Ornithological Society of New Zealand

Wellington 2006

Scientific Days

Programme and Abstracts

2 and 3 June 2006

Compiled by Ralph Powlesland & Graeme Taylor

Programme

Friday 2 June

08:30 - 08:35	Welcome and House keeping messages – Ian Armitage
08:35 - 08:50	Introduction – President, David Medway
08:50 - 09:30	The challenge of restoring birds to an urban sanctuary – Raewyn Empson
09:30 - 09:50	Bird banding amongst the animals – Peter Reese
09:50 - 10:10	Deciphering post-release success in a translocated population of North Island fernbird (*Bowdleria punctata vealeae*) – Kevin Parker, Sandra Anderson, Ian Price, Barbara Walter & Dianne Brunton
10:10 - 10:30	Battle of the sexes: food hoarding in New Zealand robins – Jayden van Horik & Kevin Burns
10:30 - 11:00	Morning tea (Aqua Bar)
11:00 - 11:20	Birds and the New Zealand Threat Classification System – Rod Hitchmough
11:20 - 11:40	The Department of Conservation Contingency Plan for Protection of Threatened Species from Avian Influenza (bird flu) - Kate Mcinnes, Janice Molloy & Rachelle Linwood
11:40 - 12:00	New Zealand garden bird survey – Eric Spurr
12:00 - 12:20	New Zealand biodiversity recording network – Eric Spurr, Colin Meurk, Mark Fugelstad & Jerry Cooper
12:20 - 13:30	Lunch (Aqua Bistro restaurant)
13:30 - 14:10	Are kiwi doomed? – Hugh Robertson
14:10 - 14:30	Kiwi on offshore islands; populations, translocations and potential release sites – Rogan Colbourne
14:30 - 14:50	Campbell Island snipe (*Coenocorypha* undescribed sp.) recolonise subantarctic Campbell Island following rat eradication – Colin Miskelly & James Fraser

14:50 - 15:10	Kakapo: big birds, big bums – Paul Jansen
15:10 - 15:40	Afternoon tea (Aqua Bar)
15:40 - 16:00	The forgotten 60%: challenges and opportunities for the conservation and management of avian biodiversity in New Zealand's agricultural landscapes – Catriona MacLeod, Grant Blackwell, Henrik Moller, John Innes & Ralph Powlesland
16:00 - 16:20	New Zealand falcon surveys - past, present and the future – Dave Bell
16:20 - 16:40	Rock wren in Henderson Basin, North-west Nelson – Richard Stocker, Marian Garrett & Chris Petyt
16:40 - 17:00	Conservation of the kakerori: to the brink and back – Hugh Robertson & Ed Saul

Saturday 3 June

08:30 - 08:40	Announcements
08:40 - 09:20	Sooty shearwaters across the Pacific: a long term study of titi behaviour and population ecology for harvest sustainability and island restoration – Henrik Moller
09:20 - 09:40	Prioritising seabird conservation management and research – Stephanie Rowe & Graeme Taylor
09:40 - 10:00	Problems with birds and fishing boats – Chris Petyt
10:00 - 10:20	Great Barrier Island and beyond - monitoring black petrels on Great Barrier Island – Elizabeth Bell & Joanna Sim
10:20 - 11:00	Morning tea (Aqua Bar)
11:00 - 11:20	One burrow, two burrow, three burrow, four, a bunch of Cook's petrel and kiore no more: a test of the mesopredator release hypothesis on Hauturu – Matt Rayner & Michael Imber
11:20 - 11:40	Whakapapa o te taiko, conservation genetics of New Zealand's most endangered seabird species – Hayley Lawrence, Graeme Taylor, Craig Millar & David Lambert

11:40 - 12:00	Unravelling the 'grey' issue of the black-and-white storm-petrels – Brent Stephenson, Richard Griffiths and Halema Jamieson
12:00 - 12:20	Ancient Otago fossils open a window on the evolution of New Zealand's animals – Alan Tennyson & Trevor Worthy
12:20 - 13:30	Lunch (Aqua Bistro restaurant)
13:30 - 14:10	The status and conservation of New Zealand penguins – Dave Houston
14:10 - 14:30	Southern royal albatross on Campbell Island - band recoveries and population trends – Peter Moore
14:30 - 14:50	Foraging strategies of southern royal albatrosses (*Diomedea epomophora*) from Campbell Island during incubation – Christina Troup
14:50 - 15:40	Afternoon tea (Aqua Bar)
15:40 - 16:00	Movements of Arctic-breeding waders in New Zealand: what's new after year two? – Phil Battley, David Melville & Rob Schuckard
16:00 - 16:20	The status of braided river birds on the Wairau River, Marlborough – Mike Bell
16:20 - 16:40	The caspian terns at Onoke – Colin Scadden
16:40 - 17:00	Launch of *Notornis* online – Chris Robertson & Murray Williams

Posters

Robert Peeters: Has the impact of aerial 1080 operations on tomtit populations been underestimated?

Graeme Taylor, Ros Cole and Sharon Trainor: South Georgian Diving Petrels – Population trends and threats at Codfish Island (Whenua Hou), New Zealand.

R. Nagarajan, S.E.G. Lea & J.D. Goss-Custard: Consistency and change in mussel (*Mytilus edulis*) shell thickness detection threshold by Eurasian oystercatchers (*Haematopus ostralegus*).

R. Nagarajan, K. Thiyagesan & R. Kanakasabai: Nesting behaviour of Indian barn owls (*Tyto alba stertens*) in man-made structures, Tamilnadu, Southern India.

OSNZ Wellington members: Bird Survey at Pencarrow Lakes and Coastline.

Friday 2 June

THE CHALLENGE OF RESTORING BIRDS TO AN URBAN SANCTUARY

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The Karori Wildlife Sanctuary is a 225 ha mainland island surrounded by a predator-proof fence constructed in 1999. Located in Wellington, with its northern end nestled within an urban environment, the Sanctuary is surrounded mainly by regenerating shrublands where some possum control is currently undertaken. Birds dispersing from the safety of the Sanctuary are exposed to the risk of predation by introduced mammals and, since the fence does not hinder dispersal of flighted species, transfers to a fenced mainland site are assumed to have a higher risk of failure than transfers to offshore islands. Following eradication of mammalian pests in 1999, the first fenced mainland site to undertake the removal of multiple pest species as a single operation, the Sanctuary began an ambitious plan to restore functioning forest and freshwater ecosystems.

Since 2000, 12 species of birds have been released into the Sanctuary including three species (Little spotted kiwi (*Apteryx owenii),* North Island saddleback (*Philesturnus carunculatus rufusater)* and hihi (stitchbird) (*Notiomystis cincta*) never before released into a mainland environment. Despite the limitations of the Sanctuary (e.g. location, size, habitat and risk of dispersal), most species have been successfully transferred, with populations continuing to increase since release. Even bellbirds (*Anthornis melanura)* and North Island tomtits (*Petroica macrocephala toitoi)* bred in the Sanctuary, despite a history of failed releases elsewhere, but they remain vulnerable and the possible reasons for this will be described. Since the transfer of saddlebacks and hihi to the Sanctuary was the first to the mainland of these flighted species and transfers elsewhere are planned, their survivorship and breeding success will also be described.

BIRD BANDING AMONGST THE ANIMALS

PETER REESE
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The Wellington region of the Ornithological Society of New Zealand, in conjunction with the National Banding Office of the Department of Conservation, began banding wild birds at the Wellington Zoo in July 2000. Since then over 3300 birds of 15 species have been banded, and in excess of 1,000 recaptures have been made. The species most frequently caught have been the silvereye (1,211 banded, 462 recaptures), house sparrow (689 banded, 242 recaptures), greenfinch (428 banded, 95 recaptures), and starling (281 banded, 109 recaptures). Most birds were caught in mist nets set in non-public areas, with some birds caught in funnel traps or with hand nets when they entered zoo cages. All birds were fitted with numbered leg bands supplied by the Banding Office. As part of a larger study of bird movement around Wellington, tui have been captured and colour banded with unique combinations. Over 100 tui have been banded in Wellington City, with 57 being banded at the zoo during regular banding sessions and at special sessions targeting tui. A large number of people have

attended bird banding sessions, with attendees coming from a diverse range of institutions, including OSNZ, DOC, Forest & Bird, Karori Wildlife Sanctuary, Bird Rescue, universities and both primary and secondary schools. As well as banding, samples have been taken for various studies, including salmonella, avian malaria and ectoparasite research.

DECIPHERING POST-RELEASE SUCCESS IN A TRANSLOCATED POPULATION OF NORTH ISLAND FERNBIRD (*Bowdleria punctata vealeae*)

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The success of a translocation can only be adequately measured by thorough post-release monitoring. However, this can be difficult if the translocated species is cryptic, or if only small numbers of birds are translocated. We describe here the translocation methods and post-release monitoring used for a translocation of North Island fernbird from Orewa to Tiritiri Matangi Island. Thirteen birds were translocated in 2001 and a further twelve in 2002. Territorial fernbird were lured into low set mist nets using locally recorded calls. Birds were quick to habituate to recorded calls, and captures were only made at nets with overhead cover. Thirty-three percent of translocated birds were caught in one territory. Captive birds showed a preference for live active food, such as wax moth larvae and cricket nymphs, and nine birds were successfully held overnight prior to release. Fernbird were very rarely detected in the two years following introduction, despite extensive survey using pre-recorded calls. However, breeding was detected in the first year following release, and fernbird sightings have increased each year since release. We did not consider the translocation a success until the fifth year of post release monitoring when approximately sixty birds were detected on Tiritiri Matangi. We suggest criteria for measuring the success of translocated passerine populations.

BATTLE OF THE SEXES: FOOD HOARDING IN NEW ZEALAND ROBINS

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Like humans, New Zealand robins are monogamous and pairs live together on exclusive territories. Males and females must therefore share food resources, which often leads to conflict. Previous work has shown that both sexes hoard food to offset periods of food scarcity, but fights over cached food are commonplace. We tested whether conflict over caches is mediated by differences in their spatial orientation. We hypothesized that males aggregate caches to facilitate their defence, while females scatter caches more widely to make them more difficult for males to find.

Results confirmed that males aggregate caches while females segregate them in space. However, cache spacing patterns did not reduce cache theft. Females stole male-made caches when males left them unattended. Similarly, males were able to locate female-made caches. Conflicting patterns in cache orientation and retrieval suggest that selfish hoarding and mate cooperation interact to determine food hoarding dynamics in New Zealand robins.

BIRDS AND THE NEW ZEALAND THREAT CLASSIFICATION SYSTEM

ROD HITCHMOUGH
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The New Zealand Threat Classification System was developed in 2000-2001 by a group led by Janice Molloy. It was developed because weaknesses of DOC's Molloy & Davis (1992) threatened species prioritisation system had become increasingly apparent, and using the 1994 IUCN red-list criteria for New Zealand species led to some obvious anomalies. The NZTCS criteria were used to assess all known potentially threatened species in 2001-02, and this exercise was repeated in 2004-05.

The results of that exercise are now in press. All resident native birds were assessed on both occasions. Assessment was by an expert panel. Submissions were called for, and a form provided for them to give standardised information on species of concern, but few forms were returned. Most listings are based on the pooled knowledge of the panel members, supported by checking of reference material and personal communication with specialists outside the panel when there was any doubt. The draft lists generated were then circulated for comment and feedback before being finalised. Changes between the two lists were more often a result of improved knowledge or changed interpretation than of actual changes in status. These changes will be briefly discussed.

THE DEPARTMENT OF CONSERVATION CONTINGENCY PLAN FOR PROTECTION OF THREATENED SPECIES FROM AVIAN INFLUENZA (BIRD FLU)

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Avian Influenza (AI) viruses are members of the genus *Influenza virus A*. Many subtypes of AI viruses are carried by healthy wild birds, especially waterfowl and most do not cause disease. South East Asia H5N1 is a highly pathogenic strain of avian influenza virus (HPAI) with the potential to cause high levels of mortality in poultry and other species of birds. It has the ability to occasionally cause mortality in humans following prolonged close contact with infected poultry, with just over 200 cases since 1995. It has now been detected in mainly poultry in 57 countries throughout Asia, Europe and Africa. The virus has unusual characteristics compared with other avian influenza including the ability to survive for longer in the environment and the ability to cause disease in waterfowl.

Discussion of its spread is controversial and includes the legal and illegal movement of poultry and poultry products, smuggled birds and migratory waterfowl (via short movements of birds rather than long distances along migratory pathways). There is great variation in the susceptibility of different species. New Zealand is fortunate that the migratory birds which visit the country are predominately waders that are considered a low risk in the spread of the disease. Even with high mortality rates, only species with very small populations and high susceptibility to the disease are at any degree of risk of extinction from the virus, however DOC is taking a precautionary approach and developing a contingency plan that includes a wider pool of species.

The plan (currently draft) identifies threatened species at risk of extinction from HPAI, identifies the trigger points where intervention is required, and provides a prescription for the response which includes preventative measures such as hygiene, increased biosecurity and vaccination. Fears of a human pandemic relate to the ability of the virus to mutate or mix with other influenza viruses to produce a new human-adapted strain. A human pandemic virus is considered very low risk to avifauna.

NEW ZEALAND GARDEN BIRD SURVEY

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A New Zealand garden bird survey is proposed, based on similar surveys overseas, such as the Garden BirdWatch (www.bto.org/gbw) and Big Garden Birdwatch (www.rspb.org.uk/birdwatch/) in the UK, Great Backyard Bird Count (www.birdsource.org/gbbc/) in the US and Canada, and Backyard Birds Survey (www.birdsinbackyards.net/) in Australia. These overseas surveys have proved very popular. For example, more than 470,000 people participated in the 2005 RSPB Big Garden Birdwatch.

The basic format of most of these surveys is that people (either individually or in groups such as families or school classes) spend a specified, short, length of time (e.g. 15–60 minutes) at least once a year (e.g. a specified weekend in winter) counting the maximum number of birds of each species they detect at any one time in their home garden, school ground, or public park. However, there are some differences between the different surveys overseas. For example, the BTO Garden BirdWatch records only the presence, not numbers, of each bird species. It is done weekly, rather than annually, and the length of time is not specified but must be the same each week. The RSPB and US/Canadian surveys are done only once per year (in winter), and record the highest number of each species detected in a set length of time (15 minutes in the US/Canadian survey and 60 minutes in the RSPB survey).

If we had a garden bird survey in New Zealand it would provide a great opportunity to encourage more people to become actively involved in bird-watching. The results, over time, would also provide valuable information on changes in bird distribution and population trends. Although the birds commonly found in gardens in New Zealand are introduced or common native species, such as silvereye, grey warbler and fantail, in some places less common native species such as kereru, tui and bellbird also occur. Data on the changes in distribution and population trends of these species would be invaluable for biodiversity management.

In this talk I will describe possibilities for a New Zealand garden bird survey and seek feedback on what format it should take. For example, what should be the frequency (annually, bi-annually, quarterly, monthly, weekly), time of year (July if winter only, July, October, January, and April if quarterly), and duration (15, 30, or 60 minutes) of counts? I will also describe a possible bird feeder survey. Whatever format these surveys take, they should be easy to do, enjoyable, educational, and fun. If there is sufficient support, I hope to trial both a garden bird survey and bird feeder survey this winter.

NEW ZEALAND BIODIVERSITY RECORDING NETWORK

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The New Zealand Biodiversity Recording Network (NZBRN) is a proposed public-access, internet-based, multi-taxa data recording, storage, and retrieval system, being developed with funding from the Terrestrial and Freshwater Biodiversity Information System (TFBIS) programme. A prototype version is being adapted from the Swedish "Artportalen" (Species Gateway) system (http://artportalen.se). "Artportalen" currently has modules for recording observations of birds, butterflies and moths, vascular plants, and fungi (with modules planned for amphibians, reptiles, and mammals). It was awarded the 2004 Ebbe Nielson Prize by the Governing Board of the Global Biodiversity Information Facility (GBIF). Between 2000 and 2004, it received 2.6 million records (98% of which were birds), from 50,000 sites, contributed by 6,200 volunteer observers. It currently receives more than 10,000 bird records per day. The system accepts records from any type of field observation, including casual sightings (such as those currently recorded in the OSNZ Classified Summarised Notes), time-based observations (such as 5-minute counts or mist-net captures), and distance-based observations (such as transect counts). The reported information is normally freely available, although providers can limit or prevent public access if they wish (e.g. suppress the exact location of a sighting of a protected species).

In this presentation, we demonstrate progress with development of the NZBRN bird module. To enter records, a user must first select an existing site or establish a new

site. Existing sites are selected from drop-down lists. New sites are established by entering map grid co-ordinates or by pointing to the site on a map of New Zealand and giving it a name. The user can indicate if the data were collected for a special purpose (e.g. breeding bird survey or garden bird survey). There is a diary section that allows recording factors such as wind, temperature, visibility, cloud, and precipitation. Bird species names are entered either directly or from a drop-down list. The user then enters, if known, the number of each species, age, sex, activity, comments, and a tick in up to eight other fields including "searched for but not encountered", "identification uncertain", and "hide record". Only date (start and end date) is compulsory – it appears automatically as today's date, but can be edited. If a user has lots of observations, the data can be imported from a Microsoft Excel spreadsheet instead of being entered online. Records can be displayed, by species, as (a) a list of observations, (b) map of distribution, and (c) histogram of numbers counted over time (currently up to 15 years). It is hoped that the system will be publicly available by December 2006.

ARE KIWI DOOMED?

HUGH ROBERTSON
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Kiwi are an endemic order of ratites that have evolved many bizarre traits during their long isolation in New Zealand. Their largely benign, predator-free world was turned upside-down with the arrival of humans, and now all five species (*Apteryx mantelli*, *A. rowi, A. australis*, *A. haastii*, and *A. owenii*) are classified as 'threatened'. Initially habitat loss had a great impact on kiwi, but their main threat now is predation by introduced mammals. Stoats (*Mustela erminea*), ferrets (*M. furo*) and dogs (*Canis domesticus*) are the main culprits, with the bird's vulnerability to each past varying with life stage. Since 1991, a Bank of New Zealand-sponsored recovery programme led by the Department of Conservation, has led to many advances in knowledge of the taxonomy, ecology, distribution, and population trends of kiwi; identified the threats they face, and devised tools to successfully manage kiwi populations.

The public of New Zealand has embraced the kiwi as a national icon, and the potential extinction of kiwi on the mainland within a human lifetime has galvanised many community-based 'landcare' groups to protect or establish their local kiwi populations. Although the total numbers of kiwi continue to decline, some taxa are now increasing, and examples from experimental management programmes in various locations provide hope that no species of kiwi is doomed, although it will remain a long uphill battle, especially in the South Island.

KIWI ON OFFSHORE ISLANDS; POPULATIONS, TRANSLOCATIONS AND POTENTIAL RELEASE SITES

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At least five species and six taxa of kiwi (Apteryx spp.) are recognised at present. Since the 1890s translocations of kiwi populations has been used in the conservation of the genus. This talk identifies offshore (and lake bound) islands where kiwi occur

naturally, together with islands to which kiwi have been translocated. At least 28 islands (excluding Stewart Island) currently support populations of kiwi. Some potential islands for further translocations have been assessed. The criteria include lack of predators, sufficient size (at least 100 ha), presence of suitable habitat and absence of conflicting conservation values. Unfortunately few islands meeting these criteria remain.

CAMPBELL ISLAND SNIPE (*Coenocorypha* undescribed sp.) RECOLONISE SUBANTARCTIC CAMPBELL ISLAND FOLLOWING RAT ERADICATION

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The Campbell Island snipe (*Coenocorypha* undescribed sp.) was unknown to science until its discovery on 19 ha Jacquemart Island in 1997. Following the successful eradication of Norway rats (*Rattus norvegicus*) from 11,268 ha Campbell Island in 2001, there was increasing evidence that snipe had begun to recolonise the main island: footprints were found at Monument Harbour in 2003, and a fully-feathered dependent chick was captured nearby in March 2005. A survey of Campbell Island snipe recolonising Campbell Island was undertaken by the authors and a trained bird-locater dog during 7-15 January 2006. We confirmed the presence of snipe and their successful breeding at two sites: the outlet to Six Foot Lake (head of Monument Harbour), and near the mouth of Kirk Stream at the head of Six Foot Lake. We estimated at least 22 adult snipe to be present. Twelve adult snipe were caught, along with 5 dependent chicks with estimated ages ranging from 8 to 37 days old. One snipe nest was found. Subsequent sightings in February 2006 revealed at least two snipe to be present on the north-western shores of Perseverance Harbour, approximately 3 km north of where we recorded them. We document the successful re-establishment of snipe on Campbell Island within 5 years of rat eradication, and recommend that their natural recolonisation be left to continue unaided.

KAKAPO: BIG BIRDS, BIG BUMS

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The kakapo has been the subject of an intense recovery effort since efforts began in the early 1960's. Efforts to recover the species have focused on removal from predators, and the management of breeding events to maximise productivity. Data collected from breeding events have highlighted that kakapo are one of the least fecund birds in the world with an abysmal egg fertility rate of 40% and high rates of early embryo deaths. This coupled with a small pool of only 49 original founders with a high degree of homozygosity between all but one of these birds, points strongly towards a genetic reason. Methods to overcome inbreeding depression and retain

genetic material have now superseded early recovery goals now that kakapo are predator safe and effective methods to maximise breeding have been developed. Management will now be focused on investing rare genes within the population through the development of artificial insemination techniques and the storage of sperm and germ cells from all kakapo to protect against permanent loss of genetic material.

THE FORGOTTEN 60%: CHALLENGES AND OPPORTUNITIES FOR THE CONSERVATION AND MANAGEMENT OF AVIAN BIODIVERSITY IN NEW ZEALAND'S AGRICULTURAL LANDSCAPES

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RALPH POWLESLAND
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Over the last 150 years, several historic phases of agricultural development have significantly modified the composition and functioning of New Zealand's lowland ecosystems. Agriculture continues to impact on New Zealand's environment as this trend for land use change is an ongoing process. However, although agricultural land currently covers approximately 60% of New Zealand's land area, the impact of these land use changes on bird populations is unknown. This is because bird research and conservation in New Zealand has primarily focussed on the preservation of its critically endangered, endemic species, with very little focus on production landscapes, which have historically been perceived as devoid of endemic and native species and thus of no conservation value.

Our talk, therefore, highlights the challenges and opportunities that New Zealand's agricultural landscapes present for the management and conservation of endemic and introduced avian biodiversity. We posit that changes in agricultural land management, in particular habitat modification, altered predator-prey regimes, increased farm inputs, increased stocking rates and yields, and threats to biosecurity, may affect bird communities associated with the farming landscape. However, at the same, we emphasise that empirical data on the ecology or population status of bird species in farmland are required before we can quantify the impact of these landuse changes on their populations. The perceptions of farmers and wider New Zealand society of the value of utility of different bird species also need to be better understood when planning conservation outcomes. Management efforts will need to consider processes occurring at both the farm- and landscape-scales as well as the need for co-operation and co-ordination of management efforts between private landholders and regulatory authorities.

NEW ZEALAND FALCON SURVEYS – PAST, PRESENT AND THE FUTURE

DAVE BELL
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The New Zealand falcon (*Falco novaeseelandiae*) is a fast-flying raptor that is endemic to New Zealand. There are three forms of the falcon, the Bush, Eastern and Southern falcon. These vary in size, colouration and the habitat in which they live. Regarded as an iconic species, encounters with falcon tend to be remembered and more often than not recorded. In the 1970's Dr Nick Fox undertook the first detailed survey of the distribution of the New Zealand falcon and collated historical sightings in order to do this. During the period 1994-98, the Raptor Association of New Zealand (RANZ) together with the Department of Conservation (DOC), undertook a survey of the New Zealand falcon's distribution in the breeding season. Twenty-eight nest sites were located, described, and breeding success recorded. In the course of this study an additional 360 sighting records were received and these have recently been entered into a database. In 2004, 113 New Zealand falcon sightings for the Taranaki region were collated, and a report and maps produced. Since then a further 111 sightings for the region have been obtained, and sightings continue to be reported. The Wingspan Birds of Prey Trust is also collecting and mapping falcon sightings from members of the public. RANZ is embarking on an ambitious project to enter all the sightings of the New Zealand falcon from around the country into a database.

Since the 1970's, when Fox carried out the initial survey, there have been records indicating that falcon numbers have declined (e.g. Gaze & Hutzler 2004). The aim of the present study is to get a more detailed picture of the distribution of the species rather than overall population size. This is important in understanding what factors may be affecting the species, and such a survey will highlight some important nest sites, which could be used as ongoing monitoring sites or for future research. Initially a web site (*www.ranz.org.nz*) to capture present and future New Zealand falcon sightings will be set up, and then further effort will be put into collating additional historical records from around the country.

ROCK WREN IN HENDERSON BASIN, NORTH WEST NELSON

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MARIAN GARRETT
Onekaka, R.D. 2, Takaka, New Zealand

CHRIS PETYT
Tukurua, R.D. 2, Takaka, New Zealand

Following on from a study of rock wren in Henderson Basin in1989, predator trapping banding and observation of the rock wren population and nesting has been carried out in Henderson Basin, Kahurangi National Park, since 2000. Stoats have been caught throughout the year with up to 7 being caught in a year. Difficulty has been experienced in getting consistent counts of rock wren. Nevertheless, the rock wren population appears to have varied from a high of 29 in 1986 to a low of 10 in 2004-05 with a spectacular recovery to 23 in 2005-06. The resighting of banded rock wren has

turned up a female at least 6 years old. Only one banded rock wren has been sighted beyond the area of contiguous favourable habitat in which it was banded.

CONSERVATION OF THE KAKERORI: TO THE BRINK AND BACK

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ED SAUL
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The kakerori (*Pomarea dimidiata*) is a small (22g) insectivorous passerine endemic to the Cook Islands. In 1989, it was one of the 10 rarest birds in the world, with a declining population of 29 individuals. They were confined to three steep forested valleys in the southern part of Rarotonga. Since 1989, rats and cats have been poisoned within the 155 ha Takitumu Conservation. The breeding success of kakerori improved, and their survival increased markedly. Despite naturally low annual productivity of 1-2 clutches of 1-2 eggs, the population grew rapidly, reaching 255 birds by August 2001. Since then, the emphasis of management has shifted from the 'recovery' of kakerori to a programme aimed at 'sustaining' the population at 250-300 individuals on Rarotonga, and establishing an 'insurance' population on Atiu.

The kakerori population on Rarotonga has remained at over 250, despite five tropical cyclones battering the island during February-March 2005. The cyclones caused the mortality rate to double, with young adults (<3 years old) and very old birds (>20 years old) being especially affected. These storms highlighted the vulnerability of single-island endemics, and underlined the value of establishing a second population on Atiu, where a minimum of 15 of the 30 birds transferred in 2001-03 plus two paired island-bred birds were found in the 2005/06 breeding season.

Saturday 3 June

SOOTY SHEARWATERS ACROSS THE PACIFIC: A LONG TERM STUDY OF TITI BEHAVIOUR AND POPULATION ECOLOGY FOR HARVEST SUSTAINABILITY AND ISLAND RESTORATION

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This talk outlines the results of an 11-year study of sooty shearwater (*Puffinus griseus*) behaviour and ecology by New Zealand and international ecologists and mathematicians working with the Rakiura Māori 'muttonbirding'community. The harvest of the chicks of sooty shearwaters ('tītī') from 35 islands off Rakiura (Stewart Island) has until now been guided by the Traditional Ecological Knowledge (Mātauranga Māori). This science partnership sought to add information, especially about harvest and non-harvest impacts on the birds, to assess prospects for tītī remaining sufficiently abundant to allow the mokopuna (grandchildren) to harvest.

Satellite tracking and data loggers have revealed the detail of superb long-distance and rapid migratory paths and foraging range of the tītī and their diving stamina. However, despite the miniature size of the transmitters and loggers, they interfere with movements and foraging enough to distort patterns of colony attendance and chick provisioning. OSNZ beach patrols show that tītī numbers have declined over the past four decades. Breeding burrow entrance density, burrow occupancy and harvest success diaries also indicate declines, especially from 1989 until 1998, though not nearly to the extent of declines in counts from ships off the western seaboard of USA over the same period. Bycatch in North Pacific driftnets until 1991 may have driven some of the declines, but correlations with climate oscillations suggest a potential impact of climate change on food supplies or the ability of the parent birds to provision their chicks. Declines in tītī breeding density have occurred in both harvested and unharvested islands, so harvest pressure alone is an insufficient explanation for population declines unless rapid migration between islands obscures a harvest impact signal. Introduced rats and weka may have contributed to declines in some places.

An oil spill off California, USA, in 1998 killed up to 30,000 tītī, including one of our banded birds, so Rakiura Māori successfully petitioned the US Law Courts for cultural damages from the owners of the tanker. This resulted in a grant of around $500,000 for eradication of rats (egg and chick predators) from four large Tītī Islands in winter 2006 to replace the birds killed in the oil spill and to establish improved quarantine procedures amongst the birding community. Introduced predators currently occupy around 47% of the breeding colonies in New Zealand. If eradication and quarantine are successful, this will be reduced to 14%.

The research project and ensuing restoration effort is an encouraging cross-cultural and trans-national example of community-led conservation. The project has been made possible by generous assistance from the birding community, Foundation for Research Science & Technology, University of Otago, The Pacific Development & Conservation Trust, Ngāi Tahu, Department of Conservation, NZ Aluminium Smelters Ltd., and South West Helicopters from within New Zealand. International scientists and Oikonos (a US conservation NGO) have reached across the Pacific to help keep the tītī forever. *Kia Mau Te Tītī Mo Ake Tōnu Atu*!

PRIORITISING SEABIRD CONSERVATION MANAGEMENT AND RESEARCH

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New Zealand has the highest diversity of seabird species in the world with more endemic species than any other country. We have a staggering 76 species or subspecies of seabirds that are imminently threatened with extinction, in decline or at risk from the restriction in their breeding range. The Research, Development and Improvement Division, Department of Conservation is preparing a planning document to address issues facing this iconic group. Seabirds that breed in New Zealand or on its outlying islands are affected by both land- and sea-based issues and threats.

To ensure the long-term viability of seabird populations, it is essential to develop a coordinated approach to monitoring and protecting seabirds both on land and at sea. The *Five-year RD&I Seabird Priorities* document aims to, firstly, identify the most important land- and sea-based issues affecting the long-term viability of seabirds that breed in New Zealand and, secondly, outline priority recovery actions and research to reduce or mitigate the highest priority issues. This talk reports on the process followed for prioritising issues impacting seabirds, and outlines the highest priority issues and threats to be addressed over the next five years.

PROBLEMS WITH BIRDS AND FISHING BOATS

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Problems with seabirds, mainly albatrosses and petrels, feeding around fishing trawlers in New Zealand waters have become increasingly apparent over the years. Net monitor cables used by Russian trawlers were banned in the early nineties, but bird kills and strikes on the warps of the net seem to have become more common. Various mitigation devices have been developed, and during the last squid season three different devices were trialled on certain vessels and observed by fishery observers. One of these devices, the use of Tori lines, was originally developed for use on long-liners. Offal management systems to try and reduce the interactions between trawlers and seabirds are also being investigated.

GREAT BARRIER AND BEYOND …. MONITORING BLACK PETRELS ON GREAT BARRIER ISLAND

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The black petrel, *Procellaria parkinsoni,* a medium-sized, endemic seabird, breeds on Little and Great Barrier Islands, New Zealand. The main population on Mount Hobson, Great Barrier Island has been studied as part of an ongoing long-term monitoring project which begun in the 1995/96 breeding season. This study investigates causes and timing of mortality, breeding success, estimating population size, current population trends, foraging and recruitment in relation to fisheries interactions.

Black petrels feed in areas where there is long-lining for many months of the year, and migrate to South America where by-catch of unknown cause has occurred. In New Zealand waters they have been hooked in both commercial and recreational fisheries. Observer coverage of the fisheries that potentially interact with this species has been poor, and it is suspected that more black petrel are taken incidental to fishing than are reported. No reliable long-term population data exists for the black petrel. Before a maximum level of fishing related mortality can be set, survival, recruitment and population size must be known.

The breeding population on Great Barrier Island has been monitored for eleven years (1995/96 to 2005/06 season). Over this period, up to 367 study burrows have been intensively monitored, and use by breeding birds varies from 60-70%, by non-breeding birds from 20-25% and the remaining burrows have been empty. Several factors affecting the black petrel breeding success have been noted. Breeding success rates range from 69-84%. Nine census grids were monitored within the study area and account for 142 of the inspected burrows. Extrapolating from the random transects, and the grid and study burrows, the black petrel population estimate around the peak of Mount Hobson (30 ha) range from 1640 to 2154 birds. Over 1000 adults and 700 chicks have been banded during this study. There have been 42 ‘chicks’ from earlier breeding seasons recaptured within the Mount Hobson colony. ‘Chicks’ banded during this study have also been recaptured in Australia and Peru.

Foraging data was collected during the 2005/06 breeding season using two types of logger (light and GPS). Eleven light loggers and fourteen GPS loggers were placed on breeding adults. All eleven light loggers were recovered and nine GPS loggers were recovered. Flights locations ranged widely from close to the colony (Hauraki Gulf area), to East Cape, towards Fiji and to the Chatham Islands.

ONE BURROW, TWO BURROWS, THREE BURROWS, FOUR, A BUNCH OF COOK'S PETREL AND KIORE NO MORE: A TEST OF THE MESOPREDATOR RELEASE HYPOTHESIS ON HAUTURU

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The negative impacts of introduced mammals on island avifauna are well established and much conservation effort goes into the control and eradication of such species. Whilst predator-control strategies often focus upon removal of top predators, such actions can result in a mesopredator release of smaller carnivores with subsequent negative impacts upon small vertebrates. The mesopredator release hypothesis predicts 1) higher nesting success in presence than absence of top carnivores, 2) an inverse relationship between the abundance of top carnivores and mesopredator abundance, and 3) positive relationship between mesopredator abundance and vertebrate predation. Whilst the hypothesis has been supported by studies in continental habitats, there is little field evidence for this hypothesis following predator eradications from island systems.

We used eradications of feral cats (*Felis catus*) and kiore (*Rattus exulans*) and a long-term breeding study of Cook's petrel (*Pterodroma cookii*) on Hauturu (Little Barrier Island) to test the predictions of the mesopredator release hypothesis. When cats were eradicated from Hauturu in 1980, Cook's petrel breeding success declined significantly and data available suggest an increase in kiore numbers in conjunction with diet switching at high altitudes as causal mechanisms. Kiore eradication in 2004 provided a test of prediction 3 demonstrating that kiore presence was the predominant factor in the reduction of Cook's petrel breeding success.

From our study we find support for the mesopredator release hypothesis on Hauturu and the role of the kiore as a predator of small seabirds such as the Cook's petrel. We suggest that environment can play a major role in predator-prey relationships and conservation management strategies should be considered on an island-by-island basis.

WHAKAPAPA O TE TAIKO; CONSERVATION GENETICS OF NEW ZEALAND'S MOST ENDANGERED SEABIRD SPECIES

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The Chatham Island taiko (tchaik in Moriori; *Pterodroma magentae*) is New Zealand's most endangered seabird species. The entire population is estimated at 120-150 and only inhabits the main Chatham Island. There are around 15 breeding pairs, with 11 pairs successfully raising a chick this season. Blood and feather samples have been collected from almost the entire known living population of around 100 individuals. In total there are 136 blood and feather samples (including those from 65 chicks reared since 1996).

This is a rare opportunity for a genetic study, to be able to measure the genetic diversity of an entire species rather than estimate it from a sample. I am studying the genetics of the taiko for a PhD project at the Allan Wilson Centre, Massey University. Adult taiko have shown a surprising amount of mitochondrial genetic diversity for such a small, endangered population. Unfortunately only half of these mitochondrial haplotypes are being retained in the next generation of chicks.

This has implications for conservation management. The results of this project also have relevance to conservation in the search for unknown burrow groups. Study of microsatellite DNA will enable determination of parentage, estimation of relatedness, and aid in understanding taiko behaviour. Genetic techniques are also used in identifying sex. Also part of the project is the study of ancient DNA extracted from taiko bones, to examine past genetic variation and perhaps past breeding distribution and population size. Ancient DNA techniques will also be used to examine the type specimen of the magenta petrel (thought to be a taiko).

UNRAVELLING THE 'GREY' ISSUE OF THE BLACK-AND-WHITE STORM-PETRELS

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On 25 January 2003 the sighting of a small black-and-white storm-petrel off of Whitianga, North Island, New Zealand, started a controversy that still ensues today. Photos taken of that bird showed that it differed in many ways from all extant black-and-white storm-petrels known at the time, but closely resembled the supposedly extinct New Zealand storm-petrel, *Pealeornis maoriana*. Known from only three specimens, and varying from being described as a distinct species (*P. maoriana)*, to an aberrant form of Wilson's storm-petrel, *Oceanites oceanicus*, the taxa had not been seen for more than 150 years. A second sighting of up to 20 similarly marked black-and-white storm-petrels just north of Little Barrier Island, Hauraki Gulf, New Zealand, on 17 November 2003, provided evidence that a population of these birds existed, but was still not able to provide the evidence needed by the Ornithological Society of New Zealand's Rare Birds Committee to officially recognise the rediscovery. Since these initial sightings the birds have been regularly seen in the Hauraki Gulf between October and March, and further offshore during April-May.

The pattern of these sightings has led to the suggestion that the bird breeds somewhere in the Hauraki Gulf during the summer months, and disperse more widely post-breeding. Several attempts to locate the breeding grounds and capture birds have been conducted since the initial sightings, but on 4 November 2005, a bird flew onto a trawler anchored for the night off Little Barrier Island. The bird was examined, measured, photographed and released the following day. In January 2006 a team managed to catch three more birds, examining the birds closely, and fitting them with transmitters in the hope of following them to a breeding site.

This talk provides the first preliminary analysis of these captures, and presents further evidence linking the black-and-white storm-petrels found in the Hauraki Gulf, with the three museum specimens. It provides an overview of the story to date, examines potential taxonomic relationships between this taxon and other storm-petrels, and outlines future work.

ANCIENT OTAGO FOSSILS OPEN A WINDOW ON THE EVOLUTION OF NEW ZEALAND'S ANIMALS

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Since 2001, we have made five expeditions to excavate lake sediments in Central Otago that have produced the only Early Miocene (16-19 million year old) terrestrial vertebrate fauna known for New Zealand. We now have hundreds of identifiable bird, reptile and mammal bones. Birds dominate the terrestrial fauna, with several hundred identifiable bones. Most are from anatids (about six species) ranging from the size of a small goose down to a minute duck. Rails are easily the next most common bird represented but nearly all bones may come from one small flightless species. All other birds species are represented by a small number of fragmentary bones. The fauna includes a diving petrel, a pelican, a small eagle, about three waders, one gull, a small pigeon, three parrots, an owlet-nightjar, a swiftlet and at least four passerines. A toe bone closely resembles that of an adzebill (*Aptornis*). Eggshell is abundant and is assumed to be mostly anatid, however, shell about 1.1 mm thick has ratite morphology and indicates that moa ancestors were large and flightless at this time. Thus a minimum of 26 bird species is represented.

Reptile bones are less common. We have found two fragmentary tooth rows of sphenodontids, several teeth and osteoderms and a few bones of a crocodilian and several bones of geckos and skinks. Our collections no longer support earlier reports of snake bones from this deposit. Bat bones are rare but hint at a diverse fauna. At least four species are represented, including a *Mystacinid* and two other families. Dominating the deposit are fish bones from a small (up to 30 cm long) gobiid. A few bones are referable to the galaxiids.

This fauna allows a first glimpse of what was living in New Zealand after the Oligocene submergence, when land area was reduced to about twenty percent of present. This event is hypothesised to have been a bottleneck to species diversity based on DNA divergence dates for various taxa. Initial results show an early Miocene presence of some characteristic New Zealand taxa but that there have been substantial changes to New Zealand's vertebrate community, both by extinction and colonisation since then.

THE STATUS AND CONSERVATION OF NEW ZEALAND PENGUINS

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New Zealand has six species of penguin, four of which are endemic. Four species are classified by the Department of Conservation as being “acutely threatened”, one as “chronically threatened” and one “at risk”. The conservation of mainland penguins has focussed on mammalian predator control and habitat protection while that of island-based species have relied on their isolation and absence of introduced predators. Despite some localised and periodic improvements, no species is experiencing sustained population growth. While the importance of managing mammalian predators on the mainland will remain, additional effort must be focussed on issues including

tourism, coastal subdivision, climate change, disease, fisheries bycatch and interaction if penguins are to remain a feature of New Zealand's marine avifauna.

SOUTHERN ROYAL ALBATROSS ON CAMPBELL ISLAND – BAND RECOVERIES AND POPULATION TRENDS

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Widespread banding of Southern royal albatrosses on Campbell Island in the 1960s-1980s provided valuable data on dispersal and a resource for estimates of survival and recruitment. However the banding by untrained volunteers in some years, possibly combined with the springiness of the R-band, left a legacy of injured birds.

To remedy the problem, in 2004 and 2005 Department of Conservation removed 1264 bands from nesting areas that are rarely visited. As a trial, in the Col and Moubray study areas, 836 birds were re-banded with stronger bands and 136 transponders were implanted. Of 2113 previously banded birds, 2.6% had major leg injuries caused by open bands, 7.5% had minor leg injuries caused by open, tight or misshaped bands, and 6.6% had bands open by 3-11mm with no injury. Away from Col and Moubray the proportions were 4.7%, 10.2% and 9.4% respectively.

Over half the nesting area on the island was searched two or more times each season to find nests and both breeding partners. A bonus of searching remote sites was that many birds were found for the first time since they were banded, up to 40 years ago. Some birds that were banded as chicks had recruited to sites up to 3km from their natal areas. Nest maps were produced from GPS locations and the nest counts allowed comparison of population estimates. Although the albatross population on Campbell Island increased overall during the 20th Century, the number of nests in 2004 and 2005 showed a 5% decrease since 1995.

FORAGING STRATEGIES OF SOUTHERN ROYAL ALBATROSSES (*DIOMEDEA EPOMOPHORA*) FROM CAMPBELL ISLAND DURING INCUBATION

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During breeding southern royal albatrosses cover considerable distances between breeding sites and foraging zones. This has costs, both in energy and time, for transporting resources back to the breeding site. This study identified foraging sites visited by ten southern royal albatrosses breeding on Campbell Island during the second half of incubation (January to early February). Flight movements and landing activity were recorded using satellite telemetry and wet/dry activity loggers for one complete foraging trip per bird.

These data were integrated with meteorological data to examine the birds' flight and activity in relation to wind direction and strength, to identify strategies adopted by the birds that would minimise costs associated with commuting to and from foraging grounds. Foraging was concentrated along shelf breaks above depths of 200m to 500m. Two key foraging areas were the shelf edge south-east of the Snares, and

along the Chatham Rise. Two of three males also foraged south of Campbell Island. Most birds commuted rapidly to a key area, then foraged flying in localised loops alighting frequently on the sea. Some visited more than one key area. Maximum displacement rate during commuting phases was 845 km in 24 hours; six birds exceeded 500 km in 24 hours; the three males reached 400 km in 24 hours. During foraging phases displacement distance for all birds was below 180 km per day. Mean maximum distance from the colony was 702 km, range 343 - 1259, *sd* 310.5. Mean cumulative distance between satellite uplinks was 4262 km, range 2898 - 6589; *sd* 1317.7. Mean trip duration was 11.97 days, range 16.27 - 6.81; *sd* 3.66. Mean proportion of time spent on water was 34.2%, range 9.7% - 58.5%; *sd* 14.1.

Wind speed and wind direction influenced aspects of forging trips. During foraging wind speed influenced landing activity; landings by lighter birds <9kg (n=6) decreased at mean wind speeds above 30 kph, but remained constant for birds >9 kg in mean winds up to 50 kph. Mean wind speed during commuting was significantly higher than during foraging. Flights back to the colony coincided with increasing wind speeds, usually initiated in favourable wind directions. Cumulative distance flown during commuting phases was greater in side to stern quarter winds (60˚-160˚, with maximum between 100˚-120˚), than in head winds (0˚-40˚) or direct tail winds (160˚-180˚). Foraging trip duration tended to be shorter for birds experiencing higher wind speeds overall.

MOVEMENTS OF ARCTIC-BREEDING WADERS IN NEW ZEALAND: WHAT'S NEW AFTER YEAR TWO?

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The Ornithological Society of New Zealand has just completed the second year in a three-year study on the movements of bar-tailed godwits and red knots within New Zealand. Achievements over the past year have included expanding banding to new sites including the Manawatu Estuary in the lower North Island and Warrington in Otago, and finally catching godwits on Farewell Spit and knots in Tasman Bay. In total 718 godwits and 293 knots have been colour-banded; additionally, knots around Auckland have been given lettered leg-flags as an alternative marking scheme.

Over 1000 godwit leg-check sessions have been logged, with almost 5000 resightings being made, including a large number of birds seen on migration in eastern Asia and Alaska. Over 360 knot checks have been made, resulting in over 1150 resightings. Movement patterns have confirmed the pattern seen in the first year – knots are far more mobile than godwits, and in both species subadults move more than adults. During the southward migration period in September-October 2005 godwits were recording making stopovers on their way towards final destinations, with northern South Island birds seen around Auckland, and an Avon-Heathcote bird seen in Nelson one day and Christchurch the next.

There are still areas that we have not managed to monitor well, including much of the North Island away from the Auckland region. Plans for next summer include trying to

catch both species in the Far North, Manawatu and Southland, godwits in Otago and knots in Golden and Tasman Bays in the northern South Island.

We encourage OSNZ members to make a real effort to check godwit and knot legs over the next year (including this winter!). As part of this we are planning two concentrated "band checking weeks" to mobilise as many eyes as we can as widely around the country as we can. These will be in July and October, to give good coverage of overwintering immature birds and birds during southward migration.

THE STATUS OF BRAIDED RIVER BIRDS ON THE WAIRAU RIVER, MARLBOROUGH

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For the first time since the mid 1990's, Ornithological Society of New Zealand members carried out a census of braided river birds on the Wairau River, Marlborough. The black-fronted tern appears to have declined by 24%, with a 20% contraction in breeding range. The black-billed gull has declined by 55%, with breeding now occurring in only one site along the river. Populations of banded dotterel, South Island pied oystercatcher, and pied stilt appear stable. In contrast, black-fronted dotterel numbers have doubled, and the species breeding range has greatly extended.

For the first time wrybill have been recorded on the river during the breeding season, and may possibly have attempted to breed. Population declines are probably the result of poor breeding success. In the 2004/05 and 2005/6 breeding seasons, the black-fronted tern had only 50% hatching success and 30% fledging success, with most failures being caused by predation. There is no breeding data for other species on the Wairau River and further study is required.

THE CASPIAN TERNS AT ONOKE

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Caspian Terns have nested at Onoke for over 70 years and nest record cards go back almost that far. The population of the colony has fluctuated considerably over that time as has nesting success. Efforts have been made to band the chicks which have been met with varying degrees of success. The possible reasons for these fluctuations are discussed and comparisons are made with other colonies.

POSTERS

SEASONALITY OF OCCURRENCE FOR NEW ZEALAND STORM PETREL (*PEALEORNIS MAORIANA*) IN NORTHERN NEW ZEALAND WATERS

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We observed the New Zealand storm petrel (*Pealeornis maoriana*) on 51 seabird-watching trips to the outer Hauraki Gulf and northern New Zealand, November 2003 - April 2006. These sightings were concentrated in the outer Hauraki Gulf from October to March and further offshore in April-May. Their presence in the Hauraki Gulf coincided with summer breeding of other seabirds. Their pattern of occurrence in northern New Zealand waters suggests these birds are also breeding in the Hauraki Gulf during summer months.

CONSISTENCY AND CHANGE IN MUSSEL (*Mytilus edulis*) SHELL THICKNESS DETECTION THRESHOLD BY EURASIAN OYSTERCATCHERS (*Haematopus ostralegus*)

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We investigated changes in the mussel (*Mytilus edulis*) shell thickness detection threshold of wintering Eurasian oystercatchers (*Haematopus ostralegus*) on the Exe estuary, Devon, United Kingdom. Approximately once in a fortnight, towards the end of the low tidal cycle, a total of 50 mussel shells freshly opened by ventrally hammering oystercatchers were collected. For each opened mussel, an unopened mussel of the same length was collected from under nearby weed and these are referred to as “Comparator mussels”. Oystercatchers’ preferred to open mussels through the right valve which suggest that they attack the thinner valve when the thickness difference between the valves exceeds a threshold. Based on the thickness detection model we found that oystercatchers detect and attack the thinner valve when the thickness difference between the two valves is more than a threshold of 0·036mm.

oystercatchers use vision and touch cues to select mussels. Furthermore the mussels show spatio-temporal variations on the shell thickness. Therefore the detection threshold could change with reference mussel length, season, between day and night, between mussel beds and estuaries, and with in a mussel in relations to shoreline. So, we hypothesize that the thickness threshold of oystercatchers could vary in relation to above factors. In this paper we examine whether thickness difference detection threshold changes with the above factors. Results so far suggest that oystercatchers behaviour remains consistent with a threshold level of 0.036mm despite changes in some of these factors.

NESTING BEHAVIOUR OF INDIAN BARN OWLS (*Tyto alba stertens*) IN MAN-MADE STRUCTURES, TAMIL NADU, SOUTHERN INDIA

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The Indian barn owl (*Tyto alba stertens* Hartert 1929) preferred temples in southern India for nesting. We examined 337 nests of barn owls from 44 temples (21 in rural and 23 in urban areas of Tamil Nadu) to investigate the influence of structural features of the temples and extent of habitat structure around the temples for nest-site selection. Number of nests per temple varied between one and 50 and most of the nests were found in various chambers at different tiers of the temple towers and also the holes present in the temple walls, ledges behind the statues on temple towers, lofts inside the chambers, barns and unoccupied rooms of the temples. Most of the nests had accessibility from the east and west direction as the towers were also facing only that way. Overall height of the temples used for nesting (nest-site height) was 22.5 ± 10.51 m and the nests were placed at an overall height of 14.1 ± 8.77 m and there is a significant difference in the nest-height between rural (9.4 ± 5.07 m) and urban (16.7 ± 9.91 m) areas. The overall nest chamber length, width and height were 1.6 ± 1.08 m 1.0 ± 0.65 m and 2.6 ± 1.71 m respectively. The nests in the urban temples had a significantly greater chamber length (1.8 ± 1.25 m) than that of the rural temples (1.4 ± 0.78 m), whereas, the nest chamber width and height did not vary significantly between rural and urban temples. The barn owls placed their nests in high temple towers with spacious nest chambers, which are located at reasonably good distances from the human habitations and groves and with lesser amount of disturbances but with an overall greater availability of human habitation within 1 km radius around the temples selected. Furthermore the density of nests per temple varied. Nesting density was low (<2 nests/temple) in 21 temples and medium (3-9 nests/temple) in 12 temples, and high (>10 nests/temple) in 11 temples. The high density temples had greater placement in temples with more number of rectangular towers with opening/temple. The low density temples seemed to be more associated with temples possessing higher number of round towers.

BIRD SURVEY AT PENCARROW LAKES AND COASTLINE

Wellington members of the Ornithological Society of New Zealand.

Surveys of the numbers and species of birds observed on two coastal lakes near Pencarrow, located east of the entrance to Wellington Harbour, and on the adjacent Cook Strait coastline (and up to 300 m offshore), have been conducted at approximately monthly intervals by Wellington members of the OSNZ. The locality is a part of the East Harbour Regional Park. Surveys commenced in October 2004 and will continue until October 2008. Data for a 14 month period (Oct 2004 to Jan 2006) have been analysed in terms of relative species abundance, frequency of species occurrence and, for nine species in selected habitats, the variation of the monthly population has been examined. 36 species have been recorded on the coastline habitat, 30 species on lake Koangapirirpiri and 35 species on Lake Koangatera. Black-backed gulls, banded dotterels, white fronted terns and red-billed gulls are the most numerous species recorded on the coastline. Mallards, paradise shelducks, black swans and the N.Z. shoveler are the most numerous species recorded on Lake Koangatera, the larger of the two lakes. It is hoped that this survey will provide a baseline for monitoring changes in the occurrence and abundance of different bird species in the future and that the results will be helpful for regional park management.

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