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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.

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FEATURE ARTICLE

Kaki (black stilt) recovery programme

from Richard Maloney

Kaki are one of New Zealand's and the world's rarest birds. Of 37 adults in the wild only 9 - 10 are females. There are just 6 wild breeding pairs. On the positive side, kaki will lay multiple clutches per season, and with recent advances in captive management there are now 8 breeding pairs in captivity that regularly produce eggs. Jointly, these wild and captive pairs are the key to increasing kaki numbers in the wild. The search is now on to find the most effective method to turn eggs in the incubators into sub-adults, and then breeding adults in the wild.

The kaki recovery programme aims to increase the number of breeding pairs in the wild to re-establish a self-sustaining population. It will do this by research and management strategies that have objectives of protecting nesting adults, eggs and chicks from predators and floods; enhancing habitat to provide better quality habitat; captive-breeding; and captive-rearing for release.

Research is presently focussed on identifying causes of chick mortality, and on improving present predator control methods. Key limitations to increasing kaki numbers are poor recruitment of chicks into the breeding population and high levels of mortality of adult females. The strategy for the next 3 years is to move away from production of chicks in the wild (which have a 4% chance of reaching breeding age) and into mass production of captive-reared young. Such young will be released as juveniles or sub-adults. Released birds have a minimum of 29% chance of reaching adulthood (but see the increased survival rates reported below). This will increase numbers, but to maintain wild populations we will still need to address ultimate causes of mortality in the field.

Hybridisation

Recent analysis of mtDNA from pied and black stilts and a review of hybridisation in stilts show that kaki is very definitely a distinct species that has maintained a separate genetic line from pied stilts. The DNA analysis was by Liz MacAvoy and Geoff Chambers of Victoria University and the hybridisation review by Graham Wallis of Otago University. Furthermore, it is likely that kaki have been isolated from pied stilts for about 1 million years. Kaki and pied stilts have remained separate, in part, because offspring survival from mixed pair matings is only about half that of pure black pairs. Hybrids are maintained in the stilt population because of the imbalance in the number of males and females. If no kaki females are available in the area, males will choose to mate with a hybrid or pied stilt rather than not mate at all.

Department of Conservation
Te Papa Atawhai

Current season

The 1999/2000 breeding season is well underway, and looks like being a particularly interesting one. The shooting of one male from a breeding pair by a duck shooter in winter could have been a significant blow to the wild breeding population this year, but fortunately the female found another partner quickly (a male that had been captive-reared and released at a site 15 km away). At the beginning of the season there were 6 breeding pairs in the wild, but because of difficulties with access to private runholders land, and one major flood in all braided rivers, we have been able to find and collect eggs from only 3 pairs. With 5 of 8 captive pairs already laying 3 clutches each, we are up to 79 eggs for the season. So far 32 of these have hatched and will be hand-reared ready for release. We expect around 50 sub-adults ready for release. About 20 of these will be released as juveniles in January, and the remainder will be held over winter and released in September.

Release

Seventeen sub-adults and 3 adults were released to the wild near Tekapo on 16 September 1999. As with the last two releases in 1998, the survival rate for these birds has been outstanding, 19 (95%) are still alive and well 2 months after release. In past releases, the period immediately post-release has been the time many of the released birds have died.

The reason for the difference in survival? We have changed two things. First, we have managed to get released birds to take supplementary food following release - and we feed them for about a month, until they wean themselves off it. Second, through intensive post-release monitoring of previous releases we were able to collect many freshly killed/dead stilts and send these to Massey University (Caroline Twentyman and Maurice Alley) for necropsy. The necropsy results showed that many of the stilts had thyroid dysplasia (goitre), probably owing to a lack of iodine in their captive diet. Therefore, iodised salt was added to their food in captivity prior to release.

Prospects

Given these recent advances in survival rates of released sub-adults, the Kaki Recovery Programme Team is optimistic about the chances of increasing numbers of kaki in the wild. However, there is still a long way to go before we can confirm that the current strategy is the right one, and we still have much to learn about how to manage the species in its natural habitat.

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NORTHLAND

from Lisa Forester, Mike Thorsen, Andrea Booth, Mike McGlynn, and Richard Parrish

Threatened plants

A busy orchid season for Northland staff has been hampered by a long dry spell, which seems to have delayed the flowering season for some species. Resurvey of pre-1980 records of threatened plants continues with mixed results in Kerikeri and Whangarei Areas. As with the Far North re-survey, poor returns are a concern, with only around 30% of the old records in Kerikeri being found, and even poorer results in Whangarei. This has been mostly due to habitat destruction. A positive side, however, is that the re-survey has produced some new records, and revealed populations which are larger than previously recorded. In addition, many management issues have been identified for threatened plant sites, including fencing, weeds, wild animal impacts, stock, illegal land clearing, and vehicle impacts.

The recent discovery of a small but healthy population of the rare sand tussock *Austrofestuca littoralis* at Mimiwhangata is a surprise because this plant has not been seen recently in southern Northland or in Auckland. It is now only found on beaches from Te Paki to Karikari Peninsula and Great Barrier Island in this region, but old records indicate it was widespread. Also at Mimiwhangata is a population of *Hebe bollonsii* on an isolated headland. It is the only mainland record for this plant.

Grey-faced petrels

A recent re-survey of grey-faced petrels on the Rimariki Islands, where Norway rats invaded 1 or 2 years ago, found that probably all breeding has failed. Surveys by people and a specially trained dog in August found about half the burrows occupied by grey-faced petrels. A repeat of this survey in October found no burrows with any adults, eggs or chicks. The presence of rat-eaten eggs and occasional carcasses outside some burrow entrances gives a clue to what may have happened. Possibly the rats are at their most hungry after a population explosion outstripped the available food supply on the previously rodent-free group, forcing the rats to tackle the aggressive petrels.

Cave invertebrate survey

Staff from Whangarei Area Office and Conservancy Office recently assisted with a cave invertebrate survey carried out by Maree Hunt from the Science and Research Unit. Four days were spent at Waipu Caves, and 1 day at Abbey Caves. The survey involved searching the cave walls, floor, and stream bed for anything moving. Maree also set up several pit traps baited with pet food in Waipu Caves, which were left for 4 days then removed. Maree will now send the specimens to various entomologists around the country. They will report on any new and unusual cave invertebrates in Northland.

Native freshwater fish survey

Mike McGlynn and Alan McCrae have been carrying out an extensive survey of the wetlands and dune lakes on the Aupouri Peninsula during the winter/spring months. They have found several new mudfish localities, the most important of which has been the extensive Waiparera wetlands complex (c. 70 ha). Another interesting find has been several landlocked inanga populations that have managed to survive the ravages of *Gambusia*, and the ongoing destruction of their habitat. Interestingly enough, *Gambusia* have not been as widespread as initially thought. An interesting sideline to the fish survey has been finding many sites supporting the

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introduced golden bell and southern bell frogs. Aupouri Peninsula is frog heaven!

Fairy terns

The fairy terns caught us out this year. In previous years the earliest they have ever nested on the east coast was 13 November. This year the first nest at Mangawhai was discovered by one of our volunteers on 3 November right at the start of the big north-easterly blow. The next morning we were fully expecting to have to retrieve the eggs buried in the sand and send them to the zoo, but we found the birds sitting tight. Because they had survived 60-km gusting 90-km winds and heavy rain and the forecast was for the winds to ease to 40 km we decided to leave the eggs with them. A week later they are still incubating. Two pairs have eggs at Waipu now, so it looks like being an early start to the season.

Flax snails

The annual Far North flax snail monitoring/research trip found the snails at Surville Cliffs have recovered from the severe horse browsing damage a couple of years ago. Significant numbers of juveniles were seen; something we've not seen previously. A dramatic die-off of adult snails has occurred at the Cape Maria van Diemen *Placostylus paraspiritus* colony. We are not sure why, but suspect an increase in kikuyu grass which has smothered some shrubs. Things were better at the *P. paraspiritus* subspecies release area, with a large number of juveniles being found at the rodent controlled site. Unfortunately, there were few snails at the non-treatment site.

WAIKATO

Hauraki Area

from Jason Roxburgh

Pterostylis puberula: This threatened orchid is known from a site in the Kauaeranga Valley, near Thames. Peter de Lange, Lisette Collins, and Suzan Dopson spent a day looking around the known site and searching for more plants in the area.

Lepidium oleraceum (Nau): A large population of this species was relocated earlier in the year on a small island south of Coromandel township. Many plants, and some of their habitat, are being threatened by kikuyu grass. Paul Champion (NIWA) and Lisette Collins are trialling grass specific herbicides for Nau kill, like Gallant Grasskiller. Ngati Tamatera owns the islands, and this project is being carried out with direct iwi involvement.

Islands: A trip to Cuvier Island in November uncovered some interesting information. Another tuatara was found taking the known in-situ population up to 3 (the rest are at Auckland Zoo). Two pukeko, not previously recorded on the island, have set up residence. Cuvier is 30 km offshore, so this is a good flying feat. We also uncovered more Moth plant than previously estimated.

While the team was on Cuvier there was an illegal landing. Many such landings might be happening at this time of year, especially with the America's Cup bringing so many boats in from overseas and nationally. This is a real concern given that all the DoC-managed islands in the Mercury and Alderman Groups are rodent free.

Other island work in the next month includes trips to Stanley, Red Mercury, Green, Korapuki, Double, and Middle Islands. Work includes re-surveying released population of threatened lizards, and a research project on temperature dependent sex determination in the egg-laying Suter's skink (an MSc project by Kelly Hare of Victoria University).

Middle Island tusked weta: The captive breeding programme is proving extremely successful. About 400 eggs

were laid, and at least 160 weta already hatched. The critters will be kept at the Landcare Research, Mt Albert "wetarium" until their 4th instar, then will be released into enclosures on Red Mercury and Double Islands.

Jan Stringer's research programme on Middle Island tusked weta continues, with regular trips throughout the year. The visits have highlighted how difficult this species is to work with because it seems to spend most of its time underground.

NZ dotterel: Breeding started quite early this year in the Coromandel. A number of birds have fledged or are very close. The main breeding site at Opoutere has around 15 chicks, with several pairs still incubating, or preparing for second clutches. The rest of the peninsula is looking equally promising, and if we have no major storms before Christmas this will be a successful breeding season.

Project Kiwi/Kuaotunu Kiwi Sanctuary

from Lance Dew

We recently extended our stoat trapping regime from 800 to 1200 ha, using raw fat in raised Conibear sets, and plastic eggs in Fenn sets. The plastic eggs have proven good for catching stoats, although this year there appear to be less stoats around than last year. We have had a poor result for kiwi hatching success so far this year. The 18 eggs from 10 nests monitored from the first crop produced the following results:

- 2 eggs infertile
- 12 eggs failed either just before or during hatching
- 2 eggs simply vanished
- 2 chicks produced.

Two eggs from the first crop are due to hatch in early December and are not included in the above sample of 18.

The reasons for the high hatching failure are unclear. Several of the males are now incubating a second clutch, and we look forward to those producing a better result. Apart from the technical difficulties of:

- having only 2 (or maybe 3 with some luck) chicks to monitor so far
- having chick monitoring happening over the "busy" stoat period
- having a natural event of some sort affecting hatching.

We are looking forward to more success with the second crop. Our observations and catch records suggest that for every stoat seen in the bush we are catching 5. Has anyone seen similar trends?

TONGARIRO/TAUPO

from Nick Singers, Cam Speedy, Peter Morton, and Nigel Hollands

Dactylanthus taylorii protection

We've had an excellent seed production year for *Dactylanthus taylorii* at 100 Acre bush (a small remnant with good possum and moderate rat control). A report of a bat near this reserve suggests we may have the natural pollinator functioning here - the short-tailed bat. Some seed heads have been collected, and the seed will again be sown beneath young vigorous and healthy host trees (poor things having to cope with a parasite!). Elsewhere seed set has been minimal or not at all, and this is probably owing to the high number of rats around this year. At Opepe a recent search found many more plants, both caged and uncaged. A recent 1080 operation on the neighbouring farmland and forest during winter appears to have removed the constant re-invasion into the reserve. Flowering will be monitored again this season, and we hope to see some good seed set. Flowering success in uncaged plants will really test our current possum control.

Some interesting plant finds have also occurred recently, though we can not

take the kudos. The swamp nettle (*Urtica linearifolia*, Cat. B) was recently found by Paul Champion (NIWA) in a wetland on Lake Rotoaira. This find is a first for this conservancy.

Sarah Beadle also found a good population of the dwarf mistletoe *Korthalsella salicornioides* grown on approximately 20 kanuka trees at Tokaanu thermal area next to a walking track! This area has been previously described as ideal habitat for this species (CMS, Vol.2) though it was never known there. This discovery is the second location of the plant in this conservancy, the first being found only last year. Tokaanu and the Taupo kanuka forests provide ample opportunity for more dwarf mistletoe finds.

Alepis flavida

Some of last year's *Alepis flavida* (golden mistletoe) propagation is doing very well at Mangaehuehu Hut. One host tree checked in October had almost 100% take of seeds so far. It's early days yet, but it's a good start.

Kaka

The team from Terry Green's kaka research project came down from Pureora during early November to try and catch some elusive Ruapehu kaka. This is part of a monitoring programme looking at breeding success in a low-density beech forest kaka population where there is no control of predators or possums. The team successfully caught 3 birds at a mist net site off the Ohakune mountain road. Two males received colour bands while the only female caught was banded and had a radio attached. All of the birds had sticky beaks and 1 had sticky wing edges indicating that they had been sap feeding. The female kaka will be tracked and her breeding and nesting success monitored. The only female tracked last season ended up as stoat tucker at her nest. Hopefully more females will be caught this season to provide a greater sample size. The target is 10 females, but this will no doubt prove very challenging in such a low-density population.

Bats

The annual population count of the Rangataua short-tailed bat population is underway prior to the breeding season. As temperatures rise and different food types come on stream the bats have moved away from their lower altitude winter roosts around Lake Rotokura (700 m a.s.l) to roosts more often about the 1000 m a.s.l level higher on the mountain. No results from the count are to hand just yet, but one very large roost with several thousand bats has already been video taped.

Kiwi

An 'Operation Nest Egg' kiwi releasee has been predated by a pig in Tongariro Forest. This was the first known predation among the 13 young kiwi released so far. On a brighter note the 1999/2000 kiwi breeding season is off to a good start, with 6 hatched chicks and 2 fertile eggs currently at Rainbow Springs in Rotorua. This includes 3 eggs taken for the first time from the kiwi population in Waimarino Forest near Raetihi where local iwi and the forest's owners (Winstone Pulp International Ltd) have initiated a kiwi management regime, including 'Operation Nest Egg', with input from DoC.

Rodent plagues?

Ecological theory over the relationship between rodents and beech seed seems to be holding very true in the central North Island this year. A heavy red beech/silver beech mast last summer was followed by a dry winter/spring. (Taupo had just 11% of its average October rainfall this year.) This has resulted in unprecedented

rat and mouse numbers in central North Island beech forest, particularly in the south and east. Heavy fruiting/seeding last autumn of kahikatea, miro, hinau, a wide variety of *Coprosma* spp and even tussock, has probably also contributed to the problem.

Possums appear fatter and more productive than usual as a result of the good conditions, while pig populations also appear to be on a periodic peak in many parts of the conservancy. Likewise, rabbit populations are on the rise throughout the developed pumice country around Lake Taupo. The logical progression in the current scenario is higher than usual predator numbers this summer with associated impacts on our native fauna. Time will tell!

BAY OF PLENTY

from Keith Owen

Whirinaki kiwi

During March to July this year 6 adult kiwi were caught in the Whirinaki and fitted with radio tags. Three of these are the male component of a breeding pair so in the last few months we have been monitoring burrows and coming to grips with the midnight world of kiwi reproduction.

'Kiwi gurus' Sid Marsh and Lance Dew, with dog Murphy, caught all our kiwi. Their assistance was invaluable. Advice from John McLennan, Cam Speedy, and Brent Beaven has also been encouraging and useful.

In late October 2 eggs were removed from a burrow in an area that has had no animal pest control and taken to Rainbow Springs for incubation One egg proved to be rotten, but the other was in a well advanced state of embryo development and should hatch very soon. (Ross and Anna from Ruapehu took us through the O.N.E. procedure.) The other two nest burrows are within our 2000-ha bait station area, and we hope we have done enough within this block to allow for kiwi chick survival. Possums are down to 1% R.T.C. and a 14-km Fenn trap line was established along the access ridges and valleys.

We hope to trial a shade-cloth type enclosure for in-situ chick raising if funding and the opportunity arises. Ultimately we are aiming to have 10 pairs monitored.

Moutohora tieke

Over half the 40 tieke transferred to this island from Cuvier in March have been clearly identified by university staff.

EAST COAST/HAWKE'S BAY

North Island Weka Project - Motu

from Steve Sawyer

Another North Island weka breeding season is well underway in the Motu Field Centre area. Through time lapse video and radio telemetry we have kept close tabs on 12 weka pairs and their offspring throughout the season so as to monitor nesting and productivity.

Sixteen of this year's progeny will carry 13-month backpack harness transmitters next year to enable us to compare dispersal and predation rates in our predator treatment and non-treatment block.

Because of the low incidence of mustelids at our original Toatoa study site we have recently re-located the predator treatment phase of the project to the Whinray Scenic Reserve and surrounding farmland near Motu township. The reserve itself is a 400-ha area of podocarp-tawa-kamahi forest and currently contains a small population of NI weka as well as NI brown kiwi, kaka, NI robin, kereru, blue duck, NZ falcon, long-tailed bats, and possibly Hochstetters frog.

Stoats are common in the area with a high number of sightings already reported this year. Mustelid control has begun and will continue until late April.

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Puketitiri Dactylanthus

from Eddie Te Kahika

We are about to survey the Ngaruroro and Makino catchments for *Dactylanthus* habitat. Once the area has been mapped we will be adopting the 'Atkins' survey method and laying a number of cyanide lines in the priority areas to establish what *Dactylanthus* plants are in the area. It'll certainly be an interesting time, and we are hopeful of finding more plants. We are maintaining possum bait stations at the Ngaruroro site while a high take of poison is still evident. We look forward to the flowering season.

Dactylanthus survey, Tarawera

from Alan Lee

Historic records indicate that *Dactylanthus* was once relatively common in the Tarawera Forest area, half way between Napier and Taupo. Intermittent reports have been coming in over the years from hunters and locals, and in April 1999 four areas were noted for ground survey. One of these areas was surveyed using the 'Atkins' gut sampling method and although unsuccessful for *Dactylanthus* evidence the trip wasn't a total waste of time. Shortly after the sampling trip we received a call from a hunter who had been yarning with locals about our strange habits concerning possums, and he gave us the grid reference of a site where he had caged a number of plants. A quick trip to the site confirmed a healthy population of about 40 *Dactylanthus* plants in an area of around 40 m square. Most plants appeared to be healthy, and almost all of the caged plants had produced flowers this season, compared with only a couple of the uncaged plants. Hosts here seem to be mainly kohuhu, lemonwood, and putaputaweta growing on a steep face about 100 m above the stream. Further survey work is scheduled in the future, and after this promising start we hope that more plants will turn up, either near this site or at one of the other reported sites.

Boundary Stream

from Steve Cranwell

The NI robins released in the reserve 2 years ago have begun their second breeding season. Twenty-six birds have been accounted for from a possible pool of 44, and of these 18 birds have formed pairs, producing 7 fledglings from 4 pairs to date. With all these having been from first clutch attempts many more are anticipated this season.

Progress has been made with efforts to reintroduce NI kiwi into the reserve. Four adult males have been successfully monitored in the Eastern Kaweka ranges, between them providing 5 eggs. The eggs having been removed at the final stages of incubation for artificial rearing under the operation nest egg technique. Three eggs failed owing to natural causes with the remainder producing 2 feisty chicks. Release of the chicks is expected early in the New Year once they reach the target weight of 800 gm. Continued monitoring of the Kaweka males has shown evidence of repeated nesting attempts, these hopefully providing further eggs in months to come.

WANGANUI

from Tim Holmes, Graeme La Cock, and Rosemary Miller

Our problem has been solved - we now have a rose amongst the thorns. Welcome Rosemary (our new 'fishy-water person' or is that 'fishy, water person'). So cheers Wayne Beggs and good luck in Arthur's Pass. Thanks for the effort while you were in Palmerston North, and keep your eyes peeled for the moa.

FLORA

Twelve *Celmisia* "Mangaweka" plants grown for us by Percy's Reserve were planted at a reserve near Mangaweka.

The Wanganui Botanical Society turned

up a few items of interest on a recent trip to Castlecliff cliffs - *Leptinella dispersa* subsp. *rupestris* at its type locality. We don't think it's been seen here for over 30 years. Also an erect form of *Pimelea prostrata* that looks suspiciously like the critically endangered *P.* "Turakina". A young plant has been sent to Colin Burrows who is looking at the taxonomy of this group.

Colin Ogle spotted and Astrid collected *Brachyglottis kirkii* from Egmont, the first sighting for many years.

Jim Clarkson completed a survey of *Euphorbia glauca* on the south Taranaki coastline, and *Sebaea ovata* has survived another year. The area staff are going to attempt transfers to three depressions dug near the population.

Paengaroa Mainland Island

We've been offered a lease for the Railcorp land on the other side of the railway line. This exciting news prompted *Olearia gardneri* to produce even more seedlings on the banks of a little stream running through the property, and we (Colin) found a tawa seedling at the mainland island. Tawa hadn't been recorded here before.

FAUNA

Looking good for brown kiwi

The research project on the effects of an aerial 1080-drop on rodents, mustelids, and kiwi productivity on Aotuhia continues. The 1080-drop has now occurred, and all 3 stoats with transmitters died shortly after the event. Three males are currently sitting on eggs so things are looking good.

Blue duck productivity up from last year

A survey of the Manganui a te ao River found 31 ducklings. There has been recent rain, which might affect their survival rate but numbers will continue to be monitored prior to the possible transfer of birds into Egmont National Park.

NZ dotterels out on a limb

A pair of dotterels nested and fledged a chick at Pungaereere on the South Taranaki coast last year - the southern-most breeding in the North Island. Two birds have again been seen in the same area, and it is hoped they will breed.

Reintroduced robins

Of the 40 birds released into Paengaroa, our mainland island, 23 have subsequently been regularly observed. Robins are now nesting, and so far 3 chicks have been banded, however, there has been a high level of nest predation.

Fishy news

Rosemary Miller has managed to migrate back into the TSO team from the community relations group. This may mean a short break for those councils she has been badgering about native fish through resource management processes, or hopefully more opportunities to get her gumboots wet in the search for more compelling evidence of these fascinating fish!

Spawning kokopu gives researchers the slip

In the last *Rare Bits* we reported finding possible evidence of a short-jawed kokopu spawning site. Genetic analysis has since suggested that we were premature in our baby birth announcement, and that the juveniles are likely to be koaro rather than short-jaws. Richard Allibone (NIWA) will continue to rear the juveniles in order to verify this identification. Growth rates of short-jaws in the high density population seem to be slower than those in a nearby stream where the densities are lower. Dean Caskey continues his thorough micro-habitat assessment work which confirms earlier suspicions that short-jaws stick to their favourite pools and rarely go roaming far from home.

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Homes for mudfish

A significant population of brown mudfish has been located in a wetland area near Eltham. Trial releases of juveniles into more secure habitats (owned by friendly non-drainage inclined farmers) have also been undertaken. These will be closely monitored to see how well the fish settle in. We are keen to ensure genetic purity is maintained and hope to undertake further genetic analysis of the Eltham and Ngaere site populations to assess if these populations are significantly different.

WELLINGTON

FLORA

from Phillipa Crisp and Tony Silbery

New discoveries

Pimelea tomentosa has been rediscovered in Craigie Lea Forest, Eastern Wairarapa, by Wairarapa Area staff. Last seen in the Wellington Conservancy in 1945 it was presumed extinct. The single plant was located during a Wellington Botanical Society trip in December 1998, but remained unidentified. Recently, the same small plant (about 1 m tall) was found flowering in dense vegetation under kanuka. Also located in the Craigie Lea Forest area: at least 5 female plants of *Clematis quadribracteolata*, previously found at only one site in the conservancy, along with a number of scarce orchids and ferns. The site conditions here hold great promise for future discoveries because the range of environments closely resemble a number of sites where threatened species have been found.

Dr Patrick Brownsey from the Museum of New Zealand visited a number of the more interesting fern sites in the area. *Annogramma leptophylla* and *Pleurosorus rutifolius* were high on his list along with the Wairarapa's only known site of *Asplenium* aff. *trichomanes*.

The small mistletoe *Korthalsella salicornioides* was located at a new site in the southern Wairarapa, while its relative *K. lindsayi* continues to appear in favoured sites. Patience and persistence, along with the light being 'just right' are the keys to finding these enigmatic species! *Peraxilla colensoi* was found by Trevor Thompson in the Blue Range. Flowers were seen in silver beech forest on this range last summer, but this particular plant was found at another site, raising the hope that there is a good population. The species was last recorded many years ago, though there have been sporadic unconfirmed reports (and unsuccessful searches) in recent years. The challenge to find *Alepis flavida* is now before us. This would give the Wairarapa a 'full set'of mistletoes.

Chatham Island update

A publication on the Chatham Island endemic plant species is due to be released in December 1999. The booklet will include 16 threatened Chatham Island plant species and photos or drawings of each species. Distribution maps, plant descriptions, threats and flowering/fruiting times are included.

FAUNA

from David Agnew, Hilary Aikman, Glen Holland, and Mike Ogle

Taiko, Chatham Islands

It's a great season for taiko! Seven birds have been caught so far. Five birds were caught at the Light Site (where taiko are attracted to spot lights). Two of these were banded. Of the 2 banded birds, 1 was the first ever bird caught that had been banded as a chick in a burrow. This bird led staff (via telemetry) to a new burrow about 200 m downstream from where it was born. The other banded bird caught was banded in 1985. This 14+ year old bird led people with telemetry equipment to a new site where a further 2 banded taiko were found. One

of these 2 had been banded at the Light Site. The other was first banded as a chick in the Northern Burrows (about 2 km to the north). Taiko were also heard calling in flight above at this site. Does this mean that taiko could be lured to a new, predator free, location? Watch this space over the next few years to find out.

National Wildlife Centre, Mount Bruce

The breeding season has begun in earnest with nearly all the pairs that we had hoped would breed either nest building, incubating or rearing chicks. The Campbell Island Teal have one clutch due to hatch any day. We suspect another pair is currently laying, but the pair's secretive ways have allowed them to avoid nest site detection so far. A third pair is also looking promising. Two shore plover pairs have a total of 5 chicks, and a third pair are on eggs. The new Taranaki male kokako has settled in very well and is regularly seen preening and feeding the female, and she has also been seen carrying nesting material. The first stitchbird is incubating a clutch, which is destined to be used for a hand-rearing trial. Three other females are nest building so a busy time is ahead for the 2 males. The captive kaka have 1 newly hatched chick with a further 4 fertile eggs to go. The 4 long-term captive male kaka, newly introduced into the reserve, have adapted extremely well with 100% survival. The bad news is that our talking tui, Jack (world famous at Mt Bruce), passed away from a pancreatic tumour. He will be sadly missed by our visitors, particularly the children.

Brown teal

A survey conducted on Kapiti Island in October by James Fraser and his dog revealed only 1 male brown teal (1 female has been seen since). The aim of the survey was to assess the need for a transfer of birds to the island, and planning for the transfer will now begin.

Takahe

One of the 2 takahe pairs on Kapiti Island has a chick and the other pair is currently sitting on 2 fertile eggs. On Mana Island there were 7 nests this month. Three pairs each hatched 1 chick. Three other pairs also produced fertile eggs which failed during incubation, and 1 pair produced infertile eggs. Interestingly the pattern of island takahe producing infertile eggs in their first clutch has not been a feature on the Wellington islands this season. Unfortunately, it appears as if only one of the Mana chicks has survived to date.

Kokako

The breeding season on Kapiti Island is off to a promising start with 4 nests currently being monitored by contract staff.

Diving petrel

On Wednesday 3 November Graeme Taylor visited the site on Mana Island which has been set up with a sound system that broadcasts calls around 93 artificial burrows and the site where diving petrel chicks have been transferred to over the past 2 years. A check was made of the colony after dark, and 8 diving petrels were found! Four of these were banded and were chicks from the transfers. However, the most amazing find was a pair of diving petrels in a burrow with a small fluffy chick! This is the first record of this species breeding at Mana.

The final transfer of 50 chicks from North Brother Island is scheduled for the week of 23-26 November.

NELSON/MARLBOROUGH

from Peter Gaze

Rat eradication on the Rangitoto Islands

An aerial rodent eradication operation

was conducted on these three islands, east of D'Urville in late August. Norway rats were on all of these islands and kiore on one of them. The interesting aspect to this operation was that only one island is administered by DoC, one is owned by the sole resident, and the other is in multiple Maori ownership. The islands are close enough together so it was considered futile to eradicate rodents from the reserve island only. Apart from the private ownership there was the added complication of removing the sheep from the partially grazed island and paying for the owner's meat bill until the sheep could safely return. The easy parts were the smooth running of the operation, organised by sounds area staff, and the funding which came from an application to the South Pacific Conservation and Development Trust.

Mohua to the Chetwodes

When I wrote this article others were camped on Mt Stokes waiting for a break in the weather and a chance to move mohua to the Inner Chetwode. This relict population has been nursed back to health over the last 10 years by seasonal stoat trapping. The population has now reached the size where we can risk taking some mohua to establish a second population. The move to a predator-free island should occur in time to escape the imminent stoat irruption this season and an even bigger one predicted for next year if current beech flowering is any indication.

Weka trends

We took advantage of the recent invoicing of licensees on the Queens Chain (Sounds Foreshore Reserve) in the Marlborough Sounds to ask some simple questions about their observations on weka. This was considered a useful form of monitoring because most licensees are interested in the local birdlife and have been going to the same spot in the sounds for many years. A steady response is starting to show some consistent trends – that weka are more frequently encountered in the Outer Sounds than elsewhere and that they were just as abundant 5 years ago. The Inner Sounds have apparently experienced a decline over this period and in some areas the birds are now absent.

Weka have traditionally been very rare in Nelson Lakes National Park and yet within the space of 2 weeks there have been reports of several birds at St Arnaud and more in the surrounding forest. Like the dramatic decline of weka in Golden Bay in the early 90s, this is a phenomenon that has not been adequately explained.

Predation of Huttons shearwater

The best evidence to date has been that stoats are not having a significant impact on the viability of the colony at Kowhai Stream. However, with heavy tussock seeding last summer and the consequent threat of high stoat numbers this season Josh Kemp has been contracted to continue the monitoring of their impact. His innovative technique of attaching radio transmitters to dead birds has lead to at least one cache of kills and a reassessment of our understanding of predator-prey dynamics.

Blue duck in Golden Bay

Last year Belinda Studholme led a very successful census of whio in the western catchments of Kahurangi National Park. This year she will be concluding the work with a census of the rivers draining into Golden Bay. A better understanding of the size of this population should result and indicate whether a change in the conservation status of the species is warranted.

Lizards

Tony Whitaker has been instrumental in providing the conservancy with guidelines for conservation of lizards.

The document goes much further, however, in describing each species and its distribution, the conservation significance of local populations, the threats and the management options as well as the specific needs for research and survey. Tony is now producing a colour illustrated binary key for lizard identification and along with the new ARDS database which Mandy Tocher and Pauline Penny have developed in ACCESS we should have no excuses for not making real progress.

Fresh from UK

Cathy Jones has returned from doing an international diploma in plant conservation techniques at Kew Gardens in London. She brought back a draft recovery plan for six monocots of dry fertile sites (*Australopyrum calcis* ssp *calcis*, *A. calcis* ssp *optatum*, *Carex inopinatata*, *Dichelachne lautumia*, *Poa spania*, and *Simplicia laxa*), a broadened outlook and some new ideas.

WEST COAST

from Lynn Adams, Selena Brown, Chris Rickard, Jo Crofton, Paul van Klink, and Megan Hieatt

Haast Tokoeka

Recent trips to the Haast Range and Waiatoto Valleys tracking radio-tagged kiwi resulted in the discovery of 4 nests. Three of these nests are in the alpine tussock on the Haast Range at Lake Greaney and Thirsty Ridge and the other is next to the Waiatoto River. Since being found in September, the nest on the Waiatoto has failed, with the egg found abandoned in the breeding burrow. From examination of the egg, it appears that the egg was fertile but the chick had died in the egg. Both birds were present on the nest when it was discovered and again on the one occasion that it was checked before being abandoned. We will be going back to the Haast Range in the next 2 weeks to check the nests there.

During the September trip to Lake Greaney, new data was gathered on the 'shift changes' during the night between the male and female of one incubating pair. The male incubated all day and up until 10-10.30 pm when the female took over. She remained on the nest until 3-3.30 am when the male returned. Unfortunately the female always headed over the saddle out of radio range after coming off the nest so we were unable to determine what time she finished feeding and went to her day burrow.

Okarito brown kiwi

Mid way through the breeding season 21 eggs have been laid, 5 being second clutches. Of our 4 failures, 3 were eggs that failed to hatch - 2 were abandoned in the burrow, and the third had been incubated but didn't hatch. Massey University is currently researching their cause of death. The fourth was a chick found dead in the burrow; cause of death unknown but it did not appear to be predated.

At the time of writing 9 chicks were in captivity, 4 of which were removed as eggs and artificially incubated. The first 3 will be sent to Motuara Island on 22 November, the others will follow when they are bigger. One chick in our study/control area has been left in the forest with a transmitter attached. There are still 7 eggs being incubated one in captivity and presently the rest are in the forest.

We've had problems with transmitters dropping off the birds so are now renewing harnesses using black "Nitto" tape at 6 x 1.5 turns on the baby bands. This tape is supposed to be strong and the multiple lengths should stop all the tape coming off if it starts unravelling.

Juveniles: Five of the yearlings put on Motuara last year were returned to Okarito on 28 October and were doing well in mid November. One bird, Albi,

was left on the island because it was smaller than the 1.2 kg weight at which juvenile can defend themselves against predators. Albi is a white bird and despite his name is not albino but is mottled brown and white with brown eyes. He has received much media attention over the past months and is likely to be returned to Okarito in the next month or two.

The 6 juveniles released in December 1997 have made good weight gains and are using excellent shelters. Two of them have been consistently together and 2 others have paired up with juveniles released in December 1998. Unfortunately one is still on the loose after dropping its transmitter in August.

Seven of the 10 juveniles released in December 1998 are still alive, 2 dead (beaten up) and 1 missing. A pairing with a December 1997 juvenile only lasted 6 months when the younger but larger (2.1 kg) bird was found beaten to death. Her mate did not appear to have any signs of injury and there were 3 other juveniles in the area. Also there were no wild adult birds nearby. We are speculating that Okarito juveniles become territorial at between 2 and 3 years old. Another 1998 bird, Tony, has set up 5 km from the release site and has paired with a wild female.

Wild raised chicks: The two wild raised chicks are now 9 months old and weigh over 1 kg. One has always been sheltering in the breeding burrow and the other has sheltered the majority of the time but at last check was a considerable distance from its parents. The eggs that their parents laid this season were removed for incubation and hatched successfully in captivity.

OTAGO

from John Barkla and Bruce McKinlay

Mohua

Graeme Loh reports that all the indicators are present for a bad year in the Catlins for mohua after last year's silver beech mast. Rodents and mustelids were monitored through a large aerial 1080 operation that targeted possums, and rat and mice numbers are high. Unfortunately some weasels, stoats and ferrets were present after the operation. The lack of secondary kill of stoats will not be clear until trap catch monitoring is complete in early February. The high number of rats is a novel occurrence in this forest and the consequences are concerning. We do not have resources to protect the mohua population this season but will remap the distribution of mohua throughout the forest next spring to establish the extent of female mortality. This spring we completed the first full distribution survey of mohua and other forest birds in the Catlins. We found mohua present, usually in good numbers, in 84 1-km squares.

Dawn Palmer has been putting the finishing touches to the trapping set up in the Lower Dart Valley. This is to protect nesting mohua later in the summer. Additionally, Barry Lawrence and crew have been banding lots of mohua as part of the monitoring of success of the predator trapping work. Barry reports that he's only finding young females (ie, no females with really yellow heads suggesting a juvenile/young population). We're seeing yet another season of prolific flowering and clouds of pollen are reported to be wafting through the valleys.

Macraes Flat

At Macraes Flat a major land exchange to acquire the core populations of Otago skinks and Grand skinks has just been signed. Over 1000 ha of prime skink tussock land has been protected. The protected area also includes three RAPs, two chains of ephemeral bogs that are plump full of several rare herbs such as *Gratiola* nana, *Isolepis basilaris*, and

Tetrachondra hamiltonii, 5 *Simplicia laxa* sites, a good deal of (idiomatic science unit of measurement) *Carex tenuiculmis*, and an ancient remnant of bog pine.

Penguins

Yellow-eyed penguin nest checks have been done on most scheduled habitats. Generally the pattern appears to be one of late egg laying and a bit of variation in numbers compared to last year. Although some habitats have slightly more birds, most are either about the same or down in numbers. There appear to be a few partner changes but no real sign of dead birds from last season. Cheryl Mudford reports that yellow-eyed penguin nest numbers in the Catlins are well down particularly at Long Point (22) and Nugget Point (5). Time will tell how bad the season is! On the Otago Peninsula Lyndon Perriman says that blue penguins are again late laying (started in October) and that only 50% of last season's breeding birds have turned up. There was about a 90% survival of the 1998/99 breeding birds at the end of the moult (around April) so 40% of the 1998/99 birds have not been seen since May. Last year (1998/99) there was no double-breeding, and the same is expected this year.

Central Otago plants and beetles

In central Mike Tubbs and Jim Henderson have been working on rare spring annuals and also chafer beetles around Alexandra. They have also been visiting the various inland *Lepidium* sites, carrying out population monitoring, and generally checking out their status. In addition, they and Bruce McKinlay have been radio tracking hedgehogs to see if they are targeting Cromwell chafer beetles. So far little damage has been recorded.

Olearia hectorii

Conservation consultant Neill Simpson from Queenstown has just turned up a new *Olearia hectorii* site in the northern Eyre Mountains. Neill recorded 11 adult trees, a significant addition to the only other site in Wakatipu Area at Lake Dispute.

SOUTHLAND

Te Anau Area

from Dave Crouchley and Murray Willans

Takahe: We have just started this year's takahe work in the Murchison Mountains with the main nest location field work taking place over November. October field work in the McKenzie block as part of the egg/chick mortality study revealed several nests well into incubation and even 1 pair that had hatched 2 chicks on 23 October. One of these is now at the Burwood Rearing Unit. An extremely early season!

Good results were achieved in the spring deer control ground hunting. The 1-week operation at the end of October accounted for 22 deer, exceeding the harvest target of 16 for this hunt. Also during the month Des Smith started an MSc study on stoats in the area. He will be working in the Mystery Burn, Takahe Valley area, where we are establishing a stoat control programme. His work aims to help us to design an effective control programme for the area.

Brown Teal: Two teams (with dogs) spent 6 days following up sightings from recent years, with the hope of catching birds for captive breeding. Only two singles were observed. A follow up trip is planned for December.

Te Kakahu/Chalky Island: Stoat eradication is progressing well. One male stoat has been caught on Te Kakahu, none on Passage Islands, and 1 on Great Island.

Eglinton Valley: There is another heavy beech flowering year. Rat numbers are very high. Mohua nesting has started and Science and Research Unit staff are

monitoring 20 nests. The October stoat line check caught 4 stoats, all in the northern portion of the valley.

Murihiku Area

from Wynston Cooper, Brian Rance, and Eric Edwards

Mohua: Stoat trap lines have been established and monitored in the Borland and Otways Clearing areas (31 and 2 caught respectively. Stoat trap lines also established in the Blue Mountains. These lines are twice the length of previous years owing to the mouse plague. Surveys are planned for parts of the Longwoods.

Yellow-eyed penguin: The small eastern Southland populations are holding on with 3-4 nest at Curio Bay and 2 nests on North Head. Nest search will be completed soon.

The nettle *Urtica linariifolia* has been found along the northern shore of Waituna Lagoon. This is the first record of this plant in Southland for many years. The area also has a healthy population of *Deschampsia caespitosa*.

There has been a good seeding of *Olearia hectorii* plants in early November. Seed has been collected from several plants for restoration projects. A new plant has been found in a conservation covenant.

The dwarf lily *Iphigenia novae-zelandiae* is currently flowering (ie, mid November). This plant is know from a single site in Southland. Plant grown from seed has finally flowered after 5 years.

Powelliphanta spedenii surveys

Six known sites have been revisited to determine their suitability as monitoring sites. The snails were localised at all sites, but relatively common at most sites.

Southern Islands Area

from Pete McClelland

Whenua Hou: Campbell Island teal are all alive and well. Here's hoping for some ducklings. Young fernbirds have been observed which confirms they have survived the rat eradication.

Putauhinu Island: A recent trip found no sign of rat following the kiore eradication operation in August 1997. Young Codfish Island fernbirds and Stewart Island robins were both observed, indicating the success of the transfers. Saddleback and yellow-crowned parakeets were both abundant. Mist netting failed to catch any bats, however bat detectors recorded two bat passes on different nights. This confirms short-tailed bats, but which species? Southern skink (*Oligosoma notosaurus*) was found to be common in the pakahi areas and an eyeshine of an unidentified gecko was observed.

OTHER BITS

CONTACT PEOPLE FOR PUBLICATIONS

from Nicola Patrick

Here's a quick reminder for your staff if they have any publications coming up that will help Head Office manage public information requests.

Please tell the following people what publications are being released, and who the contact person is for them:

- Third floor receptionists (Leigh Bramley, Gail Knol)
- Records staff (Kira Karena)
- Science and Research publications co-ordinator (Sarah Vaughan)
- Library (Janet Forbes) and
- Public Awareness Unit (Elizabeth Marenzi).

This information will allow Head Office staff to direct callers or requests to the correct contact person.

Consider getting your publication loaded to the DoC website so it is easily and quickly available for people with access to the Internet. Tim Amos can give you advice about how this works and the costs.

A tip for general public requests, especially from students, is to refer callers to the DoC website (www.doc.govt.nz) because it is home to lots of useful information. The new fact sheets under the Mega Events shortcut on the homepage are worth a look if you haven't seen them yet.

VERTEBRATE PESTICIDE SPREADSHEET

from Olivia McHalick

What is it?

The Vertebrate Pesticide Spreadsheet stores information on vertebrate pesticides registered for use in New Zealand. The Biodiversity Recovery Unit has produced the spreadsheet as a reference document to assist in deciding what pesticide to use for a specific pest control operation. The information in the spreadsheet comes from the registered toxin labels. This includes:

- Toxin name and trade name
- Toxic loading (concentration)
- Form in which toxin is available
- Target species
- Registered method of application
- Name of the licence holder and the licence number/s
- Legal restrictions on use
- Any additional requirements mentioned on the label.

Where is it?

The Vertebrate Pesticide Spreadsheet is now available on the DoC Intranet. It can be accessed by opening the Science Publications site, then open the Biodiversity Recovery Unit publications page and double click on either Introduction or Vertebrate Pesticide Spreadsheet. Please note it may be useful to read the introduction before opening the actual spreadsheet.

Hard copies can be provided for those who cannot download it from the Intranet. For a hard copy, contact the Biodiversity Recovery Unit, Conservation Sciences Centre, PO Box 10 420, 58 Tory Street, Wellington. Email: imcfadden@doc.govt.nz.

ELECTRONIC DATA LOGGERS AND MICRO-CONTROLLERS

from Murray Douglas and Peter Carey, Electronics Officers, Science & Research Unit.

One of the many spin-offs of the development of cellphone and palm-top computer technology is the availability of low power miniature electronic components. In particular, micro-controllers (computer-in-a-chip), memory and clock calendar devices, enable the construction of very small timers and switches, data conversion processors and automatic data storage units.

Some of these components are so tiny that applications such as data loggers for small animals, such as fish, birds and bats, are now possible. Like large computers they too can be programmed, customising their functions to suit the job required. We have been using larger versions for a number of years for climate monitoring, but with the new era of miniaturisation we can now build, or source, micro-logger units and fit them like radio tags to study animals.

To give you an idea of possible applications here is a short summary of the ones we are developing. Also there is an example of a general purpose logger (TINYTAG) from a commercial manufacturer:

SNARK: has a powerful microprocessor and 2MB of memory, developed for use in the kakapo programme to record information from kakapo radio transmitter tags. SNARK controls a telemetry receiver by scanning through the animal tag channels, storing timed tag ID, average weight and recording the presence and absence time for each

kakapo visiting at a particular feeding station. Units are also being used in the bat and stoat programmes to record presence and absence as well as feeding activity periods using special activity tag information.

MATEID: this is a micro-logger that is fitted in a collar and used to record the particular possum's contact with other possums. It has a radio receiver as well as a data logger so records the time, ID and duration of any other radio tag within a set range. Because very little is known about possum contact rates this device will be a very useful research tool for helping to understand their behaviour, vital for developing effective bio-control strategies. You may find other uses!

TRACKLOG: is a small logger that we are developing for monitoring visitor usage in DoC's parks. It is fitted to steps and boardwalks to collect the frequency of usage of tracks and various structures. The communications software will be installed on the portable PSION WORKABOUT™ hand-held computers allowing data collection via the Visitor Asset Management System, (VAMS). The data can be transferred later to your PC for analysis along with the other VAMS information. Ten STEP-UNITS using this logger will be evaluated as track counters during this summer.

BATROOST: uses an infrared beam across the exit hole to count the numbers of bats arriving and departing large roosts. It may be used for other monitoring applications where large numbers are expected within a short time.

BURROWLOG: is a petrel burrow entrance logger that records the time, entry, and exit of occupants.

TINYTAG™: is a commercial single channel temperature, light, voltage, or humidity data logger that enables you to record accurately transient changes in environmental conditions in small places. It uses the TINYTALK™ communications software to allow graphing and downloading the data to a PC.

Electronic R&D has changed so engineers now spend more time programming than just component selection and circuit board development and modification. Although the development of new devices requires special software development tools and specialist knowledge the overall cost of engineering such equipment using micro-controllers is less because changing functionality is done in the chip rather than by adding or deleting discrete components. These devices can operate at very high speeds and do complicated processes in a very short time, then remain idle while waiting for the next event to occur. This means they consume very little average power so can last several years on a small 3 V lithium battery. Prices for fully developed loggers range from $300 for small tag types to over $2000 for multi-channeled larger units.

Many of these loggers have logger specific functions so they come with their own Windows software, usually included in the purchase price or for a small extra cost. They have Year 2000 compliant software and some are suited for direct connection to a PSION hand-held computer or to a stand-alone laptop with other Windows software. Data output is usually available in text format as raw records, graphs, or in date/time and data fields suitable for importing to Excel.

We are currently in first trial stages, or preparing final plans for production of our loggers (SNARK, MATEID, TRACKLOG, BATROOST and BURROWLOG) so they will be available for purchase in DoC. If you have an enquiry regarding any of these then please contact us at the Electronics Laboratory, SRU, (VPN

8269, 04-4713269). The TINYTAG loggers are available from Energy Engineering Ltd, phone 09-5233090. Email: energy@nznet.gen.nz, or for the manufacturer's homepage http://www.geminidataloggers.com

ISLAND ROUNDUP

from Ian McFadden

On the eradication front there are a few events that warrant mention:

- Mayor Island planning is well underway, and if all goes according to plan the bait drop will take place in July or August next year. We hope to have several cats with Tx's on them so they can be monitored after the poison drop to determine how many die from secondary poisoning. Follow up for the cats will be conventional trapping and/or hand laid baits.
- Little Barrier is on hold until certain iwi and Treaty of Waitangi Tribunal issues have been sorted out. The negotiations are somewhat complicated. Because there are no outstanding technical matters (associated with applying poison or non target species) we will simply put things on hold.
- Raoul Island planning is in the preliminary stage. Mayor will be a very good pre requisite for Raoul, and provide useful information because both islands have Norway rat, kiore, and feral cats.

Campbell Island

After two days of confinement in the bowels of the *Marine Countess*, a team of pale-faced people emerged onto the deck to gaze in awe at the bleak cliffs at the northern approaches to Campbell Island. As the vessel ploughed its way through the southern ocean towards Perseverance Harbour the sheer size of the island, its massive cliffs, and raw beauty were rammed home. If Norway rats are to be eradicated on this island it will be due to careful planning, quite a lot of money, the involvement of capable people, and quite a lot of good old fashioned guts (that is, to have a go).

The main purpose of this visit was to carry out a non-toxic bait trial that would provide information critical to the planning of this rat eradication programme. Owing to the remote location of Campbell there are enormous costs associated with this proposal. In order to reduce that cost where possible it was decided to carry out a bait trial which would involve only one application of bait.

Some previous eradication programmes have used two applications of bait in an attempt to reduce the risk of gaps in bait spread (eg, Kapiti and Codfish). However, prior to the eradication attempt on Kapiti there were two sets of non-toxic trials. This demonstrated that at an application rate of 5 kg/ha all Norway rats had access to bait.

Accordingly the plan for Campbell was to apply bait once at a nominal rate of 6 kg/ha. This was to be achieved by using DGPS to plot flight paths and by setting the bucket at 3 kg/ha. The entire drop zone of 600 ha would be flown once but with an overlap of 50%. When slope, contours, etc are considered the application rate should be about 5 kg/ha.

We left Bluff on 3 August, arrived at Campbell on the 5th, and Peter Garden arrived that afternoon in his Jet Ranger with Don Sanders as co pilot. A drop zone was marked out at the head of Perseverance Harbour and the bait was applied on Saturday the 7th. When work began there was a light nor'westerly blowing, but by mid day it had increased to a stiff 30 knots, probably gusting 40. This was certainly marginal flying conditions made worse by the fact that by this time bait was being applied to the steep faces above NW bay. In

hindsight this part should have been baited first. Six gram non toxic Wanganui No 7 pellets loaded with the bio marker Rhodamine B were used. This bio marker fluoresces pale orange under UV light, and is easily detected in any animal that has eaten bait.

There followed an intense rat trapping session up to 2 September by which time 630 rats had been trapped in or about the drop zone. Some rats trapped 200 m outside the drop zone had eaten bait. While it is quite likely there was bait spread outside the marked boundary of the drop zone, it did give some indication of the home range of these rats. Of far greater concern and interest were 3 rats trapped inside the drop zone which had not eaten bait.

It is not clear exactly why these rats had not eaten bait, however two possibilities are likely. There is a gap in the DGPS print out where 1 rat was caught so no bait is the most likely explanation for that animal. The other two were caught above NW Bay so it is also possible no bait was there (the strong winds may have been responsible for that). It is also possible all three rats had moved into the drop zone as resident rats were trapped. To date, bait aversion has not been an issue (all rat eradication programmes using this method have been successful) so it is unlikely these rats found the bait to be unpalatable.

For the actual eradication operation (when it takes place) the plan is to fly the entire boundary of the island twice. This should ensure any gaps at the start or end of runs will be filled. The issue of re-invasion will be removed as the entire island is to be treated. Because of the sheer size of Campbell, 11 200 ha, it will not be possible to poison the entire island in 1 day. This means frequent print outs from the DGPS unit will be required to identify any gaps. It also means there will need to be an overlap of about 200 m when adjacent blocks are poisoned on subsequent days. Details of all these issues will be discussed on 18 November when the team meets in Invercargill to plan the next phase of this project.

While on Campbell the team also spent some time searching for cats with Bowers, the cat dog from Pitt Island, under the close control of Sandy King. We found no evidence of cats at all which is good news but a bit puzzling. If cats have gone they must have died out from natural causes. There are plenty of dry areas for cats to live in, and rats provide ample food all year round. It has been suggested that an extensive period of wet weather in the mid 1980s might have sealed their fate. Some time was also spent looking for mice which have been recorded on several occasions in the past. Mouse traps were set around all huts and buildings, and no sign of mice was detected. It is unlikely mice are present, but if they are we would expect to eradicate them when we drop bait for the Norway rats.

Once Campbell is free of all introduced mammals, species like teal, snipe, and some of the smaller ground nesting sea birds can be re-introduced.

Chalky Island

The stoat eradication programme on Chalky Island is progressing well. There are three islands in this chain: Chalky, Passage, and Great. Chalky is the outermost and is considered a safe site to maroon endangered species sensitive to the impact of introduced predators. The only introduced mammal known to exist on this island is the stoat. On the last trip only 1 stoat was caught on Chalky. Passage is the stepping stone between Chalky and Great, and no stoats were caught there this visit. As was to be expected stoats remain on Great,

which is only about 100 m from the mainland, but Great has always been accepted as the source of re-invasion to Chalky via Passage. With no sign on Passage this trip, and only 1 stoat on Chalky, it looks very promising.

Rangitoto Islands

By a round-about way funds were obtained which enabled this project to proceed this year. This group of islands is just off the east side of D'Urville and comprises three islets. Tinui is in multiple Maori ownership, Puangiangi is privately owned and currently farmed, and Wakaterepapanui is part of the conservation estate managed by DoC for the general public. All three islands had Norway rat, and Wakaterepapanui also had kiore. The sheep were barged off Pupuangi with the intention to return them at a later date. Talon 20 P was applied by helicopter using DGPS. Application rate was approximately 12 kg/ha, and by now we expect those islands to be rat free.

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Please follow these word limits: Conservancy News 800 words, Restoration Resume 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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