

RESEARCH NEWS

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

Editor:
Christine Farrell
Wildlife Research Centre
PO Box 51 Wanneroo WA 6065
Telephone: 4055 105

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Editorial

Recent advances in Managing Endangered Species in New Zealand: An International perspective on the Noisy Scrub-bird Recovery Program

Address delivered by Don Merton, New Zealand Department of Conservation to the Noisy scrub-bird Conservation Workshop convened by the Western Australian Department of Conservation and Land Management and held at the C.A.L.M. Training Centre, Como, WA on 9th May 1991.

"First I would like to thank the Department of Conservation and Land Management (CALM), and especially Andrew Burbidge and Alan Danks for this opportunity to revisit the Noisy scrub-bird (NSB) recovery program, both from within and beyond CALM, not only for their success to date but for their commitment to the field program which is now in its third decade. The program is unquestionably one of the classic species rescues of our time! Positive elements include -

- * the timely rediscovery of the bird in 1961;
- * the securing of its final refuge in the face of imminent major commercial development;
- * encouragement and support CSIRO's (Graeme Smith's) biological research and captive breeding programs;
- * very effective management of the remnant habitat - including in particular the exclusion of fire so permitting survival and recovery of the species together with the important animal/plant community of which it is part;
- * recognition of the urgency in establishing alternative population in order to ensure the species long-term security;
- * development of safe and effective capture/translocation techniques so facilitating establishment of new populations. (Management techniques developed in NZ were successfully adapted and applied during my 3 months secondment to the NSB project in 1983.)
- * demonstrating that translocation is a viable option. (You've not only proved that it can be done very successfully, but that regular cropping can take place without harming the parent population);

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* development and implementation of a formal "management program";

* and, unlike many such programs, you've carefully monitored both donor and host populations and documented results.

Although you have a good few hurdles yet to negotiate the program is already a classic text-book example of how recovery can be achieved in a critically-endangered animal. This is especially important since the NSB is not only of significance at the state level - its plight is of concern both nationally and internationally and your management of it is being followed with interest by a global audience. The techniques you are refining and applying, and the success being achieved are not only breaking new ground and facilitating recovery in a unique life-form, they are of crucial importance in inspiring and encouraging similar action elsewhere.

YOUR INTEGRATED MANAGEMENT OF THE NSB TOGETHER WITH ITS HABITAT IS DEMONSTRATING THAT DIRECT INTERVENTION CAN BENEFIT A CRITICALLY-ENDANGERED BIRD AND THAT RECOVERY IS FEASIBLE.

Like Australia, NZ had its origins in Gondwanaland but since break-up of that supercontinent around 65 million years ago the NZ archipelago has been isolated from other land masses. This long isolation together with an absence of land mammals (other than bats) gave rise to a fauna characterised by oddities

- a macrofauna dominated by birds filling to some degree niches elsewhere occupied by mammals. These birds were often large, flightless, predator-naive and with "K" breeding strategies - a combination that made them highly vulnerable to the impacts of introduced mammalian predators of which we now have a formidable combination. This, together with the current global crisis affecting species, habitats and natural systems everywhere has resulted in massive extinction and endangerment in the NZ fauna. We've lost about 47% of our endemic land-bird species since human colonisation began around 1000 years ago, and of 49 species now surviving 27 (55%) are threatened with extinction. It's not surprising then that through necessity we've become pioneers in the field of endangered species management - our endeavours to protect and to manage diminishing bird species date from soon after European colonisation began last century.

There are four basic strategies that can be used in the conservation of species:

- i) The ecosystem approach: securing the animal or plant in its natural habitat. This is of course the preferred option. Increasingly however it is no longer effective - or even available.
- ii) Translocation: this has been the mainstay of our endangered bird management when the ecosystem approach has failed. Around 168 transfers involving 26 animal - mainly bird - taxa

have been carried out. Four bird taxa have been saved from extinction and many populations owe their existence to this strategy.

iii) Captivity: now playing an increasingly important role in recovery programs. However, as yet no NZ animal taxa is dependent for its survival on this strategy.

iv) Life-line: the maintenance of free-ranging populations in degraded habitats through provision of those essential elements no longer available naturally, such as adequate foods, nest-sites, roost-sites or freedom from predators or competitors. It is in effect an artificial "prop" that in some instances can be used as an alternative to captivity or to "buy time".

In spite of our best efforts the number of threatened animal and plant forms in NZ has continued to grow. We now have over 170 animal taxa and 250 plant taxa believed to be threatened with extinction. NZ's new Department of Conservation (DOC) has the statutory obligation to ensure survival of all native plants and animals. To help facilitate this goal, in 1989 it set up a Threatened Species Unit (TSU) of 6 people. The TSU has a national co-ordination, facilitation and technical advisory, assistance and training role in the species recovery area. It does not however fund threatened species operations or projects as does your ANPWS Endangered Species Unit.

One of our most significant recent advances has been in formal recovery planning for threatened species. We now have over 30 species recovery plans in various stages of completion. Preparation and ultimately implementation of plans is overseen by a "recovery group" of around 6 people. Some species such as takahe, black stilt, kokako and kakapo each have full-time management and/or research staff assigned to them. All are regionally-funded and supported, however, with a shrinking departmental allocation major corporate sponsorship has over the last few years become a necessary and accepted part of most higher-profile recovery programs. Many field programs have long been heavily dependent on unpaid volunteer labour.

In NZ we generally regard the Black robin's rescue as having been one of the most rapid and inexpensive of our species recovery programs. Intense management commenced in 1980 and ceased in 1989 and cost in the order of \$Aust.23,00 per year. Most programs are however more costly than this - especially those that must be helicopter-supported. For example the kakapo parrot budget for 1990/91 was in the order of \$Aus.300,000 of which two thirds was sponsored by Comalco (NZ). Research and management effort on kakapo intensified with the discovery in 1977 of a population of these birds on Stewart Island, and the level of management activity is expected to remain high well into the twenty-first century.

With an all-up annual budget of, I understand less than \$10,000 your NSB program is remarkably inexpensive. However, I am sure that with such a high-profile species, should it be necessary you would have no great difficulty in finding a corporate sponsor.

Although excellent progress is being made in increasing the numbers and range of the NSB some set-backs are inevitable, and in spite of the recent very significant expansion in range and numbers the NSB remains highly vulnerable. A wild-fire could occur in Two People's Bay Nature Reserve at any time and destroy not only a major part of the population, but effectively remove the option of further transfers for another 20 years or more. I believe you must urgently proceed with your officially-endorsed, formal recovery program while you have that option. This being so, I believe that the stated goals are not only attainable, but attainable in the medium to short-term - a time-scale rarely found in endangered species recovery. Nevertheless, annual cropping and relocation is likely to be necessary for at least the next ten years.

I've a number of technical suggestions which may help the program. These I'll present during the discussion which is to follow.

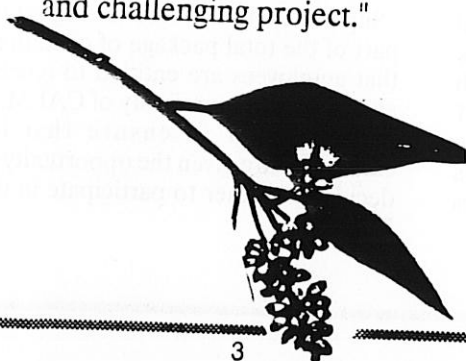
In conclusion, I wish you every success in this very important and challenging project."

REPORT ON A VISIT TO THE AUSTRALIAN INSTITUTE OF MARINE SCIENCE

S. J. Turner

I spent the last week in May visiting the Australian Institute of Marine Science (A.I.M.S.) in Townsville, Queensland, as the guest of Dr Peter Moran, the program leader for the crown-of-thorns research program. The primary aim of the visit was to familiarize myself with the "in situ larval rearing system" that has been successfully employed by scientists at A.I.M.S. to rear the larvae of the crown-of-thorns in the field. A.I.M.S. had previously agreed to loan C.A.L.M. the equipment for a few months to enable me to try and rear *Drupella* larvae at Ningaloo. It is envisaged that these experiments will provide a lot of interesting information regarding the early life-history of *Drupella*. I spent several days with Mr Paul Dixon, the experimental scientist who did a lot of the crown-of-thorns work using the equipment, learning how to assemble and operate the equipment, how and where to position it on the reef, and all its idiosyncrasies! As Paul has done a lot of work with larvae, we also spent time discussing ideas, techniques and possible areas of future work on *Drupella* larvae.

One of the scientists working on the crown-of-thorns research program is just starting a M.Sc. on the feeding and reproductive biology of *Drupella*. I spent some time with him at A.I.M.S., talking about some of the things he intends to study, and looking at his animals and larvae. This was especially interesting



because there are more species of *Drupella* on the Great Barrier Reef than we get at Ningaloo.

I also took the opportunity to meet with people at other institutes in Townsville who are interested in the work being carried out in Western Australia on *Drupella*. There is increasing concern over the potential effects that *Drupella* is having on the Great Barrier Reef - it is now recognized that some of the coral damage previously attributed to the crown-of-thorns may actually have been caused by *Drupella*! I spent sometime talking with Robyn Cumming and Professor J. H. Choat at James Cook University, who have recently submitted a proposal to examine *Drupella* at Lizard Island on the Great Barrier Reef. I also met with several of the scientists at the Great Barrier Reef Marine Park Authority who were interested to learn about the *Drupella* problem in Western Australia and the research that is being carried out. It was also very interesting to talk to the scientists involved in the

crown-of-thorns research program at A.I.M.S. and to have access to a lot of the results and management proposals that have come out of the work.

**Please note Seminar
Change**

on

**Friday 5 July 1991 at
Wildlife Research Centre,
Woodvale**

will now be given by:

B Shearer

titled -

**Banksia Killing Canker
Fungi**

**AIMS AND PRIMARY
OBJECTIVES OF
RESEARCH DIVISION
1991/92**

As detailed in Ian Abbott's memo of 7 May on this topic, Tony Friend has contributed the following.

"In the section of the Overall Primary Objectives entitled "Management of Biological Resources", the second point should go further than

- (a) sustained yield; and
- (b) minimizing impact on other values.

Current principles being used in framing National and State Conservation Strategies centre on ecological sustainability. This concerns not only the sustained yield of exploited resources but also the maintenance of other natural values. This is not implied by the phrase "minimizes impact on other values: Our aim should be ecological sustainability.

The idea has been accepted.

SUPERANNUATION

A memo was recently sent to CALM from the Office of the Minister Assisting the Treasurer reminding Government departments and agencies that they have an obligation to their employees to inform them of the Government Employees Superannuation (GES) Scheme's existence and the benefits it offers.

In 1987 the Government introduced the Government Employees Superannuation (GES) Scheme which extended the coverage of superannuation throughout the State public sector. The Scheme offers full-time and most part-time employees

generous lump sum benefits that are guaranteed by the Government.

In addition, the GES Scheme incorporates settlement of the first 3% productivity claim. It is envisaged that any future superannuation awards will be settled for government employees through the GES Scheme.

Superannuation forms an important part of the total package of conditions that employees are entitled to receive and it is the responsibility of CALM as the employer to ensure that its employees are given the opportunity of deciding whether to participate in the Scheme.

Introductory notes and essential features of both the Contributory and Non-Contributory schemes are displayed for your perusal. Further information can be obtained from:

Government Employees
Superannuation Board

10 Kings Park Road
WEST PERTH WA 6005
Telephone: (09) 327 4111

Application forms to join are available from the Personnel Officers, Peter Algaba (09) 367 0361 or Sylvia King (09) 367 0360 at Como.

(Extract from Information provided by G.E.S.B.) Guide Only

INTRODUCTORY NOTES

(A) *Two types of membership are available to staff employed in the public sector:*

- Non-Contributory Membership; or
- Contributory Membership.

(B) *Membership is voluntary and will generally be available to employees who:*

- have been employed continuously for a period of 12 months or who have a reasonable expectation that employment will be for a period of not less than 12 months;
- are employed full-time; or who are employed part-time but regularly work not less than 35% of the hours worked by equivalent full-time employees;
- are employed in a permanent capacity;
- are employed under contract of service and able to satisfy the 12 months expectation of service.

ESSENTIAL FEATURES

NON-CONTRIBUTORY MEMBER

- You do not pay any contributions;
- No medical certificate is required;
- Insured benefits are automatically applied to members or their estates on disability or death;
- Membership does not affect tax deductability of contribution to private schemes.

CONTRIBUTORY MEMBER

- Maximum benefit is paid on an average contribution rate of 5% of your salary;
- You may elect to pay 3% or 4% of your salary and arrange to catch up at a later date, by increasing the rate to either 6% or 7%;
- A two year membership vesting period is required to obtain full benefits.
- Proof of age is required.
- Subject to a satisfactory medical certificate, insured benefits automatically apply from date of membership for members or their estates on disability or death.

Report on a workshop to establish a set of core attributes for vegetation survey sponsored by Environmental Resources Information Network of the ANPWS. Canberra 16-17th May 1991

by Neil Gibson.

Environmental Resources Information Network (ERIN) has been set up as a unit in the ANPWS to establish national environmental resource databases to aid in the resolution of land use conflict. These databases are envisaged to complement the resource databases presently being set up by National Resource Information Centre (NRIC) which is part of the Department of Primary Industries and Energy. To achieve this aim ERIN is attempting to integrate all available site record data (eg herbarium records, records of the National Insect Collection, vegetation survey data, etc.) held by State and research agencies into a national database. Some funding is available to compile these data into a suitable electronic form.

This workshop was primarily looking at vegetation data and had two major aims:

- (1) to help define a core list of vegetation attributes used in vegetation survey which will allow the maximum data compatibility between different agencies and researchers.
- (2) to examine the possibility of instigating a national list of rare and endangered communities.

The workshop also took the opportunity of familiarizing the participants with Environmental Resources Information Network's (ERIN) role and capability.

Vegetation attributes

ERIN supplied a draft list of "national core attributes for biological site records". These were worked through at workshop sessions considering each of them at continental, regional and local scales. The second question asked was which of these core attributes should be considered mandatory for a record inclusion into a national data base. This second question generated considerably more lively discussion both inside and outside the formal sessions than the first.

Considerable refinement of the draft core attributes was achieved. An updated draft will be circulated to the participants for further comment and this list should be finalized within the next 12 months. Basically the core attributes can be broken down into record attributes, location attributes, temporal / disturbance attributes, abiotic attributes, vegetation attributes and flora & fauna attributes. From this list a subset would be drawn for any particular survey depending on the purpose of the survey.

ERIN took the position that only the absolute minimum of these attributes should be considered mandatory (i.e. if not present then the record would not be incorporated into a national database). As a consequence they were strongly of the opinion that only some of the record attributes (who collected the data, plot size, time etc.) and the location attributes be considered mandatory. This lead one of the participants to point out that this would result in a national site based vegetation database in which no vegetation data (even species name) was mandatory. It is likely a category of "desirable" characters will be included in the draft.

Rare and endangered plant communities

In a session run by John Hicks of the Endangered Species Program (another ANPWS unit) he floated the idea of drawing up a national list of rare and endangered plant communities, similar in concept to the ROTAP list for individual species. Each of the State and Territory representatives was asked to outline what they considered the most threatened communities in each area. ESP was interested in developing such a concept to aid in prioritizing research and funding at the community level. They considered their funding role was in the development of recovery plans and the study of endangering processes of the communities most at risk.

It became clear from the ensuing discussion that if such a list was to be

developed a clear statement of the scale at which communities were defined would be needed and that this would vary between states. The information available in Victoria and Tasmania would allow definition of communities at scales of 1:25 000 or better, while the larger states need to use scales of 1:500 000 to 1:1 000 000.

It was recognized that the early lists would be approximations of reality but none the less would be of considerable use to both ANPWS and the States. At present only Victoria has legislation to protect endangered communities.

ERIN applications

As part of the workshop ERIN displayed some of the applications they have up and running. Several of these could be potentially useful to CALM.

- (a) NOAA continental coverage.

Beginning in February 1991 ERIN will be accumulating fortnightly NOAA imagery of all of Australia. They have the capacity to display this information down to the pixel level (1km²). This could be extremely useful in compiling maps of large fire and flood events, and in the detection of significant rainfall events in remote regions. This system should be operational in August 1991.

- (b) FINDAR directory

The NRIC has had a very sophisticated information retrieval system developed which can easily find information either by keyword search or by spatial searches. A fully implemented version of such a software package would allow quick access to all available information. A version of this software has been supplied to WALIS and the States are being encouraged to input information into this system to develop various national data directories.

While the software is very impressive the resources needed to implement and maintain such a directory, even in an organization the size of CALM, would be considerable.

(c) GIS

ERIN has a considerable variety of data captured by both raster and point source GIS systems (e.g. ROTAP sites, climate, political boundaries, river systems, etc). These data have been compiled under their National Index of Ecosystems and continental GIS systems. Such data in this format may be useful to CALM in the future.

Implications for CALM

ERIN has been given the job of assembling a national vegetation database that is useful in resolving potential land use conflicts. In addition they see themselves as a resource that can be utilized by contributing organizations. They do not appear to be presently funded at a level anywhere near necessary to achieve their primary role. Never the less they are a potentially useful funding source for databasing and perhaps biological survey work in the future.

During the workshop ERIN was careful to stress the care with which they managed data from outside agencies. They would like the data without any strings but have generally developed separate MOU's with each of their contributors. Under such arrangements the copyright of the data resides with the contributor and can be accessed by people outside of ANPWS only with the permission of the data collector.

In the next 12 months they are interested in capturing a wide diversity of data. They are prepared to help in the databasing of this information. The herbarium will be able to utilize some of this funding. Biogeography Program's suggestion of databasing the eastern goldfields floristic data is outside their priority areas for this year.

It is unlikely that ERIN will fund any new survey work in the foreseeable future (expect in political hotspots) since their available funds fall far short of that required to compile existing data. They are paying for the databasing of 80k records of the National Insect Collection over the next 12 months - this represents only 1% of this collection.

Conclusions

ERIN has an almost impossible task with insufficient funding. Despite this, considerable effort has been expended in designing highly flexible databases

and strategies for data capture. There appears to be a well defined set of policies in place to protect the copyright of contributing agencies. There appears no reason why CALM should not make maximum usage of the limited funding available to database information ERIN perceives to be important.

The core attributes discussed at the workshop will probably take a further 12 months to be finalized. Site based data collected by various programs of Research Division over the last 10 years will easily fit within the requirements of the proposed national database.

The ESP proposal for a national listing of rare and threatened ecosystems would seem worth adopting. It would raise the public and political profile of the conservation of plant communities, and since W.A. has by far the most serious problems in community conservation (i.e. dieback), it should aid in the directing of funding into this area.

A.P.P.S. RHIZOCTONIA WORKSHOP

Fungi of the genus *Rhizoctonia* were the subject of a three-day workshop held recently in the Department of Soil Science and Plant Nutrition at the University of Western Australia.

The workshop was conducted by Dr. Gordon MacNish and Dr. Mark Sweetingham from the W.A. Department of Agriculture. It was organised by the W.A. Branch of the Australasian Plant Pathology Society, with Dr. Elaine Davison (CALM) carrying out much of the behind-the-scenes preparation and administration. The workshop was sponsored by the Wheat Research Committee of Western Australia.

Among the 20 participants were seven CALM professional and technical staff from Research Centres at Como, Dwellingup and Manjimup.

Rhizoctonia species are important pathogens of cereal crops and grain legumes in W.A., as well as causing problems in nurseries. (*Pinus radiata* seedlings have been affected in CALM's Manjimup Nursery). Their

activity in native vegetation in W.A. has not been documented.

The identification of *Rhizoctonias* to species level is far from straightforward, and a good deal of time was devoted to the specialised techniques which have been developed. Of particular interest to CALM participants was the isoenzyme electrophoresis (pectic zymogram) technique. It may be possible to adapt this method to assist in the identification of *Phytophthora* species, and some other pathogens of native flora, in the future.

Mike Stukely
Como Research

BIOCLIM

BIOCLIM is a climate modeling program which has been developed by Nix and Busby during their time at CSIRO. Climate was modelled by fitting 16 mathematical climate surfaces to all available met station data across Australia. The 16 parameters include mean annual temperature, annual temperature range, minimum temperature of the coolest month, mean annual rainfall, mean rainfall of the wettest quarter, mean rainfall of the warmest quarter, etc.

The program can give two outputs. Firstly for any location (given as latitude, longitude and elevation) it can provide estimates of the 16 climate parameters. Secondly it will predict in which 0.5° latitude/longitude grid cells across Australia a similar climate exists.

Both outputs are ASCII files. To map predicted distributional data it is necessary to feed predictions data into a plotting program such as MAP PLOT (with some degree of preprocessing).

BIOCLIM has previously been available on CSIRONET. Research Division now has a PC version available (courtesy of John Busby) at Woodvale and the Herbarium. It is very quick to run with a full analysis of 100 input sites taking about 4 minutes on a 386 machine.

Neil Gibson



The pros and cons of learning from others in the herd

Why do birds flock, fish school, and mammals gather in herds? One idea is that individuals in a group can benefit from the experience of those around them - for instance, by monitoring how and where they forage, and what they eat.

Recently, two teams of researchers have carried out two studies to determine the truth of this "information centre" hypothesis. The first study, carried out on rats, supported the idea, the other, on zebra finches, showed that the benefits of such behaviour might be rather limited.

Bennet Galef and his colleagues of McMaster University in Ontario, Canada, carried out an investigation of captive rats (*Rattus norvegicus*). They found that an individual is able to tell what food another rat has eaten recently and to learn from their experience (*Animal Behaviour*, vol 41, p 295).

Galef fed rats food that was flavoured with cocoa, cinnamon, aniseed or marjoram. He then took each rat from its home cage and confined it in another cage with an animal that had been fed differently. After 30 minutes, he returned each rat to its home cage, and gave it a choice between two flavours of food. Neither flavour had it come across before, but one had been the diet of its partner of the past half hour.

Galef found a rat would select the flavour that had been fed to its temporary cage mate. Indeed, the rat would even prefer this novel flavour to a food it was familiar with.

This type of behaviour might well be sensible and adaptive, says Galef. In the experiment, he says, an animal is sampling a new food which a member of its species has shown to be palatable and harmless.

Galef and his colleagues have carried out similar experiments which have

shown that rats are influenced by their fellows in other foraging situations as well. For example, they use the experience of other rats to help them to decide where to seek food. They also use other rats' experience to avoid poisonous foods and choose foods that are nutritionally valuable.

But if animals that live in colonies can get information about foraging opportunities, might it not result in some individuals always being parasites or "scroungers"? Guy Beauchamp and Alejandro Kacelnik of the University of Cambridge set out to investigate this with zebra finches (*Taeniopygia guttata*). They found that, contrary to expectations, scrounging does not always benefit an individual (*Animal Behaviour*, vol 41, p 247).

Beauchamp and Kacelnik taught male zebra finches that if they pushed the door of a dispenser when a red light came on, they would be rewarded with food. They then introduced naive female finches to the experimental cages. Half were put with males as naive as themselves, and half with ready-trained or "knowledgeable" males.

Over the next week, the researchers regularly removed the females and tested them. They found that females that had been confined with naive males soon learnt the significance of the red light. However, females who had been with "knowledgeable" males were much more likely to peck the food dispenser at random, whether or not the red light was on.

Although the females that were confined with the "knowledgeable" males were able to exploit the skill of the other bird to gain more food, their "scrounging" was counter-productive. They relied on another's skill and so failed to learn about the environment and the foraging technique for themselves. (In the same way, humans driven around a strange town are slower to learn its layout than if they drive around themselves.)

The experiments on rats and finches show that animals can benefit from the foraging expertise of others, but it backfires if they always rely on it.

Georgia Mason

Release of the book 'Human Ecology - Coming of Age; An International Overview'

At the occasion of the Fifth International Congress of Ecology (Yokohama, Japan, August 23-30, 1990) INTECOL invited Shosuke Suzuki and Richard Borden to organize a major symposium on human ecology.

The symposium served different goals. Foremost was the need to portray an outline of contemporary human ecology. In this regard the organizing themes for this symposium have been threefold:

- to show where human ecology has developed,
- to illustrate what human ecology is,
- to show some examples of what human ecology is doing.

A second goal of the symposium was to recognize the philosophical and conceptual changes which are taking place in biological ecology and to identify their importance for human ecology.

A third goal has to do with the need to clarify questions of human-nature relations and demonstrate the value of a broad human ecology perspective in practical and theoretical terms.

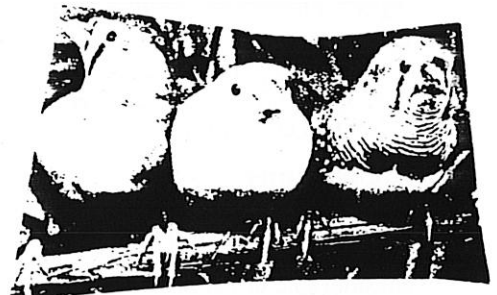
The book 'Human Ecology - Coming of Age: An International Overview' contains the proceedings of this symposium. It consists of twelve papers delivered by authors actively involved in human ecology from eleven different countries from three continents. Each paper contains two parts. In the first part, the emphasis is on the historical rise of human ecology within the region the author is from. In the second part the focus is on a study from that region as an example of human ecology in the practical realm. In this way the book provides a representative and useful overview of human ecology on an international scale.

The editors are Shosuke Suzuki (Japan), Richard J. Borden (USA) and Luc Hens (Belgium).

The book is available in paperback (ISBN 90-70289-81-4), contains 256 pages, costs 22 US \$ and can be ordered at every major bookshop or at the following address:


▪ VUB-PRESS
Pleinlaan 2
B-1050 Brussels, Belgium

Press review copies are available at the same address. They can be obtained on simple request.



Research Project Plans

The following Research Project Plans have been approved:

- | | | |
|---|---|---|
| <p>No: 60/90 Title: Re-establishing the rare and endangered Boodie (<i>Bettongia lesueur</i>) into the arid zone of mainland Australia: a pilot study Officers-in-charge: P Christensen and N Burrows</p> | <p>No: 55/91 Title: Mormopterus taxonomy Officer-in-charge: N L McKenzie</p> <p>No: 56/91 Title: Inoculation of <i>Pinus radiata</i> seedlings with different mycorrhizal fungi Officer-in-charge: Elaine Davison</p> <p>No: 57/91 Title: Analysis Software for survey data Officer-in-charge: N L McKenzie</p> <p>No: 58/91 Title: Eastern Goldfields Biological survey Officer-in-charge: N L McKenzie and G J Keighery</p> <p>No: 59/91 Title: Community structure Ecomorphological clues to community structure Officer-in-charge: N L McKenzie</p> <p>No: 60/91 Title: Kimberley Rainforests Officer-in-charge: N L McKenzie</p> <p>No: 61/91 Title: Mandora Palaeoriver/Radi Hills survey Officer-in-charge: N L McKenzie</p> <p>No: 62/91 Title: Buccaneer Archipelago survey Officer-in-charge: N L McKenzie and K F Kenneally</p> <p>No: 63/91 Title: Regional survey design Officer-in-charge: N L McKenzie</p> | <p>No: 64/91 Title: Database of mammal records from Australian islands Officer-in-charge: A A Burbidge and I Abbott</p> <p>No: 65/91 Title: Systematics and zoogeography of Australian landhoppers Officer-in-charge: J A Friend</p> <p>No: 70/91 Title: Biogeography and ecology of WA granite outcrop plants Officer-in-charge: S D Hopper</p> <p>No: 71/91 Title: A biological survey of the proposed Mt Windell (eastern access) road alignment into the Hamersley Range National Park Officer-in-charge: S van Leeuwen</p> <p>No: 72/91 Title: Flora surveys of the wheatbelt and other selected lands Officer-in-charge: S D Hopper</p> <p>No: 74/91 Title: Comparing floristic and structural data and satellite anematic mapper OTM imagery in the Walpole Nornalup and Mt Frankland National Parks Officer-in-charge: G Wardell-Johnson</p> <p>No: 77/91 Title: The early life-history of <i>Drupella cornus</i> at Ningaloo Officer-in-charge: S Turner</p> |
| <p>No: 24/91 Title: Annual waterfowl counts in South-western Australia Officer-in-charge: S A Halse</p> <p>No: 25/91 Title: Assessment of the value of different types of wetland for waterbirds using the Swan Coastal Plain as a case study Officer-in-charge: S A Halse</p> <p>No: 31/91 Title: Biological survey of the islands of Exmouth Gulf Officers-in-charge: N L McKenzie and A N Start</p> <p>No: 37/91 Title: Impact of Autumn (dry soil) burning on abundance of Jarrah Leafminer in Collie District Officer-in-charge: I Abbott</p> <p>No: 36/91 Title: Impact of prescribed Spring fire on rate of parasitization of Jarrah Leafminer mines in heavily infested Jarrah forest. Officer-in-charge: I Abbott</p> <p>No: 54/91 Title: Fire-Mulga Study - Project 1 Officers-in-charge: A N Start and S van Leeuwen</p> |  | |

No: 78/91
 Title: Biological survey of John Forest National Park and the adjacent Red Hill area
 Officer-in-charge: A H Burbidge

No: 79/91
 Title: Comparison of the efficiency of 4 grass specific herbicides to control weeds in the Tuart National park
 Officer-in-charge: R Fremlin



No: 81/91
 Title: Heat tolerance of *Phytophthora cinnamomi*, *P. citricola* and *Armillaria luteobubalina*
 Officer-in-charge: Elaine Davison

No: 82/91
 Title: Lead shot ingestion by Waterfowl
 Officer-in-charge: J A K Lane

No: 83/91
 Title: Biological survey of

Officer-in-charge: Serpentine National Park S Moore and A H Burbidge
 No: 84/91
 Title: Taxonomic and evolutionary studies of *Drosera* and *Byblis*
 Officer-in-charge: N G Marchant

No: 85/91
 Title: Taxonomic studies in Western Australian Myrtaceae
 Officer-in-charge: N G Marchant

Scientific and Technical Publications

The following have recently been approved for submission for publication:

Author: Kevin Kenneally
 Title: *Styloidium lateriticola*, a new species from the Perth Region, Western Australia
 For submission to: Nuysia

Author: Gillian Perry
 Title: Nomenclatural stability and the botanical code : A historical review
 For Submission to: Regnum Vegetabile

Authors: Helen R White and Raymond T Wills
 Title: Leaf spot fungus on *Acacia alata*
 For submission to: Poster presentation at 8th APPs Conference Sydney

Authors: Phil Fuller and A A Burbidge
 Title: Pelsaert Island, Houtman Abrolhos, Western Australia
 For submission to: Corella

Authors: A J Sharley, L W Best, J Lane and P Whitehead
 Title: An overview of lead poisoning in Australian waterfowl and implications for management
 For Submission to: Proceedings of International Workshop on Lead Poisoning in Waterfowl, Brussels

Author: G K Brennan
 Title: Basic and air-dried density and log moisture content survey of regrowth jarrah and karri
 For submission to: WURC Technical Report No 28

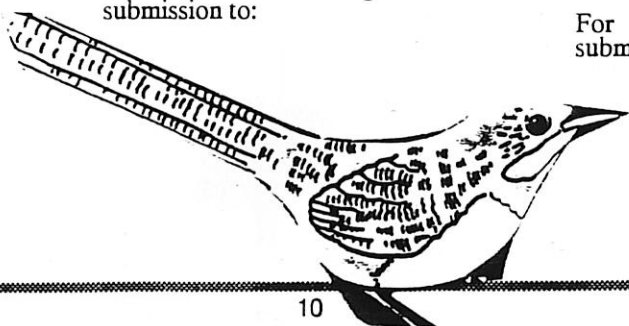
Author: S J Turner
 Title: The egg capsules and early life-history of the corallivorous gastropod *Drupella cornus* (Roding, 1798)
 For submission to: The Vellger

Authors: G K Brennan, B R Glossop and M E Rayner
 Title: Sawmilling regrowth karri of different ages from different site types and dominance classes
 For submission to: WURC Technical Report No 29

Author: J Lane
 Title: The wise use of wetlands - managing wildlife habitat
 For submission to: Proceedings of Wetland Conservation and Management

Authors: E R Hopkins and T B Butcher
 Title: Improvement of *Pinus pinaster* AIT. in WA as a bulletin
 For submission to:

Authors: E R Hopkins and T B Butcher
 Title: Provenance comparisons of *Pinus pinaster* AIT. in WA as a Bulletin
 For submission to:



SCIENTIFIC PUBLICATIONS EDITORIAL COMMITTEE

The Scientific Publications Editorial Committee (SPEC) was formed shortly after the inception of CALM to oversee matters relating to the editing and publishing of research and technical material. During its first two or three years the committee set about the large task of integrating and rationalizing the scientific publishing guidelines of the three Departments which amalgamated to form CALM in 1985. This culminated in the production in April 1989 of a "Guide to Authors - Requirements for CALM Technical and Scientific Manuscripts Presented for Publication" which was prepared by the Scientific

Editor, Marianne Lewis. This Guide set out to 'clarify requirements, criteria and policy for Departmental scientific and technical publishing, and assist authors and editors in the preparation and progress of these manuscripts'.

With this major reorganization and rationalization completed SPEC's primary role is now to facilitate the refereeing, editing and publishing of research and technical material within the above guidelines. However a new initiative currently before the committee is the amalgamation of journals such as Kingia, Research Bulletins and Technical Reports into a



single CALM Journal. This proposal has been approved in principle by the RDPG, and Marianne is currently preparing a set of guidelines for consideration by the Corporate Executive.

I am the Woodvale representative on the Committee, and the other members are: Ian Abbott (Chairperson), Marianne Lewis (Scientific Editor), Stuart Crombie (Dwellingup) Nick Lander (Herbarium) and Frank McKinnell (SOHQ). Feel free to approach any of us if you have any publishing or editorial queries.

Gordon Friend



SNIPPETS SNIPPETS SNIPPETS

Brian Morgan awarded First Class Honours for his project on Survival of *Phytophthora cinnamomi* Zoospores.

Vinca Bijman, a Dutch volunteer student is currently working with Bryan Shearer for 5 months with the view to writing his M.Sc thesis.

Bryan Shearer (Plant Diseases Program) has received the final approval of a grant from the Minerals & Energy Research Institute of WA.

The grant will fund a Research Scientist for three years in the biology and control of *Phytophthora Citricola* in natives plant communities affected by mining.

Narrogin Coffee Shop

All researchers and technicians doing work in the Narrogin area are encouraged to drop in for a cup of coffee with me, a chat about their work and the latest research div gossip! I might even be able to help with some

local information or fieldwork. This would help to provide a better background for my research as well as contact with staff in other programs.

Patrick Piggott

*Research Station, located in the
Ag Dept Annexe
10 Doney Street, Narrogin
098 810233*



TIME MANAGEMENT COURSES

by Tony Start

A lot of people have taken time management courses and many others are thinking of doing so. There seem to be many different courses (and costs) to choose from but opinions on which one is worth while and which is not are as variable as the guesses about what wine we're sampling at the Woodvale Wine Club.

One reason for the conflicting and confusing opinion is that each course is designed to meet the specific needs of people in particular circumstances. If you select a course on the basis of "Time management" somewhere in the title, you have a fair chance that it won't suit your needs.

I asked Alan Scott for advice. He recommended the AIM series of courses. Summaries of their range of Time Management courses follow. The prices for attendance at one day courses seems to be about \$245.00 and the available dates are fairly restricted.

However AIM tell me that they will bring courses to us. We need to have groups of 10 to 15 people per course and the cost is about \$1350.00 per course. (10 people = \$135.00 per head; 15 people = \$90.00 per head).

HELP

If you have done a time management course in the last year or two please send me a note detailing:

* Which course did you do?

- * What were its high points/low points?
- * What did it cost?
- * Was it value for money?

If you would like to do a course:

- * Would any of the AIM ones suit your needs- which one?
- * Would you like me to arrange for AIM to come to us?
- * Are there any others that have caught your attention that we should recommend or bring in-house?

Advanced Time Management — Time and the Team

Managerial time is a precious resource, often squandered because of the very nature of managerial work. Managers' time is generally not their own — frequent interruptions, handling crises, putting out fires and reacting to the needs of others (superior, subordinates and peers). The missing link between managerial productivity and organisational productivity, critical for overall success is the manager workteam interface.

While it is important for individuals to recognize their personal time management problems, they also need to examine their work group. This course will concentrate on that management/organization interface and focus on the manager's role in contributing to or deterring work group productivity.

CONTENT

- What is productivity? Effectiveness vs Efficiency.
- Managing subordinates' time.
- Delegation.
- Meetings.
- The Manager/Secretary team.
- Audits of team skills for productivity.
- Organising the work space.

COURSE OUTCOMES

At the end of the course participants will be able to:—

- Develop a team time management focus.
- Differentiate between effectiveness and efficiency in their work place.
- Apply new strategies to meetings.
- Delegate efficiently and effectively.
- Analyse their work space for productivity gains.

WHO SHOULD ATTEND

Managers and supervisors of work teams or work units: individuals who want to examine their effectiveness in relation to their work units. This course will not address individual time management needs — participants will need to have previous self analysis of time management skills. Some pre-workshop preparation is required. N.B. This course is likely to be even more effective if several or all members of the team attend to allow "functional group" analysis and reinforce the implementation and use of time management techniques.

☎ 387 7788

Title: Advanced Time Management

Course No.: 133

Duration: 1 day

Times: 9.00-5.00

Dates: 6 June
6 August
19 November

Fees: AIM Members \$210 Non-Members \$245

Time Management — Organising Yourself

It seems to be a common belief that by working harder, or for longer hours, you'll achieve more. This is a myth. Many find themselves overworked, but feeling little sense of achievement. This is based on an inability to work effectively rather than efficiently; or a failure to understand just why they aren't getting things done.

This one day workshop approaches Time Management from a personal perspective. The key to effective time management is effective self management and the key to that is to first understand what you do and why you do it.

CONTENT

This workshop is highly interactive — participants should be prepared to do some intensive self analysis as an integral part of the process. There will be small group exercises; facilitator intervention and video presentations throughout the day.

Information/Topics covered include:—

- A personal profile — what you do now.
- The effect of individual personality on workstyle — you need to accept, understand, and work with your natural style.
- The clear desk a myth for some.
- Recognising the link between personal values and productivity.
- The link between time management and stress.
- Hints for effectiveness.
- Action planning for change.

COURSE OUTCOMES

Participants will benefit from taking 'time out' to assess their current patterns of behaviour. As a result they should be able to:—

- Keep regular tabs on their own performance.
- Plan and act more effectively.
- Reorganise their environment to improve effectiveness.
- Spend more time on important tasks.
- Feel more in control; and a greater sense of achievement.

WHO SHOULD ATTEND

Individuals at all levels who wish to take more personal control of their time.

☎ 387 7788

Title: Time Management

Course No.: 134

Duration: 1 day

Times: 9.00-5.00

| | |
|--------------------|------------|
| Dates: 11 February | 13 August |
| 11 March | 1 October |
| 23 April | 6 November |
| 4 June | 9 December |
| 29 July | |

Fees: AIM Members \$210 Non-Members \$245

Time Manager Effectiveness

A world ranking improvement seminar for results-committed business people. Gives you a fresh start, a new attitude of mind, a new approach to life and work.

The Time Manager System has already proved itself in Western Australia with organisations as diverse as Computing, Banking, Retail Shops, Restaurants and Engineering and Mining, finding benefits for managerial efficiency and organisational effectiveness.

OBJECTIVE

To provide the means by which men and women can be more efficient and effective whilst enhancing their quality of life at home and at work.

CONTENT

- Lack of time, a daily problem for most, but why?
- Time planning and personal development.
- Resources in personal development.
- Demands at work — setting the work agenda.
- Demands of life — setting the personal agenda.
- Obstacles to effective planning.
- Effective communication — networking.
- Time Manager Planning Tool.
- Better Delegation.
- Deskwork.
- How to get started.

Delegates will receive a 112 page illustrated self-instructing workbook 'Me, My Time, My Life' and the unique Time Manager System tool — an attractive binder and storage folder together with a 36 page illustrated User Manual.

COURSE OUTCOMES

On completion of the course, participants will:

- Locate at least an additional 500 productive hours per annum.
- Be in better control of their time.
- Delegate more effectively.
- Set and achieve realistic and challenging objectives.
- Improve interpersonal communication skills.
- Spend more time with family and friends.

WHO SHOULD ATTEND

Senior and middle level executives who want to be more effective and make better use of time, together with all men and women whose work requires them to influence others and to develop the business they are in.

☎ 387 7788

Title: Time Manager Effectiveness

Course No.: 113

Duration: 2 days

Times: 9.00-5.00

| | |
|--------------------|-----------------|
| Dates: 11-12 April | 12-13 September |
| 27-28 June | 14-15 November |

Fees: AIM Members \$840 Non-Members \$925

Time Management in Sales and Marketing

Time management and the broader scope of personal effectiveness have become key areas of concern to the truly capable sales and marketing people. This new course will give immediate and lasting benefits.

CONTENT

Establishing work goals.

- Setting daily priorities.
- Territory planning.
- Setting up a daily 'to do' list.
- Handling and controlling paperwork.
- Establishing the 'time robbers' and working on them.
- Making use of 'waiting' time.
- Identifying the role of the sales force.
- Maximising returns on calls.
- Achieving worthwhile results.

COURSE OUTCOMES

The course contains literally dozens of good ideas — proven ideas used by thousands of Australian sales and marketing people. Effective use of these ideas will result in immediate and visible personal effectiveness.

Application of the principles covered in this one day activity will result in a significant improvement in personal company income.

The outstanding time management film 'Time of Your Life' will be screened for participants.

WHO SHOULD ATTEND

Marketing and sales personnel at all levels.

ALL OF AIM's public and in-company training courses are 'Structured' and satisfy the criteria for eligible training programmes and expenditure.

☎ 387 7788

Title: Time Management in Sales and Marketing

Course No.: 213

Duration: 1 day

Times: 9.00-5.00

Dates: 3 May
1 November

Fees: AIM Members \$210 Non-Members \$245

Time Management for Secretaries

This one-day programme provides a specific framework for support staff effectiveness. The accountabilities and how to make them happen. The vital influence of TIME and how to define and meet deadlines realistically. How to interact with co-workers, managers and supervisors in a mutually acceptable manner. How to perform in an organised manner, providing effective interfaces for other departments and the outside world.

OBJECTIVE

To enable secretarial staff to understand their use of time and plan it more effectively.

CONTENT

- Understanding and rating objectives and priorities. Time should go where the priorities are, not where you think they are.
- Self-discipline. How to control eliminate time wasters.
- How to plan, organise and schedule effectively.
- How to use tact, diplomacy and assertiveness to meet deadlines, and cope with the unexpected.
- How and when to delegate (what, to whom, and why).
- Communicating more effectively — how to minimise breakdowns and conflict caused by misunderstandings.
- How to develop a personal action plan to accomplish more each day, as a matter of habit and self-improvement.

COURSE OUTCOMES

Upon completion of the course, participants should be able to:

- Show full awareness of manager priorities and objectives.
- Demonstrate greater confidence and poise in fulfilling commitments.
- Competently rate objectives, priorities as a habit.
- Manage effectively all interruptive influences.
- Effect face-to-face communication with improved results.
- Place more emphasis on results, less on activity and effort.
- Exhibit ability and readiness to accept greater responsibility, accountability and to grow under positive expectation.

WHO SHOULD ATTEND

Secretarial, administrative and other support staff in every type of commercial, industrial, technical, administrative and educational situation, as well as supervisors of office support services.

☎ 387 7788

Title: Time Management for Secretaries

Course No.: 412

Duration: 1 day Times: 9.00-5.00

Dates: 31 May 5 August

Fees: AIM Members \$210 Non-Members \$245

MAC COMPUTING JARGON

Ray Wills Editor CALM MAC USER

One of the problems that new computer users face is the jargon that old computer users are throwing around. For new users, here are some of the more common jargon terms explained, a few just a little facetiously (qv 'IBM')

ASCII: American Standard Code for Information Exchange - established in 1967 as a standard machine code, virtually every personal computer in the Western world uses the ASCII character set. 256 characters are represented by a unique 8-bit digital number in the computer. (A new industry-standard code - "Unicode" - is now being developed to cope with all the world's major languages including Japanese and Chinese [New Scientist, 9 Mar 91, p.22])

Bit: Short for binary digit (either 0 or 1)

Byte: A group of adjacent bits configured to represent alphanumeric data.

CAD: Computer Aided Design - Using computer graphics capabilities to aid in the design, drafting and documentation of a product.

Compatibility: pertaining to the ability of one computer to execute programs of, access the data base of, and communicate with, another computer (also communication between computer programs).

DA-Desk Accessory: useful gadgets that sit under the (apple?) in your menu.

Desktop computer: Any computer that can be conveniently placed on the top of a desk (and you can't get more convenient than a Mac!!!)

Disk Drive: a magnetic storage device that records data on flat rotating disks (floppy disk or diskette - so keep away from magnets!).

Firmware: operating instructions which must be available for the computer when it is switched on - stored in ROM (qv) (qv Hardware, Software, Shareware, Vaporware, Liveware).

Hardware: the physical devices that make up the computer system (qv Software, Vaporware, Shareware, Liveware)

HD: abbreviation for hard disk or high density (qv).

High density: refers to the 1.4 mb disks which can be read by the Mac Superdrive.

I/O: Input/output.

IBM -

1. Intercontinental Ballistic Missile - antiquated thermonuclear device.

2. (or IBM-compatible) - International Business Machines - manufacturers of antiquated computer used by blinkers philistines

INIT: a startup file that is loaded into RAM when the machine is switched on.

KB: kilobyte.

Liveware: the people using a computer system (qv Hardware, Firmware, Software, Vaporware, Shareware).

MB - Megabyte: one million bytes of storage.

MSDOS: Microsoft Disk Operating System - the computing code used to operate most IBM and IBM-compatibles.

Operating Systems: The software that controls the execution of all applications and systems software programs.

OS/2: IBM's most recent version of the disk operating system on the latest IBM-type machines.

PC: Personal Computer - (see also IBM).

Peripherals: The bits that hang off your Mac that make it even more useful - printers, scanners, plotters, video recorders, the Space Shuttle...

RAM cache: a utility that allows you to load information into RAM (qv.) so that the things you do on your Mac will go even faster.

RAM: Random Access Memory - the working memory area of the computer into which the system is loaded when the machine is switched on (booted) and into which applications and documents are loaded while you use or access them.

ROM: Read Only Memory - RAM that can only be read, not written to.

SIMMS: the computer chips that make up your RAM. Machines with 1 mb of RAM have four 256 kb SIMMS.

Shareware: non-copyrighted programs that are free to all users of a computer system (qv Hardware, Firmware, Software, Vaporware, Liveware).

Software: the programs used to direct the functions of a computer system (qv Hardware, Firmware, Vaporware, Shareware, Liveware).

User: you (see also Liveware).

User friendly: pertains to a computer system that allows a person with relatively little computing experience to use the computer. Synonymous with Macintosh.

Vaporware: programs announced by developers which will do everything you ever imagined computers could do (and more), but which never actually appear on the market place (qv Hardware, Firmware, Software, Shareware, Liveware).

Virtual Memory: uses the computer's storage devices (e.g. the hard disk) to act as extra RAM (qv).

SEMINAR

Thursday 20 June 1991

Fire Management in the western United States : some contemporary issues

presented by Lachie McCaw

Fire managers in the parks, forests and rangelands of the western United States face a number of important issues in the 1990s. The extensive fires of 1988 in the Northern Rockies have prompted a thorough review of fire management in wilderness areas, and highlighted the need for fire behaviour prediction systems capable of dealing with crown fire and long distance spotting.

From a silvicultural standpoint there is now strong evidence of the need to re-introduce periodic fire into ponderosa pine forests.

Legislation governing smoke emissions, and the encroachment of urban settlement into wildlands are restricting the opportunities for widespread application of prescribed fire.

These, and a range of other fire management issues, will be discussed in the format of a slide talk.

Venue:
Training Centre
CALM State Operations Headquarters
Hayman Road
COMO

Time:
3.00pm

