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# RARE BITS

THE NEWSLETTER ABOUT THREATENED SPECIES WORK

*This newsletter is produced primarily as a vehicle for information exchange between departmental staff involved in threatened species recovery and ecological restoration programmes. In recognition of wider interest, however, "Rare Bits" is also provided to non-departmental groups on request. The newsletter's informal style may occasionally lead to misunderstandings for some of those readers. Views expressed by the authors are not necessarily those of the Department of Conservation.*

## FEATURE ARTICLE

Campbell Island teal 1

## CONSERVANCY NEWS

Northland 3

Waikato 4

Tongariro/Taupo 5

Bay of Plenty 5

East Coast/Hawke's Bay 6

Wanganui 8

Wellington 8

Nelson/Marlborough 10

West Coast 11

Otago 13

Southland 15

## OTHER BITS

Electronic monitoring

equipment update 17

Transmitter design 18

Whenua Hou

(Codfish Island) eradication 20

## FEATURE ARTICLE

### Campbell Island teal

*from Pete McClelland*

After a slow initial start the Campbell Island teal recovery plan is now well on its way to achieving its final goal in the near future. While some major hurdles still ahead should not be underestimated, the light at the end of the tunnel is now visible. The greatest hurdle is the eradication of rats from the island.

Following their rediscovery in 1975 on 26 ha Dent Island, 3 km off main Campbell Island, 4 teal were bought back to New Zealand in 1986 to start a captive-breeding programme. Unfortunately the only female among them produced no eggs, although a range of pairings was tried. A further 7 birds, including 3 more females, were returned to New Zealand in 1990. After a slow start the first ducklings were produced in 1995.

Since then, as is often the case with captive breeding programmes, the captive females have been more than willing to participate, and a total of 55 ducklings have now been produced. This is full credit to the team at Mt Bruce. Despite considerable change of members during the project the team has never lost its drive, enthusiasm and dedication to the project. Various combinations of birds and aviary layouts were tried under the guidance of DoC's waterfowl scientist Murray Williams.

In the end, it turned out that the best system was to flock mate the birds and let them sort out their own mates and then separate them off. Unfortunately while most of the

males have been willing to contribute to the gene pool, all the current birds originate from one female. The option of bringing in new genes has been considered but is not practical. Helen Gummer (who until last year was a key member of the team) produced an excellent husbandry manual for the species, which will be important for the ongoing management of the captive population. This manual was a result of all the trials and observations carried out at Mt Bruce over the years.

The option of a direct transfer from Dent to Campbell after the eradication of rats was rejected, because the most recent survey (1997) of the island indicated that the population may well be below the 30 bird minimum previously believed to be present, and hence sufficient birds are not available.

The rapidly expanding captive population in turn brought with it another hurdle. It had been agreed in the recovery plan that rather than simply maintaining a population in captivity with the hope of 'one day' returning the birds to Campbell, a holding island would be used. This would allow the captive breed birds to adapt to life in the wild and to hopefully produce wild young for direct transfer to Campbell.

The slow start in the breeding programme meant that there was no rush for the holding island so, as is often the case, it was pushed back in the 'to do' list. However, the holding island rapidly



Department of Conservation  
*Te Papa Atawhai*

became an urgent priority when teal productivity appeared to outstrip the holding capacity at Mt Bruce. All options, including the Falklands, were considered but the required conditions - out of the range of Brown teal, suitable habitat (whatever that was), and no introduced predators greatly restricted the options.

Whenua Hou/Codfish Island was selected, almost by default, although the habitat is not much like Campbell. It is planned to remove all the teal from Whenua Hou at the end of the project, but only time will tell if this is possible. Twelve birds (8 female and 4 male) were released in March 1999. These were monitored using backpack transmitters, and all have survived, although we have lost track of a couple that decided to go walk-about around the island's rugged southwestern coast.

Last summer 5 nests were made with 14 eggs laid, 9 of which hatched but unfortunately only 2 ducklings fledged, both from the same clutch. This low survival may have resulted from a dry summer reducing the potential duckling feeding areas, or from the sex imbalance, because as soon as a female went down on the nest she became a 'solo mum' as her mate moved off to find another female. This is not normal for sub-Antarctic teal where the male usually guards the territory. However, work done on the closely related Auckland island teal by Murray Williams indicates that fledgling rates of this order may not be too unusual in the wild. Also, because teal are long lived, up to 16 years in captivity, the low fledgling rate is not likely to be a problem.

In May this year a further 12 teal were released, this time 8 males and 4 females to correct the sex imbalance. All the birds have settled in, although 2 males that went walk-about soon after release have proved elusive to track down.

This founder stock, when combined with birds direct from captivity, will hopefully provide sufficient birds for the release on Campbell, which is planned for 2003. No

further releases on Whenua Hou are intended unless the genetic base of the population needs expanding or for any reason the birds do not breed as well as expected. Further releases would risk 'over-populating' the island and forcing birds into less desirable habitats from which it would be harder to catch them for transfer to Campbell.

The captive population will now be managed to maintain the maximum genetic diversity within the logistical capabilities of the two institutes involved, (i.e. the holding capacity at the National Wildlife Centre, Mt Bruce and Peacock Springs near Christchurch). To minimise quarantine risks only birds from these two institutes will produce birds for the release. The captive-breeding programme has now produced sufficient birds to allow the release of some to external institutions for advocacy. This population will need to be managed to ensure that it does not expand too greatly and that its goal of advocacy does not get confused with one of providing birds for Campbell Island. Also losing control of the captive population increases the risk of hybridisation with Brown teal.

The eradication of rats from Campbell will be the largest such operation ever attempted in the world. The logistics of carrying out such a project on the 11,300 ha island 700 km south of Bluff have meant that the techniques which have been successful elsewhere have had to be modified to make the project feasible. The modified techniques were trialed on the island in August 1999 and proved successful. The bait drop is planned to take place in the winter of 2001. If it is successful the main island will see the return of not only teal but also snipe, pipit, and a range of small seabirds that have long been restricted to the small outlying islands. As well, the natural balance of invertebrates and plants, which the rats have dramatically altered, will be restored. Keep watching this space for progress on this exciting project.

*...the eradication of rats from Campbell will be the largest such operation ever attempted in the world...*

NORTHLAND

*from Nicky Syddall, Andrea Booth,  
Pat Miller, and Richard Parrish*

***Atriplex aff. billardierei find in  
the Far North***

Karen Riddell has found 9 *Atriplex aff. billardierei* plants in the Far North this season. This is an extremely rare coastal strand plant, and this form is only known from two adjacent beaches at the northern tip of the North Island. Staff have been searching somewhat futilely for these plants over the past few years, and have become increasingly concerned for the plant's status owing to the incredibly low numbers found - from 1 to a maximum of 6 plants in the past 3 years. Finding 9 plants, all on one small beach which usually only has 1 or 2 plants a year, is very encouraging for the recovery group. Staff are planning to monitor these plants throughout the season and search as many adjacent beaches as possible.

***Far North mammal strandings***

During late winter and spring, staff responded to various species being found by members of the public. Most of these have been natural events, but one incident disturbed staff more than any of the others. Late in October the Kaitaia Area office received a report of 4 dead bottlenose dolphins that looked like they'd been shot. On closer inspection, they were identified as striped dolphins. This was a very significant find, because these temperate species have been recorded in New Zealand waters only four times previously.

The dolphins had unusual holes in their bodies, some going straight through and others deep into the body cavity. Staff weren't convinced they'd been shot but couldn't work out what had happened to them. After gaining iwi support, 2 dolphins were sent to Massey University for autopsy. The results showed that they

died after becoming bycatch in fishermen's nets - the face and beak of one was quite strongly imprinted with the pattern of the net mesh. The holes in their bodies were thought to have been a result of marine scavengers feeding on the carcasses. It was a relief to hear that the wounds were not caused maliciously but tragic to hear that their deaths were still a direct result of human activities.

***Northland mudfish update***

Mike McGlynn continues to work on the Northland mudfish survey in the Kerikeri area. Since the last *Rare Bits* issue, Mike has another five new Northland mudfish sites, making a total of nine new sites found since the survey began. Before the survey, Northland mudfish were known from only two sites - Ngawha Springs and a wetland adjacent to Kerikeri Airport. Four of these new sites are on the edge of Lake Omapere, which makes them the western-most sites found so far. The fifth site is a wetland next to a river draining the lake. The new sites are on a combination of Maori Trust and private land, and all are threatened by stock trampling. Mike has been discussing protection measures with landowners, which have been supportive. He now intends to survey new sites further to the west and south of the known sites.

***Beaky becomes a dad***

Beaky is an Operation Nest Egg (ONE) kiwi who hatched at Auckland Zoo on 8 January 1997 from an egg collected from Hodges Bush in Northland. He was released into Hodges Bush in July 1997, and this year made his first nesting attempt - a 1-egg clutch, which hatched successfully. The week-old chick was found in the nest with Beaky on 25 October. This is the first known successful breeding of an ONE bird anywhere in the country, so is quite a milestone for the project. Because of its

## CONSERVANCY NEWS

importance to the ONE project, a decision was made to transfer the chick to Motuora Island, which is being used as a kiwi creche. The chick was removed from the nest and delivered to Auckland Zoo where it will live for a week or two pending its transfer to Motuora. It has been named Lorraine in honour of a colleague who provided a heap of worms to feed a kiwi chick held at the Northland Conservancy Office 3 weeks earlier.

### ***Fairy terns and flax snails***

Good news and bad news for fairy terns. The good news was that all 7 of last year's chicks were seen together at Waipu in August. The bad news is that the first two nests of this year at Mangawhai were abandoned during yet another La Nina-like southeasterly storm.

The same bad weather disrupted the annual *Placostylus* and *Paryphanta* research and monitoring trip to Te Pahi. The wet weather at least appeared to have favoured the snails, and a few *Placostylus* nests were found, one with 84 eggs!

## WAIKATO

### **Hauraki Area**

*from Jason Roxburgh*

### ***Moehau kiwi zone***

The end of September saw the completion of the baseline kiwi survey for the Kiwi Zone. Our team of contractors completed surveys at 80 sites covering 13,250 ha of private and DoC managed land. This totalled about 450 hours of listening, and gave 143 confirmed kiwi, a great result that exceeded our estimates.

### ***More kiwi***

After a possum control operation at Whenuakite (over 1100 ha of private and DoC land north of Tairua), the contractor became quite enthused about kiwi protection. The contractor (Keith Driver

of Wildlife Management Services) then offered two of his staff for a day a week for 3 years to trap stoats for kiwi protection. Adele Smaill (Kiwi Recovery Advocate) Hauraki Area staff, landowners, and volunteers undertook a kiwi survey, which identified about 20 individual kiwi in the block.

Adele, Fin Buchanan, and key landowners then established the Whenuakite Kiwi Care Group. Waikato Regional Council has given financial support to purchase trap sets because the block is one of their key ecological sites. The contractor is currently working on placing trap sets throughout the block. The work should be completed and fully operational by the end of the year. This is a great example of what can happen in a short time when keen landowners, and regional and central government get together. Will keep you posted.

### ***Middle Island tusked weta***

Ian Stringer has completed another stint on Middle Island, continuing his MITW research. The 150 young weta released on Red Mercury and Double Islands seem to be doing well.

### ***Cuvier Island***

Another weed control party has just returned from Cuvier, and again the weed focus was mothplant. We are beginning to see reducing returns of weeds found per unit effort, so it looks like we are getting somewhere.

### ***Muttonbirds***

Tairua Field Centre staff and members of the Ngati Hei iwi from Whitianga, undertook a survey of grey-faced petrel nesting on Penguin Island, which is owned by Ngati Hei. A burrowscope borrowed from STIS Wellington made the job a lot quicker and easier. The longer-term aim of this work is to assess the rate of production of grey-faced petrel, and the potential of this island for cultural

harvest of muttonbird. Monitoring will continue for several years.

### ***Lepidium oleraceum***

The population of this threatened plant on the Matariki Islands (near Coromandel Harbour) was visited again, and the kikiyu grass threatening its long-term viability was controlled with Gallant herbicide. This work was done using data from a NIWA trial for Waikato Conservancy on the effects of grass specific herbicides on *Lepidium*. The sites will be visited once a year, and the same treatment applied. Next year we also plan to take seed from these plants, and to propagate them for planting on other nearby islands.

### **TONGARIRO/TAUPO**

#### ***from Nick Singers***

The white mistletoe (*Tupeia antarctica*) has again been found at Te Porere redoubt fairly close to a large population found on Mt Tongariro last year. The vegetation is similar, and it is likely that more plants are present throughout the adjoining Tongariro Forest. Unfortunately all of the plants were heavily browsed and the only shoots present were out-of-possum reach. The host species was putaputaweta.

Though not categorised as a threatened species, a single shrub of the possum palatable and epiphytic shrub *Pittosporum kirkii* was found fallen to the ground amongst perching lilies at Karioi rahui. This is perhaps another indication that the intensive possum control at the rahui is showing benefits. There have only ever been three records of this species previously in the conservancy, the last in 1976.

Possum browse monitoring has started in Karioi rahui this season, and within the first days several new and healthy *Peraxilla tetrapetala* mistletoe were found. A survey specifically for mistletoe is planned during the flowering period,

which makes this early find very promising.

### **BAY OF PLENTY**

#### ***from Paul Cashmore***

### ***Rorippa divaricata***

A recent survey has been undertaken on Lake Rotoiti for *Rorippa divaricata* following the discovery of a plant on the northern shores of the lake in August 1999. A detailed survey by boat and by traversing lake edge around the northern bays relocated the original population and revealed three further populations, all occurring on recent open pumice slips under the cliffs. All plants appeared to be vigorous and healthy with mostly very large specimens present. In total approximately 12 plants were found. Lake Rotoiti is now the third lake in the Rotorua lakes system where *Rorippa* is now known from.

The second known *Rorippa* population at Blue Lake has reappeared. After initially finding plants present in 1998 no plants were seen during two checks in 1999. In October this year the site was checked and 1 flowering and seeding adult plant was found along with 16 juvenile plants. Several hundred metres further along the shoreline another site was also discovered with 2 adult plants and a juvenile plant.

Staff have recently checked on the survival of the *Rorippa divaricata* planted on Mokoia Island last year. Because most plants had died off during winter a spring check for seedlings was necessary. Unfortunately no seedlings were found despite most of the original plantings surviving and setting seed.

### ***Moutohora (Whale Island)***

In August, further planting and monitoring of threatened/uncommon plant species as part of the restoration project on Whale Island continued. Monitoring of those species initially planted last year has revealed mixed

## CONSERVANCY NEWS

survival rates. Parapara and tawapou have had close to 100% survival in forest environments; *Euphorbia glauca* has had 85%+ survival on coastal cliffs but no plants survived in dune environments; *Sicyos australis* - 10% survival similar to what was expected; *Rorippa divaricata* at least 32% of plants have grown and set seed; *Pimelea tomentosa* - 47% survival. While there were marked differences in survival rates between some sites owing to environmental differences some of the variation in survival between species was due to differences in size and quality of plants used.

At the same time another 340 plants of eight species were planted this year. These consisted of various existing species including further pingao and *Austrofestuca littoralis* plus two new species – *Lepidium oleraceum* and *Tetragonia tetragonoides*. Further monitoring will continue.

The project is being undertaken in conjunction with Wildland Consultants with equipment and plants provided by Fletcher Challenge Forests and Naturally Native NZ Plants.

### ***Taumaihi Island and Tubua (Mayor Island)***

In August, 120 *Euphorbia glauca* and 27 *Lepidium oleraceum* were planted on Taumaihi Island, a small island off Motiti Island. The aim was to increase the small existing natural population of *Euphorbia*, which is being overgrown, by developing tall vegetation. Nursery grown planting stock was sourced from the local population. *Lepidium oleraceum* until recently was present on one of the small neighbouring islands - Motuputa. With no known slugs or snails present Taumaihi was considered a good site to establish the species with nursery raised planting stock sourced from nearby Karewa Island. Forty plants of *Lepidium oleraceum* from the same

source have also been established on Tuhua during the winter near the existing buildings in SE Bay as a trial to assess survival rates.

### ***Mistletoe***

A new population of *Ileostylus micranthus* has been found on the southern edge of Lake Rotoehu, not far from a known existing population. Approximately 17 plants were seen on a small group of ageing mahoe trees in a paddock on the lake edge. Staff plan to visit the site soon to discuss options for management with the landowner.

## **EAST COAST/ HAWKE'S BAY**

*from Andrew Glaser, Steve Sawyer and Steve Cranwell*

### ***New Zealand dotterel***

Once again the NZ dotterel programme was undertaken in the Opotiki area. The aim of this project was to increase NZ dotterel breeding success, chick survival, and to protect important habitat.

Three main breeding sites were monitored in the Opotiki Area at Waiotahi Spit, Waioweka river mouth and the Waiaua Spit. These sites held a total of 22 resident birds (11 pairs). There was 1 pair at Waiotahi, 3 pairs at Waioweka, and 7 pairs at Waiaua.

A total of 21 nesting attempts were made by 11 pairs with 23 chicks known to have hatched from 46 eggs this season. Predators that preyed upon nests were stoats, hedgehogs, black backed gulls, and spur winged plover. Five pairs were unable to rear any chicks including 1 pair, which made 3 attempts. Overall there was one less chick known to have fledged for the area than last season.

Key predators were removed during the season through trapping, shooting, and poisoning. Thirty-two mustelids, 42 hedgehogs, 11 rats and 148 black backed gulls were killed during the season. There was also increased advocacy and public awareness through liaison,

signage, newspaper articles, and greater staff presence at the breeding sites.

Two banded birds were seen at these sites during the course of the breeding season. One banded bird that set up residency at Waihua was BM-OG (Matakana Island, 1995).

### ***North Island weka project and kiwi***

The NI weka project is about to commence a third year of radio telemetry and video monitoring of adult breeding pairs and juveniles at Motu.

The project is a paired trial study incorporating two areas of similar habitat type, topography, weka density, and predator threats. The Whinray-Marumoko block at Motu is a predator treatment area (primarily mustelids), and the Whitiakau Valley is strictly a monitoring area with no predator control undertaken at all. Both study areas are approximately 430 ha and are a mixture of podocarp-tawa-kamahia forest and kahikatea-rush-carex swamp. The surrounding country contains large areas of rough pasture and regenerating natives. Mustelid tracking, rodent indexing, invertebrate pitfall trapping and phenology data are recorded from both areas.

Since September 1997 we have captured and radio transmitted 36 fledgling weka within the two study areas. Each bird carries a transmitter for 13 months and is tracked at weekly intervals.

Post fledging survival of weka in the broader Motu area so far appears to be high. In the Whitiakau non-treatment area a mean survival rate of 71% has been recorded for juvenile weka in their first year. The recorded predation events were attributed to stoats (4) and feral cats (3). One predation contained evidence of interference from both cats and stoats. To date, we have not recorded any predation by ferrets.

This season we have introduced feeder

stations to selected breeding pairs and installed an infra red beam switch to our time lapse camera equipment which should allow for more efficient monitoring. We hope we can bring the adults and their chicks to us instead of us chasing them.

The Whinray Scenic Reserve predator treatment block also contains kiwi. Mustelid control should also benefit the kiwi in the block, and we will be monitoring this through a radio telemetry study of chicks and sub-adult kiwi. At this stage we have one adult male kiwi incubating in an area populated by NI weka. We have a time lapse camera filming the burrow entrance and hope to record any interaction between the two species.

### ***Boundary Stream Mainland Island kiwi and rat control***

The 3 North Island (NI) brown kiwi released into Boundary Stream earlier in the year have had mixed fortunes. In late September the oldest (6 months) and largest (1300 gm) kiwi was found dead in the reserve. The cause of death is thought to be exposure because the bird was located in an exposed part of the reserve. There was no evidence of predation, and a severe southerly storm had hit the reserve at the time bringing extreme winds, freezing temperatures, and snow. The remaining 2 birds have continued to gain weight and remain within the 800 ha area of the reserve. A further 2 chicks are being raised as Operation Nest Egg (ONE) birds for release into the reserve. With the potential to collect additional kiwi eggs from the Eastern Kawekas this season it is hoped further releases will be possible. The trial of a rodent-based formulation of Cholecalciferol (Feracol) to maintain rat numbers at low levels of activity over a c.250 ha area appeared effective. The use of tracking tunnels to evaluate rat activity between June and August

## CONSERVANCY NEWS

detected no rats in the area where 'Feracol' was available. In the non-treatment area rat activity was detected at indices of 32 and 40% for the same period.

### WANGANUI

*from Rosemary Miller and Graeme La Cock*

#### **Brown mudfish habitat restoration work**

Stratford Area staff have now taken to earth-moving techniques to create more mudfish habitat! Unfortunately last year's fry transfers were not successful, but we hypothesise that the size of fish transferred may be influential. Mudfish rearing facilities out the back of the area office will be tested out before the next transfer.

#### **Rare botanist**

Our rare botanist (well officially the CAS), Colin Ogle, is retiring to do some botany - but not before the end of January, so send in your questions while you've still got a chance. Luckily for me (Graeme) he'll be settling in Wanganui. Needless to say he'll leave a huge gap in the department.

#### ***Euphorbia glauca***

The *Euphorbia glauca* site at Coast Road near Cape Egmont was surveyed for the first time since 1995. Initially a patch of *E. glauca* was fenced off to determine the impact of cattle grazing on it. So the farmer promptly decided to stop grazing his cattle at the site. *E. glauca* appears to be coping pretty well at the site, and there's little difference between the control and the experiment.

The transplant site at Cape Egmont was blitzed by a storm early last year, and is battling to recover. Some plants have survived, but the good soaking by the sea killed most of the population that had been establishing well.

Overall Jim Clarkson is still turning up

new populations, so things are looking okay at the moment if we can control the *Gunnera tinctoria*.

### WELLINGTON

#### FAUNA

*from Glen Holland, Albert Rebergen, Hilary Aikman, Mike Thorsen, Mike Ogle, and Christine Reed*

#### Chathams Area

#### **CI oystercatcher**

The investigation into the benefits of management on Chatham Island oystercatcher has got off to a good start. Twenty-two cats, 166 weka, 13 possum, and various others (harriers, hedgehogs, etc), have been caught in the two managed areas. In these two areas are 19 pairs of oystercatcher with 10 nests (and increasing). The 8 monitored pairs in the unmanaged sites are yet to lay. A dune restoration project is due to start this season to benefit oystercatchers. Marram invasion has caused the dunes to become steeper which in turn forces the oystercatchers to nest closer to the storm surge line (the major cause of nest loss).

#### **Shore plover**

The pre-season shore plover census on Rangatira counted a total of 127 birds, consisting of 70 males, 55 females, and 2 unknown. This is the average of three repeat island-wide counts.

A visit to the only other natural shore plover population in the Chathams, revealed only 11 birds, all males. This is quite a decrease from the 15 male, 5 female, and 1 juvenile in February 1999. Where the missing birds are is a puzzle because there are no introduced predators on the reef. A check of the adjacent mainland is planned.

#### **Forbes' parakeets**

Research into hybridisation between Forbes' and red-crowned parakeets is

*...our rare botanist Colin Ogle will leave a huge gap in the department...*



continuing on Mangere, and a project looking at host-parasite interactions in Forbes' parakeets began this season. Terry Greene and Christine Reed recently visited Mangere where they assisted Denise Fastier mist-netting and banding Forbes' parakeets. They took plumage descriptions, measurements, photographs, feather and blood samples for DNA analysis (being undertaken by Matthew Chan at Victoria University), and faecal samples and blood smears for disease identification. Point-count stations were established to estimate numbers. A total of 46 birds was caught. Three were recaptures from last year's mist-netting, and 1 bird had been banded as a nestling in the 1999/2000 season. The remaining 42 birds were unbanded. There still appear to be a large number of unbanded birds on the island, despite having now banded approximately 150 so the population may be over 500 birds. The distance sampling and mark-resighting surveys will better quantify this.

### **Taiko**

It's shaping up for another good taiko season. Thirty-five burrows have had taiko activity to date, and 6-8 should breed. Graeme Taylor from BRU has been in the Chathams catching birds to take blood samples and band with black and white colour combinations. The colour bands will enable identification of individuals during video monitoring at the burrows. Graeme caught 13 birds, 8 banded and 5 unbanded. Cat trapping has been underway in the area since September, and 25 cats have been caught so far. Early indications are that there are high rat numbers in the areas, so lots of work will be needed controlling them around breeding burrows.

## **Wairarapa Area**

### ***Grey faced petrels***

Mt Bruce is trialing rearing these birds as practice for more threatened species. Six of the original 12 birds are doing well with some very impressive weight gains. Several of them are now well feathered on the belly. We also received another abandoned bird from a researcher. Four are on sardine diet, 1 on fish/squid, and 2 on Chef cat food. Preliminary results suggest sardines are the best diet.

### ***Notoreas***

An area of *Pimelea* aff. *urvilleana* has been fenced at Onoke/Ocean Beach by the YMCA Conservation Corps. On 22 October 100 *Notoreas* moths (Wellington species) were seen here, indicating a nationally significant population.

## **FLORA**

*from Aalbert Rebergen, Garry Foster, Dick Gill, and John Sawyer*

### **Kapiti Area**

### ***Restoration***

Seed and some plants of the orchid *Spiranthes novaezeelandiae* have been collected from an area at Paraparaumu airport – our only known population. Those plants have been relocated to Nga Manu Sanctuary and Andrew's Pond. Some plants are held in pots at Percy Scenic Reserve. The pygmy button daisy (*Leptinella nana*) has been translocated to Mana Island, and the first assessment shows they are surviving quite well. Follow up inspections over the next year are planned.

## **Wairarapa Area**

### ***Field survey***

A number of botanical discoveries have been made recently in the Wairarapa. New *Kortbalsella salicornioides* populations have been located at four

## CONSERVANCY NEWS

sites: Bidiford; Hidden Lakes; North Martinborough; and Featherston. A new *Coprosma pedicellata* site has been found at Wainuioru (55 individuals in three areas - the largest is 8.5 m tall), 47 occur in a perfect stand of kahikatea forest where it is the dominant sub-canopy. Members of the Wellington Botanical Society, DoC Wairarapa, and Geoff Rogers relocated a large population (at least 300 individuals) of *Myosotis pygmaea* var. *minutiflora* at Te Kawakawa Point (Palliser Coast). *Leptinella pusilla* was also re-surveyed here and on rocks at Pahaoa station, East Wairarapa coast.

### **Restoration**

In a fenced area on private property at Peter's Bush (Gladstone) DoC and Conservation Corps have planted 27 *Coprosma pedicellata*, 22 *C. wallii* and 15 *Pittosporum obcordatum*. At Te Kowhai Station 65 *C. pedicellata* have been planted. At Koromiko Farm 32 *Olearia gardnerii* were planted, as well as 100 *C. wallii*. In Carter Reserve the YMCA Conservation Corps planted 4 *C. pedicellata* and 20 *C. wallii*. Several 100 more plants of threatened species are currently being grown by Norfolk Road Nursery, Plantwise, Percy Reserve and Otari, including *C. pedicellata* (Alfredton Stock), *C. wallii*, *O. gardnerii*, *P. obcordatum*, *Muehlenbeckia astonii*, *Amphibromus fluitans*, and *Pimelea tomentosa*. In November 1999 and April 2000 about 300 small seedlings of *C. pedicellata* were collected from under a single tree at Carter Reserve. These have been potted and are now being grown at local nurseries. No seedling has survived at Carter's beyond the first year and growing the seedlings into sizeable plants at nurseries may be the only way to maintain a population here. Only 5 *Olearia gardnerii* are known in the Wairarapa, and until now plants have been cultivated only from the 2 trees at

Koromiko Farm. Many hundreds of cuttings from the other 3 single trees of *O. gardnerii* were taken in July 2000. Cuttings from only one of these trees (Te Kowhai station) have formed roots.

### **Poneke Area**

#### **Restoration**

Dean Baigent-Mercer, a member of the Wellington Plant Conservation Network, has collected and grown a number of rare plants for introduction to Matiu/Somes Island (as part of the ecological restoration programme for the island) and for other restoration projects. The species grown include *Muehlenbeckia ephedroides*, *Acaena pallida*, *Clematis afoliata*, *Rubus squarrosus*, *Austrofestuca littoralis*, and *Melicytus* aff. *obovatus*.

### **Conservancy Office**

#### **Plant database**

The native plant database now holds over 10,000 species occurrence records. The plant checklist database now holds over 800 plant lists for areas in Wellington Conservancy (an increase of 250 lists over the last 2 years).

## NELSON/ MARLBOROUGH

### *from Ian Miller*

When the Hutton's Shearwater Recovery Group met in early October one of the key agenda items was a debate over the need for stoat control in the colony. The impact of stoats on this species has been a concern for many years and was the prime reason for DoC funding Richard Cuthbert's PhD research.

This research concluded that while many colonies have become extinct, including four in the last 30 years, these were all accessible to pigs. The two remaining colonies are inaccessible to pigs and considered to be stable, most probably limited by the lack of further safe breeding areas and possibly by 'at sea'

factors.

The impact of stoats on Hutton's shearwater in these two colonies is limited by the lack of prey available in this alpine environment during winter and an inability for them then to make a significant dent in such a large bird population. Another factor is that more eggs and young are preyed on than adults and the cropping of this annual production is less harmful than predation of breeding birds. While it is not an easy decision to accept the presence of stoats within a colony of endemic seabirds the recovery group believes the quality of scientific information available supports this approach, and that while there is robust monitoring of the colonies our management effort is best spent elsewhere.

Mohua: Rats have been caught on Mt Stokes every month through winter except September - not good! Brian Paton was up there early October and heard one bird but also caught another ship rat. Graeme Elliott heard one of the males on Nukuwaiata last month so hopefully the one female is still kicking out there.

Takahe on Maud Island are slowly starting to nest with the first egg due to hatch very soon.

The fluttering shearwater colony on Maud Island is doing very well with twice as many eggs this year as last year...14! Over half the kiwi on Motuara Island have gone back to Okarito. Our programme may be on the back burner while the birds are managed down there with the extra dosh!

The SI saddleback on Motuara Island seem to have just about reached their maximum carrying capacity for the island. Nesting seems to be later than previous years.

### **South Marlborough plants**

Over 600 *Carex inopinata* plants have been planted at three new sites. Kowhai

Point in the Wairau Valley contains the only healthy population of the species in the country so it is hoped that the new plants will establish and give us some insurance against floods or fire. Marlborough District Council staff were taken on a field trip to inspect threatened plants growing on roadsides and to consider sites in council reserves which might be suitable for insurance plantings. An anecdotal record of *Muehlenbeckia astonii* was followed up, confirming the presence of two plants. A new report resulting from Girl Guides planting *M. astonii* during Conservation Week, was also confirmed, making it the second plant in the Wither Hills Ecological District.

*Cheesemanian fastigiata* samples were collected (in driving snow!) for research into the distinctiveness of *C.* "Chalk Range", and information on Marlborough rock daisy was gathered at nine sites - also for a research project.

### **WEST COAST**

*from Ron van Mierlo, Phil Knightbridge, Don Neale, Natasha Grainger, Chris Rickard, Josh Kemp and Jo Crofton*

#### **Okarito brown kiwi (rowi)**

The announcement of the biodiversity package has resulted in increased funding, opening up many new opportunities for the programme. The most exciting of these is the ability to trial a large-scale stoat control programme over the entire known range of rowi (10,000 ha). Meetings with predator specialists have suggested that protecting rowi chicks over an area of this size using a traditional trapping regime is likely to be a challenging but realistic goal. It is intended that approximately 250 km of trap lines will be established with about 1500 tunnels containing Fenn traps at 200 m spacing along the lines. The establishment of

*...the most exciting opportunity is the ability to trial a large-scale stoat control programme over the entire known range of rowi...*

## CONSERVANCY NEWS

trapping is expected to be complete by April 2001, and the traps will be running from May onwards. Next year it is intended that 20-30 rowi chicks will be monitored in the forest to assess the success of trapping.

The extra funding has also allowed us to increase our kiwi monitoring team. Two extra permanent and two summer staff are being employed to more than double our staffing level. This will allow the capture and monitoring of 20 more pairs of rowi and the extra Operation Nest Egg (ONE) birds returning later in the year.

The breeding season is well and truly in full swing. We have located a total of 30 rowi eggs to date: 10 of these have been taken for ONE and have hatched successfully. It is certainly the most promising season yet in terms of egg production and with luck that will translate into a bumper year for chick production.

The 17 ONE birds being monitored in Okarito forest have continued to do well. Three of them have wild mates, and a number of others seem to be establishing pairs with other ONE birds. A ONE male paired with a wild bird is incubating an egg, and this is the first confirmed record of an Okarito ONE bird breeding.

The 2 wild chicks that hatched in February 1999 have continued to thrive; one is still living with its parents. The other has been travelling throughout the forest over the last few months and has ranged up to 4 km from its home territory.

The first 8 of the 14 chicks taken for ONE last year were returned to Okarito on 11 October. Although 1 bird has died from unknown causes the remaining 7 seem to be doing okay despite some weight loss.

As at 1 November, there are 6 rowi chicks on Motuara Island and 3 due for transfer there. At this stage of the season, with

further eggs expected from the field, chick production and survival is looking good. Only 1 egg, diagnosed as an early dead embryo or infertile, has been lost since the beginning of artificial incubation in mid August. This season's chicks have been released on Motuara 2 to 4 weeks old and are doing well.

Six of the 14 juveniles from last season's releases remain on the island and will be transferred to Okarito Forest in December. Fortunately observations indicate that non territorial juvenile rowi on Motuara are tolerant of young chicks and will share burrows with them without harm.

### ***Pterostylis cernua* ('drooping greenhood orchid')**

The latest rankings list ranks this recently described species as critically endangered, but it is likely that it occurs at more sites than the two we presently know. To better define the plant's short flowering period (i.e. the best survey window) as well as find out more about the plant's ecology and the health of its stronghold population, a monitoring transect was set up at the species' type locality in a SH 73 roadside ditch near Kumara. This site is very dependent on the mowing and roadside maintenance regime, which has the potential to both benefit the orchid (by keeping the grass sward low) and destroy it (by mowing down flowers, or ditch clearance), and we are beginning to work with Opus to manage the site.

### ***Frost Flat plants***

A joint West Coast-Nelson-Marlborough trip was made in November to the Maruia Valley to survey some of the remaining frost flat shrublands and to discuss ongoing research. New *Coprosma wallii* and *Melicytus flexuosus* sites were found in Station Creek. This was especially welcome, because it appears the type locality of *Melicytus flexuosus* has been

destroyed by the site's conversion to a dairy farm. Craig Bishop updated us on his research on frost flats, which includes some restoration trials. Spray treatments to remove adventive grasses have generally resulted in increased cover of broad-leaved weeds. Removing the grazing threat is clearly only a first step to restoring these communities.

### ***Lepidium flexicaule***

A trip to Dolomite Point (Punakaiki) in October found 12 *Lepidium flexicaule* seedlings had established on disturbed ground where seed was scattered in March. This is an encouraging start to work aimed at establishing some more secure sites for this species. In addition, the viability of seed was tested by placing 238 seeds in petrie dishes back at the office. Germination has now tailed off, with 70% of seeds germinating. This confirms that seed viability is not a limiting factor in establishing new sites.

### **Wetland research**

Natasha Grainger has just completed her Masters thesis on fire ecology in a pakihi wetland near Westport. The study examined the recovery of the vegetation and the distribution of brown mudfish (*Neochanna apoda*) and freshwater crayfish (*Paranephrops planifrons*) following a fire in a pakihi bog wetland, German Terrace.

Just over 100 ha (a third) of the wetland was burnt in an illegally lit fire in November 1998. Pakihi wetlands are subject to periodic fires and German Terrace has been burnt several times in the past. Vegetation recovery was monitored in April, July, October 1999 and January 2000. Fish were surveyed in April and October 1999.

The vegetation recovery was rapid. Species that could re-sprout from burnt bases or rhizomes recovered quicker than species that had to re-colonise from seed. Consequently sedges and ferns recovered quicker than woody species

such as manuka (*Leptospermum scoparium*) and *Epacris pauciflora*. A pre-fire dominant wire rush (*Empodisma minus*) showed a very slow recovery, the fire destroyed its shallow root systems and re-colonisation has been slow. Species diversity in the burnt area was higher throughout the study period and rare species were more commonly encountered in the burnt area.

No differences between the numbers of brown mudfish and freshwater crayfish were detected following the fire. This indicated that brown mudfish and freshwater crayfish either survived the fire or re-colonised the burnt area within 5 months. In addition, the biomass of brown mudfish did not differ between the burnt or unburnt areas. Brown mudfish did not appear to be associated with any environmental parameters. There was weak association between freshwater crayfish and open water. Brown mudfish and freshwater crayfish populations appear to be unaffected by the fire and the vegetation is beginning to resemble the unburnt area, but monitoring will continue for some time yet.

## **OTAGO**

*from Bruce McKinlay*

### **Mistletoes**

A visit to the Hunter Valley at the head of Lake Hawea provided an opportunity to see an important mistletoe site. In a submission on the draft Mistletoe Recovery Plan, Peter Wardle described it as "the best population of all three beech mistletoes that I have seen in recent years". Although we didn't find any *Alepis flavida* in our short visit we were certainly impressed with the abundance and size of *Peraxilla tetrapetala* and *P. colensoi*. Large plants up to 3 m across were common although looked in poor health with considerable dieback, but smaller (younger?) plants

## CONSERVANCY NEWS

were generally in good condition. The site meets many criteria as a representative site for mistletoe conservation.

John Barkla met with Dunedin Botanic Garden staff to discuss the importance of the gardens as a site for *Ileostylus micranthus* conservation. *Ileostylus* is abundant on a large range of hosts including many unusual ones. Garden staff are keen to develop conservation guidelines which will help recognise and protect the species and diversity of host relationships.

### **Upper Taieri wetlands**

An inspection of reserves and covenants along the upper Taieri River scroll plain resulted in much new information on the biodiversity of these areas. A substantial new saline area with associated halophytic vegetation was found as well as six new sites for *Lepidium sisymbrioides* subsp. *sisymbrioides*. The *Lepidium* discoveries more than double the number of known sites for this species in Central Otago. The reserves and covenants are being evaluated as the first stage of a process aimed at progressing protection of this nationally important wetland.

### **Ischnocarpus conservation**

Staff from Otago and Canterbury conservancies met recently to review work being carried out on *Ischnocarpus novae-zelandiae* and *I. exilis* and to discuss the way forward. One of the outcomes of the meeting was the desire that these species be brought into the recovery planning framework. In the interim, the meeting identified several goals and objectives of a recovery process for the next 12 months. These revolve around further survey, standardisation of data collection, profile raising, and research. Alice Miller, a MSc student from Lincoln, is looking at the ecology of both species. Wakatipu and

Wanaka Area staff have been helping Alice choose suitable study sites.

### **Central Otago beetles and wetas**

Annual survey work for the Alexandra chafer beetles continues with pitfall trapping and continuation of other searching on the Airport Terrace. At Cromwell an assessment of mice as a potential predator is ongoing but for the second half of October when the chafers were well and truly out there was only 1 mouse caught.

In an attempt to improve our distribution survey methods for ground wetas in Central Otago scab weed terraces bait trials were undertaken and it seems that first and second instar of the Central Otago ground weta prefer jellimeat over pears, carrots, and peanut butter.

### **Mohua/predator control**

Rat captures in the Makarora and Dart Valleys are up on previous years, and rodents now appear to be a permanent feature of these permanent trap lines. Also, in the Dart stoat numbers are increasing as a result of the mast event last spring. This is the third season in a row for high stoat numbers in the Dart. In the Catlins the post irruption survey for mohua has been started, and results so far are showing good numbers of mohua in the core.

### **Giant skinks**

The predator control pressure at MacCraes is finally starting to have an impact with cat and ferret totals caught this year being substantially lower than last year. Overall we have removed at least 138 cats, 161 ferrets, 26 rats, 13 stoats, and 17 weasels from about 700 ha of tussock grassland. This achievement has taken the efforts of 1.5 full time people.

## SOUTHLAND

*from Brian Rance, Dave Crouchley,  
Pete McClelland, Jeremy Carroll,  
Pbred Dobbins, Brent Beaven, and  
Chrissy Wickes*

### **Te Anau Area**

#### ***Takabe***

Thirteen captive reared yearling birds were released in the Murchison Mountains on 25 October. Three others will be released later in November. (We had trouble locating them in the main enclosure in time for the screening programme.) The takahe-nesting season is underway with field teams now in the Murchison Mountains. A few pairs have nested early, but it appears that most will be laying a bit later than normal owing to the snowfalls and cooler weather over October.

#### ***Whio***

The productivity and survival study has just kicked off in the Clinton and Arthur Catchments (Milford Track). This study has already provided some interesting information. We are placing video cameras on nests (3 so far) and will continue this throughout the summer. Two of the three videoed nests have been visited by stoats and one also by a possum. A stoat destroyed one of the nests and the female survived, while the other female managed to defend her nest from a stoat and a possum although the stoat stole one egg.

A third female was thought to have just begun incubating when she was killed, she was found pulled under a rock with stoat scats surrounding her.

The sex imbalance, particularly in the Clinton Study site, is also concerning, containing 14 males (2 male/male pairs) and now, only 2 females. This is alarming evidence of the impacts of stoats on whio and probably more

serious than most expected. The impact is possibly worse this year than normal because of the mild winter and double beech mast, but the sex imbalance suggests that this has been an ongoing problem.

A stoat trap line along the same design as the Eglinton programme has recently been set up in the Clinton Catchment. We hope that this will provide protection, not only to kaka and mohua but also whio and kiwi next year.

#### ***Mohua***

Rat numbers are very high in the Eglinton Valley and appear to be causing heavy predation of mohua in the Eglinton this year.

### **Southern Islands Area**

A census of Snares crested penguins has been completed by a highly skilled team consisting of Jac Amey, Gus McAlister, Alan Tennison, and Dave Huston. The team counted 25,764 pairs on North-East Island. Indications are that the population is relatively stable. Chick counts done by the University of Canterbury in the early-to-mid 1980s indicated similar numbers.

In December a survey trip to Rose Island (northern Auckland Islands) will take place. The survey will develop and refine census/monitoring techniques with Auckland Island snipe to guide management for the recently discovered Campbell Island snipe as part of the recovery programme objectives.

Permit workload is high with increasing numbers of research and tourist permits for the sub-Antarctic Islands (40 applications and they are still coming). The Campbell Island eradication preparation continues.

#### ***Southern NZ dotterel***

Cat poisoning commenced again in mid August and will continue until mid February. It appears to be a good

*...a highly skilled team  
counted 25,764 pairs of  
Snares crested penguins on  
North-East Island...*

## CONSERVANCY NEWS

season with many nests and some early chicks. A survey of all potential nesting sites has started.

A major exercise to determine management units and ecological values on Stewart Island is underway.

### ***Stewart Island plants***

All the known *Gunnera hamiltonii* sites were monitored this year by DoC staff. All are doing well and generally increasing in size from the last annual visit. Two populations were flowering. The population at Doughboy, which is on the edge of a sand escarpment, is still rather precarious. Transplants from this population have previously been planted out on different locations to insure this population does not disappear to the sea.

*Euphorbia glauca* is still limited to Cow Island and Masons Bay. A transplant from the precarious Cow Island population has been put on Ulva Island to ensure its future (a storm destroyed the habitat on Cow Island). *Stilbocarpa lyallii* has been transplanted to several different sites on Ulva Island. The source being the small population already existing on Ulva. *Korthalsella salicornioides* has been found throughout the Tolson River, growing on the manuka hanging over the riverbanks. A new plant record for Stewart Island is *Fuchsia perscandens*, which was found on Cow Island. This adds to other recent additions by Peter de Lange and Geoff Rogers.

A threatened plant garden has been established outside the Stewart Island DoC office, which has attracted local attention.

### **Murihiku Area**

#### ***Powelliphanta spedeni spedeni* (giant land snail) monitoring**

This rare species lives in the mountains of northern Southland. Monitoring is

needed to detect potential decline in numbers. During October Lyne McFarlane, Wynston Cooper, Beatrice Lee, Eric Edwards, and Murray Efford from Landcare Research in Dunedin visited Mt Bee in the Eyre Forest to establish a monitoring programme to detect decline in snail numbers. Two methods of sampling were used. Three monitoring plots in tussock were established, and 1.5 plots were searched. Live snails were recovered and a number of shells also. The second method is to search discrete patches of the plant *Astelia nervosa* for snails. The snails have been marked and released. We hope to learn about life history and home range from this study.

While Lyne and team were on Mt Bee sampling for snails in *Astelia nervosa* clumps, a new *Peripatus* record was made. The find is interesting because it is an *Ooperipatellus* species. It has 13 pairs of legs, a velvet brown body, and lays eggs to produce young. This type of *Peripatus* has not been found in the Eyre Mountains before. It may be closely related to the Takitimu Range endemic species *Ooperipatellus nana* or a new species. Either way this is a significant find.

### **Lizards**

While visiting Bare Hill in the Hokonui Hills 4 species of lizards were found – *Oligosoma nigriplantare polychroma*, *O. maccanni*, *O. inconspicuum* and *O. chloronoton*. Although widespread throughout Southland it was good to see healthy numbers of these lizards.

### **Threatened plants**

An inspection of Crosby's Reserve near Wyndham revealed a small population of *Olearia fragrantissima* adults and seedlings. Also found was one *O. hectorii* plant.



### ***Mohua***

The Blue Mountains annual counts of mohua were down by between one third and one half on what would have been expected. This may have been a result of weather conditions at the time and the fact that the birds were nesting. Numbers in Western Southland (i.e. Pig

Creek at Borland, Otways Clearing in Rowallan Forest, and the Hauroko Burn, Head of Lake Hauroko) were also down on last year. However, the numbers of stoats caught in the August trapping was higher than the numbers last year.

## **OTHER BITS**

### **ELECTRONIC MONITORING EQUIPMENT UPDATE**

*from Murray Douglas, Science & Research Unit.*

#### ***Electronics lab***

During the last 12 months we have undergone a number of important changes. Many of you will have caught up with the move of SRU and BRU from Tory Street to the refurbished central Wellington office at 65 Victoria Street. We were lucky to get sufficient space allocated for a good Electronics Workshop on the 4<sup>th</sup> floor and a Mechanical Workshop in the basement. Just before the busy time (end of financial year and building moves) Peter Carey resigned to join the NZ Police special unit. Many thanks to Peter for his many technological developments, particularly in the area of remote monitoring gadgetry for threatened species.

This work is still carried on in our laboratory by myself and with our new electronics engineer, Stuart Cockburn. Stuart comes to SRU with considerable previous practical experience both in conservation DoC work and in electronic engineering, particularly in the video and micro-controller areas. We also have Brian Heath working for 1-2 days per month helping us service our designs. We can do small repairs on TR4s for you (e.g. channel switch changes) but all other commercial devices should be sent back to their manufacturer for service.

#### ***Current work***

The aim of the Electronics Laboratory is to provide necessary advice, development and enhancement of electronic technology for the benefit of DoC's management and research programmes. We are not a commercial service and prices are set to just cover our manufacturing costs for DoC. The primary focus this year is to improve the quality and delivery times of existing designs and develop new ones. Stuart is currently busy upgrading our predator video systems so that we can manufacture the various configurations more easily. I have been improving the standard Automatic Bat Monitors (ABM) for similar reasons. See the December 1999 issue of *Rare Bits* (No. 35) for more information on our data logger units such as SNARK, BURROWLOG, BATROOST, and MATEID.

#### ***New designs***

- Predator video: a time-lapse video system, which includes a VCR, two 12V batteries, charger, waterproof cables & housings, plus a small door-type video monitor. About \$4000.
- Nest viewer: a small waterproof "bullet camera" with infra red LEDs. For use with either the predator unit, cavity inspection unit or for long cable installations such as at kaka or shorebird nests. Good for when you don't want to disturb the sitting bird - just plug in the monitor to view the particular nest. About \$1000 for a

## OTHER BITS

monitor and \$300 per camera.

- Bats: improvements to the standard ABM unit have been made to make it more universal and easier to construct. These are mainly internal improvements – the units work the same as before. Upgrade price depends upon how many components you have already but ranges from \$200, for a few changes, to about \$1300 for a complete unit.
- Kiwi amplifier: a portable 5-10W amplifier connected to a horn speaker for call survey work, c. \$180 + battery. A larger internal battery version is also being developed that may be ideal for kokako/mist netting.
- SCAT: Single Channel Automatic Telemetry recorder: Ten seconds of receiver noise is recorded onto a dictaphone from a TR4 or TR2 during every hour of darkness. Working prototypes in field, POA.

If you want more information about any of these, or have any other great ideas for development please give us a call at the Electronics Laboratory, SRU.

Murray Douglas, VPN 8269,  
mdouglas@doc.govt.nz and  
Stuart Cockburn, VPN 8265,  
scockburn@doc.govt.nz

## TRANSMITTER DESIGN

*from Dave Crouchley, Jane Maxwell,  
Tania Fechney, and Andrew Smart*

When the Takahe Recovery Group was approached with a proposal to conduct an energetics study to compare habitat quality between the Murchison Mountains and island sites the group was very hesitant. It felt that the research was of a low priority and that the results were unlikely to influence management decisions. Also, the study would be very invasive because takahe are not always easily caught. In fact we considered the

number of repeated captures needed would not be possible to achieve in the Murchison Mountains.

A compromise arrangement was negotiated. The energetics researchers were approved access to takahe at the Burwood Bush Rearing Unit and Mana Island in exchange for completing a trial investigating the energy cost to a takahe of wearing a transmitter. We have been monitoring a sample of radio-tagged takahe in the Murchison Mountains since 1991 to compare the success of captive-reared birds and wild-reared birds. That sample has numbered more than 30 birds over recent years and we were keen to see if the transmitters may be compromising the birds' survival in any way.

Jason Godfrey, of Stirling University, Scotland, conducted the research over April-May 1999. Jason had been in NZ working on several related projects with Murray Williams.

He used the doubly labelled water technique to measure the free-living energy expenditure of the 8 birds at Burwood. During the first period of measuring the mean daily energy expenditure half of the birds wore transmitters. Treatment was reversed over a second period.

We received Jason's final report earlier this year. Some of the points of particular interest to us were:

1. "The increase in daily energy expenditure due to tags (transmitters) was estimated at 8.6%."
2. "The scale of increase in expenditure due to tags might be sufficient to compromise survival and/or reproductive success."
3. "Time-budgets indicated no significant impact of tag-bearing on behaviour."
4. "Mechanical power required for muscular support of the extra mass is

*...the results of Jason's research have identified an issue that will have relevance for other transmitter studies...*

unlikely to explain more than 15% of the observed increase in living costs.”

5. “We suggest that the principal cost of tag-bearing derived from increased thermoregulatory costs consequent on feather disruption by the tag and/or harness and heat loss transfer via tag itself.”
6. “Increased energy demands due to tag-bearing can be expected to peak in montane winter conditions.”

Jason suggested considering improvements to tag-design. To our knowledge no takahe have died as a result of transmitters, however, we were concerned about the implications of his findings and immediately started looking for ways to reduce the possible impacts he had identified. As well as feather disruption, we considered that heat loss from the transmitters was likely to be a significant factor. We set out to:

- Reduce the weight of the transmitter.
- Reduce the size (less feather disruption and surface for radiation).
- Insulate the surface of the transmitter resting on the bird.

Heat loss via the long external antenna was considered as another potential factor. An internal loop antenna would help here but was not considered as an option owing to the reduced transmitter

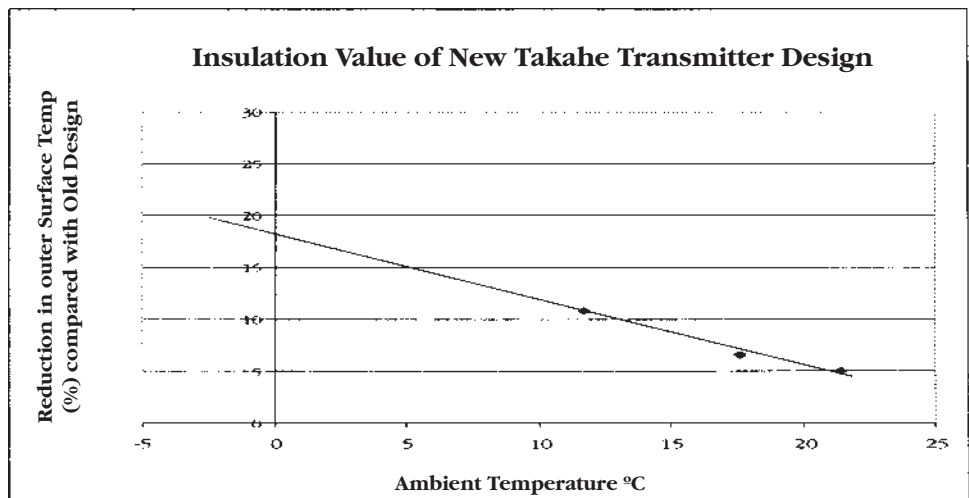
range. We are happy with the backpack harness design so only looked to make changes in transmitter package. Leg band or patagial tag systems are potential options for attaching long-life transmitters. However, these are likely to be less suitable for takahe and would pose greater risks of entanglement considering the habitat and behaviour of the birds.

We made the following changes to the takahe transmitter package design:

1. Removed the mortality mode switching.
2. Installed a 12-hour on, 12-hour off duty-cycle system.
3. Used one 2/3 AA sized battery rather than two.
4. Had a “silvered” layer incorporated into the surface resting on the bird’s back.
5. Glued a 3 mm thick layer of neoprene on to the same surface.

These modifications resulted in the following improvements:

1. Weight reduced from approximately 50 gm to 30 gm.
2. Package width reduced from approx. 31 mm to 22 mm.
3. Insulation between the bird and the transmitter.
4. Transmitter life extended from 38 months to 44 months.



## OTHER BITS

We were interested to get some idea of the benefit of the insulation so we carried out a simple trial. The controlled environment of the incubator-room at the Burwood Bush Rearing Unit was used to make comparative tests between the old and new designs at various ambient temperatures. An incubator was used to simulate the body heat of a takahe. The bottom surface of the transmitter was heated and a temperature probe used to measure the transmitter temperature at the opposite (outer) surface. Tests were carried out at three different ambient temperatures (results graphed below).

As expected, the result showed less heat transfer through the new transmitter package design. We can not read too much into the values, because the methods used were fairly simple, but it is interesting to note that the trend shows an increasing benefit from insulation as the ambient temperature lowers.

The results of Jason's research have identified an issue that will have relevance for other transmitter studies in New Zealand. You may think it is purely a takahe problem as they live in a cold mountain environment. However, when Jason carried out his study temperatures ranged from 3.9 to 18.7°C. Even in northern New Zealand winter temperatures are not far from this.

We believe that when researching or managing endangered wildlife you should:

1. Bear in mind that the use of transmitters will always have some cost, and
2. Wherever possible use simple practical methods to reduce impacts of transmitters on the study species.

## WHENUA HOU (CODFISH ISLAND) ERADICATION

*from Pete McClelland*

After 5 years in the planning, more than

a year in the implementation and 2+ years waiting after the job, Southland Conservancy is finally able to declare Whenua Hou Nature Reserve (Codfish Island) rat free.

As with all the major eradication's that have been carried out in recent years, and those that are currently planned, the removal of rats from Whenua Hou seemed impossible until relatively recently. The island is 1396 ha, largely covered in mixed podocarp forest, and rises to a height of 250 m. It is best known as the home of the kakapo, for although the numbers have fluctuated as birds have been moved around, and breeding has occurred, Whenua Hou has more kakapo than everywhere else combined. But the eradication was not carried out solely for kakapo, in fact far from it. Whenua Hou is the largest 'predator free' island off the South Island and has a unique range of species and habitats, as well as the potential for the reintroduction/introduction of many more. Among the diverse range of species to be found are the southern short-tailed bat, which is a lek species (i.e. the males all gather in a area and try to draw in the females); Cooks petrel, only found on Whenua Hou and Little Barrier islands 11,000 km apart; South Georgian diving petrels, which unlike their more common cousins burrow into loose sand or gravel to nest rather than soil, this is the only surviving population remaining in the New Zealand region and is the most northerly; Codfish Island fernbirds – a sub species, until a recent transfer, found nowhere else. It also has the only population of riflemen remaining within the Stewart Island area, several species of lizard including 1 gecko only identified from a shed skin and another only seen three times and never formally identified, as well as a

relatively poorly known range of invertebrates and a diverse flora (at least 232 native species). In summary, Whenua Hou is important enough to have the rats removed even if kakapo had not been present, but the big green budgies certainly acted as a flagship for the eradication.

The work started more than 4 years before the bait drop with many trials – from what effect would the bait have on the various non targets, to which bait type was the most suitable for the job. Non targets were the big issue with emphasis on the bats, fernbirds and kakapo. The kakapo were ‘relatively’ straightforward, if not easy – find another suitable holding island, set up a new infrastructure for the team and move the birds for the duration of the programme. This meant timing the eradication for a year when the birds were unlikely to breed so as to minimise disturbance. Indications were that 1999 was not going to be a breeding year so things were able to go ahead. Ironically the birds bred on their temporary home, with one of the most productive (egg wise) years ever ! Sometimes you just can’t pick it. Trials showed that the fernbirds were at significant risk from the bait, although there is debate over whether it is primary or secondary poisoning, so to safeguard the subspecies it was decided to establish another population on a nearby island. All the likely islands were owned by iwi, most of them being muttonbird islands. We are grateful that the birders supported the project fully and allowed their islands to be used as an integral part of the process. The first attempt to the only available island at the time failed for reasons we’ll never know. This meant that we had to eradicate the rats from another island (146 ha Putauhinu) in order to make it suitable for fernbirds.

*...it was an amazing achievement to keep so many bats in captivity for over 3 months...*

This bait drop was carried out in conjunction with another nearby island (Rarotoka/Centre Island) in 1997 and proved to be an excellent training run for the team, most of whom had not been involved in an eradication of this kind before. The eradication on Putauhinu was successful, and 21 fernbird were transferred in November-December 1997 and have, after some initial concern from some people, thrived, rapidly spreading around the island. Back on Whenua Hou it appears that sufficient birds have survived to re-populate the island with the first post drop breeding recorded in 1999.

The bats were another story, trials indicated that transferring to another island was not an option, and that although the risk from the bait drop was low, it was present. Eventually we decided to hold up to 400 bats in captivity for the duration of the programme. A trial with 50 bats was carried out first with no loses. So before the bait was dropped 385 bats were caught and put into four purpose built aviaries (batteries). Under the watchful eye of a dedicated team they were feed a diet of mealworms that had been feed a nutrient supplement. This proved very acceptable to the bats, with most putting on weight and having to be put on a diet. They were all weighed and checked every 8 days, which was no small task. During the operation only 9 bats were lost up until the week of the final release in late September, when for some unknown reason 45 bats died during the check up, apparently from heat stress. Even with the mass mortality it was an amazing achievement to keep that number of bats in captivity for over 3 months. Overseas experts had indicated that we should expect a mortality rate of up to 50 percent as a matter of course.

## OTHER BITS

Monitoring of the wild population and of the released bats, showed that definitely at a population level and probably at an individual level, the bait drop had no effect on the bats. This is important for future operations of this kind in bat areas.

After many trials "Agtech" bait manufactured by Animal Control Products at Waimate was selected, because it breaks down faster than the baits usually used for island eradications. This meant that the risk to non-targets was reduced by not having bait on the ground for so long, but also meant that the margin for error with the weather forecast was also reduced. The bait was stored on the island in two pipe framed "Coverall" tents, which could be opened up on fine days to allow ventilation. Initially 25 tonnes of bait was ordered and this was held on the island for nearly 2 months prior to the first drop with no apparent deterioration. After one false start when the forecast deteriorated after everything was gathered on the island, the first drop was carried out on 19 August 1998. Two choppers (1 jet ranger and 1 Hughes 500) were used to spread the bait with a Squirrel ferrying bait up to a second loading site near the top of the island. Two loading sites were used, both to speed up the operation by reducing ferrying time and for safety. While it was planned to put on the bait at 8 kg/ha for the first drop, double ups around the cliffs meant that it went on at just over 9 kg/ha. The bait spread was monitored using a differential GPS on which an outline of the island was recorded by flying around it the night before the first drop. Then as the pilots drop the bait, the system blocks in the areas that have been flown over. Note, you still have to rely on the pilots turning the system off when there's no bait flowing.

Unfortunately the forecast was not as

accurate as hoped and it started raining, albeit lightly, shortly after the drop. While not a major down pour it was sufficient to justify upping the second drop from the planned 4 kg/ha to 8 kg/ha. More bait was ordered and this arrived in time for the second drop on 27 August. Once again the double ups mean that the bait went on at an average of just over 9 kg/ha. The bait stations in the core fernbird area were maintained from the day of the first drop until 33 days after the second one and the last station was active until 10 days after the first drop.

At the start of the project it was decided to use the kakapo feeding stations as the monitoring system for the success of the operation because these are fairly wide spread and would rapidly attract any rats in the area. However, changes in the management of the kakapo meant that the feeding was put on hold until October 2000. Three false (hopefully) alarms with possible rats being reported meant that for peace of mind a trapping session was carried out in March 2000 with 1000 trap nights. This showed no signs of rats present. The kakapo feeding has now been underway for nearly 2 months with no rat sign. Lines of kakapo food have been set out around the island in an attempt to get selected birds onto the artificial food, which we are satisfied would have detected any rats present.

### ***The future***

The potential for an island the size and diversity of Whenua Hou is huge with the species suggested for introduction including snipe, mohua, saddlebacks, robins, kiwi, and even South Island kokako if they can be found and caught. Also, possibly Harlequin geckos and a range of invertebrates could be introduced. However, it is important that these species are looked at in a wider sense and the consequences of each considered against

what is best overall. The joint management committee established under the Ngai Tahu settlement will be involved in approving any future transfers and management. Whenua Hou is another step in the ongoing battle against rodents. The information learnt will be put to use in the

planning for other eradications both in New Zealand and around the world. It is vital to remember that eradication is simply the first step, now everybody must play their part in ensuring that rats and other predators do not make it on to the island or any other island where they can upset the natural balance.

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Articles about threatened species management issues are welcome from anyone. Send them to the Editor, *Rare Bits*, BRU, Department of Conservation, PO Box 10-420, Wellington, in Word, on a floppy disk, or as an Email attachment (internet mail: [smoconnor@doc.govt.nz](mailto:smoconnor@doc.govt.nz)).

Please follow these word limits: Conservancy News 800 words, Restoration Resumé 500 words, Island Roundup 1000 words, Other Bits 900 words, Feature Article 800 words.

Articles should be clean (ie, free of any formatting) and any graphs or figures should be saved as TIF files.

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