as much as 60% of the flora can be eliminated from *Eucalyptus* forests with sclerophyllous, shrub-dominated understoreys.
- ii) certain taxa are more vulnerable than others. In Western Australia, plants in the families Proteaceae and Epacridaceae are particularly susceptible. These two families are important in the highly endemic flora of south-western Australia.
- iii) the elimination of particular taxa from a site may cause structural changes to the vegetation. It may become lower and more open. For example *Banksia*

woodlands and *Dryandra* thickets may alter to become open shrublands and sedgeland.

iv) It is probable that productivity will also decline.

There are few data on the impacts of *Phytophthora* on the fauna. However major changes to assemblages of invertebrates and vertebrates would be expected as a consequence of the changes expected in the vegetation. Postle *et al.* (1986, *Pedobiologia* 29 : 47-69) have shown a marked reduction in composition and abundance of litter invertebrates in a badly *Phytophthora* - degraded jarrah forest when compared with healthy forest. This is significant because not only are the invertebrates important in their own right but they also provide dietary requirements for many of the vertebrates.

A recent trapping study of small mammals in the Otway Ranges (Victoria) by Barbara Wilson and others (in press, Proc. Ecol. Soc. Aust. 16) showed that sites not infected with *Phytophthora cinnamomi* had more species and greater numbers of those mammals than infected sites. A more general finding was that species richness of small mammals in sclerophyllous plant communities correlated with richness of vascular plants. It is not possible to say on this basis that a 60% loss of plant species would cause a commensurate loss of mammals, however a significant loss should be expected.

Hart (1983 Reserve Management Consultant's Report 3, Dept Fish. Wildl. West. Aust.) showed a significant decline in richness and abundance of birds in a *Phytophthora* infected area at Two Peoples Bay Nature Reserve. Although the expectation would be that honeyeaters would decline and open areas feeding birds would increase, this was not evident in the limited data provided.

In summary, the future for many nectivorous and frugivorous vertebrates looks bleak. Insectivorous animals may persist at reduced densities provided they are not too specialised in their dietary requirements.

The second major threat to the conservation estate is the greenhouse effect. Optimistic scenarios for year 2040 for the south-west show a 20% decline in winter rainfall and a 40% increase in summer rainfall, corresponding temperature rises of 1.8-2.1°C and 1.2-1.5°C and changes to sea level, windspeeds and the incidence of extreme events. Although there is considerable uncertainty attached to these predictions, it is essential that we plan now for the possibility of changes taking place.

It is not possible to review here all the likely consequences of greenhouse induced climatic changes on the native biota. However, in the context of the earlier discussion it is useful to look at the implications for the spread and expression of *Phytophthora*.

Phytophthora cinnamomi is known to be favoured by periods of high soil moisture at temperatures about 15°C and below 31°C with an optimum at approximately 22-27°C. The warmer winters will certainly extend the period of activity of *P. cinnamomi* as will the wetter summers.

Perhaps more importantly, the geographic range of *P. cinnamomi* and other species is likely to expand in all areas except possibly the wheatbelt.

Unfortunately the wheatbelt biota will not escape major impacts of the greenhouse effect. The reserve system there is extremely fragmented - thus the opportunities for plants and animals to migrate across the landscape to cope with the climatic changes are very limited. Corridors may ameliorate the isolation to some extent but I am not optimistic about the long term value of an approach which relies solely on corridors. In my view we need to identify now important refugial environments and focus our management energies on those. These regions contain relictual taxa and highly localised endemics that have persisted at those sites through previous periods of climatic flux. It is critical that these refugia be protected from *Phytophthora*.

Angas Hopkins

THE EFFECTS OF PRESCRIBED BURNING ON SOIL AND LITTER INVERTEBRATES IN A WESTERN AUSTRALIAN WHEATBELT NATURE RESERVE

Is the title of a poster delivered at this year's annual conference of the Australian Entomological Society at Macquarie University in Sydney on 3-6 May 1989 by Stuart Little, an honours student from Curtin University.

Stuart is currently working with Dr Gordon Friend (at Woodvale) on the effect of fire on invertebrates in kwongan and this poster presents some of his preliminary results.

For those interested in viewing this poster, it is residing for a short while in the Library at Woodvale.

David Mitchell.





CALM LIBRARY NEWS

At the May meeting of the CALM Library Committee, the two issues covered which are of general interest to Research Division were: User co-operation; and Information management policy.

User Co-operation

The Librarian reported that many books and scientific journals have vanished from both the Woodvale Library and the Como LRC. This is of concern as it is not known whether the items are in offices and labs in CALM (a Clayton's borrowing system?) or whether they have actually been stolen.

Hugh will shortly be announcing an amnesty for all those CALM staff who return items immediately.

We should not forget that books and journals are expensive. The Library does not have a budget allowing it automatically to replace lost or stolen items. The ultimate consequence of non-cooperation by users is a deteriorating library service, which is unfair to the majority who abide by the rules.

Information Management Policy

Hugh Clift will shortly be seeking staff's views on items such as: What do you expect from the library?; Does it have a role in curating research archives?; Is the library doing anything it shouldn't?; What's the principal way that you obtain information, for example, is it through a network of peers exchanging reprints, through Current Contents/Inter Library Loans or through actual scanning of contents pages of journals?; How do you cope with the information explosion?

Don't wait to be asked, contact Hugh Clift now!

Ian Abbott

Explorer's Notes

Readers familiar with the Journals of the great 19th century explorers of central Australia (Giles, Carnegie etc) might be interested in this extract from the diary of a more modern adventurer to these regions.

"April 20: With another long day's travel across these arid lands ahead of us, we broke camp under the stars and were away at daybreak. There were no signs of recent rain. Parched spinifex and mulga stretched to the horizon on all sides.

Towards midday we stopped for a frugal meal. The leader allowed us one cup of bitter fluid each.

Late in the afternoon we came upon a low range, beyond which higher hills and broken country stretched away. The leader's maps indicated good water holes were likely in a gorge beneath a high red bluff to the north, and we made for this. Suddenly, to our alarm, we were approached by a party of natives. There were three men, several women, children and dogs. However, our leader greeted them in their own tongue and a potentially threatening situation was avoided. They continued on their journey south and we on ours north towards the hills.

As night fell we came to a lovely glade of gums beneath a high cliff, from a narrow cleft in which a waterfall fell to a deep, clear pool. Camp was quickly made and we had our first good drink for 24 hours. This was soon followed by a rough, but substantial meal cooked over the coals of the mulga wood fire, and by more drink.

The "session of sweet silent thought" which then overtook our tiny camp in the midst of this great wilderness was however, rudely shattered, by the unexpected arrival of another group of explorers, who by chance had decided to use this very spot for their own encampment. Three ruffians (one of whom appeared to be at least seven feet tall) dismounted noisily and accosted us by our fire. It transpired they also had endured a long perish. However, almost no time elapsed before they commenced the prolonged process of replenishing their bodily fluids. By a further strange coincidence, the men were known to our leader from a previous expedition, and a great deal of reminiscence, some of it scarcely credible to my untutored ears, was exchanged long into the night."

Anonymous



Research Project Plans

The following Research project Plans have been approved this month.

- No: 9/89
 Title: A trial measurement of a catchment leaf area index (LAI) using hemispherical photography
- Officer-in-Charge: Kim Whitford
 No: 10/89
 Title: Survey of the genetic structure of the mainrange Jarrah forest using Isozymes
- Officer-in-Charge: Richard Mazanec
 No: 11/89
 Title: *Eucalyptus botryoides* family provenance trials
- Officer-in-Charge: Richard Mazanec
 No: 13/89
 Title: Shelter cup sowing of *E. diversicolor* (F. Muell) seed in regeneration coupes.
- Officer-in-Charge: Penni Hewett
 No: 14/89
 Title: Field survey of the incidence of brown wood in regrowth karri
- Officer-in-Charge: Elaine Davison
 No: 15/89
 Title: Thinning and fertilizing regimes for 13 year-old *Pinus taeda* on the Donnybrook Sunklands
- Officer-in-Charge: John McGrath

Have you heard?

- Biogeography Program Leader - Greg Keighery has recently taken over the role of Program Leader of the Biogeography Program from Norm McKenzie
- Stuart Crombie has transferred into Geoff Stoneman's position at Dwellingup. Geoff will be spending the next three years studying towards his PhD. The vacancy resulting from Stuart's move will be advertised shortly - this position is funded by Alcoa.

STOP PRESS

Seminar - A vacancy exists in the seminar program for 19 October. Would anyone willing to give a seminar on this date please contact Jeanette.

THANK-YOU

The Editor wishes to thank all contributors to this edition of the newsletter and looks forward to continued support from all readers. Thanks to Ian Abbott, David Mitchell, Steve Hopper, Ray Wills, Richard Moore, Angus Hopkins, Allan Burbidge, Greg Keighery, Andrew Burbidge and Anonymous.

*

*It's More Important
 To Be Doing
 The Right
 Things
 Than To Be
 Doing Things Right.*

*

	ISSUE	DEADLINE	DISTRIBUTION
DEADLINE FOR NEXT ISSUE	JUNE 1989	26 JUNE '89	EARLY JULY