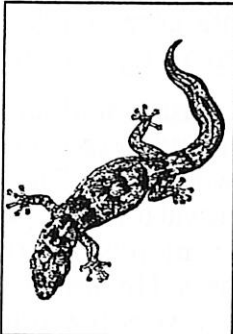


RESEARCH NEWS



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

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FEBRUARY 1991

Editorial

Research News commenced publication in January 1987 and is now three years old. Happy Birthday Research News and thank you to all who have contributed to it over the past three years. I look forward to receiving any interesting articles you may care to contribute, highlights of field trips, results of latest research or news on any interstate and local conferences.

DATES TO REMEMBER

The following are a list of dates to remember.

MARCH

Seminar - 14 March at Como Training Centre - Electronic Methods of presenting flora information - alternatives to the printed word (Terry Macfarlane)

Alcoa Grants - proposals must be submitted to Christine Farrell by 20 March 1991.

APRIL

RDPG at Woodvale 4 April 1991.

Seminars - 5 April Woodvale - Applying modern technology to research - M Choo

18 April - Como - topic to be decided - Judy Wheeler

MAY

Research Plan 1991/92 - Program Leaders submit draft revised program and appendices to SPRS/PRS team for consideration

SEMINARS

3 May at Woodvale - to be decided

16 May - Como - Post fire regeneration of granite outcrop Mallee at Chiddarcooping - S Hopper

31 May - Woodvale - *Cardiaspina* sp. a new insect species outbreaking on Flat-Top Yate (*Eucalyptus occidentalis*) - J Farr

JUNE

Research Plan 1991/92 - Final copies of Programs and appendices on disk and sent to Jill Pryde at Woodvale.

RDPG - 6 June (venue to be confirmed).

Annual Report - submissions called for.

Seminars - 20 June at Como. Fire response to regrowth Karri stands - L McCaw

Research Project Plans -

It has come to my attention as Admin Assistant that Supervising Scientists are not receiving feedback once they have submitted a new Research Project Plan. Therefore, a copy of each new Research Project Plan will be forwarded to the relevant Supervising Scientist for their information.

*Christine Farrell
Administrative Assistant*

ISSUE . . . DEADLINE . . . DISTRIBUTION

DEADLINE FOR
NEXT ISSUE . . . MARCH 91 . . . 21 MARCH . . . LATE MARCH

INFORMATION FROM RDPG'S FEBRUARY MEETING

RDPG's first meeting of the year was held at the Herbarium on 14 February 1991

The following is a summary of that meeting.

Budget

The Research Division is currently 61% through the year and the total CRF expenditure is approximately 58% spent.

Overtime was looked at closely by members of RDPG as we are currently 67% spent. The three teams are to meet with program leaders to review their overtime allocations.

Guidelines for Research Division staff

Draft Guidelines for Research staff are currently being prepared to assist them in fulfilling their duties in the Division. Areas currently being considered are refereeing papers and reports, transfers between centres, criteria progression (update our current document) and how to work in committees and teams. Any suggested topics to Andrew Burbidge, please.

Co-ordination of Alcoa Funds

Research staff have been notified of a new system of co-ordinating requests for funds from Alcoa. Rather than individual scientists approaching Alcoa staff directly, they are now to submit their requests each March to RDPG which will rank the proposals according to Departmental goals.

Research proposals should be submitted to C Farrell at Woodvale by 20 March 1991.

Proposed workshop on "Improving vegetation cover in rural areas"

A workshop on the above topic, including CSIRO staff, is being considered. Andrew Burbidge will liaise with Roger Underwood on the principles.

The next meeting of RDPG will be held at Wildlife Research Centre, Woodvale on 4 April 1991.

CONFERENCE ON CONSERVATION BIOLOGY IN OCEANIA, BRISBANE, 30 SEPTEMBER - 4 OCTOBER 1991

This Conference will be a major event in the conservation scene during this year. CALM is a co-sponsor of the Conference and David Coates is a member of the Organising Committee.

Seven Research Division staff have been invited to present keynote addresses and scientific papers and/or chair workshops. The Executive Director has given approval for these people to attend, subject to them paying their own accommodation expenses. He has also given approval in principle for a very few other staff to attend on the same conditions, but only if they are invited by the Organising Committee to present a paper. Anyone who is approached should seek approval to attend from me.

Anyone else who wants to attend the Conference will have to pay their own way.

Andrew Burbidge

Biological control, weeds and CALM

Few people in CALM probably realize the level of activity undertaken on biological control of pests in Australia, or CALM's role in these studies.

During 1987-88, two major events occurred in biological control. One was the Inquiry into the effects of biological control of Patterson's Curse (*Echium* species), which resulted in considerably more rigorous host specificity testing. The other was the import/export provisions of the Australian National Parks and Wildlife Act, which gave this organization power to veto the importation of harmful foreign organisms into Australia (CALM as the responsible State government body vets these proposals as to their effect on Western Australia's flora and fauna).

From Canberra all requests to import biological control organisms (or other foreign organisms - one was a bacteria to make artificial snow!) are sent to John Blyth at Crawley. These are then divided into agents to control plants (sent to Greg Keighery), agents to control animals (sent to Bob Prince, Ian Abbott or other specialists in a few cases) and general (fungi, marine pests, viruses) requests not filling either category. John co-ordinates the Department's response, from advice he receives from these specialists.

From mid 1987 to the end of 1990 there were 134 requests for the importation and testing of agents to control plants, 130 for animal control and 37 on general subjects. About seven requests a month!

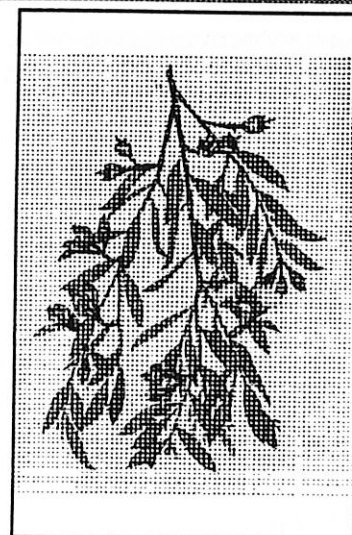
Nearly all of these were to control agriculturally damaging organisms, eg the animals are usually insects (Blowflies, Apple moths, Bark Beetles, Cotton bole moths, Banana moths, Lucerne flea, Cutworms, European Wasps, Coffee scale, mealy bugs etc etc) and the plants (Patterson's Curse, St John's Wort, Scotch Broome, Mistflower, Groundsel Bush, Ragweed, Parthenium weed, Thistles) again are generally agricultural weeds.

However, with increased environmental awareness, and pushing by CONCOM's standing group on environmental weeds the target species are changing. The first to be attempted were Blackberries using rust fungus (currently held in quarantine because of a Tasmanian court injunction). This has been followed by studies on Bitou Bush and Boneseed (*Chrysanthemoides monilifera*) resulting in releases of control agents in 1990. Giant sensitive plant (*Mimosa pigra*), which has invaded the floodplain of the South Alligator River, should have control agents released against it shortly.

The latest target, Bridal Creeper (*Myrsiphyllum asparagoidea*), should be of particular interest to CALM, as it is potentially a devastating weed in southern Western Australia. Hopefully the initial studies on control agents in South Africa by Dr John Scott (CSIRO) will soon be translated into potential control agents to be tested in Australia.

Concomitant with this activity quarantine and nursery operations are under review to stop potential weeds at their source, before importation and spread. CALM has had input into these activities, and in the future may be affected in aspects of its nursery, rehabilitation and land care activities by the cost-benefit analyses being projected for some potential weed species currently being used in such projects. Finally a major position review of environmental weeds in Australia has been prepared for the Australian National Parks and Wildlife Service. This, hopefully, will increase the awareness of these problem species at the Federal level.

Greg Keighery



Scientific and Technical Publications

- Authors: Anderson, A N & Burbidge, A H
 Title: The ants of a vine thicket near Broome : a comparison with the north west Kimberley
 For submission to: Journal of Royal Society of W.A.
- Author: Alford, Jeni
 Title: A new species of *Tetratheca* (Smith) from the Coolgardie District of W.A.
 For submission to: Nuytsia
- Author: Wilson, Paul
 Title: The classification of the Australian species currently included in *Helipterum* and related genera (Asteraceae : Gnaphalieae). Part 1
 For submission to: Nuytsia
- Author: Keighery, G.J.
 Title: Environmental weeds of Western Australia
 For submission to: 9th Australian Weeds Conference
- Authors: Keighery, GJ, Harvey, J and Keighery, BJ
 Title: Vegetation and flora of Bold Park, Perth
 For submission to: The Western Australian Naturalist
- Authors: Wong, D.H., Kirkpatrick, W.E. Kinnear, J.E. and King, D.R.
 Title: Environmental factors and microbial inoculum size and their effect on biodefluorination of sodium monofluoroacetate
 For submission to: Soil Biol & Biochem

NEW POLICY STATEMENTS

The following new policy statements are available and copies can be obtained from your Research Centre Manager or Christine Farrell, Admin Assistant at Woodvale.

1. Revised Policy Statement No. 36, Post-Graduate Studies and Study Grants. The revision is the addition of a new section 4.2.2. Please destroy your September 1990 version of this document;
2. New Policy Statement No. 38, Business Units;
3. New Policy Statement No. 39, Fees and Charges.



Conference

A conference with the theme of "Soil Science and the Environment" is being organised by the WA Branch of the Australian Society of Soil Science Inc and will be held at the Albany Town Hall between 19-21 September 1991. Papers or posters in the following areas are invited:

- Pesticides and herbicides in soils
- Nutrient behaviour in soils
- Heavy metals in soils
- Microbiological aspects of soils
- Soil rehabilitation following agriculture and pastoral activities
- Soil Management

Further details can be obtained from Richard Harper, Albany (098 417 133), or the conference secretary Keith Lindbeck (Bus (09)222 3437; a/h (09)332 5108).

RESEARCH TECHNIQUES

New Waterbird database system

- Phase 1 completed

This system maintains a database for the Waterbird 1981 to 1988 Survey data using Oracle SQL*PLUS and SQL*FORMS. It is designed so that its future versions can include the Scopewest Survey and the Duck Count survey data in an integrated manner.

In principle, it is capable of including any other data as long as they satisfy the relational database design requirements.

Now it provides extensive querying facilities on screen. Hardcopy reports and ASCII data file output can also be produced for statistical analysis.

M Yung

CALLING ALL CALM MAC USERS

Ray Wills is trying to get a Mac user group going in CALM. He has just produced his first newsletter and is calling for new members. The newsletter is designed to offer advice to new users, swap ideas and knowledge with people who have valuable experience and cooperate when buying software and hardware to keep costs down. There is plenty of other interesting information as well, so if you wish to be put on the mailing list contact Dr Ray Wills, CALM Research, Brain Street Manjimup WA 6258, phone (097)711988



**REPORT ON A VISIT TO NEW ZEALAND
TO ATTEND THE ICBP CONFERENCE
AND INTERNATIONAL
ORNITHOLOGICAL CONGRESS,
NOV-DEC 1990.**

Allan Burbidge
Senior Research Scientist, Woodvale

On arriving in New Zealand I spent several days (including two days in the field) with Dr Peter Wilson and Ms Jacqueline Beggs (DSIR Division of Ecology in Nelson). They are studying the breeding biology and population dynamics of the Kaka (a rare parrot), and interactions between this and other bird species with introduced European wasps. The reduced breeding success shown by the Kaka, and the reductions in numbers of some other bird species, may be due to competition for food resources (especially honeydew) with introduced European wasps, which are now widespread and abundant in many parts of New Zealand. Honeydew, which is an energy rich carbohydrate produced by a scale insect, is easily harvested by wasps or nectivorous birds, including parrots. This is relevant in Australia because European wasps are already established near Perth and in a number of locations in south-eastern Australia.

Other officers spoken to at DSIR included Mr Brian Karl who is involved in radio-tracking projects concerning native bird species, and Mr Rowley Taylor, who has considerable experience studying parakeets and removing introduced rodents from off-shore islands.

Several of the DSIR projects utilize a group of young people from the New Zealand Conservation Corps, a scheme employing a leader and using 16-23 year old unemployed people with the aim of providing them with a learning and skills-raising experience in return for assistance in various projects.

The 20th World Conference of the International Council for Bird Preservation (ICBP) in Hamilton, 19-27 November, was attended by about 300 delegates from 54 countries. One of the themes (one workshop and one symposium) which generated much interest was "Birds and Tourism". Tourism is the largest and fastest growing industry of its type in the world. Tourists can generate much revenue and, in Canada, there is about four times more revenue generated from taxes related to the use of natural resources (wild

animals, wilderness, etc) than is spent to conserve them. A similar situation may occur in Australia. Considerable discussion was devoted to the advantages and disadvantages of "eco-tourism" and guidelines for such developments.

The symposium on "National bird conservation strategies and the conservation of biological diversity" was, overall, disappointing. While there are obvious gaps in this area in Australia, none of the speakers convinced me that they had anything novel to offer. The symposium "Management methods for populations of threatened birds" included a number of interesting papers, particularly on field studies, translocations and genetic techniques.

An excursion to Mapara reserve was led by Dr Alan Saunders of the Threatened Species Unit of the Department of Conservation (DOC). It provided a useful outline of the management problems associated with efforts to conserve the Kokako (an endangered passerine) and to discuss some of the solutions being used (mainly control of feral predators and herbivores). This successful project illustrates what can be done with co-operation between central and regional staff and appropriate commitment and back-up support (including \$600 000 over five years, on top of about \$250 000 for research). Tasks are completed according to the Kokako Recovery Plan. It was thought useful for Recovery Plans (ie Management Plans) to include budgets for each task, partly in order to help gain outside funding.

Between the conferences I met a number of DOC staff in Wellington. In particular, I spent some time in the Threatened Species Policy Unit, mostly with Ms Janice Molloy, who is involved in developing a threatened species priority ranking system to include endangered species of both plants and animals.

The 20th International Ornithological Congress (IOC) in Christchurch (2-9 December) was attended by about 1200 delegates. An incredible amount of information was presented in six concurrent sessions of almost 500 symposia papers and about 350 contributed papers, together with seven plenary and about 700 poster papers. A diverse array of topics was covered, with a few examples following. Papers on the use of biogeographic data in the conservation of birds included some interesting studies relating to land use decisions, but it seemed to me that the techniques being used in CALM's Biogeography Program are as good as those being used

anywhere. The plenary paper by Enrique Bucher noted, amongst other things, that the successful integration of research results into management required effective two way communication between managers and both theoretical and empirical scientists, and furthermore that the resolution of many problems also requires examination of social and economic factors. There was some lively discussion on the problems of identifying "habitat preferences" in rare species - distinguishing real preferences from results of behavioural imprinting or learning, or stochastic processes in the past. The content of a number of papers which discussed feral predators suggest that our fox and cat problem is indeed a major conservation problem in Western Australia. The symposium on captive breeding confirmed the need for captive breeding or reintroduction to be done only within a carefully thought out research program or management plan.

In a session on "ornithogeography" I presented a talk (with Dr John Woinarski, Conservation Commission of the Northern Territory) on biogeographic patterns in rainforest birds of northern Australia. This was based on work carried out by CALM in the Kimberley and for ANPWS in Kakadu. As a result of this talk, offers of data from Arnhem Land and parts of Queensland will allow us to develop a much better overview of northern Australian rainforest bird biogeography, enabling us to provide an informed assessment of the conservation status of these communities.

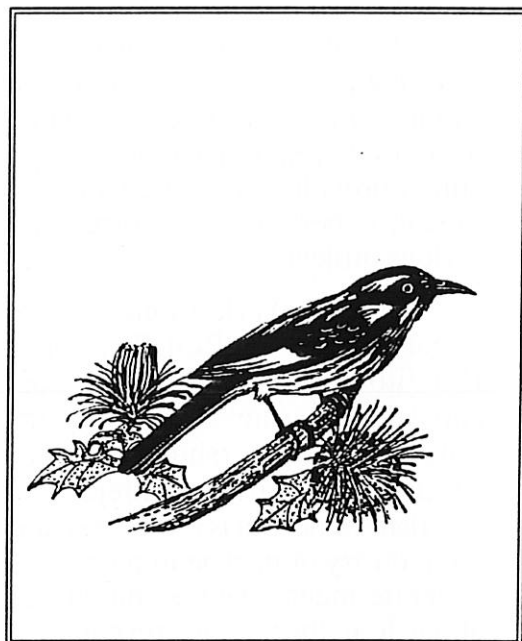
The conferences also provided many opportunities to discuss recent work with other scientists and managers. For example, I was able to discuss the results of recent work on the sometimes devastating effects of foxes on Malleefowl populations, and the possible effects of fire regimes on recruitment in the Gouldian Finch (declared "endangered" in Western Australia). In New Zealand, many species translocations have now been carried out, but one minor problem has been that excessive regionalization and/or lack of communication between Departmental regions has led to some difficulties in some translocations. It is important that (as in CALM's re-introductions to date) key staff be involved in all stages of

a translocation, irrespective of whether regional boundaries are crossed.

I visited a breeding station for the endangered Takahe, where, with meticulous attention to detail, eggs are incubated and the chicks hatched and reared with great care so that no imprinting occurs. Successfully raised chicks are released in suitable protected habitat. Of obvious importance were experienced and dedicated staff and departmental commitment and back-up (three staff have been employed at this field station solely for this project for the last five years). Other breeding stations are located at Twizel (Black Stilt) and Mt Bruce (various bird species).

My last week in New Zealand was spent in the field with Dr Graeme Elliott and Mr Colin O'Donnell of DOC. They are studying the effects of stoats on the breeding success and population dynamics of the endangered Yellow-crowned Parakeets and Yellowheads. Stoats are thought to be responsible for their decline in much the same way that foxes interact with our native mammals.

A more detailed report on this trip has been provided to the Director of Research.





SEMINAR

Thursday 14th March 1991

Electronic methods of presenting flora information - alternatives to the written word

presented by Terry Macfarlane

Printed Floras have long been the standard source of floristic information for particular areas, providing: a means of identification of plants, an inventory of the flora, a description of the morphology, habitat and geographical distribution of taxa, and illustrations of plants. However they have certain disadvantages such as limitations of data quantity, inflexibility and poor cost-effectiveness. In today's climate of extensive demand for floristic information sources that are up-to-date, flexible, voluminous and easily used, and given the number of species we have in W.A., alternatives to printed floras are needed.

The talk will include a review of some computer technologies which currently exist, and will look into the near future of multi-media approaches to the collection, maintenance and presentation of floristic information. A joint research proposal for investigating the appropriate technology and designing a suitable framework for implementing a floristic database for the W.A. flora will be outlined. There will be demonstrations available.

Venue:
Training Centre
CALM SOHQ
50 Hayman Road
Como

Time 3.00pm

Letter from Brussels

"...Human Ecology is poorly defined as a discipline; it is at present more of a suspicion that a lot of academics, especially in Europe, Scandinavia, and USA have, that biologists who claim confidently to be "ecologists" are making the common error of mistaking the part for the whole. The survival of all life is intimately linked to the ecology of humanity, and so human activities must be better understood if "conservation" is to have any hope of long-term success. For instance a keen biologist who set up a marine reserve in the Persian Gulf would fail if he ignored the human activities and interactions which may lead to large oil slicks in the area! This perspective has deep implications for the success or failure of CALM.

There is to be a conference at Goteborg University in June to thrash out some basic principles, and I hope to attend and present the "question mapping" idea. By the way, I have been delighted to find quite a few references to a similar line of thought. For instance:

"a philosophy is characterized more by the formulation of its problems than by its solution to them. Its answers establish an edifice of facts: but its questions make the frame in which its picture of facts is plotted..." (S K Langer, 1942).

If you are interested in some relevant reading I can recommend:

1. Maslow, Abraham (1966) "The Psychology of Science"
2. von Bertalanffy, Ludwig (1981) "A Systems View of Man";
and as a comment on research priorities:
3. Jordan, Gilpin & Aber (1987) "Restoration Ecology : A synthetic approach to ecological research".

David Ward

Laptops and Rechargeable Batteries

Laptop computers are generally fitted with rechargeable NICAD batteries which are the main power source when the AC adaptor is not attached.

The nature of all NICAD batteries requires them to be periodically depleted of their charges and then completely recharged to preserve their operating features. NICAD batteries should undergo this depletion process every 2-3 months.

1. Remove AC adaptor and turn laptop on.
2. Deactivate any power conservation processes.
3. Leave laptop on, ignoring all low battery warnings until batteries are fully discharged and the laptop has turned itself off.
4. Attach AC adaptor and fully recharge batteries
5. Reset any power conservation processes.

On the Toshiba T3100 laptops use the pop-up window (En + ESC) to disable power conservation processes; disable sleep, HDD-Auto-Power-Off and Display-Auto-Power-Off. Use the up and down arrow keys to select each option on the screen and the right and left arrow keys to change its value. Press En + ESC to close the pop-up window.

Yvonne Woods

CONGRATULATIONS

Congratulations to Karyn and Matt Williams on the safe arrival of their baby daughter.

Congratulations to David Pearson on his recent engagement to Donna Clinch.

RESEARCH HUMOUR

Finance Generating Research Project For Entomology - Response To Review Comments

Research into the mass production of Witchety grubs to be marketed as an Australian delicacy for Australian and international tables. Emphasis would be placed on targeting the Japanese market as Witchety grubs are most suited to being eaten with chopsticks

Phase I

To locate suitable insect species. The identity of the original Witchety bug is not known (Ebbie Neilson, ANIC, pers comm). Thus a search for suitable species would have to be made.

The search would concentrate on species within Hepialide, Cossidae and Cerambycidae.

Collecting trips would need to be made to the northern part of Western Australia, both coastal and inland regions, also entomology collections already made would be examined. Tryphocarea and Phoracantha could also be considered as possible candidates.

Aboriginal expertise would need to be incorporated into this phase of the research.

Preliminary taste tests and chopstick manipulation lists to determine which species would be suitable for further investigation since large numbers of fresh insect larvae would be needed, this part of phase I would need to be interfaced with phase II.

Phase II

Determine the general biology and host preferences for possible species. Taxonomic work would also be needed.

Develop small scale rearing programs for taste tests. Taste tests would involve testing larvae reared on different hosts/foods, as this may have some influence on taste acceptability and compatibility with soy sauce.

End of phase II, market research to be initiated.

Phase III

Develop mass rearing techniques for most suitable species.

Phase IV

Advertising campaign. Product demonstration.

Patents for mass rearing techniques. Contracts for mass production. Techniques either to be sold by CALM to interested manufacturer or CALM to set up a company to produce and distribute "Aussie Witcheties".

Profits to be used for Entomological conservation research by CALM.

Popular justification for research

1. Involves food. Particularly food which would be consumed as a delicacy thus a potential seller as far as affluent markets are concerned. Is not a potential seller as far as third world countries are concerned, as it is not a staple food. This is an advantage as we don't have to ensure it is sold at a price they can afford, also third world markets more unstable.
2. Will generate money in 10 to 15 years ready for the next generation of entomologists in CALM.
3. Employs Aboriginals.
4. Harps on our heritage or rather the "Australian Dream" heritage.
5. Will help increase Australia's exports.
6. Will provide jobs in the short term for out of work economists and market researchers. Will provide jobs in the long term for out of work graduate entomologists who can manage the mass rearing program.

**Dinkum
Aussie
Witchety
Corporation**

Scientific Justification for research

1. Greater knowledge of the Cossid, Hepialid and Cerambycial population of Western Australia, particularly northern Western Australia.
2. Would create a demand to have taxonomy of above insect families revised and investigated.
3. Biology and life cycles of suitable species would be known and would therefore contribute knowledge on conservation entomology.
4. Knowledge of parasitoids and predators of suitable species would need to be investigated to maximize grub production.
5. Life cycle, biology, parasitoids of *Tryphocaria* would be investigated.
6. Learning how to maximize grub production may lead to knowledge on what influences populations of *Tryphocaria* in Karri.
7. Benefits in conservation in terms of knowledge of distribution of suitable species throughout Western Australia. Knowledge of wild populations would have to be documented so that fresh genetic material could be found to supplement breeding program.

Janet Farr

