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EDITORIAL

Science and research has been undergoing a review of its operations and structure as a part of the overall restructuring of the Department. The following is excerpted from a fact sheet prepared to explain the findings of the review.

Review of science and research in DoC

What did the review find?

The review found improvements could be made in the way DoC identifies its research needs and the way science contributes to the effectiveness of conservation management. It was acknowledged that there is involvement of management and policy staff in the current priority setting system for Science and Research. However, this involvement is currently not sufficiently well structured to ensure research investments would benefit conservation management as well as possible. In particular, the review identified the absence of formal links between research projects and the field staff for whom it was being carried out as a major deficiency. This will be addressed by the establishment of the formal client-service provider relationship.

The difficulties in making sure science information was used for conservation management arose because of a lack of clearly defined accountability for information transfer within the organisation as a whole. This will be addressed by Technical Services Managers in regional offices, with support from Principal Regional Scientists.

Management practice must always be based on the best information available. Science can provide new information from research, using research by management. Research by management ensures effective transfer of information and ensures that information gained in management operations is used to improve future management. It also helps identify priority research needs for feeding to research providers.

The review team's report identified eight major areas for improvement. These will all be addressed, although the rate at which improvements can be effected will vary since many depend on changes in the nature of relationships, both internally with managers and externally with science providers.

Increasing the ownership of science projects

All science projects will have a specific client. Science and Research will provide projects for Head Office, conservancy or regional office staff as the assigned clients. Regular reports will be made to these clients. The approval of the annual science programme will be the responsibility of the Regional General Managers, Science, Technology and Information Services General Manager and Conservation Policy General Manager, assisted by Technical Services Managers in regional offices.

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Department of Conservation
Te Papa Atawhai

EDITORIAL

Improving definition of roles

Science and Research will provide a national service to management in Head Office, conservancies and regional offices - the clients. Accountability for transfer of information will be formally assigned.

Defining information needs better

The planning system will be changed to emphasise the role of management in specifying needs for science input. Present research strategies will be further developed, including a system for identifying information needs and the availability of new science results.

Improving project management

Formal project management methodology will be adopted for all science projects.

Improving information gathering and management in the Department

This is only partly a responsibility for Science and Research. Science and Research will support the improvements needed across DoC.

Improving the funding system

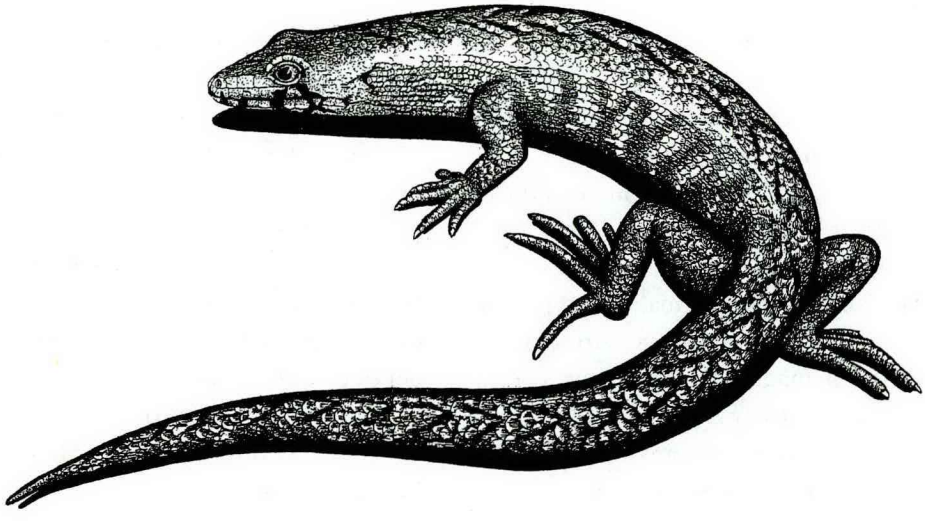
The appetite of science for funds is insatiable. The challenge for science is to prove to users of research that increased funding will deliver benefits. DoC needs to make the best possible use of all funding sources, including the Public Good Science Fund.

Improving access to science advice

The relocation of science staff, creation of Principal Regional Scientists and the refocussing of the Conservancy Advisory Scientists will improve access to advice. However, the major advance will come from the closer relationships between Science and Research and its clients.

Strengthening relationships with associates and stakeholders

This is a key component of the science strategy which will be achieved by assigning science staff to relationship management, including other DoC staff as major stakeholders.



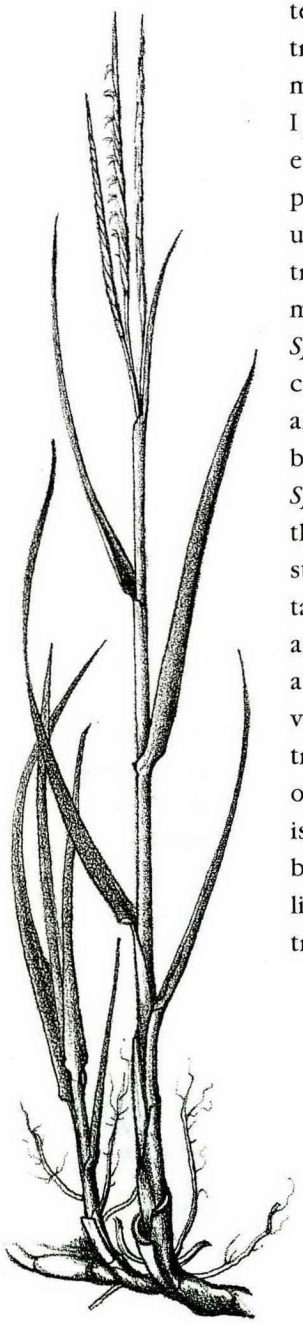
Chevron skink — *Bruce Mahalski*

REPORTING BACK

Spartina Conference

Willie Shaw reports back on the "Spartina" conference in Olympia, Washington State, U.S.A.

Willie Shaw (formerly the Conservation Advisory Scientist in the Bay of Plenty Conservancy) is now with Wildland Consultants Ltd, Rotorua.



In March 1997 I attended a conference on *Spartina* in Olympia, Washington State, USA. The conference was well-organised with an excellent range of papers that included international overviews, policy, ecological impacts, public involvement, control techniques and efficacy, risks of control techniques, and research and monitoring needs.

I gave 3 presentations at the conference and have submitted an overview paper for the proceedings. This is an update of a paper presented at an Australian conference in 1995. I recommend that DoC staff working with *Spartina* obtain a copy of the proceedings when they are published, and I will circulate details when they become available.

Spartina is causing huge problems on the west coast of the USA, and it is still spreading. The scale of the infestation in some estuaries is massive and has to be seen to be appreciated, along with the intensity of the controversy associated with *Spartina* control. Very tight restrictions are placed on weed control in estuaries and this is well illustrated by the level of debate associated with even the very limited use of plastic matting for control trials. However this has paled into significance compared with the debate over the use over herbicides. Rodeo™ (Glyphosate) is the only herbicide registered for application in US estuaries. Current techniques include ground-based application, aerial treatment, and various combinations of herbicide and mowing techniques. My impression was that some results were encouraging but there were no success stories along the lines of what has been achieved in New Zealand. However, the Americans are trying every allowable method imaginable and may yet achieve a breakthrough.

The intensity of the US debate about the use of herbicides (in this case Glyphosate) is akin to the Kaimanawa wild horse debate. There is NZ involvement in this debate, in opposition to herbicide use. There are some salutary messages to be gained from the American experience; (1) don't ever let the infestations get to a scale where they become virtually uncontrollable; (2) ensure that there is good community understanding of the need for control, and that consultation is undertaken; (3) ensure that all environmental safeguards are met for control operations (i.e. obtain resource consents and conform to the consent conditions); (4) don't be deterred by the need to "jump through a few hoops" before control can be undertaken; (5) eradicate *Spartina* from New Zealand estuaries while it is still possible.

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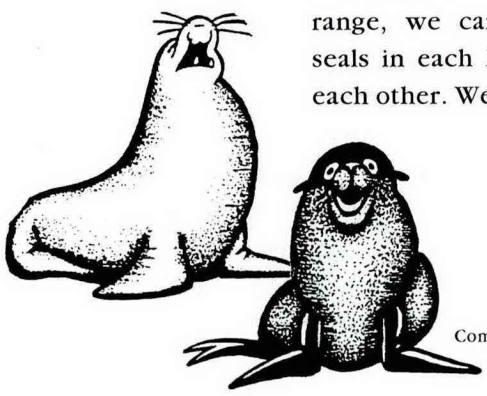
email: wildland@wave.co.nz

Geographic distribution of mitochondrial DNA haplotypes in New Zealand fur seals

Gina Lento, Rob Mattlin, Geoff Chambers and Scott Baker investigated the genetic variability of NZ Fur Seals and interestingly found a high degree of rookery fidelity.

The New Zealand fur seal is found around the mainland coast of New Zealand and, in fewer numbers, around Western Australia, South Australia, and Tasmania. This species was hunted to near extinction during the late 18th and 19th centuries. Presently, a major trawl fishery is situated near fur seal rookeries and haul-out areas on the west coast of the South Island of New Zealand and fur seals are attracted to the vessels during their normal fishing operations. A number of fur seals are caught in trawl nets each year (800 in 1989 reducing to 170 in 1991) and a number of these were sexually mature females (21%). It is not known how this continuing incidental kill affects fur seal populations. In order to ascertain whether this fishery affects only those fur seals from nearby rookeries or fur seals from a wider range around the fishery, we needed to examine the population structure of New Zealand fur seal.

In an attempt to characterise fur seal populations, we studied genetic variation in the mitochondrial cytochrome b gene. It has been shown that small differences in the sequence of DNA that makes up all genes are inherited in related groups of animals. By comparing these small variations in New Zealand fur seals from across their range, we can determine how fur seals in each location are related to each other. We chose a mitochondrial gene because it is passed on only through the maternal lineage and is less sensitive than nuclear genes to large population fluctuations (such as may have occurred during sealing exploitation). These two facts make interpreting patterns of mitochondrial DNA variation less confusing.



Comic seals — *Bruce Mabalski*

Shaughnessy (1970) compared serum proteins of "fur seals" in Western Australia, Victoria, Tasmania and New Zealand. All transferrin types found in *A. forsteri* fur seals from Western Australia were also observed in fur seals from New Zealand, but not all "New Zealand transferrin types" were seen in Western Australia. Based on these data, Shaughnessy suggested that Western Australian rookeries were repopulated by New Zealand fur seals from New Zealand rookeries after sealing exploitation ceased in the early 19th century.

We tested Shaughnessy's (1970) recolonisation hypothesis by comparing the frequency of mtDNA haplotypes in New Zealand and Western Australia. We also tested for possible genetic divisions within New Zealand populations. The latter comparison has important conservation implications because evidence for genetic divisions within New Zealand might indicate a need for rookery-specific management plans for fur seals.

For updated reading on this topic, please see:

Lento, G.M., Haddon, M., Chambers, G.K. and Baker, C.S. 1997. Genetic variation, population structure, and species identity of Southern Hemisphere fur seals, *Arctocephalus* spp., *Journal of Heredity* 88: 202-208.

Lento, G.M., Mattlin, R.H., Chambers, G.K. and Baker, C.S. 1994. Geographic distribution of mitochondrial cytochrome *b* DNA haplotypes in New Zealand fur seals (*Arctocephalus forsteri*) *Canadian journal of Zoology* 72: 293-299.

Drawing upon life!

Bruce Mahalski has made hundreds of exact and beautiful line drawings of New Zealand fauna. He is making them available for our use, so we thought readers might like to know something about him! — Ed.

Hi! I am a 34 year old artist and designer with a particular interest in natural history. When I was young I really wanted to be a marine biologist and spent a lot of time hanging around Portobello Marine Laboratory in Dunedin. Other interests beckoned, however, and I quit University to play in a rock band.

The arrival of my first child —Jaz — forced me to think about taking up a slightly more stable (and lucrative) career. Dutifully I returned to University and finished my degree, majoring in Psychology and Zoology.

After a short stint as a lab technician for MAFish I realised that short of getting a PhD I was unlikely to end up doing any work that was really interesting. By this time we'd had another child —Phoebe —and I could not afford to spend any more time studying, even if I wanted to.

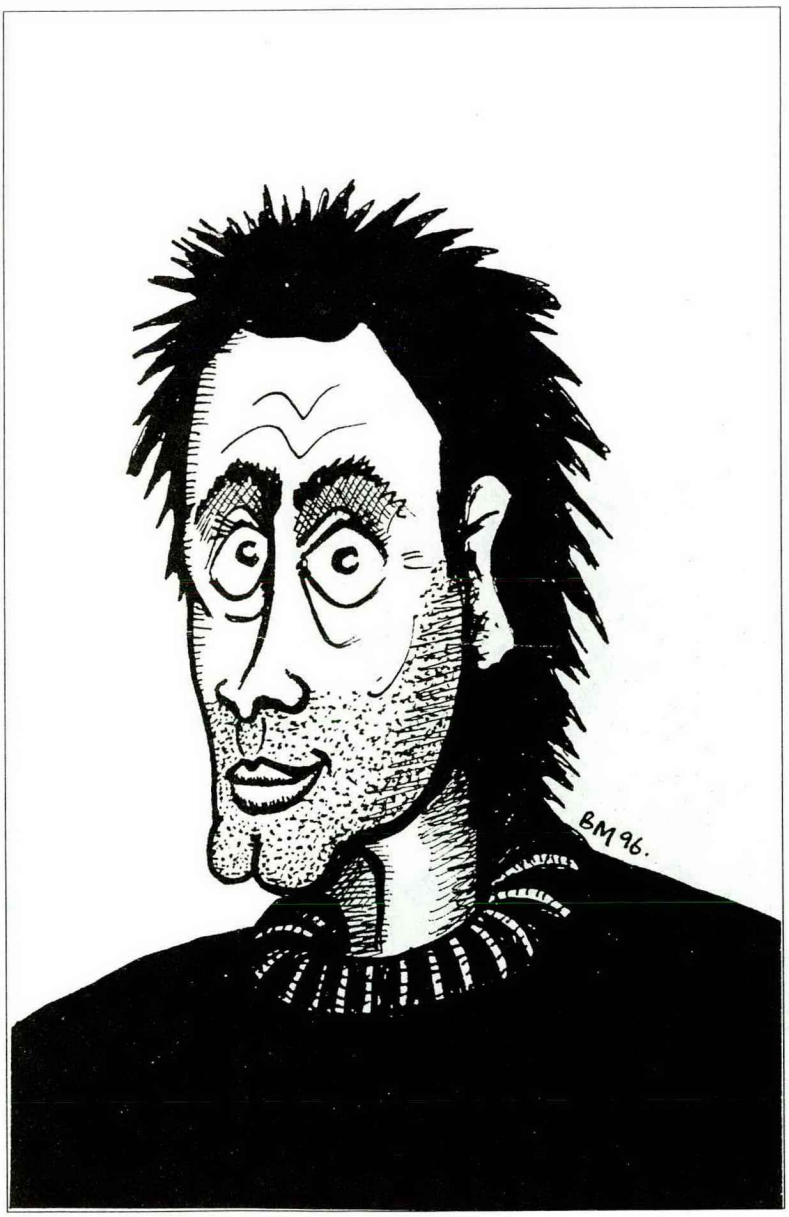
After some success selling T-shirts and other clothing with my own marine-life inspired designs printed on them I decided to get into clothing full-time. With no capital but a lot of enthusiasm myself and my partner, Fiona, set up our own clothing and design business, Fantastic Life. For more than five years we had our own outlet at the market and wholesaled our clothing to outlets around the country. We produced much of the clothing which featured in Forest and Bird's mail-order catalogues.

These days Fiona has taken a job at the Ministry of Health and I have stopped making clothes to concentrate on illustration work and fine art. I do book and record covers, design gift cards, wrapping papers and T-shirts, and provide illustrations for a wide range of publications. I specialise in scientific style illustration work involving NZ wildlife. I am also involved with the Marine Education Society of Australasia (MESA) and help to organise their main annual event in Wellington —Seaweek.

Earlier this year I had my first exhibition of fine-art and intend to try and produce at least one show a year from now on.

If you would like any illustration or design work done please give me a ring on (04) 802-5121 or write to me c/o 52 Todman Street, Brooklyn, Wellington.

Haere ra — Bruce Mahalski



Self-cartoon — Bruce Mahalski

RESEARCH IN PROGRESS

Investigation into secondary poisoning: Short-tailed bats and their invertebrate prey

By Shirley McQueen and Brian Lloyd, Science and Research Division, Science Techno;ogy Information Services, Dept. of Conservation.

Aerially broadcast 1080 is an effective method for control of vertebrate pests, such as brush-tailed possums, in mainland forests. However a cost-benefit analysis of the method requires an assessment of its impact on non-target species.

The presence of short-tailed bats (*Mystacina tuberculata*) in mainland indigenous forests has led to concern about the potential risk of secondary poisoning of these bats through consumption of invertebrates that have fed on poison baits. Lloyd (1994) assessed the risks using information available at the time and recommended further research to measure the impact of aerial 1080 operations on short-tailed bats and their invertebrate prey.

We are attempting to determine which invertebrates regularly feed on 1080 baits, and then to determine whether these taxa are part of the short-tailed bat diet. This work is part of a wider study assessing the impact of 1080 operations on short-tailed bats.

Invertebrates feeding on baits

The study area is within Rangataua Forest, south of Mt Ruapehu. Rangataua Forest comprises 10,000 ha of magnificent red and silver beech forest with a podocarp component at lower altitude. This area is suitable for the study because of the presence of a large population of short-tailed bats in relatively accessible forest. There also appears to be an abundant and diverse invertebrate fauna in the forest.

We monitor invertebrates feeding on non-toxic carrot and pollard baits at night, both by direct observations and time-lapse video surveillance. Baits are laid out on transect lines in an area

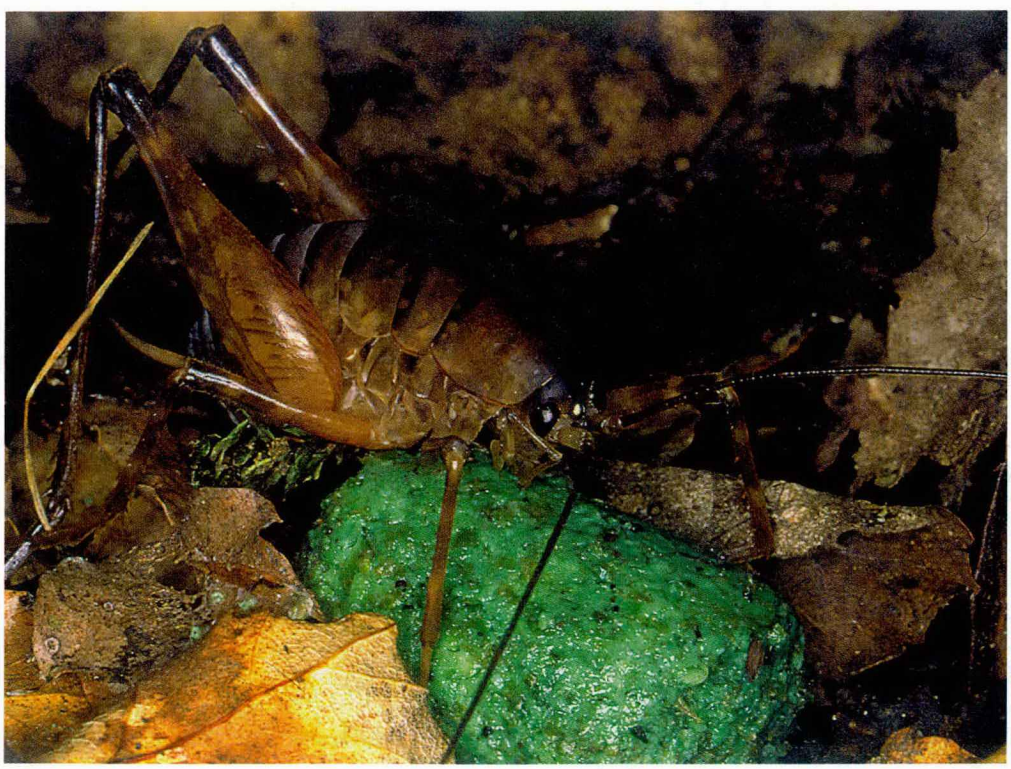


Figure 1. Cave weta (*Gymnoplectron tuarti*) feeding on pollard bait. Photo credit: Brian Lloyd

Figure 2. Captive short-tailed bat feeding on tree weta (*Hemideina crassidens*). Photo credit: Brian Lloyd

with additional baits distributed to simulate a 1080 operation of 5 kg baits/ha. Baits are checked for invertebrates once each night on six nights each month from May to October 1997. Pyranine, a fluorescent dye, is added to the baits, and enables us to detect bait particles in mouth parts and gut of invertebrates. Possums and rats remove most baits by the third night, and so transect lines are relocated. This stops resident pests learning where to find a free meal and reduces trampling by observers and local effects on invertebrate populations.

Time-lapse video surveillance is undertaken for twelve hours each night for six nights per month for each bait type. The results from this method complement 'direct' observations of the baits as they provide estimates of feeding duration and observer induced biases during direct observations.

An aerial 1080 pest control operation at the end of August 1997 has enabled us to carry out observations of toxic pollard baits during a real pest control situation. We have collected invertebrates from baits and pitfall trap within the 1080 control area and these will be assayed for 1080 content.

Diet analysis for Rangataua Forest short-tailed bats is underway. We have collected bat droppings both at bat roost trees and from individual bats caught in mist nets during the last two years.

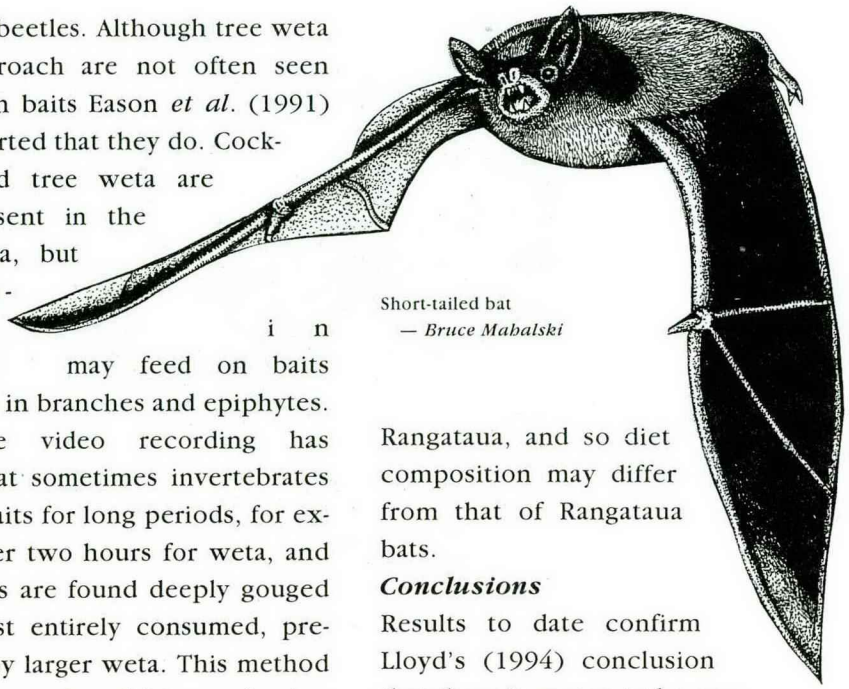
Preliminary results

The results from a pilot study during 1996 and the work to date this year show that there is considerable variance from night to night in both the abundance and diversity of invertebrate species found feeding on baits. Larger invertebrates frequently found feeding on pollard baits are listed in Table 1. The high nightly variance in numbers seen may be due to changes in factors such as ambient temperature or moisture level in the upper layer of leaf litter. The size of these invertebrates varies greatly. The larg-

RESEARCH IN PROGRESS

weta and beetles. Although tree weta and cockroach are not often seen feeding on baits Eason *et al.* (1991) have reported that they do. Cockroach and tree weta are both present in the study area, but presumably stay in trees and may feed on baits caught up in branches and epiphytes. Time-lapse video recording has shown that sometimes invertebrates feed on baits for long periods, for example over two hours for weta, and some baits are found deeply gouged and almost entirely consumed, presumably by larger weta. This method has also proved useful in confirming that invertebrates found on baits are feeding on them.

Many of the taxa that we see feeding on baits are consumed by short-tailed bats on Codfish Island (Lloyd & McCartney, in prep.), and on Little Barrier Is. (Arkins 1996). However, these are both island bat populations living in different forest types to Rangataua, and so diet composition may differ from that of Rangataua bats.



Short-tailed bat
— *Bruce Mahalski*

TABLE 1. LARGER INVERTEBRATES FOUND FEEDING ON NON-TOXIC POLLARD BAITS DURING DIRECT OBSERVATIONS (ONCE PER NIGHT).

INVERTEBRATE CATEGORY	NO. OF SP. IDENTIFIED	MEAN NO. INDIVIDUALS*
Cave weta (Rhaphidophoridae)	5	4.8±6.9
Ground weta (Stenopelmatidae)	1	
Beetles (Carabidae, Cerambycidae,	3 Scarabaeoidea)	11.7±21.1
Harvestmen (Phalangiidae, Triaenonychidae)	4	4.5±4.9
Millipedes (*Icosidesmus* sp., *Dimerogonus* sp.)	2	1.9±6.9
Amphipods	n.d.	9.65±9.1

* (±SE) per 100 baits/night (May-August 1997)
n.d. = not determined

Conclusions

Results to date confirm Lloyd's (1994) conclusion that there is reason to be concerned about the possibility of secondary poisoning of short-tailed bats during aerial 1080 pest control operations. Information gained from this study and the parallel study of short-tailed bats in Rangataua Forest should contribute to the evaluation of both the risk of secondary poisoning of bats and the impact of 1080 operations on some invertebrate species.

References

Arkins, M.A. 1996. The diet and activity patterns of short-tailed bats (*Mystacina tuberculata apourica*) on Little Barrier Island. *M.Sc. Thesis*, University of Auckland.

Eason, C.T., Batchelor, D. and Wright, G.R. 1991. Environmental impact assessments on 1080 associated with possum control in the Waipoua Forest Sanctuary, Northland. *Forest Research Institute Contract Report:* FWE 91/8.

Lloyd, B.D. 1994. Evaluating the potential hazard of 1080 aerial poison operations to short-tailed bat populations. *Conservation Advisory Science Notes* No 108, Department of Conservation.

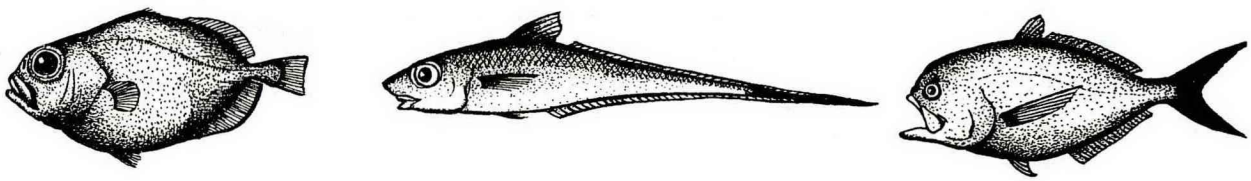
RESEARCH IN PROGRESS

DOC funds for MONZ Data Entry Project

The funds allocated for Investigation no. 1922 were used to contribute to the salary costs associated with entry of fish specimens onto the Te Kahui database. A total of 33,500 specimen fish records have been entered onto the database, representing the registered collection as of July 1997. Data entry is ongoing as the collection expands at a rate of between 1,000-1,500 specimens per year.

"Te Kahui" is operational and work is now focusing on mapping programmes for preparation of distribution maps from the database, however, progress is slow because of commitments to the waterfront project. Many of the records are not as yet validated because of nomenclatural changes since the collection was established in 1869, and many early localities lack grid references.

Chris Paulin
Collection Manager Fishes
Museum of New Zealand



£54,000 Available for Conservation Research

The BP Conservation Programme BirdLife International, Wellbrook Court, Girton Road, Cambridge CB3 ONA, U.K., have sent us this information about their award programme.

How do the Awards work?

Students in full or part-time education from anywhere in the world are invited to submit proposals addressing conservation issues of global significance. Projects must fall into one of four categories: Tropical Forests; Oceanic Islands and Marine Habitats; Wetlands, Grasslands, Savannahs and Deserts; and Globally Threatened Species. Each project must also involve local communities and students or counterparts from the country where the project will take place.

From 1998 the Programme will give awards totally £54,000. Four winners will receive £5,000, eight runners-up £3,000 and one previous winner or runner-up will receive a £10,000 Follow-up Award.

Full details on how to apply are contained in the booklet "Guidelines for Applicants". The booklet and an application form can be obtained from the Programme Manager. The Programme internet site (in French, Spanish and English) also contains details and extensive information on previous winning projects.

Contact Katharine Gotto, BP Conservation Programme, BirdLife International, Wellbrook Court, Girton Road, Cambridge CB3 ONA, UK.
Tel: +44 1223 277318
Fax: +44 1223 277200,
Email:
bp-conservation-programme@birdlife.org.uk
Or find us on the Internet at:
http://www.bp.com/conservation/

NEW PUBLICATIONS

New Books from Science and Research Division

SCIENCE FOR CONSERVATION

Spurr, E.B; Powlesland, R.G. 1997. **Impacts of aerial application of 1080 on non-target native fauna: Review and priorities for research.** *Science for Conservation: 62.* 31 p. $12.50 (incl. G.S.T.)

Impacts on birds, bats, lizards, frogs, and invertebrates are reviewed. Priorities for further research are recommended. A Research Co-ordinating Group should be established.

(*Science for Conservation: 60 and 61* are still in press.)

Perriman, Lyndon 1997. **Blue penguins *(Eudyptula minor)* at Taiaroa Head and the Otago Peninsula, 1993–95.** *Science for Conservation: 59.* 22 p. $12.50 (incl. G.S.T.)

Sixty-nine pairs were monitored over the 1993/94 season, and 87 during the 1994/95 season. A minimum of 284 breeding pairs were along the outer coast of Otago Peninsula during 1994/95.

Sanders, M.D. 1997. **Food supplies at black stilt nest sites.** *Science for Conservation: 58.* 16 p. $12.50 (incl. G.S.T.)

Composition and biomass of the aquatic invertebrate community at nine sites adjacent to nests in the Upper Waitaki Basin. A basis for evaluating food supplies in constructed/modified wetlands.

Miller, Craig 1997. **Occurrence and ecology of the Open Bay Islands leech, *Hirudobdella antipodium*.** *Science for Conservation: 57.* 16 p. $12.50 (incl. G.S.T.)

This terrestrial leech in endemic to these islands. Extensive searches failed to find any remnant populations other than that discovered in 1987. Options for protection are discussed.

Constantine, R.; Baker, C.S. 1997. **Monitoring the commercial swim-with-dolphin operations in the Bay of Islands.** *Science for Conservation: 56.* 59 p. $22.50 (incl. G.S.T.)

Observations of encounters, and dolphin responses to swimmers. Future research should attempt to determine the dolphins' home range, habitat use, and the impact of environment changes.

Dugdale, J.; Hutcheson, J. 1997. **Invertebrate values of kanuka (*Kunzea ericoides*) stands, Gis-borne Region.** *Science for Conservation: 55.* 30 p. $12.50 (incl. G.S.T.)

Records increasingly complex community structure and numbers of species from pasture to old kanuka and primary forest. Recommends old kanuka be classed with forest in land-use evaluations.

Mew, G.; Ross, C.W.; Davis, M.R.; Langer, E.R. 1997. **Rehabilitation of indigenous forest after mining, West Coast.** *Science for Conservation: 54.* 60 p. $22.50 (incl. G.S.T.)

Past performance on a range of mining sites. Forest description and establishment of natives on mine overburden at Giles Creek. Fertilizer response of *Coprosma* and *Notofagus* seedlings.

Macky, Graham 1997. **Changes in stream morphology at two mining sites near Reefton.** *Science for Conservation: 53.* 33 p $12.50 (incl. G.S.T.)

Giles Creek and Slab Hut Creek were monitored by photographs and survey in a 5-year study. Observations are related to recent research results on channel morphology and erosion.

Rogers, Geoff. 1997. **Trends in health of pahautea and Hall's totara in relation to possum control in central North Island.** *Science for Conservation: 52.* 49 p. $22.50 (incl. G.S.T.)

Highlights the palatability of pahautea, and vulnerability of Hall's totara to prolonged defoliation. Defoliation, dieback, and collapse of both are widespead in montane forests.

Miles, J.R.G., Potter, M.A.; Fordham, R.A. 1997. **Northern brown kiwi (*Apteryx australis mantelli*) in Tongariro National Park and Tongariro Forest — ecology and threats.** *Science for Conservation: 51.* 23 p. $12.50 (incl. G.S.T.)

Findings from a 14 month study of calling behaviour, range size, roost choice, feeding ecology, and threats to conservation. Recommendations for the management of areas containing kiwi.

NEW PUBLICATIONS

Nugent, G., Fraser, K.W.; Sweetapple, P.J. 1997. **Comparison of red deer and possum diets and impacts in podocarp – hardwood forest, Waihaha Catchment, Pureora Conservation Park.** *Science for Conservation: 50.* 61 p. $22.50 (incl. G.S.T.)

A 1990-1993 study of the density, diet, and forage use of these two species. Assessments of forage availability and impacts on regeneration. Recommendations for further research.

Allen, R.B.; McIntosh, P.D. 1997. **Guidelines for conservation of salt pans in Central Otago.** *Science for Conservation: 49.* 46 p. $22.50 (incl. G.S.T.)

24 salt pan sites are described and ranked for rarity of habitat, biota represented, and degree of threat to each site. Contains site-by-site descriptions and guidelines for conservation management.

Gibbs, G.; McIntyre, M. 1997. **Abundance and future options for wetapunga on Little Barrier Island.** *Science for Conservation: 48.* 24 p. $12.50 (incl. G.S.T.)

A survey over 40 nights (November 1994 to May 1995) suggests the species may have declined. Includes preliminary results from monitoring and recommends a predator-free enclosure to build up numbers.

DOC TECHNICAL SERIES

Harding, J.S.; Winterbourn, M.J. 1997. **New Zealand ecoregions: A classification for use in stream conservation and management.** *Department of Conservation Technical Series No.11.* 26 p. $12.50 (incl. G.S.T.)

Developed from mapped data on six macro-environmental variables: vegetative cover, bedrock geology, soils, relief, rainfall normals, and Meteorological Service Climate Regions.

CONSERVATION SCIENCES PUBLICATIONS SERIES

Allibone, R.M.; McDowell, R.M. 1997. **Conservation ecology of the dusky galaxias, *Galaxias pullus* (Teleostei: Galaxiidae).** *Conservation Sciences Publication: 6.* 48 p. $22.50 (incl. G.S.T.)

Habitat, distribution, abundance in tributaries of the Taieri River, Otago, is outlined. Threatened species status, threats to survival, and conservation actions are canvassed.

OTHER BOOKS

Simpson, Philip 1997. **Ecological restoration in the Wellington Conservancy.** 112 p. $20.00 (incl. G.S.T.)

General opportunities for restoration are described for both protected and unprotected land. Buffer areas, roadside and riparian corridors, and farm and production forest management possibilities are raised. Linking major ecological features is a priority.

Parkes, J.; Baker, A.N.; Ericksen, K. 1997. **Possum control by the Department of Conservation: Background, issues, and results from 1993 to 1995.** 40 p. $10.00 (incl. G.S.T.)

A summary survey of the Department's objectives and operations in possum control.

de Lange, P.J. and Norton, D.A. (Editors) 1997. **New Zealand's loranthaceous mistletoes.** *Proceedings of a workshop hosted by Threatened Species Unit, Departmen of Conservation, Cass, 17 - 20 July 1995.* 220 p.

$20.00 (incl. G.S.T.)

Plus $3.00 p+p within New Zealand

Past and present distribution of New Zealand mistletoes, with papers on ecology, threats, current status, and management options. Contains an annotated Bibiography of New Zealand mistletoes.

CAS NOTES

Pierce, R.J.; Sporle, W . 1997. **Causes of kiwi mortality in Northland.** *Conservation Advisory Science Notes: 169.* 6 p.

Ecroyd, C.E.; Jones, C. 1997. **Possum monitoring plots in Waione Block, Tongariro Forest.** *Conservation Advisory Science Notes: 168.* 8 p.

McLennan, J. 1997. **Ecology of brown kiwi and causes of poulation decline in Lake Waikaremoana catchment.** *Conservation Advisory Science Notes: 167.* 25 p.

Walls, G.; Baird, A. 1997. **Holes in the fence: The vegetation of Chatham Island reserves, 1990–1996.** *Conservation Advisory Science Notes: 166.* 30 p. **$12.50 (incl. G.S.T.)**

Walls, G. 1997. **Where water meets land: Ecological values and conservation management of driftwood.** *Conservation Advisory Science Notes: 165.* 7 p. **$5.00 (incl. G.S.T.)**

NEW PUBLICATIONS

Cawthorn, M.W. 1997. **Meat consumption from stranded whales and marine mammals in New Zealand: Public health and other issues.** *Conservation Advisory Science Notes: 164.* 23 p.

McKinlay, B. 1997. **Changes in Cromwell Terrace vegetation and soils.** *Conservation Advisory Science Notes: 163.* 5 p.

Collier, K.J. 1997. **Changes in substrate and diet of blue duck on Tongariro River after the 1995 Mt Ruapehu eruption.** *Conservation Advisory Science Notes: 162.* 30 p. (colour illus.) **$12.50 (incl. G.S.T.)**

Beggs, J.; Rees, J. 1997. **Honeydew abundance in two areas at St Arnaud.** *Conservation Advisory Science Notes: 161.* 4 p.

Freeman, A.; Wilson, K-J. 1997. **Results of the Westland petrel satellite tracking programme 1995 season.** *Conservation Advisory Science Notes: 160.* 4 p.

Black-browed mollymawk and chick — *Bruce Mahalski*

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