2011 OSNZ CONFERENCE ABSTRACTS

WADER AND WATERBIRD FLUCTUATIONS ON A SMALL NEW ZEALAND ESTUARY

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The numbers of waders and other waterbirds occurring on New Zealand's larger estuaries are reasonably well documented, but data for smaller estuaries are sporadic and seldom extended through time. To assess which species use such estuaries and on what basis, the numbers of waders and waterbirds present on the Whanganui River estuary were counted at frequent but irregular intervals between mid April 2006 and mid April 2011. A total of 311 counts were made, 175 covering all species and 136 focused on selected species only (mainly waders and terns). The interval between counts was neither normally nor randomly dispersed, with an excess of counts at both short and long intervals (median interval, 3 days; 5 and 95 percentiles, 1 and 19 days). This, together with a large number of zeros in the counts of some species and the non-normality of environmental variables, even after transformation, complicates the analysis of the underlying patterns. Nine species made up 95% of all birds counted, of which black-backed gull (*Larus dominicanus*) (48.0%), red-billed gull (*L. novaehollandiae*) (14.3%), pied stilt (*Himantopus himantopus*) (13.9%), and bar-tailed godwit (*Limosa lapponica*) (4.6%) were the most abundant. Black-backed gull, mallard (*Anas platyrhynchos*), and black shag (*Phalacrocorax carbo*) are the only resident species, with some of the first two nesting within the estuary. All species showed a strong seasonal pattern of occurrence, associated either with the movement of migrating birds onto and through the estuary, or with movement of breeding birds off the estuary and their return, together with offspring, after the breeding season. Generalized additive modeling of the counts of the more frequently recorded species was used to distinguish trends in numbers through time from the influence of time of day, tidal exposure, river flow, temperature, wind and rainfall, along with autocorrelation effects and sampling and counting errors. Preliminary analyses show a significant increase in the numbers of black-backed gull over the 5-year period, whereas Caspian tern (*Sterna caspia*) numbers declined slightly. The numbers of royal spoonbill (*Platalea regia*), pied stilt and bar-tailed godwit varied seasonally but showed no clear inter-annual trends. Overall, bird numbers fluctuated considerably at various temporal scales, much of it related to movement of birds through the estuary on migration. The usefulness of one-off seasonal counts for monitoring long-term trends in numbers needs questioning, at least for smaller estuaries.

NESTING ECOLOGY OF THE EASTERN ROSELLA

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A number of hole-nesting bird species have been introduced to New Zealand over the last 200 years and have established wild populations within native systems – some very successfully. The impacts that these exotic cavity-nesting birds are having on communities of native hole-nesters are largely unknown. This study focused on the nesting ecology of an introduced parakeet, the eastern rosella (*Platycercus eximius*). Rosella nest-site use and selection was investigated at the microhabitat, macrohabitat and landscape scale. Additionally, preliminary nesting niche comparisons with native hole-nesting birds were made in an attempt to understand what impact the use of cavity resources by eastern rosella may have on native species. We found that the overall availability of cavities in the forests sites studied to be low. Within these sites, rosella were found to nest in areas where more potential nest sites were available, typically where the forest was more mature. The characteristics of nest sites used by rosella overlapped in a number of respects with those of native cavity-nesting birds, particularly red-crowned kakariki (*Cyanoramphus novaezelandiae*). Consequently rosella can be considered a genuine competitor for nest sites where they occur together in sympatry with their native counterparts.

CHANGE IN PATTERN OF BIRD NUMBERS AND USAGE ON OTAGO HARBOUR 1977-2010

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The Otago Harbour supports a wide range of birds. Monthly counts spread over 40 years have documented the seasonal pattern of bird usage of the harbour and changes in the usage. The pattern emphasises the importance of Otago Harbour as a post-breeding congregation site for waders and waterfowl. Shags by comparison have highest numbers in winter. The counts reflect the national decline of black-billed gulls (*Larus bulleri*), and record increases in numbers of royal spoonbill (*Platalea regia*) in Otago and grey teal (*Anas gracilis*), paradise shelduck (*Tadorna variegata*) and variable oystercatchers (*Haematopus unicolor*). The environmental implications of the results of these surveys will be discussed.

SUCCESSFUL TRANSLOCATION OF SNARES ISLAND SNIPE *Coenocorypha huegeli* TO REPLACE THE EXTINCT SOUTH ISLAND SNIPE *C. iredalei*

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Deliberate taxon substitution is a much discussed but rarely enactioned concept in restoration ecology. The first New Zealand bird translocation where taxon substitution was a specific objective was the 2005 translocation of Snares Island snipe (*Coenocorypha huegeli*) to Putauhinu Island. Putauhinu is a 141 ha muttonbird island which lies alongside Taukihepa (Big South Cape Island), the last stronghold of the extinct South Island snipe (*C. iredalei*). Thirty Snares Island snipe were captured on North East Island, Snares Islands in April 2005 and released on Putauhinu Island 3-5 days later. A survey on Putauhinu Island in March 2011 resulted in the capture of 54 descendants of the released birds and estimation of a total population exceeding 500 birds. This is one of very few documented translocations of an organism anywhere that has achieved the intended objective of replacing a closely related extinct taxon. The Snares Island snipe is now more abundant than at any time in its evolutionary history.

REINTRODUCTION OF CHATHAM ISLANDS TOMTITS TO AWATOTARA VALLEY, CHATHAM ISLAND

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The Chatham Islands tomtit (*Petroica macrocephala chathamensis*) occurs on Pitt, Rangatira and Mangere Islands, with a total population probably numbering about 1000 birds. The last sighting of a tomtit on Chatham Island was in 1975. Following its successful re-establishment of tui on Chatham Island in 2009-10, the Chatham Islands Taiko Trust received permission to reintroduce 40 tomtits to Awatotara Valley. It was planned to transfer only juveniles to promote the chances of the birds remaining near the release site. In addition, while in captivity at the capture and release sites (soft release), the birds would be trained to associate a tapping sound with being offered mealworms so as to aid subsequent monitoring of their survival and nesting. In January 2011, 20 juveniles (10 males, 10 females) were readily captured on Rangatira Island, and transported by boat and vehicle to Awatotara Valley. Fifteen juveniles (6 males, 9 females) were captured in Caravan Bush, Pitt Island, and were transported by light plane and vehicle to Awatotara Valley. Two Rangatira birds died during the first night after being transferred, but the remaining 33 birds appeared to cope well with being held captive for 2-4 days in tent aviaries. Within a day of release

some birds, particularly males, seemed to confine their activities to a localised area, a territory. Twenty-six (79%) of the tomtits were seen at least once after being released, and 13 (39%) were regularly seen. We look forward to spring to see how many pairs are present and to monitor their nesting success.

PREDATION BY MUSTELIDS IS NOT A SIGNIFICANT CAUSE OF BREEDING FAILURE OF BLUE PENGUINS ON THE WEST COAST, SOUTH ISLAND, NEW ZEALAND

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Predation by introduced mustelids is a major cause of breeding failure in white-flippered penguins (*Eudyptula minor albosignata*) on Banks Peninsula and has either been shown to be, or assumed to be an important cause of breeding failure in blue penguins (*E. minor*) elsewhere in New Zealand. We have monitored breeding success in blue penguin colonies with, and colonies with no mustelid control near Charleston for three years and in South Westland for two years. We have found no significant differences in breeding success between colonies with or without mustelid control in any breeding season at either area. Breeding success has generally been high in all colonies in all study years with about half the pairs fledging two chicks. Breeding success was lower in one Charleston colony in 2010 with flooding of nesting burrows and other natural events contributing to the loss of eggs and chicks. Breeding success was also low in the predator trapped colony in South Westland apparently also due to natural mortality. Our Penguin Mortality Database has shown roadkills and dogs to be the most significant mortality factor for West Coast penguins, with most deaths apparently being of adult penguins, which has a greater impact on population viability than breeding failure.

ESTABLISHING A NORTH ISLAND BROWN KIWI POPULATION IN THE RIMUTAKA FOREST PARK

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Kiwi (*Apteryx* sp.) disappeared from the Wellington region at least 100 years ago. In 2002 the Rimutaka Forest Park Trust began a programme of pest control with the aim of introducing and establishing a self-sustaining population of North Island brown kiwi (*Apteryx mantelli*) in the Rimutaka hills, east of Wellington. Eleven birds were introduced from kiwi houses in 2006, 2008, 2009 and 2010. Twenty birds were translocated from Hauturu, Little Barrier Island in 2009. Initially BNZ operation nest egg was used to grow the population rapidly. All birds released into the park have been fitted with VHF transmitters to enable us to monitor survivorship, locate nesting burrows and monitor productivity. In 2009 we began putting transmitters on wild-hatch chicks to determine their survival. The current population is at least 55 birds, and preliminary analyses suggest a population doubling time of 4.1 years. In this presentation we share our experiences of the largest community-led kiwi establishment project in the country, and describe preliminary results of population modelling.

PUTTING VANUATU PETRELS ON THE MAP

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When Mike Imber and I described the Vanuatu petrel (*Pterodroma occulta*) as a new taxon in 2001 (Imber & Tennyson 2001), we suggested that it may breed in northern Vanuatu and possibly on the island of Mera Lava. However the species was known only from six specimens shot in Vanuatu waters in 1927 and one found dead in New South Wales in 1983; there had been no proof of its survival for 18 years. In 2009, 82 years after the first specimens were collected, Australian Stephen Totterman discovered a breeding colony on the volcanic peak of Mt Suretamatai on Vanua Lava (Totterman 2009) - a 331 km^2 island 100 km northwest of Mera Lava. Stephen invited Mike Imber and me to join him to study the colony in March 2011. Unfortunately Mike was too ill to participate; instead my work colleague Colin Miskelly joined us. Our survey indicated that the species is widespread around the eastern side of Mt Suretamatai and certainly numbers tens of pairs and probably many more. The birds were incubating eggs at the time of our visit.

Only last year Bretagnolle & Shirihai (2010) described a new subspecies of collared petrel (*Pterodroma brevipes magnificens*) and suggested that it also bred on Vanua Lava. We captured two collared petrels ashore but, contrary to Bretagnolle & Shirihai (2010), our evidence suggests that the population on Vanua Lava shares the characteristics of the nominate collared petrel (*Pterodroma b. brevipes*) in being polymorphic in colour, a similar size and a winter breeder. Nevertheless the Vanua Lava population probably has a higher percentage of dark birds than other populations. Our work has identified Vanua Lava as an extremely important breeding site for petrels. Although both *Pterodroma* species persist here, the long term effects of mammalian predation

are of concern. We found the cat-killed remains of two Vanuatu petrels, and pigs and rats also have access to the colonies.

Bretagnolle, V.; Shirihai, H. 2010. A new taxon of collared petrel *Pterodroma brevipes* from the Banks Islands, Vanuatu. *Bulletin of the British Ornithologists' Union 130*: 286-301.

Imber, M.J.; Tennyson, A.J.D. 2001. A new species (Procellariidae) from the south-west Pacific. *Emu 101*: 123-127.

Totterman, S. 2009. Vanuatu petrel (*Pterodroma occulta*) discovered breeding on Vanua Lava, Banks Islands, Vanuatu. *Notornis 56*: 57-62.

TRANSLOCATIONS TO CAPE SANCTUARY: WHAT HAS BEEN LEARNT?

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At Cape Sanctuary, Hawkes Bay, the landowners are restoring native wildlife and endangered ecosystems within a multiple-use landscape. The 2500 ha sanctuary is managed as a 'leaky system', in which predators will always be present in low numbers. A 10.6 km long pest-proof fence across the base of the peninsula helps to keep predators out, but it leaks at the ends, where it terminates on the coast. An intensive predator control programme operates continuously throughout the protected area to mop-up animals that do get in.

Nine species of birds have now been translocated to the sanctuary starting in 2007 with locally common forest birds such as robin (*Petroica longipes*), tomtit (*Petroica macrocephala*), rifleman (*Acanthisitta chloris*) and whitehead (*Mohoua albicilla*). These were followed in 2008 with transfers of pateke/brown teal (*Anas chlorotis*) and brown kiwi (*Apteryx mantelli*), the first of their kind to a predominantly production landscape where summer conditions can be exceptionally dry.

Efforts to re-establish colonies of breeding seabirds on the sanctuary's headlands are also well underway after three years of transfers of grey-faced petrel (*Pterodroma macroptera gouldi*) chicks and two years of transfers of Cook's petrel (*Pterodroma cookii*) chicks. Volunteer contribution towards the project has been considerable and people have engaged on a level never anticipated.

This talk will review some of the transfers to date and describes the challenges, what has been learnt and unexpected windfalls that have come with establishing native species in this primarily privately owned sanctuary.

BIRD DISTURBANCE BY HUMAN AND OTHER FACTORS DURING SUMMER HIGH TIDES AT RUAKAKA ESTUARY, NORTHLAND, NEW ZEALAND

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Ruakaka Estuary is the most important spring tide (>2.7 m chart datum at Marsden Point) roosts for bar-tailed godwit (*Limosa lapponica*) and lesser knot (*Calidris canutus*) in Whangarei Harbour. These species use the site between 27 minutes (*se* = 3.9, *n* = 12) before and 162 minutes *(se* = 20, *n* =11) after high tide. These times corresponded with kite boarding use of the estuary, and a voluntary ban was put in place by local kite boarders in October 2009. Other disturbance factors were studied during daylight between 18 October 2009 and 1 March 2010 during 4 spring and 3 high neap tide peaks (n = 29 days). The number of wader species counted in Ruakaka Estuary declined from 11 in October to 7 in late January, as the number of people using the estuary increased during peak summer. Fifty three disturbance events were caused by birds, wind and tide; and 142 were caused by human associated behaviours (*n* = 598). Roosting waders were well spread over the estuary in October and became confined to within protective fenced breeding zones and the outer estuary margins. The inner estuary disturbance in January resulted in birds being confined to places were activities like surfing and kite boarding would complete the displacement at high tide. To retain the high tide roosts at Ruakaka both land- and water-based human activities must be controlled.

USING 1080 POISON TO PROTECT FOREST BIRDS FROM RATS, STOATS AND POSSUMS

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The poison 1080 is widely used in New Zealand to kill possums (*Trichosurus vulpecula*) to protect forests and reduce the incidence of bovine Tb in cattle. It is most often applied from the air. 1080 is also increasingly being used to kill possums, rats (*Rattus* spp.) and stoats (*Mustela erminea*) to protect native forest animals. While there is good evidence that aerially applied 1080 is very effective at killing rats, possums and stoats, there is less evidence that this actually results in improvements in forest bird populations. Large scale trials of 1080 with intensive monitoring of a wide range of forest birds are being undertaken in south Westland, the Marlborough Sounds and the Tararuas. These trials involve

modifying the timing and frequency of 1080 use to maximise the benefit to forest birds, monitoring forest bird abundance using automatic recorders, and monitoring the survivorship and productivity of riflemen (*Acanthisitta chloris*), weka (*Gallirallus australis*) and kaka (*Nestor meridionalis*). This study has not yet been running long enough to show relationships between repeated 1080 use and forest bird abundances, but there is already good evidence that repeated 1080 use has not caused dramatic declines in forest birds in south Westland.

A SURVEY OF ANTHROPOGENIC LEAD (Pb) EXPOSURE IN POPULATIONS OF A WILD PARROT (KEA: *NESTOR NOTABILIS*)

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Kea (*Nestor notabilis*), large parrots endemic to hill country areas of South Island, New Zealand, are subject to anthropogenic lead (Pb) exposure in their environment. Between April 2006 and June 2009 kea were captured in various parts of their range and samples of their blood were taken for blood lead analysis. All kea (n = 88) had been exposed to lead, with a range in blood lead concentrations of 0.014 – 16.55 µmol/l (mean ± SE, 1.11 ± 0.220 µmol/l). A retrospective analysis of necropsy reports from 30 kea was also carried out. Of these, tissue lead levels were available for 20 birds, and 11 of those had liver and/or kidney lead levels reported to cause lead poisoning in other avian species. Blood lead levels for kea sampled in populated areas (with permanent human settlements) were significantly higher ($p < 0.001$) than those in remote areas. Sixty-four percent of kea sampled in populated areas had elevated blood lead levels (> 0.97 µmol/l, the level suggestive of lead poisoning in parrots), and 22% had levels > 1.93 µmol/l – the level diagnostic of lead poisoning in parrots. No kea from remote areas had levels > 0.97 µmol/l. The kea is a long-lived, slow-reproducing species at a high risk of decline from even a small reduction in its survival rate. Based on our findings, we conclude there is an urgent need to implement lead abatement strategies in areas of the kea range that overlap with permanent human settlement.

NEW TECHNOLOGY REVEALS EXCITING INSIGHTS INTO THE BIOLOGY OF THE CHATHAM ISLAND TAIKO

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Chatham Island taiko (*Pterodroma magentae*) are a critically endangered seabird with an estimated total world population of 150 birds. Only 21 breeding burrows have been identified in the past 5 years on main Chatham Island, although undiscovered nests are still possible as the species nests in dense forest over 5 km from the coast. This talk will describe the results of new technology used to learn more about taiko biology on land and at sea, and to assist with its recovery programme. Since 2001 most adult and juvenile taiko were implanted with PIT tags (a radio frequency identification tag) to monitor activity patterns at burrows. Solar-powered automatic PIT tag recorders developed by New Zealand Department of Conservation have been installed at all known burrows since 2007. These devices are providing new insights into the daily lives of this species when on land. The activity patterns associated with courtship, pre-laying exodus, laying dates, and the coordination of incubation shifts and chick feeding are reviewed in the talk. Several unusual behavioural insights are described. In Oct 2008, small tracking devices (light sensing geolocators) were attached to the legs of 10 taiko (7 breeders, 3 non-breeders). All 10 were recovered in Oct 2009 for data processing. These devices show where taiko foraged during their pre-laying exodus, during the breeding season, and on their winter exodus from May to September. The widespread range of these birds over winter (covering much of the South Pacific Ocean) was a major surprise.

MOTU KAIKOURA: ASPECTS OF QUANTITATIVE BIRD SURVEYS 2006 - 2010

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Motu Kaikoura, a 564 ha island in the Hauraki Gulf, was gazetted as a scenic reserve in 2004, with ecological restoration a key aim of its management. The island has low vegetation diversity, reflecting a long history of anthropogenic degradation. Eradication of invasive mammals has been a management priority, with bird surveys representing a principle measure of the progress of ecological restoration. Birds have been surveyed biannually since December 2006 using both qualitative and quantitative methods, providing data before and after an unsuccessful rat eradication attempt carried out in 2008. We will present the results of the quantitative surveys for selected species, and outline implications for birds as the island's management shifts towards management of rats.

INTER-POPULATION VARIATION AND SOCIALITY OF THE NORTH ISLAND RIFLEMAN (*Acanthisitta chloris granti*): IMPLICATIONS FOR CONSERVATION MANAGEMENT

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Species management strategies are often formulated and carried out after a species has become endangered or threatened. This inevitably leads to strategies which are limited in their scope to collect explorative information related to the ecology and variation present within the species' distribution. Unfortunately this often results in a lack of fundamental knowledge related to that species, particularly in relation to aspects of their biology which may influence the success or failure of particular management strategies. Translocation is a management strategy that is being increasingly utilized as a tool for expanding the range of a declining or fragmented species. However individuals from threatened species are often translocated between populations or into new areas with little knowledge of the variation inherent between meta-populations. Using DNA analysis, bio-acoustic techniques, morphological comparisons, and behavioural observations, my research focuses on collecting both ecological and genetic data to identify variation between separated populations of the North Island rifleman (*Acanthisitta chloris granti*), a sub-species which is not yet endangered, but is declining and becoming increasingly fragmented. As translocation ultimately results in small founding populations, my behavioural research also focuses on the implications of this density change for the co-operative breeding behaviour of rifleman families. The results of this research have important implications for the definition of appropriate management strategies for the sub-species, particularly with regard to the use of translocation as a tool for future management. I will present my general research proposal and discuss some of the work completed to date regarding the relationship between density and co-operation in the rifleman.

TRANSLOCATION STATISTICS AND THE REVISED DOC TRANSLOCATION PROCESS

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In New Zealand translocation of native species are increasingly being proposed and carried out by community groups as well as the Department of Conservation (DOC). In most cases a formal translocation proposal needs to be prepared and approved for this activity. Trends in the number and type of proposals approved from 2002 to 2010 are discussed. Over 300 translocation proposals have been

approved in this period. Many proposals consist of more than one transfer. In 2002 proposals from community groups made up 16% of the approved proposals. In 2006 this had increased to 47%, and in 2010 it had increased to 70%. Proposals to move birds make up the largest proportion at 75%, followed by reptiles at 14%, plants at 6% and invertebrates at 5%. In response to this increase DOC has revised and improved the process for community groups wishing to carry out native species translocation projects. Information will shortly be available on the DOC website: http://www.doc.govt.nz

BIOGEOGRAPHY OF *Hemiphaga* PIGEONS ON ISLANDS IN THE NEW ZEALAND REGION

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Hemiphaga are forest-dependent pigeons endemic to the New Zealand region, but not New Zealand itself. Kereru (*Hemiphaga novaeseelandiae*) is the only native pigeon of New Zealand. Other *Hemiphaga* include an extinct population on Norfolk Island (*Hemiphaga spadicea*), and the Chatham Island parea (*Hemiphaga chathamensis*). We analysed mtDNA (D-loop) genetic diversity to infer gene flow among populations, and consider biogeographic history that might have resulted in this distribution of shallow diversity. The geographic distribution of *Hemiphaga* in the Zealandia region is just one of a continuum of patterns observed among the local avifauna, suggesting a combined influence of colonization and extinction in assembly of the New Zealand avifauna. Analysis of extensive genetic data and the use of fossil calibrations show that the global pigeon clade is significantly younger than Zealandia and thus the *Hemiphaga* ancestor likely arrived by oversea dispersal with a number of other New Zealand birds. This is consistent with evidence from satellite tracking of long range movements of kereru, and our analysis showing very shallow genetic diversity among *Hemiphaga* populations in New Zealand, Chatham Islands and Norfolk Island, consistent with recent movements over ~800 km of ocean.

TRANS-HEMISPHERIC SHOREBIRD MIGRATION IN THE EAST ASIAN-AUSTRALASIAN FLYWAY: AN INCREASINGLY ENDANGERED PHENOMENON

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Migratory shorebirds face variable threats and conservation issues depending on their migration strategies and site use through the year. For northern hemisphere shorebirds that winter in New Zealand, the Yellow Sea region in Asia forms a crucial spatial and functional bottleneck, particularly during northward migration. The tidal flats in this region are also arguably the most threatened in the world. In this talk, I will review recent work that is clarifying how 'our' bar-tailed godwits (*Limosa lapponica*) and red knots (*Calidris canutus*) reach the Yellow Sea, where they occur once there, and what their prospects are for surviving into the future. In doing so, I will draw upon resightings of individually marked birds, geolocator studies of godwits from New Zealand, and satellite-tag studies of godwits from northwest Australia and New Zealand, and illustrate the issues facing shorebirds at Saemangeum in South Korea, and Bohai Bay and Yalu Jiang in China. It is clear that knots, in particular, face habitat loss that is unprecedented in recent times. This reinforces the need for quality population monitoring on the non-breeding grounds as well as on migration.

POST-RELEASE MONITORING OF BIRD TRANSLOCATIONS: WHY IS IT IMPORTANT AND HOW DO WE DO IT?

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Translocation is an important tool for the conservation management of birds in New Zealand. Early translocations marooned endangered species in predator free environments, typically remote islands. However, modern pest control, coupled with the proliferation of community based restoration projects, has led to increased opportunities for translocations, particularly to mainland sites. This provides exciting opportunities for restoring bird populations but it also provides significant challenges. Effective post-release monitoring of bird translocations is vital for resolving these challenges and for improving overall translocation success. Here, we discuss why post release monitoring is important and how it can be achieved. We suggest a series of standards for documenting and monitoring the methods and outcomes associated with translocation projects for birds. Key suggestions include: specifying the characteristics of each translocation, *e.g.* how many birds are released, demographic composition and transfer processes; conducting post-release monitoring using discreet surveys and consistent sensible methodologies; individually marking birds; distinguishing immediate post-release effects from long term site related effects; and

documenting the results in an accessible format such as a published paper or web based database. We advocate a strategic approach whereby the intensity of post release monitoring is directly related to the need and subsequent use of the data collected, *e.g.* monitoring will be more intensive where there is a greater level of uncertainty or where the results will obviously be used for the management of the current or future populations.

BIRDS OF WELLINGTON HARBOUR AND THE SOUTH COAST: TRENDS OVER THE LAST 35 YEARS

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Members of the Wellington Branch of the OSNZ have counted the numbers of birds using 64 km of coastline around Wellington Harbour and westwards from the harbour entrance to Owhiro Bay. Four sets of counts have been done at about 10-yearly intervals, starting in 1975, and finishing in 2010. Each set of counts consisted of 24 monthly counts, done over two hours on a Sunday afternoon.

The numbers of many bird species have changed dramatically during the last 35 years, and their distribution within three habitat zones have also changed. Species that declined include albatrosses (*Diomedea* spp.), giant petrels (*Macronectes* spp.), black shags (*Phalacrocorax carbo*), reef heron (*Egretta sacra*), gulls (*Larus* spp.) and chaffinches (*Fringilla coelebs*). Species that have increased include waterfowl, little shag (*Phalacrocorax melanoleucos*), pied shag (*P. varius*), little black shag (*P. sulcirostris*), spotted shag (*Stictocarbo punctatus*), variable oystercatcher (*Haematopus unicolor*) and blackbird (*Turdus merula*).

It seems likely that the main changes are due to the vast improvement in water quality in the harbour following the reduction, and now near cessation, of discharges of raw or milliscreened sewage into the harbour. Some declines may indicate more general conservation issues for the species involved, and thus highlight the need for a closer study to identify if a regional or national decline is being observed.

FORAGING MOVEMENTS OF WESTLAND PETRELS DURING PRE-BREEDING PERIODS

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Westland petrels (*Procellaria westlandica*) are an endemic seabird breeding only on the West Coast of the South Island, near Punakaiki. Around 4000 pairs are estimated to make up the world population. In 2011, pre-breeding birds were tracked with GPS technology for the first time. Although they used similar areas to birds tracked in incubation and chick rearing identified by previous studies, the concentration of birds in the West Coast coastal waters raises issues for conservation of this rare seabird.

ECOSYSTEM SERVICES PROVIDED BY BIRDS, AND CASCADING EFFECTS OF BIRD REDUCTIONS

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Birds are fascinating, but are they any use? A colleague once unkindly said they could all disappear and nothing else would change, but recent work increasingly shows this to be untrue. They have value to humans, both directly (e.g. through ecotourism) and indirectly through ecosystem services. Here we review such ecosystem services, of which the most important are pest control, scavenging, ecosystem engineering, seed dispersal, and pollination. We end by considering whether such services are faltering with bird declines in New Zealand, and if so whether services can be restored by management.

Bird roles in pest control are poorly known, but they destroy many weed seeds, and a trial using falcons (*Falco novaeseelandiae*) to protect grapes (from other birds) is under way. Scavenging of carcases involves both birds and mammals, and is only noticed when it fails to happen. Seabird nutrient inputs were probably the largest New Zealand ecosystem engineering input by birds, but this has largely ceased on the mainland.

Until recently, seed dispersal was thought to be the only service obviously at risk in New Zealand, especially for plants with large fruit moved by kereru (*Hemiphaga novaeseelandiae*). Work on germination initially reduced concern about the risk of dispersal failure to plants, but very recent work on Janzen-Connell effects has shown the risk could be substantial even for smaller-fruited plants. There are few data on rates of fruit removal.

Birds were traditionally viewed as irrelevant to pollination of native New Zealand plants, but are now known to be vital for seed production in a surprisingly wide range of species. Pollen limitation is widespread, and concern is increased by data showing seed limitation and inbreeding depression, both of which increase the need for effective cross-pollination.

Thus, for both dispersal and pollination, there are cascading effects of bird reductions. The obvious response is to manage predators to increase bird densities and thereby restore bird-plant mutualisms. However, it has proved somewhat harder to restore mutualism service than to boost bird densities, for reasons that are obscure. Even so, there is clear evidence that native birds should be protected not just for their own sake, but also for their important roles in maintaining community function.

ZEALANDIA-KARORI SANCTUARY: TRANSLOCATIONS TO AN URBAN SANCTUARY – WHAT HAVE WE LEARNED?

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ZEALANDIA-Karori Sanctuary is 225ha of regenerating forest surrounded by a fence that excludes all mammalian pests except mice. With the goal of restoring the pre-human ecosystem as far as possible and providing an opportunity for research, education and advocacy, the fence was built in 1999. It was the first of its kind, and a record-breaking eradication operation followed with 14 pest mammals successfully eradicated the same year. Since then, 14 species of birds have been released in the sanctuary, including little spotted kiwi (*Apteryx owenii*), North Island saddleback (*Philesturnus rufusater*) and hihi/stitchbird (*Notiomystis cincta*), back on the mainland for the first time in over 100 years. Our latest addition is a pair of the rare South Island takahe (*Porphyrio hochstetteri*), the first birds transferred here as an analogue for an extinct species.

Transfers to the sanctuary are necessarily experimental in nature, because for most of these species they have usually been the first to an urban mainland site with a fence that is a barrier only to dispersal of flightless species. Intensive monitoring has been undertaken following each transfer to determine if it is successful and to identify techniques and management actions that might improve transfer success and recruitment. Some transfers have been more successful than others and, in common with other isolated sites including offshore islands, long-term population viability may be a challenge for many species. Some of these challenges and the successes seen at the sanctuary so far will be explained.

TWENTY YEARS OF SHORE PLOVER RECOVERY, 1990-2010

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The New Zealand shore plover (*Thinornis novaeseelandiae*) is a threatened, endemic shorebird with a very small population and a restricted range. Twenty years ago, it was thought to be confined to a single population on South East Island in the Chatham Islands. Eggs were transferred from South East Island, and a captive population was established on the New Zealand mainland. Offspring from this captive population have been released on four offshore islands around New Zealand; breeding populations have been established at two of the four sites. In the Chatham Islands, a small population has also been established on Mangere Island by transfer of wild-bred juveniles from South East Island.

These translocations have lowered the risk of extinction of shore plover significantly. Between 1990 and 2010, there was an increase in the total population from about 150 to about 250, an increase in the number of breeding pairs, and (most importantly) an increase in the number of wild breeding populations from two to four. The population on the Chatham Islands has remained roughly constant over the past 20 years, and most of the gains have been around mainland New Zealand. Issues for the translocation programme have included avian predators, high rates of dispersal of released birds, and avian pox. Possible future directions for the recovery programme are outlined.

COSTS AND BENEFITS TO NEW ZEALAND DOTTERELS OF THE USE OF BRODIFACOUM

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The anticoagulant toxin brodifacoum is widely used in New Zealand for the control and eradication of vertebrate pests. When it is applied aerially in cereal baits, there are normally non-target victims, including birds. Following an aerial operation in 2004 at Tawharanui Regional Park, North Auckland, a number of shorebirds (including New Zealand dotterels *Charadrius obscurus*) were found dead. Direct and indirect evidence suggested they had died of secondary

brodifacoum poisoning, with sandhoppers (*Talorchestia* spp.) being an important vector. A strategy to reduce the exposure of dotterels to toxin was tested in 2009 during eradication operations in the Bay of Islands and on Rangitoto-Motutapu. While there appeared to be some reduction in dotterel mortality, evaluating the trials proved very difficult for a number of reasons. In particular, dose rates varied widely between the operations.

The short-term costs of these one-off eradication operations need to be off-set by longer-term benefits, such as increased numbers at the site, enhanced survival, and improved productivity. At two sites (Motuihe Island and Rangitoto-Motutapu) there is already some evidence of such benefits. At Rangitoto-Motutapu, enhanced productivity in the absence of pests should result in the dotterels killed during the operation being replaced within 2-4 years. However, further investigation is required on the potential impacts on shorebirds of the use of brodifacoum (and other anticoagulants) for long-term control of rodents and rabbits in coastal areas.

DISEASE RISK ASSESSMENT FOR TRANSLOCATIONS

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The Department of Conservation is developing a Disease Risk Assessment Tool for use in animal species translocations. Its aim is to simplify the process to engage conservation managers and provide a logical tool to assist in their translocation planning. Currently the Department uses the Disease Management Workbook designed by Dr Richard Jakob-Hoff, Auckland Zoo, for this purpose. The workbook is highly effective, however conservation managers may find it difficult to use due to limited resources, background knowledge, funding, time and access to veterinary advice. The new process includes the workbook but provides a "front-end" which performs a simpler risk assessment process. It determines if the level of risk requires a disease management plan. This allows non-vets to follow a transparent process to make the first assessment of their project. They can progress to a disease management plan if indicated. How it works: a series of questions in a flow-chart leads the user through the risk assessment process. These questions determine the theoretical likelihood and consequence of a disease event occurring as a result of the translocation, thus determining the level of risk. Questions focus on the ecological differences between source and release sites (likelihood) and the “value” of the species or release site (consequence). High risk situations are identified and the user is referred to the RJH workbook for a more in-depth examination of the situation. Low risk situations are “fast-tracked” to minimum requirements such as normal body weight and physical examination.

THE POTENTIAL FOR AUTOMATED ACOUSTIC RECORDING AS A MONITORING TECHNIQUE

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Automatic acoustic recording is a technique that utilises the power of modern digital recording technology to record long periods of ambient noise automatically while unattended in the field. Bird sounds can be found in the recordings relatively quickly and easily using special computer software. There is potential for this technique to provide efficient and consistent methods for monitoring and/or indexing of bird populations as well as a powerful method for the detection of cryptic bird populations. This talk will demonstrate how automatic acoustic monitoring works; its advantages and limitations and describes some of the technology both already developed by the Department of Conservation and intended future developments. Early results from trials to assess its potential will also be presented.

THE CINDERELLA SYNDROME: RECOGNIZING THE FIT BETWEEN BIRD POLLINATORS AND FLOWERS IN NEW ZEALAND

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Classical floral ‘syndromes’ have long been used to predict the partnership between flowers and their pollinators. However the shortcomings of this approach have been particularly evident for the New Zealand flora, where it predicts a misfit between native birds and many of the flowers they visit. A recent review suggests a revised approach, which recognizes additional floral features influencing visitation by perching birds. Here we present the scenario for three heavily bird-visited native flowers, only one of which has a classical ornithophilous syndrome and two of which are apparently suited to insect pollination. We obtained data on flower season, presentation and rewards as well as bird visitor morphology, foraging behaviour and pollen loads for the three species. The combination of these data shows that, despite appearances, the flowers in each case are not only legitimately pollinated by birds but the birds are receiving adequate rewards. This interaction highlights that, as for the glass slipper, the one that fits may not be the most obvious contender, and factors influencing this relationship may vary between systems.