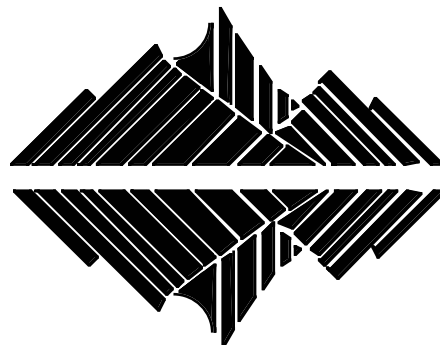


Ecological Society

Newsletter



No. 88, June 1998

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NOTES FROM COUNCIL

Council met on 19 May 1998. Items discussed; Environment/NGOs meetings with DOC in Christchurch - Dave Kelly will try one out and report back. Professional bodies meetings in Wellington by MfE, NZ EcolSoc isn't on the lists any more. Wren to check why not. New Membership leaflets will be printed showing new membership rates, put in requests to Susan Sheppard if you would like some for distribution. Finances in good health.

NZJE is gaining a higher impact factor. This is most pleasing, and Council thanks Gábor for the very efficient management of the journal at present, and to Jill Rapson who steered to the journal during the period when impact factors started to rise. There was some discussion about rules regarding ongoing debates in the Newsletter. Debate is encouraged; but editor has the right to terminate discussions if they get boring or circular.

Conference 1998 was discussed, making good progress and organisation well in hand (see this issue for registration forms). Conference 1999 and 2000: there were no responses for venue or themes. Council suggested a provincial centre next year maybe Blenheim and possibly Auckland, or vicinity, in 2000 with a theme of "state of the NZ environment". Suggestions and opinions welcome.

A submission from EcolSoc regarding cultural harvest has been submitted.

Section 6C of RMA workshop: Held 14 May with 21 ecologists and 10 MfE, DOC, Regional Council people. Discussion was on modifying or extending PNA criteria for RMA use. However to meet Section 5 of RMA (sustainability) need to consider connectivity and process, whereas PNA was very isolated-site-specific. Good discussions - for more details see item this issue.

Professional Society discussed again, see item this issue. Foresight project: Environmental Health

workshop to be organised as part of the process, on 22-23 June 1998 at Royal Society in Wellington. Wren is to represent NZES with a 20 minute talk on *science policy on the environment: gaps and future directions*.

Conservation Boards: NZ EcolSoc made one nomination: Richard Sadler for Wellington Conservation Board. We should do more. There will be more vacancies each year with staggered terms of 3 years. Are any member interested in standing for these positions, please let Craig Miller know.

Education directions: Terri McClelland (Invercargill) is to look at what is going on now in NZ schools and give us a summary of what gaps there are. Please feel free to forward any comments, suggestions, ideas to Terri.

Next meetings are scheduled for 25 August and 25 November (night before AGM)

Annual reports will be included in the next issue of the newsletter.

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IUCN NEWS ITEMS

Here's a smorgasbord of news from IUCN for your light reading over tea-break.

The search is underway for a new Director-General. New Zealand's own David McDowell announced his intention of stepping down from the top job at the end of 1998. Now begins the task of balancing North/South, gender, age, scientist/manager considerations to find the perfect candidate for one of the world's more challenging positions.

The venue for the Second World Conservation Congress has been decided. Pack your suntan lotion, IUCN is off to the Middle East for the first time. The Government of Jordan is to host the mega-event in their capital Amman in 2000. It will probably be held in the northern autumn.

The conservation publication of the year was launched on 8 April. The "1997 IUCN Red List of Threatened Plants" has been 20 years in the compilation. The depressing news is that it lists 34,000 plant species, or 12.5 % of the world's vascular flora as threatened with extinction. Of these a staggeringly high 91% are endemic to single countries. I suspect the list will be larger still when the fires that have been raging this year in Mexico, Indonesia, Brazil and Surinam are evaluated.

The New Zealand figures, which are probably under-estimates according to Dr David Given, list 211 threatened species out of 2382, i.e. 8.9% of our total vascular species. Copies of the 1997 Red List of Threatened Plants can be obtained from: IUCN Publications Services Unit, 219c Huntingdon Road, Cambridge CB3 0DL, United Kingdom. Fax is +44-1223-277175 or try their email: iucn-psu@wcmc.org.uk. The cost is 30 Pounds or US \$45 plus shipping costs. The good news is that the price drops by 33% for members of IUCN Commissions or IUCN members.

Our application for membership is now formally out for comment to the IUCN membership. The NZ Committee of IUCN that met on 4 June endorsed it and I'm confident that it will be on the next Council agenda for acceptance in November.

At the April Council meeting we approved a gender policy for the Union with an action plan to mainstream gender in the policies, programmes and projects of IUCN. Anyone interested in a copy can contact me. Significant progress is also being made on developing a social policy for IUCN.

IUCN, along with WWF, is also working at the top levels of the Chinese Government to provide them with ongoing advice and expertise as China considers the environmental implications of its massive development and energy projects.

In March I participated in a workshop that developed the framework for an IUCN initiative on invasive species. Dr Mick Clout (U of Auckland) is very much involved in this as well. The initiative will focus on four areas: improving the knowledge/science understandings of invasives, building the management capacity, improving the policies/laws at national and international levels, raising public awareness of the threats posed by invasive species.

Wren Green, *IUCN Regional Councillor*

UNITED NATIONS AWARD FOR DON MERTON

The United Nations Environment Programme (UNEP) announced on 25 May 1998 that Don Merton of New Zealand has been elected to the prestigious ranks of its global 500 roll of Honour for his outstanding contributions to the protection of the environment.

Don Merton, an officer with the Department of Conservation National kakapo team, has had a life-long passion for, and an active involvement in, the recovery of critically endangered species. A pioneer in the management of New Zealand's sadly swollen list of animals facing extinction, Merton is known for his key role in the rescue and recovery of some of this country's and the world's most endangered birds. These include the echo parakeet of Mauritius, Abbott's booby of Christmas Island, the noisy scrub-bird of Western Australia, the Seychelles magpie robin, the Chatham Islands black robin and the New Zealand saddleback and kakapo. No other conservationist in the world has been directly involved in as many bird rescue programmes, said BirdLife International, the global agency responsible for bird conservation.

The award will be presented to Don at the World environment day ceremonies on 5 June 1998, in Moscow, Russian Federation. This day was established by the United Nations General Assembly in 1972 to focus global attention and action on environmental issues. Some 664 individuals and organisations, in both the adult and youth categories have been honoured since UNEP launched the Global 500 award in 1987. Previous New Zealand recipients include (Sheila) Gwennifer Davis, Loraine Adams, Sir Edmund Hillary, Bob and Janice Jones, the Rt Hon Sir Geoffrey Palmer and the late Dame Whine Cooper.

Sourced from Doc Gazette

A PROFESSIONAL BODY FOR ECOLOGISTS

Over the last ten years the issue of whether there should be a professional body for ecologists and similar groups has been raised a number of times in the Society. While some general discussions have been held, little progress has been made in developing a specific proposal for either a structure or programme to address the issue.

While on Council until last year, Ian Spellerberg made contact with a number of established professional bodies, to discuss their approach to management and opportunities for ecologists (or other environmental professionals) within their organisations. He held a meeting in Wellington last year with interested parties, but the idea did not progress further. Due to heavy work commitments, Ian is unable to continue pursuit of these ideas, and I have taken on the role.

One of the things we need to get our minds around is **what makes a Professional ecologist?** One definition of a “profession” is:

a vocation whose practice is founded on an understanding of the theoretical structure of some area of learning or science, and upon the ability to apply this theory in practical situations”

That definition goes on to suggest some essential criteria for a profession and its practitioners, which we could debate:

- specialised knowledge - theoretical and applied
- an ability to temper theoretical and technical decision-making with wisdom and an understanding of the wider consequences of those decisions
- a belief in service to the client”

This focus on application and service to the client might exclude researchers or university staff, but would benefit those applying ecological principles in resource management or design.

The matter was discussed (again) at the May Council meeting. There is still uncertainty in a number of areas, so it was agreed that Caroline Mason and I should prepare a paper for the next Council meeting outlining “Issues and Options”. I would appreciate your thoughts on some of these questions...

1 What would be the purpose of a professional body for ecologists?

Could include:

- providing accreditation recognised by non-ecologists
- information on business/ commercial matters
- improving professional skills
- a support network

2 Do you think that there is a need for a professional body for ecologists?

3 What would the “Body” do?

Could include a range of “services” to members, including:

- continuing professional development courses,
- directory of members/ capabilities,
- newsletter,
- journal,
- advertising for jobs,
- legal support,
- input to appropriate curricula,
- setting standards for entry,
- certification/ accreditation,
- maintenance of standards of the profession,
- international contacts, Code of Practice, Code of Ethics,
- disciplinary action

4 Are these the matters that a professional body should/ could do? Are there other issues?

5 What should it cost to be a member? What sort of fees would you be prepared to pay for registration body? For a full-time secretariat?

6 What makes “Ecologist” a profession? Who should be a member?

Are other professions similar enough to benefit from a single “Body”?

Should this replace the NZ Ecological Society - maybe with non-professional members having “associate” status or similar? Or be a separate organisation?

7 Should we join with an already established body?

Do you think that we have enough in common with any other group to consider joining them?

These are just some of the questions to be addressed before the August Council meeting - Caroline and I will next:

- consider your comments on the above questions or any other aspects
- look at issues and options in detail including discussing them with existing bodies;
- prepare a discussion paper for the August Council meeting and next newsletter
- take recommendations from Council to the November conference, where they will be discussed at the AGM

Contributions from any members who wish to be involved in developing the issues and options paper would be welcomed - please contact Caroline or I direct (see back page for contact details)

The pressure for a professional group is growing - your comments are vital for its role and structure.

Dr Judith Roper-Lindsay, Councillor and
Caroline Mason, Immediate Past President

ECOLOGICAL CRITERIA AND "SIGNIFICANCE"

On May 14th a one-day workshop was held in Wellington to discuss criteria for determining ecological significance according to Section 6(c) of the Resource Management Act (see last newsletter for background). The workshop was jointly organised by the NZ Ecological Society and the Ministry for the Environment. It was attended by 21 ecologists and planning and policy staff from MfE, Local Government NZ and DOC.

Lindsay Gow (Deputy Director, MfE) welcomed participants, noting that they had all given met their own time and travel costs, indicating the importance that they felt the subject had. Nicola Carrell, from the Ministry's legal section, discussed the hierarchy of matters in Part II RMA, and summarised some of the little case law on "significance". Then David Norton presented an ecologist's overview of the background to describing and evaluating areas, in particular noting the different approach called for under the RMA from earlier Reserves Act and PNA programme methods.

The rest of the day took the form of small group sessions, reporting back to full sessions and worked through the idea of a set of nationally accepted criteria to their application at local levels.

There was a lot of discussion of the "traditional" criteria for evaluating the significance of areas for nature conservation - representativeness, rarity, diversity, distinctiveness, naturalness, intactness, integrity, presence of special features etc. It was agreed that these types of criteria, which formed the core of the Protected Natural Areas programme, were still useful, but that Section 5 RMA demands additional criteria which reflect the role that an area plays in ecological processes and its part in the wider landscape. (Section 5 sets out the Purpose of the Act and, in short, is the part in which "sustainable management" and the need to consider both protection of resources and well-being of communities is identified)

On this basis, concepts such as connectivity, connectedness, potential for restoration and context were discussed and recognised as probably appropriate to define an area as significant under Section 6(c).

It was generally accepted by the group that from terms such as these a set of "national criteria" can be drawn, but that their application may vary from place to place. There was also discussion of scale and temporal and spatial frameworks for application. For example, whether the Ecological Districts framework is useful when dealing with a territorial local author-

ity - answer: yes; or whether 1840 is a useful baseline against which to assess representativeness - answer: not always.

At the end of the day it was agreed that this type of information needs to be documented, to provide a simple reference for landowners, local authority staff and councillors and ecologists. This would provide the transparency that has been missing from some local authority assessments, and which has led to confusion in the minds of the public. It was also agreed that there needs to be clear separation between the scientific process of description and evaluation of ecological significance or areas, and the political or community values put on such areas and the extent to which their protection is pursued.

The Workshop is part of the Ministry for the Environment's wider programme for better interpretation and implementation of the RMA, and a separate strand of this involves looking for ways to incorporate community values into the process. Other steps include identification of threats to ecological values, and management regimes and tools for protecting those values. Ministry staff are now looking at options for producing a "Discussion Document" on ecological criteria, which is likely to include peer review by those present at the workshop (and others who are interested).

The Workshop was an opportunity for ecologists from throughout the country, who have been working on "significance" assessments for a range of clients, to get together to discuss their methods and concerns. It was probably the first time that such a group has considered ecology and RMA matters since we made submissions on the Bill about 10 years ago. I think that all who took part found it an stimulating and valuable day - and one which will mark the start of better communication of ecological ideas to the public.

Dr Judith Roper-Lindsay
Councillor

MUTUALISTIC RELATIONSHIPS BETWEEN PLANTS AND ANIMALS

The upcoming NZES2A conference in Dunedin in November will have a symposium on plant/animal mutualisms. This is intended to compare NZ and Australian mutualisms, which are principally pollination, dispersal and ant/plant relationships.

These relationships are often very locally adapted (thus making great natural history stories) and may be particularly vulnerable to disruption from invaders or disturbance. Novel mutualisms may be springing up as communities absorb alien species.

Any papers on any aspect of these issues (or anything we have left off!) are welcomed. Tentative papers in hand so far include the following :

- how much does dispersal matter to plants
- what do NZ pigeons eat and how do timing and nutritional quality affect diet and dispersal
- how does possum herbivory affect fruit availability and what impact does this have on frugivores and dispersal
- why are bellbirds not pollinating enough mistletoes at Craigieburn
- disrupted mutualisms on the NZ mainland

What we don't have so far is stuff on Australia and stuff on ants. So any offerings are welcomed, and we also welcome suggestions of people to approach. Please send suggestions to the organisers, preferably by 31 July:

Dave Kelly, Plant and Micro Science
University of Canterbury,
Private Bag Christchurch NZ.
Fax (03) 3642083, phone 3642782,
email: d.kelly@botn.canterbury.ac.nz

or

Alastair Robertson, Ecology Dept
Massey University, Palmerston North, NZ.
Fax (06) 3505623, phone 3569099,
email: a.w.robertson@massey.ac.nz

JS WATSON CONSERVATION TRUST

This trust is administered by Forest and Bird. Applications are invited from individuals or conservation groups for financial assistance for conservation projects over the 1998-99 year.

The criteria for assistance are

- The conservation of plants and animals and natural features of New Zealand
- The advancement of knowledge in these matters by way of research, literary contributions, essay or articles, or other efforts
- General education of the public to give them and understanding and love of the world in which they live.

A total of around \$20,000 is available for distribution. Individual applications should be limited to a maximum of \$4,000.

For further details and application forms write to:

Forest & Bird
PO Box 631
Wellington

Applications close 31 July 1998

CONSERVATION ESTATE – UNFINISHED BUSINESS

When speaking at a symposium marking the retirement of Professor Alan Mark, I acknowledged his tremendous achievements with respect to the conservation estate, but felt it timely to dwell on current political, social and economic trends that impact on its management. As I believe that ecologists should be heard on these issues, I offer this precis:

Two pervasive forces "threaten our conservation". One is global; the increasing world population and per capita use of resources, and international selfishness that permits only lip service towards halting the deterioration of the world environment. The other force combines our inability to heed lessons from world trends with the adoption of new-right economic dogma. Global and national economic strategies combine into unquestioning commitment to growth, some manifestations of which seem ultimately incompatible with our continued existence on the planet.

New Zealand's population has an enviable low rate of natural increase. But as this doesn't satisfy the requirements for economic growth, we seek to attract tens of thousands of immigrants yearly. We should question current immigration levels, and should not eschew discussion of cultural aspects that impact on conservation as being too sensitive. An example is stripping of intertidal food resources by recent immigrants. Another is East-Asian wealth as the driving force behind poaching endangered animals and plants, to satisfy medical and culinary whims. In similar vein, we should question whether it is appropriate for Maori and pakeha to be negotiating competing rights and interests on land protected for the benefit of our nation and the world.

The top management priority for the conservation estate must be protection of natural features and the communities of native plants and animals, followed by the need to provide enjoyment and inspiration for New Zealanders and visitors. Today, it can seem that there is more emphasis on facilities that generate revenue from money-paying tourists. A remunerative tourist industry is presumed to boost conservation prospects, but down-sides include relentless pressure to increase amenities, such as roads that destroy wilderness and form conduits for weeds. While many tourists are supportive of environmental matters, much of what goes on in conservation areas is objectionable, examples being the roar of helicopters around South Westland glaciers, and the infiltration of 'adventure tourism' into wilderness.

Conservation managers should be 'hands-on' and know their areas intimately, so that each species, community, and landscape unit can be managed

appropriately. Instead, the public perceives departmental staff as desk-bound bureaucrats, and poor morale pervades much of the department.

Managers must be able to call on scientists for advice, that is continually updated on the basis of research in New Zealand and overseas, yet tailor-made to specific problems. Information must be adequately recorded, to provide continuity of knowledge and practice. Local staff should be able to join scientists in the field, and rare plants should not be at risk because rapid staff turnover destroys institutional memory of their existence.

Conservation research is now more focussed, but far less energy should be expended in sequestering a share of scarce funds. Should the nation, rather than foregoing tax revenue, itself fully fund conservation of kiwi and kakapo, instead of depending on corporate funding that may not outlast the advertising appeal of the icons?

In conclusion, we must continue to seek adequate resources for managing the conservation estate, and create an environment in which managers can manage and scientists can provide research support, without being hampered by time- and money wasting trivia forced on us by advocates of the corporate model.

Peter Wardle, Research Associate
Landcare Research
Email: WardleP@landcare.cri.nz

MANGROVE DIEBACK AT WAITAKARURU

One of the largest mangrove (*Avicennia marina* subsp. *australasica*) ecosystems in New Zealand occurs as an almost continuous strip defining the coastline of the Firth of Thames. In total this strip covers approximately 900 ha. In the latter half of 1997, several kilometres of mangrove trees either side of the Waitakaruru River mouth suffered defoliation and dieback. I was fortunate to inspect these mangroves in December 1997 at the invitation of Grant Barnes from Department of Conservation.

We noted two regular features of partially defoliated trees: (1) leaves below the high tide mark were largely unaffected, and (2) many leaves still attached had been 'rolled' to encase insect larvae. A particular species of small moth was also abundant. John Dugdale from Nelson kindly identified specimens of these larvae and moths as the mangrove leafroller (*Planotortrix avicenniae*), a moth endemic to New Zealand mangroves. John remembers occasional episodes of heavy mangrove defoliation near Matakana Island in the 1960's as a result of epidemics of this moth. It therefore seems likely that the Waitakaruru defoliation episode was also a result of an epidemic of the mangrove leafroller.

Severe defoliation of *Avicennia marina*

(Anderson & Lee 1995; Murphy 1990; West & Thorogood 1985) and *Avicennia alba* (Piyakarnchana 1981) by lepidopteran larvae population outbreaks have been reported from Australia, Singapore, and Hong Kong. The Hong Kong example now occurs on an annual basis (Anderson & Lee 1995). However, none of these references suggest what factors contribute to such an outbreak.

A followup inspection by Grant Barnes in February 1998 found that many of the mangroves that had been defoliated have now resprouted and appear to be recovering, and there is no sign of excessive numbers of insects including the mangrove leafroller. Nevertheless, I would like to collect more information on this phenomenon including its causes, consequences, and chance of recurrence. I would therefore welcome recollections of similar dieback events of mangroves in New Zealand or comments on the processes involved in this dieback.

References

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- Piyakarnchana, T. 1981: Severe defoliation of *Avicennia alba* Bl. by larvae of *Cleora injectalia* Walker. *J. Sci. Soc. Thailand* 7: 33-36.
- West, R.J.; Thorogood, C.A. 1985: Mangrove dieback in Hunter River caused by caterpillars. *Austral. Fish.* 44: 27-28.

Please send information to:

Bruce Burns
Landcare Research
Private Bag 3127
Hamilton
email: burnsb@landcare.cri.nz

LOOKING FOR NEW NZJE EDITOR

Our current journal editor, Gábor Lövei, has found a job overseas and, sadly, has to resign as editor of NZJE. NZ EcolSoc is looking for a new editor. The 2/1998 issue is in print and issue 1/1999 is scheduled to contain the ecotoxicology proceedings, so it should be an easy transition. Gábor is happy to remain involved, if this is required, in which case we need a technical editor who can deal with the printer. Please contact the president, Craig Miller, if you would like to be involved or know somebody suitable.

MEDIA RELEASES FROM MANAAKI WHENUA - LANDCARE RESEARCH

For more information on any of these items please contact

Brian Ellison
Journalist
Phone: +64 3 325 6700
Fax: +64 3 325 2127
Email: ellisonb@landcare.cri.nz

Liming - a deep story

Lincoln, 27 April

Recent research by Landcare Research scientists has shed some light on the effects of lime applied to pastures.

The primary aim of the research is to find out how useful near-pristine 'reserve' sites are for assessing the impact of farming in southern New Zealand. This research is part of a study of soil quality funded by the Foundation for Research, Science and Technology.

Dunedin scientists Peter McIntosh and Allan Hewitt sampled topsoils both in reserve areas (mostly managed by the Department of Conservation) and on adjacent farmland. They analysed topsoils and subsoils to look at long-term chemical effects of farming.

Dr McIntosh said that there were some quite predictable effects. For example, as a result of fertiliser and lime application, topsoils on farmland are less acid soils and have higher nutrient levels than soils on reserve sites.

"The major soil types have a topsoil pH that is about 1 pH unit higher under farmland than under forest or tussock vegetation," said Dr McIntosh. "This is a very predictable effect of lime application. What did surprise us was that in deep soils the effect of lime can reach down to three metres."

"On Edendale soils we found that soils under native forest had a pH of about 4.5 in topsoils, which gradually increased to about pH 5.0 at a depth of three metres. But under pasture, pH was in the range 5.5 to 6.3 at all depths."

Dr McIntosh said that the pH change was not just an academic observation.

"If pH is rising at all depths under pasture, then it means that the subsoil is absorbing nutrients and becoming more fertile. If all the subsoil sites for absorbing nutrients eventually get filled, then we can expect more nutrients to come out of the bottom of profiles, in groundwater. This could affect water quality in springs, bores and streams. It is also

possible that if clays move more easily at higher pH, pores will get blocked and the drainage properties of the soils will change."

To help determine whether soil drainage has been affected by the changed chemistry, Dr McIntosh and Dr Hewitt are cooperating with Dr David Chittleborough from the University of Adelaide on a preliminary project looking at the properties of micropores in Edendale soils. If initial results show significant changes within soil pores under farmland, further work will be planned.

For more information contact:

Dr Peter McIntosh
Landcare Research, Dunedin
Ph 03 477 4050 or 025 222 6469

Managing contaminated sites

Lincoln, 12 May

Giving environmental managers the tools they need to manage contaminated sites is the aim of a new research project funded by the Foundation for Research, Science and Technology.

The estimated 7200 contaminated sites around New Zealand are stains on our clean, green image. Many of these sites are poisoned by heavy metals and volatile components of petrol. These contaminants are known to affect human health. Their effects on microbes, plants and animals are not well known. New Zealand natives may be particularly sensitive.

"Environmental managers need practical tools to assess the risks posed by these sites, and to make decisions about how to manage them," said Dr Mark Wickstrom of Landcare Research.

The aim of the research is to develop a decision support system (DSS) for the management of contaminated sites. A decision support system is a model-based set of procedures to help a manager with decision making.

The research programme calls on a wide range of skills. It includes scientists from Landcare Research, IGNS, and NIWA, and environmental consultants from Tonkin & Taylor and Lincoln Ventures. The researchers also had help from local iwi.

"The core of the DSS will be an ecological risk assessment model, which we will modify to improve its suitability for New Zealand conditions," said Dr Wickstrom. Ecological risk assessment (ERA) is the practice of determining the effects of human actions on the environment. ERA helps managers organise information and make informed decisions.

The research team will add data on New Zealand's soils, water and groundwater to the ERA model. Most of this data is already available from

the research institutes that are part of the programme.

The decision support system makes the ERA model easier to use. It guides users through the model, helping them input data into the model and interpret the output from the model. The team plans to have a prototype of the decision support system up and running by June 2000.

They will also develop new tools for the measurement of 'ecotoxic' effects in soils and surface waters on native species of microorganisms, plants, invertebrates and fish.

For more information contact:

Dr Mark Wickstrom
Landcare Research
Lincoln
Phone 03 325 6700

Good decisions based on soils

Lincoln, 12 May

If you're deciding whether to buy or build, or are making recommendations to others, then you need to know you've got the basics right. That's when a soil map comes in handy, says Greg Comfort, manager of Manaaki Whenua Press.

"Sound decisions are based on the best available information. Knowing your soil type and its properties are the most basic information you need," said Mr Comfort.

Manaaki Whenua Press, the publishing arm of Landcare Research, recently added DSIR soil maps and books to its catalogue of publications about the New Zealand environment.

"Moving the soil maps and books to our Lincoln office means that we can provide a complete soil information service. We now have the DSIR Soil Bureau's soil maps and books, as well as several books and maps on soil classification and interpretation written by Landcare Research scientists. And if people want something more than is in our publications, we can always refer them on to our science staff," said Mr Comfort.

"Most users of the maps are specialist advisers who need the information to correctly advise their clients. Without the maps they have to rely on educated guesses, which isn't good for their clients."

The soil maps and books are good value when compared to doing extensive fieldwork. Most soil maps cost \$15-30. A full soil survey report including maps and detailed analysis of the soil is only \$30-60.

A complete list of the soil maps and publications is available from Manaaki Whenua Press. They can be contacted at PO Box 40, Lincoln, or telephone (03) 325 6700, fax (03) 325 2127. The list is also available on their web site:

<http://www.landcare.cri.nz/mwpress/>

For more information contact:

Greg Comfort,
Manager
Manaaki Whenua Press
Phone: 03 325 6700

Beat bugs for fine flax

Havelock North, 29 May

Little bugs are taking a bite out of traditional Maori weaving, says scientist Sue Scheele of Landcare Research.

Maori weavers use New Zealand flax, or harakeke, to create such familiar items as kete, piupiu and mats. But flax is prone to many diseases and attacks by insects that can seriously affect the quantity and quality of useable leaves.

"The notches, 'windows' and blotches can also make flax an unsightly spectacle in the home garden," said Ms Scheele. Ms Scheele has written a booklet, *Insect Pests & Diseases of Harakeke*, describing the pests and diseases that affect New Zealand flax. In the booklet she describes various methods for controlling them, including natural methods, sprays, and home remedies.

Ms Scheele is the curator of the New Zealand flax collection. She collected the information in the book as part of her research into New Zealand flaxes and how they are used by Maori.

Insect Pests & Diseases of Harakeke (RRP \$14) is published by Manaaki Whenua Press, PO Box 40, Lincoln.

For more information contact:

Sue Scheele,
Landcare Research,
Havelock North,
Phone: 06 877 7736.

NEW MEMBERS AND RESIGNATIONS

New members

Rosemary Barraclough, Ben Brett, Melissa Brignall-Theyer, Chi-hang Chan, Mark Coghlan, Melanie Dixon, Grant Edwards, Colleen Jamieson, Peter Jones, Ian MacLean, Nicole Masters, Kate McCombs, S McQueen, MC Stanley & DF Ward, George Perry, Lisa Russell, Wendy Stubbs, Chris Thomas.

Resigned

BC Barratt, S Brager, Paul Cashmore, A Cunningham, R East, L Gurr, G Mew, Rhys Taylor, Ross Usmar, Dr J Ward.

CONTACT EMAIL ADDRESSES

NZ EcolSoc email list server

Please note that we don't promise that messages will be frequent, or gripping; this is a means of communication, not a promise of enlightenment! It will work if ecologists here use it (well).

To subscribe send a message to the automatic Mailserv processor at:

nzecosoc-request@csc.canterbury.ac.nz

The recommended way to subscribe is to send a message with two lines:

SUBSCRIBE NZECOSOC
END

UNSUBSCRIBE NZECOSOC

This is the command you should use if you want to stop receiving mail from this list.

Once subscribed, you will receive instructions on how to send messages, unsubscribe etc. PLEASE KEEP THESE INSTRUCTIONS AND FOLLOW THEM.

For information on the listserv contact the newsletter editor (astrid@mad.scientist.com) or myself at d.kelly@botn.canterbury.ac.nz. For information on the Australian listserv contact me or Kath Dickinson (ecolkjmd@matai.vuw.ac.nz).

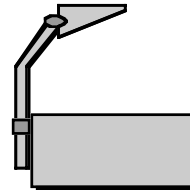
USEFUL WORLD WIDE WEB ADDRESSES

Community Indicators - Recommended Web Sites supplied by Anna Percy, Manager, Strategic Planning & Economic Development, Waitakere City Council.

- Genuine Progress Indicator - Redefining Progress: <http://www.rprogress.org>
- Ecological Footprint - Centro de Estudios para la Sustentabilidad: <http://www.edg.net.mx/~mathiswa>
- Community Indicators - Sustainable Seattle: <http://www.scn.org/sustainable/susthome.htm>

Other examples of community indicators:

- Sustain Western Maine - <http://www.mdf.org>
- Ho'okipa Network of Hawaiian CBOs - <http://www.hawaiian.net/~cbokauai>
- Hart Environmental Data - Training courses and a database of community indicators: <http://www.subjectmatters.com/indicators/>
- Waitakere City Council: <http://www.waitakere.govt.nz>



UPCOMING CONFERENCES

NZ(ES)²A 1998

November 24 - 27th, 1998. University of Otago, Dunedin, New Zealand.

Joint Meeting of the Australian and New Zealand Ecological Societies

Student session on Monday November 23rd.

Registration forms, more details and a call for papers in this newsletter.

Address any other enquiries to

Janice Lord, Botany Dept.

University of Otago

Phone: (03) 4795131,

Email: jlord@planta.otago.ac.nz

or

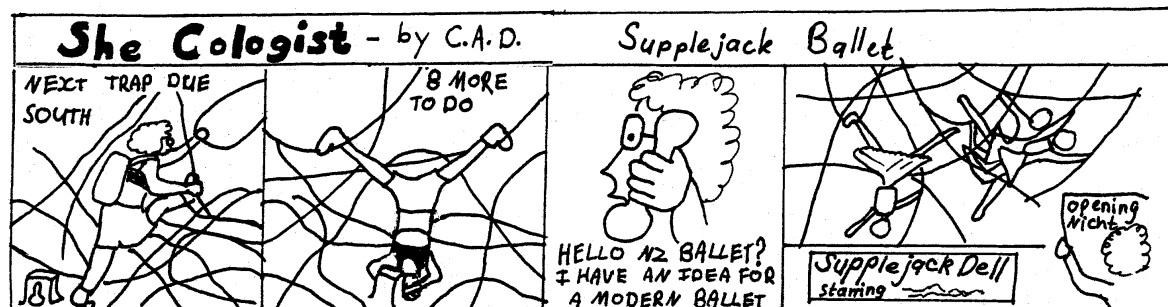
Ian Jamieson

Zoology Dept

University of Otago

Phone: (03) 4797608,

Email: ian.jamieson@stonebow.otago.ac.nz



Scientific Meeting to Address Ecological Consequences of Poisons used for Mammalian Pest Control

Christchurch, 9-10 July 1998.

Papers presented at the meeting will be published in an issue of the New Zealand Journal of Ecology. See earlier item in this issue for more details or contact

Charlie Eason (easonc@landcare.cri.nz) or Clare Veltman (cveltman@doc.govt.nz).

Registrations are being handled by Conference Coordinators, PO Box 29060, Christchurch. A flier is included with this issue.

"Restoring the Health & Wealth of Ecosystems"

Christchurch New Zealand, 28-30 September 1998

A symposium on the science and practice of ecological restoration in urban and rural New Zealand for practitioners, policy-makers, planners, landscape architects, researchers, environmental engineers, community groups, corporations, nurseries

Day 1 : Ecology, technology and sociology in restoration

Keynote speaker: *Dr Richard Hobbs*, CSIRO, Perth, Australia

Invited speakers from Auckland Regional Council, Waitakere City Council, Department of Conservation, Massey, Auckland, Lincoln and Canterbury Universities and Landcare Research.

Session themes:

1. Ecological principles and landscape processes
2. The animal and soil components
3. The social, legal and planning context
4. Visions for the future of New Zealand's urban and rural landscapes

Day 2 : Site Visits

Leaders: *Dr Colin Meurk*, Restoration ecology specialist, Landcare Research, *Dr Rachel Barker*, Waterway Enhancement Coordinator, Christchurch City Council

Experience habitat restoration dating back up to a hundred years, in and around Christchurch. This includes the work of the City Council on the city's waterways, wetlands, dunelands and dry grassland reserves. Learn about the ecology, technology and sociology of these visionary examples. Visits followed by a **conference dinner**.

Day 3 : Panel Discussions, Posters & Displays

A day for interchange of views, techniques, achievements and services.

1. Workshops addressing e.g., the regional integration of policies and activities.
2. Offered posters.
3. Displays by practitioner groups, research providers, materials suppliers, etc.

Videolink: Society for Ecological Restoration (SER) International Conference in Texas, USA

A real-time panel discussion with our overseas colleagues at the SER.

For full symposium information including registration forms, please access the *Landcare Research WWW homepage* on <http://www.landcare.cri.nz> or contact the

Conference secretary,
Mrs Petra Palmer,
Landcare Research,
PO Box 69, Lincoln,
New Zealand
E-mail: palmerp@landcare.cri.nz
Phone: +64 3 325 6701 ext 3778
Fax: +64 3 325 2418

Southern Connection Congress III

January 15 -21 2000, Lincoln University, Canterbury, New Zealand.

For further information contact

Dr Glenn Stewart,
Soil, Plant and Ecological Sciences Division,
Lincoln University,
PO Box 84, Lincoln, Canterbury
Phone: (03) 325 2811
Fax: (03) 325 3843,
Email: stewartg@lincoln.ac.nz

INTECOL - VII International Congress of Ecology

July 19 - 25 1998, Florence, Italy.

Theme: "New tasks for ecologists after Rio 1992".

For further information write to Almo Farina, Vice-President INTECOL, Secretariat VII International Congress of Ecology, c/o Lunigiana Museum of Natural History, Fortezza della Brunella, 54011 AULLA, Italy. More details in September 1996 EcolSoc newsletter or contact Newsletter editor.

Conversazione

17 June, 1998, London, UK.

Details from: The Linnean Society of London, Burlington House, Piccadilly, London W1V 0LQ.

Phone: 0171 434 4479.

Fax: 0171 287 9364.

E-mail: john@linnean.demon.co.uk.

Pollen and Spores: Morphology and Biology

6-9 July, 1998, *London, UK.*

Details from: The Linnean Society of London,
Burlington House, Piccadilly, London W1V 0LQ.

Phone: 0171 434 4479.

Fax: 0171 287 9364.

E-mail: john@linnean.demon.co.uk.

Ecological Society of America's Annual Meetings

2-6 August, 1998, *Baltimore, Maryland, USA.*

Details from: E.S.A., 2010 Massachusetts Avenue,
NW Suite 400, Washington DC 20036, USA. Web
Site

7th International Congress of Plant Pathology

9-16 August, 1998, *Edinburgh, Scotland.*

Details from: ICPP98 Congress Secretariat, c/o
Meeting Makers, 50 George Street, Glasgow G1
1QE.

Phone: 0141553 1930.

Fax: 0141552 0511.

E-mail: icpp98@meetingmakers.co.uk.

Restoration Ecology in the 21st Century: Research needs of the future

25-30 August, 1998, *Groningen, The Netherlands.*

Details from: Restoration Ecology Symposium
Secretariat, Laboratory of Plant Ecology, University
of Groningen, PO Box 14, 9750 AA Haren,
The Netherlands.

Phone: 31 50 3632273.

E-mail: RE.symposium@biol.rug.nl

Invertebrates 3rd European Workshop of Invertebrate Ecophysiology

6-11 September, 1998, *Birmingham, UK.*

Details from: Prof. Jeff Bale, School of Biological
Sciences, University of Birmingham, Birmingham
B15 2TT.

Phone: 0121 414 5908. Fax: 0121 414 5925.

E-mail: j.s.bale@bham.ac.uk.

Molecular Genetics in Animal Ecology.

15-16 September, 1998, *Aberdeen, Scotland*

Details from: Professor P.A.Racey, Department of
Zoology, University of Aberdeen, Tillydrone
Avenue, Aberdeen AB24 2TZ.

Phone: 01224 272858. Fax: 01224 272396.

E-mail: p.racey@abdn.ac.uk

Tropical Dendrology Course.

22 June - 4 July, *San Jose, Costa Rica.*

The course on Tropical Dendrology is given every
year in English in June-July and in Spanish in
March.

Details from: Dr Humberto Jimenez-Saa,
Tropical Science Center, PO Box 8-3870-1000,
San Jose, Costa Rica.

Fax: +506 253 4963.

Phone: +506 225 2649/+506 253 3267.

E-mail: hjimenez@sol.racsa.co.cr. or

hjimenez@geocities.com.

PUBLICATIONS RECEIVED.

The Belgium Embassy kindly sent us an English
version of the periodical Wallonie/Bruxelles dealing
with many energy conservation and green issues.
Anybody interested in viewing or borrowing this
issue please contact the EcolSoc newsletter editor.

**ABSTRACTS OF PAPERS
PRESENTED AT BIODIVERSITY
NOW****The establishment of fruit crop arthropod pests and their natural enemies in New Zealand: From way back to the future**

J G CHARLES

HortResearch, Private Bag 92 169, Auckland, New Zealand

Fruit crops in New Zealand are infested by 116 arthropod pests, which, in turn, are attacked by 134 arthropod natural enemies. Most pests (99) and natural enemies (116) are exotic. Ninety two species of natural enemies have established accidentally, compared with 24 through classical biocontrol introductions. Many fruit crop pests now have diverse, exotic natural enemy guilds, which are becoming increasingly important both economically and ecologically in Integrated Fruit Production and organic growing systems. It seems likely that exotic pests and natural enemies of fruit crops will both continue to establish in New Zealand at a long-term average rate of c.7 species per decade. The "greening" of horticulture means that more native insects will become pests too. The increasing pest load poses a significant threat both to the livelihood of orchardists and to the New Zealand economy. Biological control of pests by natural enemies, both native and exotic, and deliberately or accidentally established, will inevitably be further developed as a pest management strategy. Ecological studies will be required to provide the economic solutions required by orchardists on the one hand, and the environmental answers required by conservationists on the other. The existing exotic natural enemy guilds in managed environments may be a valuable resource to help predict the potential impact of new natural enemies on non-target species.

Strategies to use single gene products for pest management

JOHN T CHRISTELLER

HortResearch, Palmerston North

Anti-metabolites in transgenic plants

Bt-transgenic plants are a commercial reality. The international effort has focussed, correctly, on these compounds and the molecular biological problems have been largely overcome. The major concerns now regarding their utility are resistance management, specificity, and integration into IPM strategies.

Anti-metabolites have a role as adjuncts to Bt for resistance management (gene pyramiding). Modelling studies show this deployment of genes to be far superior to any other devised (refuges, non-transgenic mixtures, etc.). Anti-metabolites also have a role as an alternative to Bt to manage many commercially important pests (most coleoptera, orthoptera, hemiptera, homoptera).

Our work has focussed on two types of anti-metabolites, proteinase inhibitors and biotin-binding proteins. The insecticidal properties of these classes of proteins will be discussed and issues regarding their deployment raised. An assessment of the rather short list of known candidates to supplement or replace Bt endotoxins will also be provided.

GMO biopesticides

The use of biopesticides (bacteria, viruses, fungi, and nematodes which are insect pathogens) has languished for a number of well understood reasons. These are likely to be overcome by use of improved organisms and the involvement of molecular technologies in this process is clearly indicated. Our work is targeted toward improving the rate of mortality relative to wild-type organisms and is also addressing the environmental safety issues through strategies to eliminate persistence of the applied organisms without reduction in their efficacy.

The Predispersal 'seed' predators of the masting genus *Chionochloa* (Poaceae)

ANGELA CONE¹ & DAVE KELLY²

¹*LandcareResearch, PO Box 69, Lincoln, Canterbury, New Zealand*

²*Plant and Microbial Sciences Department, University of Canterbury,*

Private Bag 4800, Christchurch, New Zealand

Chionochloa is a genus of tussocks that often exhibit irregular flowering - a phenomenon often referred to as 'masting'. Inflorescences of *Chionochloa* are often damaged due to insect predation. White (1975) reported three different insect seed predators, but Kelly et al. 1992 found only a single insect.

This study aimed to clarify how many insects were attacking *Chionochloa*, determine what damage each insect causes, and determine how these insects respond to the fluctuating flowering levels. The aim was to determine whether these insects could have accentuated masting in *Chionochloa*.

All three 'seed' predators reported by White were found: *Megacraspedus calamogonus* Meyr, *Diplotoxa similis* Spencer; and an undescribed Cecidomyiid. All three feed at slightly different times. *Diplotoxa* feeds at early stages of inflorescence development, the cecidomyiid feeds later on the developing seed, and feeding by *M.*

calamogonus overlaps between the previous two.

The different types of damage that each insect causes have been identified. This information makes it possible to estimate how much damage each species has caused.

Fluctuating flowering levels do affect these insects. The way the different factors affect each seed predator and the system as a whole, is still not clear. Each insect does possess its own set of attributes which may make it resistant, or vulnerable to satiation by masting.

Units of biodiversity management: a review of species concepts

CHARLES DAUGHERTY & MICHAEL TRACY

School of Biological Sciences, Victoria University of Wellington

The past two decades have seen intense consideration of alternatives to the Biological Species Concept (BSC). A key failing of the BSC is its inability to cope with allopatric populations. In New Zealand, much of the biological diversity occurs among island populations, so the BSC may be of limited value for cataloguing natural diversity for conservation purposes here. We review alternatives to the BSC, especially, the Phylogenetic and Evolutionary Species Concepts, that may be preferable for dealing with island populations. Recent analyses of the taxonomy of New Zealand pipits and Australasian teal provide case studies that support reconsideration of the taxonomy of many widely distributed taxa. Lastly, we compare the use of various species concepts in New Zealand and overseas.

The evolution of feeding behaviour in carnivorous snails: phylogenetic evidence from *Wainuia*

MURRAY EFFORD¹ & DIANNE GLEESON²

¹*Manaaki Whenua Landcare Research, Private Bag 1930, Dunedin*

²*Manaaki Whenua Landcare Research, Mt Albert Research Centre, Private Bag, Auckland*

Carnivory has evolved in many separate snail lineages worldwide, but only in the New Zealand genus *Wainuia* does the diet contain a high proportion of arthropods. Two *Wainuia* species routinely consume forest litter amphipods. The behaviour is associated in both species with a reduction in the number of teeth and the geographic clustering of populations showing the behaviour leads naturally to the hypothesis that they form a monophyletic group. We test this hypothesis with a phylogeny based on new DNA sequence data from *Wainuia* populations throughout New Zealand. Sequences were obtained for regions of the cytochrome oxidase protein-coding gene and the 12S ribosomal subregion. In addition to shedding light on the evolution of carnivory, the DNA sequence data confirms the existence of at least three undescribed species.

Reproduction of *Dactylanthus taylorii*: towards unravelling its complexity

A S HOLZAPFEL,¹ C E ECROYD,² W B SILVESTER¹

¹*Department of Biological Sciences, University of Waikato, Hamilton*

²*Forest Research Institute, Rotorua*

The reproductive biology of the endemic root-holoparasite *Dactylanthus taylorii* (Balanophoraceae) has been studied.

Female plants produce copious seed after pollination by either short-tailed bats or ship rats. Seeds can remain viable in the soil for at least 7 years in moist conditions. A percentage of seeds from this seed bank germinate every year, developing a 1-2 mm long radicle characterised by specialised surface cells and long hairs. These features aid in the attachment to a host root and are likely to also facilitate host recognition. In contrast to some previous suppositions *Dactylanthus* does not require a host stimulus for germination. Upon contact with a root, the long hairs secure the radicle tip in place, which in turn establishes the initial haustorial contact with the host and swells up to form a young *Dactylanthus* tuber. Apart from sexual reproduction, *Dactylanthus* is also capable of reproducing vegetatively through adventitious roots almost identical in their morphology to the radicle. Both radicle and adventitious roots appear to survive prolonged periods prior to any host contact, and will attempt to infect roots growing close to them rather than actively searching for a host. As *Dactylanthus* is currently endangered, mainly through extensive possum browsing of the inflorescences, an understanding of its reproductive biology is vital to the development of suitable protection strategies.

Flower biology of *Geniostoma ligustrifolium* (Geniostomaceae)

PHIL J GARNOCK-JONES¹ AND MARY E ENDRESS²

¹Victoria University of Wellington, PO Box 600, Wellington

²Universität Zürich, Switzerland

Geniostomaceae (*Geniostoma* and *Labordia*) forms a clade which is sister to the Apocynaceae s.l., so that aspects of their flower biology are important to an understanding of phylogeny in that large family.

G. ligustrifolium (we regard it as distinct at species rank) is a small endemic shrub with apparently simple green flowers. Its flower biology was described by Rattenbury, who outlined the pollen presentation mechanism and considered it to be dioecious, based on the flower morphology.

We have studied the development and function of flowers on male and female plants and made a functional assessment of sex expression. Flowers on male plants dehisce their pollen directly onto the stigma before anthesis. At anthesis the stigma functions as a pollen presenter. Long stigma hairs contain an adhesive under pressure and we believe this glues pollen onto pollinators. The stigma is not receptive at this stage. Later, when pollen has been removed, the stigma becomes receptive, at least in late season flowers. Flowers on male plants have fewer ovules than female flowers, and set varying amounts of fruit. Female flowers have smooth stigmas and hairy sterile anthers. We have seen no flower visitors or seed dispersers. The flowers are sweetly scented, unlike other species of *Geniostoma* which have offensive scents.

We conclude that *Geniostoma ligustrifolium* is gynodioecious, and that the flowers are not as simple as they appear. Other species of the genus (including *G. rupestre*) have been described as dioecious, and these should be reassessed.

Management of *Geodorcus ithaginis* (Lucanidae), New Zealand's most endangered stag beetle?

C J GREEN

Auckland Conservancy, Department of Conservation, P O Box 69-908, Auckland, New Zealand

The Mokohinau stag beetle, *Geodorcus ithaginis* (Coleoptera: Lucanidae) is restricted to a single, approximately one hectare islet, Stack "H" within the Mokohinau Islands in the Hauraki Gulf. Historically many of the islands in the Mokohinau group had kiore, the polynesian rat (*Rattus exulans*) and have been modified by vegetation clearance. Stack H appears to have remained free from these influences. During 1990 kiore were eradicated from all islands in the group except Fanal, thus removing the risk of invasion of Stack H. Access to Stack H is highly weather dependent and fewer than 10 adult stag beetles have been seen on any one trip. Other *Geodorcus* species live in very moist habitats on mainland sites with larvae associated with moist rotten logs on the forest floor. By contrast the habitat on Stack H is arid with very poor moisture retention and a complete absence of rotten logs. Managing New Zealand's biodiversity involves the conservation of such endangered species. Management undertaken and planned for the species is outlined.

Conservation implications of cryptic diversity in the black mudfish, *Neochanna diversus*

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¹Manaaki Whenua Landcare Research, Private Bag 92170, Auckland

²University of Waikato, Hamilton

It is now generally accepted that if species are to be conserved, it is important that genetic diversity is in turn conserved to allow populations to evolve and withstand environmental change. Evolutionary theory predicts that the divergent, isolated populations of today have the potential to become the species of tomorrow. In order to maintain this diversity within species and therefore conserve evolutionary potential, genetic data can be used (i) to measure genetic variation within populations (ii) to identify evolutionary divergent populations (iii) and to assess conservation value of regions or populations from an evolutionary perspective.

We are currently determining the genetic diversity present in existing populations of the black mudfish, *Neochanna diversus*.

The black mudfish occurs from the King Country to as far north as the Kaimaumu Swamp, north of Kaitaia. This species is the most specialised of the three due to its northern range where it experiences the longest aestivation times. The major existing habitat for this species is the Whangamarino Swamp and the Kopuatai Peat Dome in the Waikato. Fire is a constant threat in these habitats with a fire in the summer of 1986 burning almost two thirds of the Whangamarino wetland. In Northland, the Hikurangi Swamp inland from Whangarei was an important habitat for black mudfish. However this wetland has been almost entirely drained for pasture conversion, leaving small remnants. It was in one of these remnants, the Otakairangi Wildlife Management Reserve, that the first black mudfish were found since the 1960s. The Kaimaumu Swamp is

currently under threat through drainage. We have sampled populations from both Northland and Waikato to determine the level of diversity between regions and among populations through sequencing the D- Loop of the mitochondrial genome.

These results and the implications for the conservation and management of the black mudfish will be discussed.

Colour preferences in weka

LYNETTE HARTLEY¹, JOE WAAS¹ & CHERYL O'CONNOR²
¹*The Animal Behaviour Unit, Department of Biological Sciences, University of Waikato, Private Bag 3105, Hamilton*

²*ABWRC, AgResearch, Private Bag 3123, Hamilton*
Email : LJH5@Waikato.ac.nz

There is growing awareness and concern about native New Zealand birds eating poisonous baits intended for pest species such as possums and rats. It may be possible to discourage birds from eating poison baits by altering bait characteristics such as colour. This study investigates colour preferences in weka to determine which colours may act as deterrents. Weka were chosen as an initial study species as they are very vulnerable to poisoning.

A preliminary study with six domestic hens was conducted to investigate the feasibility of testing colour preferences in birds and to refine our methodology. The hens were offered a choice between pellets of six different colours (white, yellow, blue, orange, green, red). Each bird was tested daily, on its own, for six consecutive days. The amount consumed differed significantly between colours with more white and yellow being eaten than orange, green or red.

Eighteen wild weka from Kapiti island, which were in temporarily captivity, were tested for colour preferences. The same methodology was used as described for the hens. Again six different colours were offered (red, yellow, brown, green, light blue and blue). Weka ate significantly more of the red and yellow and less of the two blues and the green.

Results to date are encouraging in the search for ways of deterring birds from poisonous baits. Further studies are planned to clarify the relative importance of brightness and hue in weka colour preferences.

Housing the male native scale insects: garage, tent, or just a fluffy duvet?

ROSA HENDERSON

Manaaki Whenua Landcare Research, Private Bag 92170, Auckland

Email: HendersonR@landcare.cri.nz

Male scale insects (Hemiptera: Coccoidea) undergo a metamorphosis from scale-like nymph through prepupa and pupa to winged adult. The last nymphal instar before prepupa secretes the protective covering under which these complex life changes take place. Each family of scale insects is characterised by a different type of male covering, whether cocoon, cap, or test. Male mealybugs make fluffy cocoons from cottony wax strands (the duvet of the title to this talk); eriococcids produce woven wax covers, and armoured scales incorporate their moulted skins into waxy caps (the tent); the Coccidae or soft scales

construct glassy wax tests (the garage).

The coccid male test, being rigid, needs a mechanism for adult emergence. A suture across the posterior third of the test enables the back plate to flex at a pair of hinges (so forming the garage door). The hinges are secreted from groups of tubular ducts on the dorsum of 2nd-instar males. Scanning electron micrographs show the detail of hinge types and test structure.

Very little research has been published on male scale insects, and even less on their coverings. Much more detail is now known about the New Zealand soft scales. In comparison with North American species (Miller & Williams 1990), male tests of the New Zealand Coccidae are apparently unique in the way they are constructed in rows of hexagonal wax plates. Only two species of native soft scales have tests more like those in other parts of the world.

Miller, G.L.; Williams, M.L. 1990: Tests of male soft scale insects (Homoptera: Coccoidea) from America north of Mexico, including a key to the species. *Systematic Entomology* 15: 339 - 358.

Systematic ecological entomology

J A HUTCHESON

Forest Research Institute

Sustainable management of biodiversity is based on the simple concept of managing biological resources to meet the needs of this generation, without compromising the options of our children. This requires assessment of these resources such that their stewardship may be improved through management.

Such assessments need to: include entomology, because insects comprise the overwhelming majority of biodiversity; be ecological, to enable information to be related to systems and their processes; and be systematic, in that sampling methodologies and taxonomies must be standardised for information to be cumulative. The assessment of biodiversity thus involves skills from all three disciplines represented at this conference. The subject requires urgent integration of different perceptions of ecological systems and scientific enquiry. In addition, the lack of system entomologists relative to the enormity of this field requires a focusing on what is both achievable and useful.

Insects are integral to the processes of system maintenance in a variable environment, therefore their communities offer the means for both characterising system biodiversity, and providing detailed understanding of system processes. Beetles comprise c. 50% of NEW ZEALAND insect species, and Malaise trapped beetles provide a method for characterising insect communities from any habitat. Information collected to date using standardised protocols demonstrates a close relationship between samples, and system type and processes. Development of appropriate taxonomic and processing tools and personnel, together with detailed understanding of autecology of dominant species in samples, would enhance the application of knowledge gained, to the sustainable management of biodiversity.

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This Newsletter was produced by Astrid Dijkgraaf and Jeremy Rolfe.

Contributions for the newsletter – news, views, letters, cartoons, etc. – are welcomed. If possible, please send articles for the newsletter both on disk and in hard copy. 3.5" disks are preferred; MS Word, Word Perfect or ASCII file text, formatted for Macintosh or MS-DOS. Please do not use complex formatting; capital letters, italics, bold, and hard returns only, no spacing between paragraphs. Send disk and hard copy to:

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Next deadlines for the newsletter are 27 August and 5 December 1998.

Unless indicated otherwise, the views expressed in this Newsletter are not necessarily those of the New Zealand Ecological Society or its Council.

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- School \$12 per annum

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Christchurch,
NEW ZEALAND

MOVING? If so, please print your name and new address below, and return with the old address label to us.

BLOCK LETTERS PLEASE

Address: _____

Postcode _____

Address effective from: _____ (Month) _____ Year _____