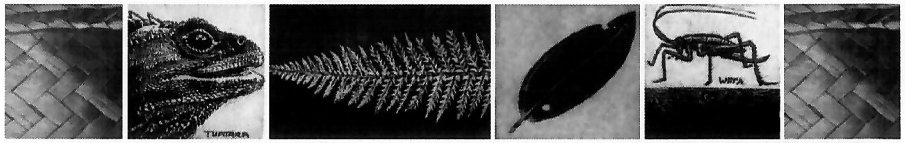
Signs of the Times at the Claris Santa Parade

Above: DOC acknowledges the huge rat problem, supported by children from Okiwi School;

At left: Jenni Ogden as kakariki, John as kokako, and Jude Gilbert as the attacking ship- rat!

Photos: IslandStay

Issue 27– FREE Spring 2011



Great Barrier Island Charitable Trust

Environmental News

PHOTO BY CHRIS COLLINS

Black Petrel – Hanging on, just

Editorial: Local Politics and ESP

Essay by Wren Green:

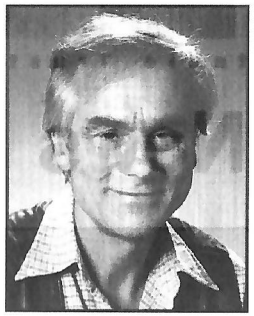
A Future Pest-free Paradise

Vision: Bring back Kokako

Editorial

Local Politics and Extra-Sensory Perception

BY CHAIR JOHN OGDEN



By the time you read this the election result will be known, so I'll avoid national politics! Local politics have also been particularly active of late. The most important thing from the Trust's perspective has been the formation of a new Local Board Committee – the ESP committee! Although I've no doubt some extra-sensory perception will be required, the initials stand, rather grandly, for 'Environmental Strategy Planning'. The committee is chaired by Richard Somerville-Ryan and comprises all Local Board members. The terms of reference include:

1. Regional Environmental Issues and their effect on Great Barrier
2. Pest Management and Eradication
3. Biodiversity and Species Management
4. Marine Parks and protection
5. Water Quality
6. Other Environmental Issues and their importance to GBI.

The committee is authorised to consult widely with the local community and community groups, to hold public meetings, to call for submissions and commission reports on any important aspects of GBI environment. The need for "community consultation /surveys on environment and pest management" was the strongest single submission to the Local Board Plan. The new Committee has got off to an excellent start with it's first 'public forum' meeting on 23 November running for over 3 hours. I presented the Trust's response to Auckland Council's paper on the pollution issues in Tryphena. One of the Council's Land and Water Management Team (Matt Harrex) was present at the meeting, and the Trust's suggestion that it would be better to get council officers to come to GBI for face to face discussion rather than continued report writing was readily agreed to. Judy Gilbert spoke about the need to set up a community consultation process on environmental issues including pest control. This was, once again, bogged down by the view that "you can get anything you want from a questionnaire". So, lets get a process going that avoids that partisan approach; who knows what we or anyone else wants, until we or they, are asked? This cannot be discovered by extra-sensory perception, by either this new committee or the Trust. As Sue Daly stressed, providing "Issues and Options" papers for people to read beforehand is part of the process. That should be led by the Local Board, with input from all concerned. To judge from the number and enthusiasm of Auckland Council advisors present at the meeting, there is a lot of potential help with this process. Judy also spoke about the possibilities of getting support for research on coastal planning, and the need to ensure that Glenfern Sanctuary is preserved as Tony Bouzaid's legacy.

A highlight of the ESP meeting was a presentation by Jack Craw (Auckland Council, Biosecurity) about strengthening measures to prevent incursions of Norway rats, possums or mustelids, and how this translates into more jobs and money coming into the Island. Jack also reported on the appointment of a local biosecurity officer, the instigation of a preventative weed program and ongoing work to contain the spread of invasive Argentine ants. In response to concerns about the use of poisons, Jack outlined research on new electronic trapping and monitoring systems, and improvements in the specific delivery of toxins. There is growing optimism about a pest-free Great Barrier in the future.

Matt Harrex talked about the role of the Land and Water Management team, and offered support and advice. His team can strengthen and support funding applications to council or other bodies. Likewise Viv. Sherwood offered help to schools in Environmntal Education, and particularly emphasized the 'Wai Care' program, which can provide stream quality testing kits.

In response to a request from Paul Downey, Tim Lovegrove of the Council's Biodiversity team presented a paper dealing with the issues and options involved in returning kokako to the Northern Block of Great Barrier. The Trust initiated a hui on this topic in September, and a working group led by Rodney Ngawaka has been formed. Although the process will inevitably be long, it has already drawn attention to some important issues about how we control animal pests. With studies at Little Windy Hill, Glenfern Sanctuary, Motu Kaikoura and others, there is a lot of local information about this. Izzy Fordham hoped to get more awareness of the need for rat control generally and moved that money be made available from the Local Board to subsidise traps (not toxins) for residents.

Marine protection was brought up by Peter Blackwell, and addressed also by Scott Mabey. Here again there is a need for community consultation, although the general feeling of Barrierites was well known by ESP – the need to curtail the local commercial catch. This must be addressed at ministerial level.

I've missed a few things out, but I hope I've given you a feeling for the wide-ranging and potentially important role of this committee. The Trust congratulates the Local Board on taking this important step forwards and looks forwards to working with the new committee and assisting with the planning of a long-term environmental strategy.

Addendum: Balance of Nature. The 'balance of nature' comes up frequently with regard to control of rats, rabbits and cats and the protection of native biota on Great Barrier. The idea is that cats eat (control) rats and rabbits, so if we remove rats or bunnies the cats will

COVER PHOTO CREDITS: Black Petrel, Hauraki Gulf 2009, by Chris Collins *Kokako: Matt Binns*

GBICT Mission Statement: To protect native species through the eradication of rats and feral cats, to re-introduce species lost to the Island, and to work towards building an ecology-based economic framework for Great Barrier Island.

www.gbict.co.nz *RD1 Great Barrier Island Ph: (09)4290940*

eat birds and/or lizards, therefore it's better to leave the 'balance' alone. This is a non-sequiteur – that is, while the first part of the sentence may be true, the second part (the conclusion) does not flow logically from it. Rats are not in balance with native birds or native plants – they are steadily destroying more and more of them. Great Barrier has already lost twelve bird species since rats arrived – kokako and whiteheads within recent decades. The process is continuing with black petrel, kakariki, tomtit, bittern and spotless crake, all either known to be declining or known to be at risk. Bellbirds can't re-establish from Hauturu because their nests are predated by rats. Much of the rat-infested bush is silent – Te Paparahi has some of the best forest left on the Island, but it is almost bird-free. In contrast the rat-free 'scrub ' and forest patches at Windy Hill are alive with the noise of birds. Cats may 'control' rats, but only because there is a constant supply of rats because they in turn are constantly feeding on native birds etc. The so-called cat/rat or cat/rabbit balance is an awful combination, which is steadily destroying our bird-life and our coastal and lowland vegetation. To stop the carnage and restore the 'balance' we need to get rid of all three pests, as nearly simultaneously as possible. This is not pie-in-the-sky: new delivery systems for environmentally safe toxins, new electronic multiple killing devices and new remote monitoring systems are all around the corner. It is quite possible that within a decade the means to achieve a pest-free Great Barrier and provide on-going employment and visitor income will be available, especially if we all agree to do our part in support of that goal.

QEII National Trust
Open Space New Zealand
Ngā Kairauhī Papa

QEII CONSERVATION AND COVENANTS TALK

• Wed 25 January 2012 •

6pm – Great Barrier Island Sports Club, Whangaparapara Road, Claris.

The QEII National Trust was set up in 1977 by a group of landowners who wanted a way to both protect special natural or cultural areas on their land while still retaining ownership of it. 35 years on this voluntary initiative has seen over 3500 covenants established, protecting around 100,000 ha of very special places on private land – forever.

Come along and hear QEII's Northwest Auckland representative, Chris Floyd, talk about the QEII Trust, what covenanting involves, and answer questions about how it all works for the landowner.

cfloyd@openspace.org.nz www.openspace.org.nz

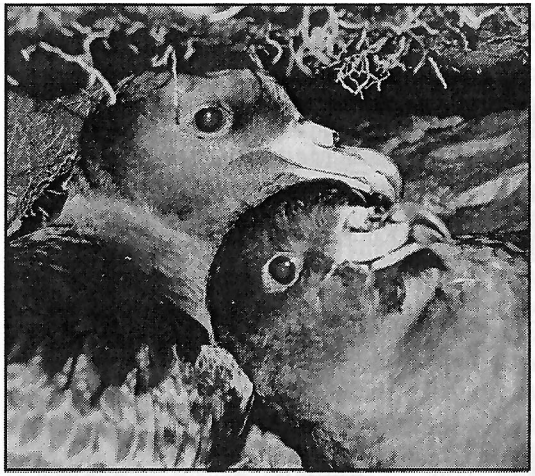
Black petrel – hanging on, just

An iconic seabird species may vanish in our lifetime – under threat from cats, pigs, rats and dogs in their ridgetop breeding sites, and from a thousands of baited hooks at sea.

BY KATE WATERHOUSE

October 22nd, coming out of Tryphena on the Island Navigator, straight into 60 knots of SW gale and 3m of steep nasty swell. What creature on earth could possibly find conditions like that habitable – Procellaria parkinsoni, *our own Black Petrels do. The wind abated to 40-50 knots as we got further across the gulf, and hanging on I watched them, barely moving as they curved and soared above the waves, the slightest adjustment of the 110cm wingspan enough to send them up into another magnificent dark arc.*

Black petrels arrive in October from their winter foraging grounds, which stretch from the east coast of Australia to the west coast of South America – the waters of Mexico, Ecuador, the Galapagos islands and Peru. They come home for one thing and one thing only, to mate. Almost all of them are looking to do this on the summits and ridges around Hirakimata/Mt Hobson. For the black petrel, mating is worthy of a soap opera. Males usually claim the same burrow year on year, returning to spruce it up and make a lot of noise waiting for their steady girl to (hopefully) come back and mate with him. This is a noisy process according to Elizabeth Bell (Biz), who has been researching these birds since 1995. If all goes well, pairs leave the island on honeymoon for up to a month, returning in late November when the females lay a single egg. Petrels are a modern family – both male and female share incubation of the egg for about 8 weeks. Eggs can hatch from late January through February but chicks take a further three months to fledge. This may happen from mid-April through to late June, so you may see Black petrels



• *Breeding pair of back petrels in their burrow on Hirakimata peak*
Photo: Biz Bell

around in the gulf until then. Bell's data shows in the past about 75% of chicks go on to fledge but in 2011 breeding success fell to 61%.

However, it's not all a bed of mairehau up there – males will try to attract another female if their mate doesn't show up, or if there's been a divorce – which happens to about 12% of pairs annually according to Bell. Some males will even be kicked out of their burrows by a returning son.

The main colony can be a busy place at night – with about c. 4000-5000 resident birds over summer, including approximately 1300 breeding pairs and 1000 "pre-breeders" looking for mates. You can hear them at dusk, but will almost never see them, as they return to the colony as a distinctive yakyakyakyakyak over-head. They sound similar to a Cook's petrel, which breed in the hundreds of thousands on Little Barrer/Hauturu.

Adults and chicks migrate to South America for winter to waters off the Ecuador coast. Juveniles will remain at sea in the West Pacific for 3-4 years until they are ready to breed – survival rate is 46% during this time vs 90% for birds over 3 years old. At about 4 years old, 'pre-breeders' as they are known, will come back to the colony to find a mate. Advertising by the males is noisy and may take 1-2 seasons to pay off.

Research by Bell and others shows birds forage much closer to the Hauraki Gulf from December to Autumn while incubating an egg and raising a chick – mainly in the Tasman Sea and to the north-east of NZ. Females and males forage separately and in different places – it is not known why this is. They may go a long way for a fish – the longest recorded foraging trip from Great Barrier is 39 days!

A Consistent Decline

Black Petrels were previously found throughout North Island and Northwest Nelson but feral cats and pigs caused their extinction on the mainland from about the 1950s. The population has been declining by at least 1.4% per year since 1995. They are at risk at sea and on land, classed as *Nationally Vulnerable* by DoC and they are listed on the International Union for Conservation of Nature *UCN Red list: Vulnerable.*

Threats On Land

Even five years ago if you walked along the Cooper's Castle track or around Tataweka in Te Paparahi, you could be confident of coming across the smell of seabirds – black petrels love mature forest with roots and rocks that provide good burrow sites, which are crucial for breeding success. Petrels occasionally nest on ridges away from the main colony and one has even nested under a house at Okupu. However Bell suspects that the Coopers Castle and Tataweka colonies have been destroyed by pigs in recent seasons. Pigs dig up burrows and eat eggs and chicks – in one example in 1996 pigs destroyed 8 burrows in one incident (Bell & Sim 1998). Pigs have been sighted on Hirakimata and around Mt Heale in the last year. If they become established this could spell disaster for the black petrel. Feral cats can kill adults on the ground or at the nest as well as chicks. DOC traps cats in the adjacent Whangapoua basin to protect Brown Teal, but until this season there has been no specific protection of the colony. This month DoC has begun trapping cats and is working on an approach to control of pigs in known nesting areas. Kiore and ship rats are less of a concern – kiore cannot eat through a black petrel egg and predation levels are between 1 and 6.5% per annum (Bell et al. 2011). The risk to black petrel survival from a one-off event is significant due to the importance of the single breeding site around Hirakimata – for example from fire, storm damage or cat and pig invasion of the main colony.

The threat at sea: New Zealand's most at-risk seabird

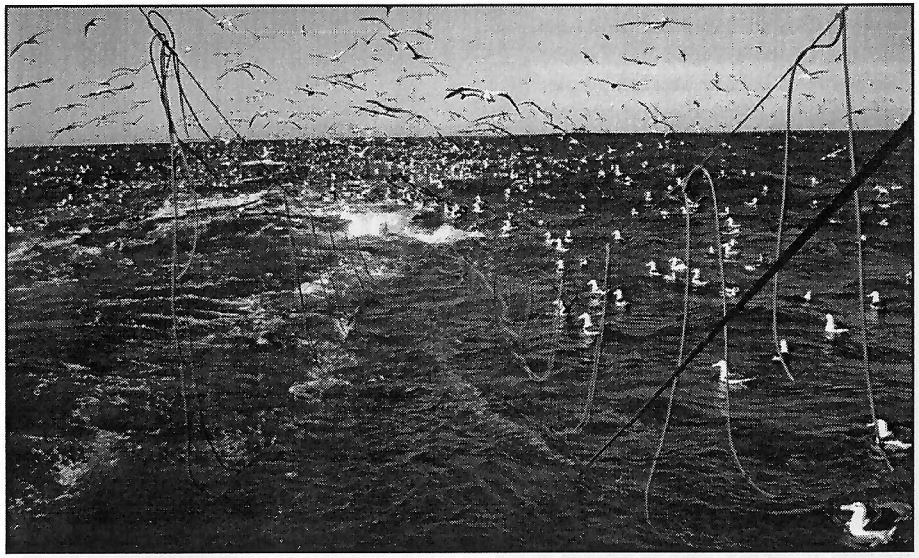
This year the Ministry of Fisheries commissioned Dragonfly to develop a Seabird Risk Assessment (Richard et al 2011). The results were horrifying for the Black Petrel. The risk assessment compares the total number of birds potentially killed (via a calculation) against the Potential Biological Removal (PBR) index – that is, the amount of human-induced mortality the species can sustain without heading towards extinction. The Black Petrel was the most at risk of 64 species studied. The report estimates that between 725 and 1524 birds may have been killed each year in the period 2003 to 2009. This number far exceeds what the population could sustain and doesn't take into account captures outside the EEZ, such as in the Eastern Pacific.

• *Black petrel chick in burrow*
Photo Biz Bell

Bottom Longline fishing for snapper and bluenose is how most black petrels are killed. However, there is virtually no monitoring or enforcement of the use of mitigation techniques in these inshore fisheries around the north east of the North Island. This is a key foraging area for Black Petrel from December to May when eggs are being incubated and chicks are hatched and need to be fed.

How black petrels are killed by fishing

Birds will aggressively follow charters and fishing boats and may dive up to 20m below the surface after baits. A longliner will let out or 'set' 500 or more hooks at a time. If a bird is caught on a set hook it will be dragged under and drown. Birds caught on the 'haul' as hooks are pulled in, have a greater chance of being brought aboard alive



• *Tori lines streaming behind a South African hake trawler off Cape Town. Photo by Barry Watkins Courtesy of University of Aberdeen.*

and then released. It is not known how many birds are killed in each instance. Discharging waste while stationary attracts more birds, since the more bait and offal are in the water the more birds want to feed. Black petrels predominately feed at night but can feed during the day, unlike albatrosses which do not feed at night, so night setting is unlikely to prevent deaths.

Reported deaths by fishers are low and likely to be under-reported – since 1996, there have been only 38 birds reported caught and killed by local commercial fishers, mainly in domestic tuna long-line and snapper fisheries. The level of deaths in fisheries outside NZ waters is unknown. Mapping of foraging patterns against fishing activity in NZ waters is currently underway. Data loggers have been attached to birds to yield maps of at sea range as we featured in our Spring Environmental News (see our website).

There are anecdotal reports of captures from recreational fishers especially in the outer Gulf, but the impact of recreational fishing is also unknown. Leigh charter operator and ex-commercial fisherman Geordie Murman has reported seeing 30-40 black petrels round his boat following baits when close to Great and Little Barrier during the breeding season. Observers have reported instances of very aggressive feeding behaviour in the same area.

If one of a pair of breeding birds is killed while foraging, chances are the egg or chick will also die – taking out 2 from the population in one hit. Biz Bell once observed a female sitting on an egg for 23 days waiting for her mate to return, before she had to leave to feed or die of starvation herself. Bell has removed hooks from birds in burrows and has found birds killed because fishers have left long traces on hooks which then become tangled in trees trapping the bird until it dies.

Mitigation methods to avoid killing birds while fishing are well known in the fishing industry.

For bottom long line (BLL) fishing mitigation is chiefly:

1. Tori lines: these are 20m long sets of streamers attached to poles at the back of the boat. They distract birds and keep them away from the setting hooks while the baits are near the surface. Twin tori lines can ensure coverage of the danger area if strong winds are present.

2. Weighted lines: Weights are attached to each hook to ensure they sink quickly and are too deep for birds to reach by the time the hooks leave the area protected by the streamers.

Ministry of Fisheries regulations for BLL fishing are that vessels over 7 m must use a streamer or tori line and night setting, or use weighted lines if during the day; and that offal/discards are not to be discharged during setting, and only from the opposite side of the vessel during hauling. In the key inshore fisheries, smaller vessels may be operating, night setting will not protect black petrels, and less than 0.5% of boats in the two highest risk fisheries have carried observers in any one year. There have been instances of observers not being able to board boats because they have left early or "decided" not to go out that day. Many boats in the Gulf reportedly do not carry tori lines and there is limited use of weighted hooks.

Preventing extinction requires action by the Ministry of Fisheries

In Auckland Council's 30 Year Plan, there is a Biosecurity target of no extinctions. At current rates of decline and taking into account the Seabird Risk Assessment, it is highly likely that the Black Petrel will be extinct sooner than 30 years, if we do not act to protect it now. Land-based protection is in hand, provided it continues to be funded by DoC in future seasons. The

Many boats in the Gulf reportedly do not carry tori lines and there is limited use of weighted hooks.

sea-based methods to protect black petrels are largely known, but not being implemented by the majority of commercial fishers in the high-risk inshore BLL snapper and bluenose fisheries. Worse, the Ministry of Fisheries does not enforce its own regulations, which require mitigation to be used.

The Black Petrel Action Group

As a result of the high level of concern about black petrels raised by the Ministry of Fisheries' own Seabird Risk Assessment the Black Petrel Action Group was formed on 16 September. GBICT, Hauturu/Little Barrier Trust, Ngati Rehua/Ngati Wai ki Aotea, Birdlife International, Forest & Bird, WWF-New Zealand, and leading seabird scientists from the Auckland Council and Wildlife Management International Limited have joined forces to promote awareness of the bird's status to take action to protect it. What we consider particularly unacceptable is that mitigation measures exist which, if used, will prevent black petrel being killed in highest-risk inshore fisheries. We have written to the Ministers of Fisheries and Conservation requesting action to:

1. Increase observer coverage of the inshore bottom longline and trawl snapper and bluenose fisheries, and/or install cameras on boats as is being trialled in Australia

2. Enforce existing regulations for the use of mitigation

3. Improve the effectiveness of regulated mitigations, especially around night setting

4. Trial an exclusion area around Black Petrel feeding grounds during breeding and chick rearing

5. Implement a revised National Plan of Action for Seabirds: Between 22,500 and 40,000 seabirds may be killed annually in New Zealand fisheries, despite New Zealand's commitment to the Agreement on the Conservation of Albatrosses and Petrels (ACAP) and other international agreements, and our claim to operate the most sustainable fisheries management system in the world.

What you can do

• Write to the Minister of Fisheries and of Conservation asking for action to protect the Black Petrel and other seabirds (go to our website for a copy of the letter the Black Petrel Action Group sent in October 2011)

• Write to or contact your MP, GBI Local Board or councillor (Mike Lee and Christine Fletcher for Auckland Central and Gulf Islands) and ask what they plan to do to protect the Black Petrel.

• Find the Black Petrel Action Group site on facebook and "like" it.

• Report any dead black petrels you see to Amelia Geary at DOC on Great Barrier – take photographs and record the location or take the bird to DOC in Port FitzROy

• Encourage any fishers you know to be responsible around seabirds, and especially black petrels, especially between December and May.

• Please see our website for guidance on how to remove hooks form birds. Do NOT leave a long trace if hooks cannot be removed.

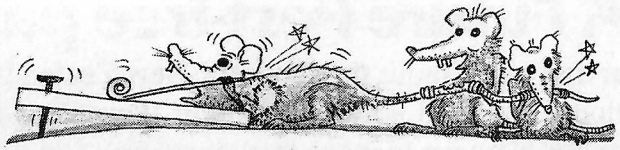
Black Petrel Essentials

- *All black except for pale sections on bill*
- *Medium-sized (about 700 g) with wingspan of up to 110cm*
- *Often seen in outer Hauraki Gulf, from October to May*
- *Range from east coast of Australia to west coast of Ecuador*
- *Breeds only on Great Barrier (c. 4000 birds) and Little Barrier Islands (c. 250 birds)*
- *Total population unknown but likely between 10-15,000 including c. 6000 juveniles at sea*
- *Oldest bird recorded is 27 years*
- *Classed as Nationally Vulnerable (DoC) and on IUCN Red list: Vulnerable*
- *Declining by at least 1.4% per year since 1995.*

REFERENCES &
ACKNOWLEDGEMENTS

We wish to thank Biz Bell for her generosity with her time, knowledge and image library in the preparation of this article. A full list of references can be found on our website appended to the document Black Petrel Essentials, which summarises and fully references the information included in this article. In particular the work of Biz Bell, Jo Sim, P. Scofield, C. Francis, E.R. Abraham, D. Filippi, Y. Richard and M.J. Imber is acknowledged.

Rat Chat



BY JUDE GILBERT

We've had a fantastic year for birds at Windy Hill. After 13 long hard years of managing to keep pests down to low levels the birds have really bounced back – up to 20 kereru have been counted a number of times and 50 kaka in one count in the Medlands valley alone. Birds are benefitting from the food abundance created by reduced rats and the wetter summer early this year.

The 620 HA sanctuary managed by the Windy Hill Rosalie Bay Catchment Trust now employs seven people – five of these people make up the field team who carry out the integrated pest management, one administers the Trusts finances, and a contractor carries out specialist monitoring as well as the Biosecurity Programme operating at the island's main wharves and the airport. Conservation and biosecurity is a growing 'business' on island.

Rats have continued to be a worthy adversary – immensely responsive to good conditions a female rat can up the number of litters, and the number of babies per litter, she has per year. It is estimated that one pair of rats and their surviving progeny can produce 15,000 rats a year! This fecundity and their capacity to access the highest tree tops and every nook and cranny in any habitat is the reason for the slow but unstoppable decline of Great Barrier's biodiversity. Even with 4800 stations for bait and traps checked on a regular basis we still trapped 2050 rats and a small number of mice between January and the end of October this year.

What is interesting is that most of the rats trapped are kiore – they bounce back after ship rat numbers are reduced, for some reason taking longer to respond to traps or bait. This has also been the situation at Glenfern Sanctuary. We are the only large island with both these species of rats which makes our pest dynamics incomparable to mainland sanctuaries – some research into the behaviour of, and between, the two species could reveal better ways of targeting them.

Next year we are planning a booster robin translocation from Pureora Forest to Glenfern and Windy Hill – this will increase the number of breeding pairs in the sanctuaries and bring in a new line of DNA. At Windy Hill there are currently five breeding females and 3 males who are very busy servicing all the females and feeding chicks in five nests. Their energy to keep their lineage going is impressive.

We look forward to continuing to increase the volume and diversity of our dawn chorus.

• *Kiore, the Pacific rat is smaller and dominated by the black rat.*

A Future Pest-free paradise

In this essay about the future of New Zealand conservation, biodiversity and policy consultant *Wren Green* takes a bold, hard look at how we manage introduced pests.

Attitude is important. When I envisage a possible future for pest management in New Zealand, a quote attributed to the German Goethe sets the right tone: "Whatever you can do or dream you can, begin it. Boldness has genius, power and magic in it." The key words here are "dream" and "bold", since we began pest management long ago.

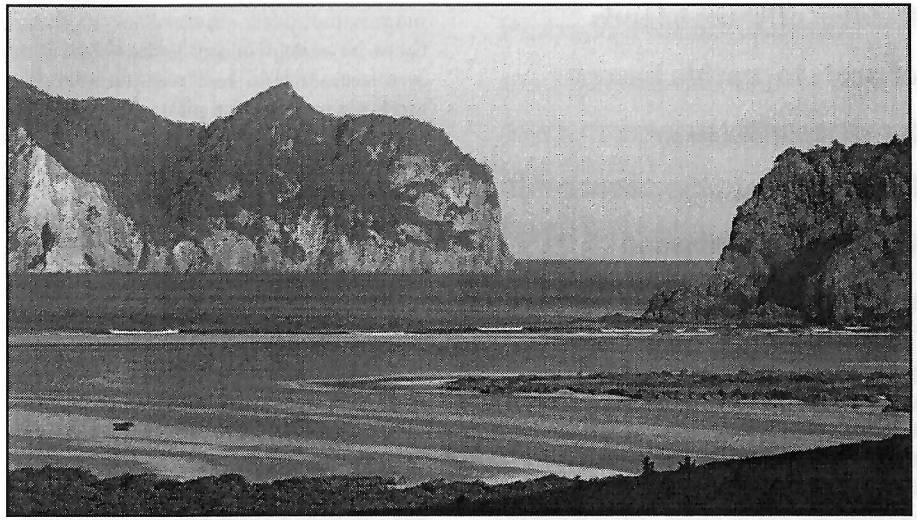
Right from its beginnings, ingenuity – a travelling companion of boldness – has featured as well. Back in 1894, Richard Henry travelled to Resolution Island, the world's first island sanctuary, as its newly appointed curator and caretaker. During his long sojourn there, Henry became a global pioneer of translocation techniques for rare endangered birds, particularly kiwi and kakapo. He ultimately left Resolution, despondent at the arrival of stoats that would undo his best efforts to provide a safe offshore island for endangered species, but his innovative techniques still inspire.

Fast forward 70 years to 1964 and another defining bold moment in pest management. At the time, the conventional approach to protecting species was not particularly interventionist. Some writings by influential scientists and managers seemed more resigned to losing rare bird species than taking dramatic action to save them. And the ability of mammalian predators, especially rats and stoats, to eliminate populations or even species was not fully appreciated.

In 1964, a plague of rats threatened three rare bird species and a native bat that lived on Big South Cape, an island off Stewart Island (Rakiura). A few Wildlife Service field officers insisted that only urgent action to relocate these endangered species could save them. Others argued that this was unnecessary; the rat numbers would eventually go down. Nonetheless, a bold rescue operation went ahead and 36 rare South Island saddlebacks were successfully transferred to local rat-free islands. Translocations of the other two rare species, Stead's bush wren and the local snipe, did not succeed and rats quickly killed off all the saddlebacks, bush wren, snipe and the unique native greater short-tailed bat left on Big South Cape. These three extinctions, and the dramatic rescue of the saddleback, was a wake-up call for conservation managers everywhere.

Hard lessons were learned: introduced predators can drive native species to extinction; off-shore islands can be essential refuges for vulnerable species; translocations can work; scientific authorities don't always know best. Ridding offshore islands of pests to provide havens for other species then became one of the successful tools for conservation management.

"New Zealand is the only country which has turned pest eradication into an export industry"
Sir David Bellamy



• *Arid Island (Rakitu) some 5kms off the NE Barrier coastline is being considered for eradication of rats. Photo: IslandStay*

One thing conservationists should do more often, in my opinion, is take the time to reflect on what their campaigns and actions have achieved – while acknowledging the part played by researchers and innovative management practices. When we do so, we can list some remarkable achievements since the 60s. For example: rat eradiation from Breaksea Island (170ha) in 1988 – then a world-first for large islands; the ingenuity of Don Merton and colleagues in rescuing the black robin from extinction; eradicating possums and rats from Kapiti Island (1965ha); dozens of eradications of mice, stoats, rats, deer, feral cats and possums from islands, followed by numerous successful transfers of birds, lizards and insects.

In 2001, little more than a decade after clearing rats off Breaksea Island, DOC took on the bold dream of eradicating rats from Campbell Island, a massive 11,300ha sub-Antarctic island. Two years in the planning, and faced with novel logistical and technical challenges, the eradication was declared a success in 2005. Other countries now contemplate clearing large islands of pests that had previously been thought impossible. Sir David Bellamy has said: "New Zealand is the only country which has turned pest eradication into an export industry." This reputation owes much to the innovative research and can-do attitude that has turned visions into reality.

Then people boldly asked "If we can do it on offshore islands, can we do it on the mainland?" This led to research during the 1990s into the feasibility of managing pests at low enough numbers in isolated areas of forest to benefit threatened species. The mainland islands model was born. Unfenced mainland islands were followed by private and innovative initiatives creating islands of habitat surrounded by predator-proof fences from which

Ridding offshore islands of pests to provide havens for other species then became one of the successful tools for conservation management.

pests were removed. Conservationists can take pride in their successful efforts to eliminate possums and other predators from Bushy Park and protect the increased kereru and kaka populations with a predator-proof fence around the whole area. However, high capital and maintenance costs limit the options for predator-proof fences. They are not a viable option for the larger landscapes over which ecosystems need to be managed and should not be held up as alternatives to the large-scale issues.

What might further research and technological advances in pest control allow us to boldly dream for tomorrow's conservation goals? Pest management options fall into three basic classes – physical, chemical and biological. There is a new generation of physical "smart traps" (*Forest & Bird* magazine, November 2010) that shows how far trap technology has advanced from the days of the cruel Lanes Ace leg trap. Cheaper, humane, resetting kill-traps for rats, stoats and possums are being tested now. With further investment and development, they could revolutionise pest management by drastically cutting the labour costs that trapping currently requires.

The chemical control option means using poisons. The current stand-out issue here is the aerial distribution of 1080 to control several different mammalian pests. In the Past 30 years there have been many technological improvements in bait manufacture, guidance systems for pilots and improved sowing buckets to spread baits. Field research has improved our understanding of how to increase the acceptability of poisons, including 1080, to possums, rabbits, rats and stoats.

The outcome of all these incremental improvements is best demonstrated by comparing how much 1080 bait was used in aerial operations in the 1970s compared with today. Success rates have improved to over 95 percent reductions in possum, rat and stoat numbers while the amount of bait used has dropped from 25kg of bait per hectare to 2-3kg per hectare. Spreading 2kg of pellet baits over a hectare is equivalent to dropping four baits on a doubles tennis court. With few baits per unit area, the risks of by-kill of non-target species is now much lower than before.

Despite the high development and registration costs, work continues on new toxins. One acts on red blood cells to cut their ability to carry oxygen around the body. Early research results suggest it may be an effective and humane toxin for stoat control. The most acceptable toxin is one that is cheap, humane and species specific – and effective. We do not have it yet, but it is a goal worth pursuing.

I am less optimistic about biological controls being developed for the nasty pest trio of possums, rats and stoats – at least in the foreseeable future. After many millions of dollars, research on a biological control for possums has been stopped. Biological control did help to significantly reduce rabbit numbers after the illegal introduction of rabbit calicivirus. However, the effectiveness of the virus has weakened over time and those farmers who did little to complement it with conventional rabbit control now face high rabbit numbers again. The lesson is not to expect research to deliver a quick-fix silver bullet for our mammalian pest problems.

With further major improvements in traps and toxins, what bold visions might we dream and what barriers could get in our way? First, let's think about even bigger islands from which pests might be eradicated. At 28,500ha, Great Barrier Island has rats, mice and feral cats, but no possums or mustelids. In a decade or two we may have a super, self-setting rodent trap that could do the job. Perhaps a combination of next-generation anti-coagulants and rolling lines of traps along the island could achieve what now seems impossible.

After clearing the North Island's largest offshore island of predators, a bigger challenge would be clearing Stewart Island of predators. Imagine the translocation options that would open up. Rakiura National Park would be home to the many surplus kakapo from Codfish Island, along with lots of kokako, kaka and other threatened species from other managed areas. Before long, the restored dawn chorus and local increase in kiwi numbers would draw visitors to Stewart Island from New Zealand and beyond.

Perhaps a combination of next-generation anti-coagulants and rolling lines of traps along the island could achieve what now seems impossible.

Study a map of New Zealand, and its geography suggests other audacious visions. How about using the urban sprawl and squeezed neck of Auckland as a barrier and clear the farmlands and forests from there to Cape Reinga of possums and stoats? Northland is home to important kiwi populations and most of these are on private, not conservation lands. Given the threats to wild kiwi populations throughout New Zealand, this could provide safe areas at a new order of magnitude for our national bird to thrive. Might Coromandel Peninsula and the bulge of Taranaki, both important areas for biodiversity, also be capable of effective "isolation" followed by intensive

• *The Richard Henry self-resetting kill trap for rats, oppossums, and stoats has been developed by DOC.*

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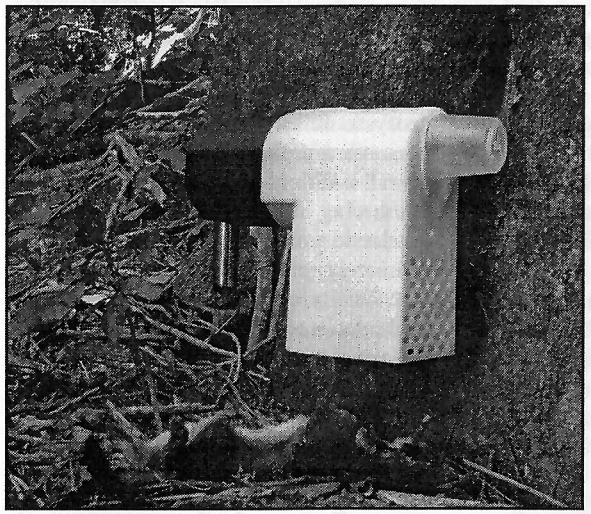

knockdown or eradication of major pests?

Thinking about pest management only in an island context is too limiting for the larger systemic issues we face in New Zealand. First, most of our threatened biodiversity is in places where the island treatment is not feasible or is prohibitively expensive at present. Second, islands are "out there", whereas we live "in here", where competing political and social influences and attitudes are more complex. It is how we change our thinking about pest management "in here" that will support or stunt bold dreams for the future. I suggest this is the fundamentally important transformation we need, supported by ongoing technical advances that will be needed to realise such dreams.

• *The whitehead* (Mohoua albacilla) – *high on the list of species to re-introduce to GBI.*
Crown Copyright Department of Conservation Te Papa Atawai Photo: Joseph Fraser

Several relevant factors underpin this transformation and they may change in ways that make it possible. These factors are:

- Shifts in ecological thinking
- Changes in values and engagement
- New governance arrangements
- Maori-Pakeha dialogues

Ecological science has undergone an important shift in emphasis and perspective in the past two decades. The earlier belief that ecosystems naturally tend towards conditions of equilibrium has shifted to understanding ecosystems as dynamic systems, capable of rapid and unexpected changes. This is particularly true in New Zealand with our geological instabilities, exposure to cyclones, droughts and floods, now overlaid with the diverse impacts of introduced plants and animals.

Management and biodiversity policies based on equilibrium assumptions can be inappropriate for dynamic and unpredictable systems. Understanding dynamic systems requires a greater knowledge of ecological processes and how key species respond to change. For example, discovering that kereru play a major role in the dispersal of forest seeds and therefore in the regeneration of forest ecosystems means their management is as relevant to maintaining the overall health of forests as it is about conserving a species. Since our primary production industries and tourism ultimately rely on the health of our biodiversity, greater research effort into understanding these ecosystem dynamics to improve their management would be a smart investment.

As David Young describes in *Our Islands, Our Selves*, attitudes to conservation change over time, reflecting and shaping broader social

• *Kokako (here being radio transmitter banded) have been sucessfully introduced into a rat-managed area in the Waitakere Ranges.*
Crown Copyright Department of Conservation Te Papa Atawai Photo: Tamsin Ward-Smith Boundary Stream Mainland Island 2007

values. Walter Buller's Eurocentric and pessimistic views on 'inferior' native species and their likely demise have long since been marginalised. New Zealanders increasingly value indigenous plants and animals. The rapid growth in the number of community groups dedicated to looking after local reserves, protecting breeding sites, starting restoration projects, restoring wetlands or opposing environmentally destructive practices attests to this.

Changing social values towards native biodiversity are occurring at a time when traditional arrangements of hierarchical government are being questioned and contested. The dominant model of top-down, expert-driven, government-led policies and practices is increasingly challenged across areas as diverse as agriculture, transport, energy, health, climate change and conservation management. These global trends reflect the increasing complexity of socio-environmental problems and the unprecedented ability of civil society to access and share knowledge and information, something governments used to control and regulate to a far greater extent than now.

As a consequence, new approaches to governance are being tried that are more flexible, adaptive and responsive to stakeholder values and interests than is possible under older hierarchical structures. These developments are particularly relevant for adaptive management approaches which, in turn, are appropriate for studying dynamic systems. The success of adaptive management requires new ways for management agencies, stakeholders, interest groups and researchers to work together, including on pest control, such as deer or possum issues. By doing so, different voices can be heard and reflected in management goals. As the late Geoff Park has written: "Good management will require public dialogue as much as expert opinion because the definition of goals and development of scientific understanding is an interactive and experimental process."

Management staff, scientists and communities have already shown that these new approaches can succeed. Even the contentious issue of aerial use of 1080 has been worked through in some places with the input of all parties to arrive at acceptable solutions. If the will is there on all sides, solutions can be found. New Zealanders, whether for or against 1080, value their native forests

New Zealanders, whether for or against 1080, value their native forests and birdlife and support pest control. They only disagree on the methods.

and birdlife and support pest control. They only disagree on the methods. With agreement on the goal, surely the rest is just detail?

I have left the impact of Maori-Pakeha dialogues to last, not because it is least important but because the other influences I have discussed all provide the context within which Maori-Pakeha dialogues on conservation, including pest management, are best considered. In the opening article in this series (*Forest & Bird*, November 2010), David Young proposed that Forest & Bird would need "to step up to a new level of relationship with iwi and hapu", noting that the Waitangi Tribunal's Wai 262 report on the claim on indigenous flora and fauna would provide an opportunity to do so. This report is due out this month and a constructive response will require more New Zealanders than just Forest & Bird to step up.

I look forward to a dialogue on how Maori spiritual and cultural values, as well as their holistic concepts, such the principles of mauri, connectedness, ecological harmony, continuity and reciprocity can inform the way we approach ecological studies and pest management. A leading scholar, Mason Durie, has argued that these principles can be measured quantitatively even though they are often seen as spiritual. Durie also writes: "Essentially value is a function of relationships ..." Pakeha relationships with Aotearoa and its wildlife will deepen as the centuries pass and therefore Pakeha values will change along the way. We are ready for a dialogue that builds a better understanding of the connections between Maori and Pakeha values because that will provide a stronger basis for new governance arrangements and partnerships with Maori for conservation and pest management. The Wai 262 report may provide the stimulus for this to happen, but we should be planning it anyway.

Some may view these developments with alarm. I see them as positive opportunities. In 2050, we should be able to look back with pride on achievements since 2011: dramatic improvements in control technologies that enabled eradication of pests on a scale previously thought impossible; generous budgets to support biodiversity research and management on public and private land by governments that finally appreciated the economic sense of this as smart investments; many new partnerships and co-management arrangements between Maori, communities and agencies that are successfully managing for biodiversity and minimal pest impacts; a deafening dawn chorus when families greet the morning sun and renew their spirits in their local forest, wherever that may be.

Wren Green
researched possums for the Forest Research Institute before joining the Department of Conservation in 1987. He has been consulting since 1997 in areas including biodiversity, biosecurity, sustainable development, science policy and climate change.

Change is afoot...

this may be your last copy of Environmental News

Since 2004 the GBI Trust Environmental News has been sent to all Barrier Residents and Ratepayers free of charge. We wanted you to be well informed about the environment of the island and the things that pose a threat to it. We wanted to engage you in this community groups' BOLD vision to eradicate the rats and feral cats, to yearn for the return of the species we have already lost like the kokako, and to understand how a pest free Barrier would hugely benefit the island's economy.

The Trust will continue to regularly publish the Environmental News with its comprehensive and informative articles but this will be for members only and available at island outlets to purchase for non members. We are still committed to engaging with all the community however, not just our members, so from next year we will be producing a short newsletter every couple of months for all island residents. This free newsletter will contain current news about events, the island's ecology, pests, pest management and who is doing it. We are pleased to send you the first edition of the Bush Telegraph with this edition of the Environmental news. Enjoy.

Please check now by phoning Fenella on 09 4290414 if you are unsure if you are a current Trust member and would like to continue to receive the GBI Trust Environmental News.

Merry Xmas and an abundant New Year

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