

ABSTRACTS from the 2014 New Zealand Bird Conference, Palmerston North

Some results of the Pauatahanui Inlet Bird Survey, 1982/84–2012/14

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The Pauatahanui Inlet, a shallow arm of Porirua Harbour near Wellington, is an important estuarine area in south-western North Island and a stopping off point for some waders that migrate north and south, notably the pied oystercatcher. Birds have been counted in Pauatahanui Inlet from 1982, in 4 two-year blocks, 1982–84, 1992–94, 2002–04 and 2012–14 (ends July 2014), a survey period of 40 years. The aim is to monitor and report on variations in the occurrence and populations of birds because of considerable local land use changes, including new suburban housing on formerly farmed hills. Thirty-six wetland, estuarine and oceanic bird species have been recorded; most are regularly seen in the Wellington Region. The total number of birds counted has declined by more than half since 1982. Two species now counted regularly but were not recorded before 1992 are royal spoonbill and pied shag. Counts of little shag, black shag, red-billed gull and Caspian tern seem to be slowly declining or are at best are steady. In contrast, counts of variable and pied oystercatcher, royal spoonbill, paradise shelduck and banded dotterel are increasing. Three species known to occur in Pauatahanui Inlet from casual observations but not recorded during surveys are white heron, wrybill and shore plover. Twenty land bird species have been recorded and include bellbird and Californian quail, neither of which were counted before 2012.

The rise and fall of the Manawatu estuary's shorebirds

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The Manawatu Estuary is well known as a site of regional and national importance to birds, especially shorebirds (waders). It also has an excellent history of bird counts dating back to the 1960s, which I have compiled from published and unpublished counts. Numbers of birds at the estuary have changed dramatically over the years. There is a suggestion that some New Zealand-breeding waders declined before being stable thereafter (banded dotterels in the 1960s, pied oystercatchers around 1990 and pied stilts in the mid-1990s). Arctic shorebirds have shown larger changes. Bar-tailed godwits increased through the 1970s and 1980s but have declined thereafter; red knots went from about 20 in the 1960s to over 400 in the early 1990s before dropping to just over 100 now. Golden plovers, sharp-tailed sandpipers, and other less common species have also declined from the mid-1980s. Peak counts of godwits, knots, golden plovers and sharp-tailed sandpipers exceeded 1000 birds in 1991–1992; now they scarcely break the 400 mark. It is likely that some of these changes reflect changes in the local environment, but a lack of historical sediment, nutrient and invertebrate data make detailed inferences difficult. Other changes match larger-scale changes in species populations. Whatever the causes, the numbers and diversity of shorebirds at the Manawatu Estuary are both substantially down on what they were 20 years ago. This not only makes birdwatching less interesting at the site, it adds to the body of work documenting declines in a range of shorebird species.

Tracking the migrations of New Zealand-wintering red knots

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Despite the global research efforts devoted to red knots, they have remained something of an enigma on the East Asian-Australasian Flyway. In particular, their use of stopover sites on both northward and southward migrations is extremely poorly documented, apart from the confirmation that knots from both Australia and New Zealand use the imperilled tidal flats at Bohai Bay, China, on northward migration. To track the migrations of New Zealand-wintering knots, in February 2013 we deployed 25 geolocators on knots at the Manawatu Estuary, and the following season recaptured eight of about 18 that had returned to the same site. Three units failed during northward migration, but the results overall painted a consistent picture – all birds had a stopover at the Gulf of Carpentaria or West Papua on northward migration, before continuing to Asia. The timing of these stopovers was surprising, with some birds resuming migration only in May or even June, and consequently spending little time in China, and far later than would have been expected. On southward migration, birds used China and the Gulf of Carpentaria again, but also had additional stops in eastern or south-eastern Australia. As consistent as these patterns were, they don't match the tracking by Pavel Tomkovich from Russia of two New Zealand-wintering knots that flew 10,000 km direct to China on northward migration. Possible explanations for this discrepancy will be discussed.

Corticosterone responses and the measurement of stress in penguins

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Stress responses are natural responses that help animals adjust to changes in their external or internal environment. Stress responses in birds are characterised by increased secretion of the steroid hormone corticosterone from the adrenal gland. Corticosterone raises blood glucose concentrations, promotes changes in behaviour, and has a variety of other actions that help animals adjust to the stressful situation. The standard protocol for measuring stress responses in birds is to catch a bird, collect an initial blood sample followed by further samples over 30 to 60 minutes, and then release the bird. Corticosterone concentrations measured in the blood samples indicate the responsiveness of each bird to this standard stressor. We have measured corticosterone responses of Adelie and emperor penguins in Antarctica and little penguins in Oamaru. There is marked variation between individual birds in the size of their corticosterone response, with some birds showing almost no response and others having a large response to the same stimulus. Corticosterone responses of emperor penguins to temporary confinement in a pen were similar to responses to capture. These birds did not show any behavioural response to confinement, clearly showing that behaviour does not indicate whether or not a bird is experiencing stress. Plasma corticosterone concentrations provide quantitative data on the degree of stress that birds are experiencing at the time the sample was collected, and corticosterone measurements can be used to answer questions about the amount of stress experienced by birds during conservation management procedures.

Reintroduction of hihi to Bushy Park, a mainland sanctuary

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In March 2013, 23 male and 21 female hihi were translocated from Tiritiri Matangi Island to Bushy Park, a mainland sanctuary comprising 87 ha of near-pristine lowland temperate rainforest and 11 ha of rough pasture and formal gardens around a historic homestead. Bushy Park was deemed to be an appropriate release site because of suitable forest habitat, kept free from non-native mammalian predators (except mice) by a well-maintained predator-exclusion fence. Community volunteers assisted by setting up and maintaining a network of feeding stations and nest boxes, monitoring the birds, and covering some of the costs. The reintroduction provided the opportunity to test the hypothesis that hihi, being a predominantly forest species, would not cross extensive open ground, such as planted pasture or grassland. If so, then an ideal site for reintroduction could be one where the forest habitat is relatively isolated, all else being equal, thereby preventing hihi from moving beyond the protected area. Accordingly, 40 of the released birds were fitted with radio transmitters and their movements tracked for the first month, the expected lifespan of the transmitter batteries. This paper describes the initial results of this reintroduction, focusing on the birds' movements, habitat choice, and early survival.

A speculative history of avipoxvirus in New Zealand birds

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Avipoxvirus (APV) has a global distribution with disease reported in more than 280 species of birds. APV is a cause of major economic loss to domestic poultry, and has been implicated in biodiversity losses in island ecosystems, in particular Hawaii, the Galapagos islands and the Canary islands. APV shows excellent environmental stability and spreads via insect vectors, through breaks in the host epithelium. The pathogenicity of APV varies between strains and host species. DNA sequences of the 4b core protein are currently used for taxonomic purposes and most isolates cluster into 3 major clades: fowlpox (clade A), canarypox (clade B), and psittacinepox (clade C). We confirmed the susceptibility of New Zealand native birds to APV infection and that at least three different strains of APV (clades A1, A3 and B1) are present in New Zealand, with overlaps in the geographic distributions between different strains. The results suggest that APV had been introduced to New Zealand through avian hosts, insect vectors or human intervention such as poultry vaccination. A high seroprevalence to APV was observed in introduced and an endemic bird species in New Zealand, confirming that the virus is well established. A significant relationship between birds seropositive to APV and the ones positive to Plasmodium spp. was also been observed, both of which are known to be pathogens responsible for dramatic declines in island bird populations. A commercial fowlpox vaccine is being evaluated as a tool to reduce APV mortality, particularly in endangered species such as the shore plover.

Monitoring terrestrial bird populations on Tiritiri Matangi Island, Hauraki Gulf, New Zealand: a 24-year study between 1987 and 2010

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Tiritiri Matangi Island is on open scientific reserve in the Auckland Hauraki Gulf. In 1986, two years after the start of a 10-year planting programme, OSNZ Auckland members began a monitoring programme of the bird populations. A biannual survey scheme commenced in April 1987, counting birds on predetermined transects and listening posts. A paper focusing on the November spring counts was published in November 2013 and this presentation is based on that data, giving an overview of changes in relative abundance of birds from 1987 to 2010. Over this time a revegetation programme, the eradication of the Pacific rat kiore, and the successful translocation of 11 native bird species have combined to dramatically alter the environmental dynamics. Overall an increase in indigenous avian biodiversity and abundance was recorded with two noticeable beneficiaries, the tui and the bellbird. These and other changes will be discussed in the presentation.

Two fairy penguins go into a bar

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Little blue penguins, *Eudyptula minor*, are the smallest extant penguin species and inhabit the coasts of New Zealand and southern Australia. Since the species was described by Forster in 1781 the taxonomy of the genus *Eudyptula* has been subject to extensive revision. The white-flippered penguin found on Banks Peninsula, Canterbury, was described as a second species, *Eudyptula albosignata*. Based on morphological measurements of penguins from around New Zealand Kinsky and Falla reclassified *E. minor* into a single species containing 6 subspecies. The first molecular analysis suggested that no subspecies should be recognized, whereas more recent studies on mitochondrial DNA (mtDNA) discovered a split of *E. minor* into two highly divergent groups, suggesting the existence of two species of little blue penguin, one Australian (including birds from New Zealand's Otago region) and one New Zealand species. Although the biology and genetics of little blue penguins have been intensively studied for many years, no consensus exists today about the taxonomy of these birds. In this study we are using mtDNA and 20 nuclear microsatellites to examine the population structure of little blue penguins across their whole distributional range. Our analyses indicate the presence of two major genetic lineages within the New Zealand region, with little hybridization suggesting the possibility of two distinct biological taxa.

Could microbes be contributing to the decline of the North Island brown kiwi?

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Sixty per cent of wild North Island brown kiwi eggs fail to hatch from causes unrelated to predation and infertility. Kiwi eggs are particularly vulnerable to microbial infection because of their structure, their nesting environment and incubation conditions. This study is the first to investigate the presence of microbes on both the shells and the contents of North Island brown kiwi eggs and discuss their potential impact on the eggs. We found that North Island brown kiwi eggs harbour bacteria and fungi both on the shell and in the contents. The most important genera identified were *Escherichia*, *Bacillus*, *Staphylococcus* and *Serratia* in the contents and *Pseudomonas*, *Streptococcus*, *Staphylococcus*, *Bacillus*, *Micrococcus*, *Serratia* and the fungus *Aspergillus* on the shell. While some of these microbes could decrease hatching success, others have been found to suppress pathogens on the eggs of other bird species, and could potentially increase hatching success. Our research supports and emphasizes the health guidelines in the Kiwi Best Practice Manual for handling wild eggs. This research also has implications for North Island brown kiwi conservation. The main conservation effort for kiwi is predator control assisted by hatching of eggs in captivity (ONE) to protect the vulnerable chick stage. This operation is planned to be phased out once predator control is deemed to be successful enough for chicks to survive in the wild. We suggest that because eggs are vulnerable to microbes (not predators) ONE may be protecting eggs as well as chicks and may need to continue to ensure enough chicks are produced.

The personality of dunnocks: consequences of consistent individual behaviour

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Animal personality has become one major area of research of behaviour ecology during the last decade. Animal personality can be defined as consistent individual behaviour across time and situations. Animal personality has been reported in a wide range of animals, especially in numerous bird species. For instance, exploratory behaviour of individual great tits to a novel environment was repeatable; that is, some individuals were more explorative in a set of novel environments than others. Importantly, animal personality in response to ecological stimuli can have consequences not only for the individual itself (e.g. foraging, fitness) but also for social processes in a population. It has been suggested that animal personality can influence mate choice and social interactions among individuals. We have been studying personality of dunnocks (*Prunella modularis*) since 2012 and their social behaviour since 2009 in the Dunedin Botanic Garden. With their complex mating system (including monogamy, polyandry, polygyny and polygynandry), dunnocks are an interesting model species for investigating the consequences of animal personality with regard to mate choice, reproductive success and social structure in the population. I will present main results from the last two years.

Evidence supporting the continued existence of populations of South Island kokako and their indicative distribution

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Prior to 2012, the most recent report accepted by the Ornithological Society of New Zealand's Rare Birds Committee of the South Island kokako (*Callaeas cinerea*) was in 1967. In 2007 the Bird Threat Ranking panel declared the species extinct. However reports of potential observations of South Island kokako continued to appear. We compiled a database of 241 reports between January 1990 and June 2012. These reports were categorised most highly if there was identification of wattles which are the most distinguishing feature of kokako. The 13 reports from the highest category were submitted to the Bird Threat Ranking panel in June 2012, who then reclassified the South Island kokako as "data deficient". The most compelling 11 of these reports were then submitted to the Ornithological Society of New Zealand's Records Appraisal Committee (RAC). One of these reports was accepted as a South Island kokako; two were deemed to be North Island kokako. This paper presents the database, our assessment process, results, RAC response, map of reports and our conclusions.

New Zealand wildlife protection myths

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All but two of New Zealand's native bird species are currently accorded some level of protection under the Wildlife Act. But when did they first receive protection and why? The answers to these questions are concealed among at least 609 legislative instruments and 47 archived government department files, and challenge much of the accepted wisdom about the history of wildlife protection in New Zealand. This talk will summarise the legal basis to wildlife protection in New Zealand from 1861 to the present day, and the roles of government agencies, politicians, acclimatisation societies, museums, collectors and conservation lobby groups in that process. Some of the dogma challenged include the identity of the first bird species to receive ongoing full protection, the dates that such iconic species as white heron, kiwi and tuatara received complete protection, and the year that it was last legal to hunt the New Zealand pigeon. Information on the history of protection of New Zealand wildlife is of value when assessing the legal ownership of specimens offered for sale.

NZ Birds Online one year after its launch

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The New Zealand Birds Online website (www.nzbirdsonline.org.nz), the digital encyclopaedia of the birds of New Zealand, is a collaborative project between Te Papa, Birds New Zealand and the Department of Conservation. The website was launched at the New Zealand Bird Conference in Dunedin on 2 June 2014. This talk will summarise subsequent developments to the website, and patterns of use since the launch. Monthly analytical reports show increasing usage over time, and changes in how users are discovering the website. However, the information of most interest to birders is what species are being viewed most often, and whether this changes seasonally. In particular, which species objectively qualifies as 'New Zealand's bird of the year' based on the frequency of online searches?

Records Appraisal Committee – processes, and recent decisions and highlights

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The primary purpose of the Records Appraisal Committee (RAC) is to assess the veracity of reported sightings of rare vagrant bird species, species occurring beyond their recognised ranges, and species otherwise considered extinct in New Zealand. The Council of Birds New Zealand has determined that it is a requirement for any such records to be accepted by the RAC before they can be reported as an accepted sighting in *Notornis* or any other publication of Birds New Zealand (the Ornithological Society of New Zealand). Submissions can be received in a variety of formats, but are typically on an Unusual Bird Report (UBR) form, with most submissions now made via the Birds New Zealand website (<http://osnz.org.nz/webforms/online-reporting-form>). UBRs are received by the secretary of the RAC (email: racsecretary@osnz.org.nz), and are collated and circulated to the five members of the RAC in batches every two months. The committee members have two months to assess each UBR and provide their independent assessment to the secretary. The collated comments are forwarded to the convenor, who determines whether each record has been accepted or not (based on the five individual assessments), and drafts a response to the submitter. These responses are sent out by the secretary by email (mainly) or post, and are typically received by the submitter 2.5 to 4.5 months after the UBR was received.

During 2013, the RAC received 100 UBRs and accepted 80 of them. Notable records accepted included a pair of white-winged black terns (*Chlidonias leucopterus*) breeding in Marlborough, New Zealand's second accepted American golden plover (*Pluvialis dominica*) in the Bay of Plenty, a Franklin's gull (*Larus pipixcan*) in Marlborough, an oriental dotterel (*Charadrius veredus*) at Port Waikato, a black-faced cuckoo-shrike (*Coracina novaehollandiae*) found dead at Waikanae Beach, Pacific herons (*Ardea pacifica*) in Southland and near Wellsford, a Juan Fernandez petrel (*Pterodroma externa*) off East Cape, a great shearwater (*Puffinus gravis*) off Mayor Island, a greenshank (*Tringa nebularia*) at Manawatu Estuary, and the return or ongoing presence of a white-eyed duck (*Aythya australis*) at Kaiapoi. The RAC also accepted the first records of nankeen night heron (*Nycticorax caledonicus*), Australian coot (*Fulica atra*) and little black shag (*Phalacrocorax sulcirostris*) at the Snares Islands, Australian coot and eastern curlew (*Numenius madagascariensis*) at Stewart Island, and eastern curlew at Campbell Island.

Thirty UBRs have been received and circulated so far in 2014. Notable records among the UBRs received but not yet all assessed are the potential first record of a buff-breasted sandpiper (*Tryngites subruficollis*) for New Zealand (at South Kaipara Head), and reported sightings of a crested tern (*Sterna bergii*) at Waipu Estuary, a long-tailed skua (*Stercorarius longicaudus*) at Foxton Beach, and five providence petrels (*Pterodroma solandri*) seen near the Kermadec Islands.

Wildbase – the past, present and future

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Wildbase, formerly the New Zealand Wildlife Health Centre, was established in 2003 within the Institute of Veterinary, Animal and Biomedical Sciences at Massey University. Wildbase's main activities include the treatment of ill and injured native animals, oiled wildlife response, and diagnostic pathology, all which are underpinned by research and education in wildlife disease.

The most visible aspect of the centre is Wildbase Hospital within the Veterinary Teaching Hospital. Originally established as a small veterinary hospital to support the University's oiled wildlife capability, Wildbase Hospital now treats over 300 native patients a year. Most of these are avian species with almost 50% of the caseload threatened or endangered species. Staffed by a specialist team of wildlife veterinarians and technicians, the Hospital's location and expertise ensures a very high degree of patient diagnostics and treatment.

Wildbase Pathology's service provides a diagnostic capability to the Department of Conservation and other wildlife conservation and management institutions. This service provides post-mortem examination of threatened native species and the investigation of mass wildlife mortalities, allowing the provision of species management advice.

Under contract to Maritime New Zealand since 1998, Wildbase's Oil Response team is recognized as a global leader in oiled wildlife preparedness and response. Staffed by veterinary professionals and ecologists, Wildbase Oil Response provides training and emergency response to spills within New Zealand, and more recently Australia and South East Asia.

This talk will discuss the activities of Wildbase, its establishment and growth, and what the future holds for Wildbase.

Wetland bird communities in the Waiatarua Reserve

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Waiatarua Reserve, in East Auckland, is an approximately 20 hectare reconstructed urban wetland. It has significant roles in stormwater treatment, recreation and off-leash dog exercise while providing sanctuary for communities of wetland birds. There has been little scientific research published on wetland birds present in the Waiatarua Reserve or their utilization of the wetland. Between July and September 2009 five-minute bird counts at 13 observation points around the wetland recorded the species of wetland birds and the number of each species present at each point. Morning, midday and late afternoon counts were made. Results showed that 16 different wetland bird species inhabit the wetland. Most are endemic or native. The species present in 2009 are compared with those recorded in an unpublished 2005 study. Relative abundance of each species was compared in terms of time of day and location in the wetland. Descriptive statistics and One-way Analyses of Variance (ANOVA) followed by *post hoc* tests were used to identify significant differences in relative numbers of each species in each of five areas, and the significance of time of day to the sighting of each species. The only species to show a significant difference in their abundance at different times of day were mallard and black shag between the midday and afternoon counts. The other fourteen species showed no significant difference in abundance with the time of day. One area of the wetland has significantly higher numbers than the other four. Nine of these species breed in the reserve.

Population genetics of the New Zealand falcon

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The New Zealand falcon (*Falco novaeseelandiae*) is currently classified as a single species with three recognized morphs or races (Bush, Eastern & Southern). The morphology, ecology and to some extent geographic ranges support this treatment but so far no genetic work exploring this variation has been conducted. We examine the evidence in support of the three distinct forms of New Zealand falcon. Should they be treated as distinct conservation units and if so at what taxonomic unit should they be split? This information is important for management of the New Zealand falcon. Evidence of population or race subdivision would suggest that the three morphs would be better managed as separate taxonomic units/sub species. After examining microsatellite and mtDNA sequence data we find little evidence for population genetic structuring that correlates with the proposed size/ecological/spatial forms. A small amount of genetic structuring was discovered with a total of five haplotypes identified throughout the country, three of which were each found in a single region in New Zealand. Phylogenetic analysis was also used to determine the relationship of the New Zealand falcon to extant species in other parts of the world.

Avian malaria in New Zealand

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Avian malaria parasites of the genus *Plasmodium* have the ability to cause extreme morbidity and mortality in naïve hosts, and their impact on the native biodiversity is potentially serious. So far, 17 different strains of avian malaria parasites have been found in 35 bird species in New Zealand. Despite the common asymptomatic nature of the infection, deaths in New Zealand birds have been recorded in South Island saddleback, yellow-eyed penguins, mohua (yellowhead), hihi and great spotted kiwi. The main objective of this study was to examine the possibility and extent of pathogen pollution (introduction of pathogens into new environments, species and/or populations) of vector borne diseases due to wildlife translocations using the New Zealand saddleback and its infections with different strains of *Plasmodium spp.* as a model. During the period 2012–2013, nine sampling trips were done and archived material from five different locations was examined. A total of 354 blood samples were collected, with 138 (39%) being positive for *Plasmodium spp.* Nine distinct strains of *Plasmodium* parasites in North Island saddlebacks were identified, with one strain formerly unknown to New Zealand, with its closest relatives found in passerine birds in Colombia and Alaska. With the finding of the KOKAKO01–strain on Hen (Taranga) Island and Tiritiri Matangi island we possibly have found the first evidence for the hypothesis of pathogen pollution, as saddlebacks from Hen Island (the source population of all North Island Saddleback in New Zealand) have been translocated to Tiritiri Matangi Island via Cuvier Island. We have also found evidence for loss of *Plasmodium* diversity following translocations.

Post-release survival and productivity of oiled little blue penguins rehabilitated after the C/V Rena oil spill

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There is contentious debate regarding the conservation value of rehabilitating oiled wildlife. One way to evaluate the effectiveness of such rehabilitation is to conduct post-release monitoring of oil-rehabilitated animals to determine whether these animals survive the transition to the wild and thereafter have survival and reproductive rates equivalent to control animals. We have been monitoring the survival and productivity of little blue penguins (*Eudyptula minor*) oiled and subsequently rehabilitated after the 2011 C/V Rena oil spill in Tauranga, New Zealand. Post-release survival of oil-rehabilitated penguins (that were micro-chipped pre-release) was similar to the survival of control birds (that were not oiled but were micro-chipped during the oil spill response). There was however a reproductive impact. Hatching success (proportion of chicks hatched from eggs laid) in the year after the spill was significantly reduced in breeding pairs containing at least one rehabilitated adult (rehabilitated pairs) compared to pairs containing no rehabilitated adults. Fledging success (proportion of chicks fledged from chicks hatched) and overall egg success (proportion of chicks fledged from eggs laid) were also reduced but not significantly so. Despite these reductions, hatching, fledging and egg success rates for rehabilitated pairs were higher or within ranges reported for other little blue penguin colonies in Australia and New Zealand. Survival monitoring surveys are on-going and data collected from the second post-spill breeding season will be analysed to determine whether reduced hatching success is a transient effect lasting one breeding season or if this effect of oil contamination persists in the mid-term.

The prevalence of avian malaria lineages in a mixed ecosystem in New Zealand, using molecular techniques

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Avian malaria causes morbidity and mortality in New Zealand's endemic bird populations. This study was initiated after *Plasmodium relictum* lineage GRW04 was found in a New Zealand robin (*Petroica longipes*) during pre-translocation health screening in the Waimarino forest. This area incorporates aspects of remnant native forest, commercial forestry and farmland, with a mixed avifauna of introduced, native and endemic species. The study aims were to evaluate the prevalence of *Plasmodium* lineages in the Waimarino forest using nested PCR and quantify parasite load in birds using real-time PCR. Results demonstrated the presence of *Plasmodium* sp. LINN1, *Plasmodium (Huffia) elongatum* and *Plasmodium (Novyella) sp.* lineage SYAT05 in this ecosystem, with the highest prevalence in introduced European species (80.5%), followed by native (19%) and endemic species (3.5%). Correlation between parasite load, haematocrit, and body condition index (BCI) was assessed for blackbirds (*Turdus merula*), silvereyes (*Zosterops lateralis*) and New Zealand robins. A significant difference in BCI between *Plasmodium* positive and negative birds was found for Silvereyes, indicating a better BCI in *Plasmodium*-positive birds ($t=-2.64$, $df=31$, $P=0.01$). The difference in BCI was not significant for blackbirds and New Zealand robins. No significant differences in haematocrit were found between *Plasmodium*-positive and *Plasmodium*-negative birds. Results suggest that introduced species may be more highly host adapted to these lineages of *Plasmodium* and may act as a reservoir of infection for other species. This research will provide critical information for the management of native species in the Waimarino Forest, the bordering Wanganui National Park, and other comparable mixed ecosystems.

Making rates count: Survey, monitoring and management of Auckland's avifauna

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The Auckland Council carries out various bird-focused survey and monitoring programmes across the region, as well as leading or co-ordinating management actions that benefit a range of bird species. From region-wide bird counts and rock stack surveys to kōkako protection, the projects are varied and many. The Council's work is not easily visible so this talk will 'daylight' our activities, revealing the level of ecological management and contribution to knowledge and understanding in the region.

Weka at Kawakawa Bay

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Weka were last known in the Hunua Ranges in 1913 so reports from Kawakawa Bay were not taken too seriously until an injured bird turned up at Bird Rescue in 2004. Knowing that this might be just the third population of weka on the North Island mainland enquiries were made to follow this up; a survey by OSNZ members located a small population of birds. Local interest and assistance from Tony Beauchamp of DOC led to the formation of a community group known as Wekawatch (www.wekawatch.co.nz) to protect and monitor these birds. Yearly call counts have been conducted in March and April each year since 2004. The results of the first ten years of monitoring are presented. During this time the population has both increased and decreased and some of the factors that may have contributed will be discussed.

Ecology and conservation of an endangered tropical island bird

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Amazingly little is known about tropical birds in the South Pacific. Samoa's endangered honeyeater the mao *Gymnomyza samoensis*, has been no exception. We studied the factors affecting the mao's productivity and its sensitivity to changes in habitat at different scales. We focused on how habitat fragmentation and land use change influence mao reproductive success by combining data from monitored pairs with results from an experiment studying the depredation of artificial nests. Our results revealed a species with extremely slow breeding traits, which is at risk from invasive species. The effects of territory selection were assessed at two scales: (1) the position of the territory within the landscape, and (2) the microhabitat positioning of the nest. Results from the experiment show that the position of a territory within the landscape and conditions directly surrounding the nest tree predicted nest disturbance by rats. We conclude that central forest blocks may not be the hoped-for breeding refuge for this species or other forest birds. Our results also indicate that with increased fragmentation and further changes in land use, nest predation is likely to increase. Research and conservation in the South Pacific lags behind Australia and New Zealand, and further research is needed so that appropriate conservation measures can be targeted.

Techniques for remote tracking and monitoring of seabirds – how these are changing our understanding of oceanic seabirds

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New Zealand has 86 species of breeding seabirds. Many of these nest on remote oceanic islands and their biology and ecology has remained poorly known until recently. The recent development of very clever new monitoring and tracking tools (miniaturised geolocation devices, GPS tags, dive depth recorders, passive tag readers) has caused a revolution in our ability to follow the daily lives of our seabirds, especially nocturnally active species of petrels and shearwaters. In this talk I will describe the techniques and methods developed to monitor seabird activity on land and sea, and for tracking oceanic movements. I will provide examples from a range of Department of Conservation projects monitoring both common seabird species and some of our most endangered bird species. New insights obtained from these tracking and monitoring projects support our conservation programmes. I will provide examples of how New Zealand seabirds are able to exploit a wide range of oceanic resources across most of the world's major ocean basins. I will show examples of previously unknown migration movements, new insights into seabird foraging behaviour and how seabirds vary their movements during different stages of the breeding cycle. I will also provide examples from remote automated monitoring devices on land that show how clever and coordinated our seabird species are. Seabirds are under extreme threat from a wide range of land, sea and climate change related factors and these threats will also be discussed during the talk.

The evolution of *Nestor* parrots

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The New Zealand *Nestor* parrots (kaka (*N. meridionalis*) and kea (*N. notabilis*)) are globally significant because, together with kakapo (*Strigops habroptilus*), they form a 40+ million year old (Ma) superfamily (Strigopoidea) that is sister taxa to all other parrots. Here, we review recent research that has provided exciting insights into the history of *Nestor* parrots. New molecular research indicates that the kakapo and *Nestor* lineages separated 23–29 Ma. The earliest fossils of this group are three species related to *Nestor* from the 16–19 Ma deposits at St Bathans, Central Otago. New molecular research has dated the separation of the kaka and kea lineages to 2.3–4.4 Ma, supporting Fleming’s ‘classic’ theory of *Nestor* diversification, i.e. kea evolving under alpine/glacial conditions c. 2.5 Ma and kaka evolving in low altitude/warmer forest habitat. We discuss how this alpine/lowland split fits with new Holocene fossils, which show that kea also lived in the North Island during the Holocene; therefore apparently kea is not in fact an obligate ‘alpine’ species and the evolution of kaka and kea may be more complex than previously thought. Kaka evolved into four distinctive taxa within the New Zealand archipelago (Norfolk Island *N. productus*, Chatham Island *N. nsp.*, North Island *N. m. septentrionalis* and South Island *N. m. meridionalis*). We present new data on size differences between the North and South Island taxa and describe the extinct *Nestor* parrot from the Chatham Islands. The Chatham species has a relatively large femur:humerus length ratio and broad pelvis compared to mainland kaka; it separated from the mainland form c. 1.5 Ma.

Why does our ability to monitor bitterns vary with wetland size, and what can we do about it?

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Wetland habitats in New Zealand now cover a fraction of their original area. Despite this, there is little information on the impact of this habitat loss on wetland species such as the endangered Australasian bittern (matuku, *Botaurus poiciloptilus*). Consequently, there is a need to develop reliable monitoring methods that are informative in terms of the distribution and abundance of such species. Three methods for monitoring bitterns in New Zealand are considered here – calling-rate-per-unit-time (index of abundance), acoustic triangulation (territory mapping method) and close approaches using kayaks (territory mapping method). At Whangamarino wetland, Waikato, research over two breeding seasons (2009 and 2010) found kayaks and triangulation impractical, and identified some factors that reduced the interpretability of calling-rate as an index of abundance. However, similar trials at Lake Hatuma, Hawkes Bay (2011 and 2012), were more encouraging, providing sensible and comparable abundance estimates for male bitterns across all methods. Why do these methods produce interpretable results at one site but not another? This talk identifies some site-specific logistic constraints and species-specific cryptic characteristics that affect the usefulness of each method. Through this process we are able to show why close approach and triangulation techniques are effective at small wetlands (< 250 ha) but should be avoided at larger wetlands with particularly high calling-rates. We also examine new technologies and innovative sampling designs that could potentially solve some of the sampling challenges associated with larger sites.

Musings about Chatham Island's extinct duck, "*Pachyanas*"

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A recent genetic study identified Chatham Island's extinct duck *Pachyanas chathamica* as more closely related to New Zealand and sub-Antarctic brown teals than to any other modern waterfowl, and calibrated their divergence as occurring 0.69–1.80 mya. The modern (but sadly no longer) occurrence of brown teal on Chatham Island was a belated colonisation which, perhaps, we could view as akin to the takahe and pukeko example on mainland New Zealand. *Pachyanas* arose from the same clade of ducks that gave rise to New Zealand and sub-Antarctic brown teals (it is not a descendant of brown teal) but became much bigger than brown teal, possibly a unique example of an island duck being larger (not smaller) than its mainland relative. Reclassified as an *Anas*, it may also have been one of the largest known of that genus, certainly exceeding the largest of the living *Anas* ducks (mallard, spotbill). Why? I will compare some of its skeletal characters with selected other ducks, present a scattering of evidence to indicate its possible ecology, and offer a (barely plausible) hypothesis to explain its apparent size.

Increasing woody vegetation in farmland – how would bird communities change?

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There is growing concern both globally and locally about the adverse impacts of land use change on biodiversity in farming landscapes. Agri-Environmental Schemes are sometimes used to try and halt, or reverse, farmland biodiversity declines. Guiding and monitoring the performance of such schemes requires the setting of meaningful targets (in terms of biodiversity benefit). Here we use an objective 'risk assessment' approach to predict how the richness and composition of New Zealand bird communities (using 88 terrestrial species [62 native and 26 introduced]) might change under different scenarios of increasing woody vegetation in farmland nationally. Our analysis uses information on: (1) food and nesting resources required by each species; (2) land-cover composition of the 3138 atlas grid cells during the survey period; (3) food and nesting resources available within each of the different land-cover types; and (4) the observed presence/absence of each bird species in each grid cell as shown in the New Zealand Bird Atlas (1999–2004). Niche breadth is reflected in a species' risk score by calculating and summing the proportion of food and nesting habitat components used by the species that are affected by an agricultural change. Native species richness increases as woody vegetation cover increases, particularly when farmland is converted to forest rather than scrub. Native species also become more dominant in the bird community as introduced species richness declines, especially when native woody vegetation cover increases.