

New Zealand Seabird Research Priorities Workshop, Te Papa, Wellington, 5-6 May 2013

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A workshop to determine research and management priorities for New Zealand breeding albatrosses and petrels held in August 2012 highlighted the need for greater communication and collaboration between people undertaking research on and management of seabirds in New Zealand. It was apparent that a lot of research and conservation was being undertaken that few other workers knew about. A two day long follow up meeting was held at Te Papa in Wellington in May 2013 this time extended to include all New Zealand breeding seabirds. This is a report on that May 2013 meeting.

On Sunday 5th of May each person undertaking work with seabirds was asked to make a short presentation outlining the aims, scope and major results of their current or recently completed work. Those who were unable to attend were asked to submit a one page outline of, their seabird research or management. Section 1 of this report presents a summary of each presentation prepared from notes taken by Susan Waugh and Kerry-Jayne Wilson followed by abstracts for those talks submitted by some of the presenters and several abstracts submitted by researchers unable to attend the meeting.

Monday 6th May was devoted to a workshop to identify priorities for seabird research, monitoring and conservation in New Zealand. Discussions were wide ranging, time was limited and it was not possible to reach consensus on all issues. Section 2 of this report lists those research/monitoring/management priorities supported by a significant number of participants. Each is ranked as high, medium or low priority.

The 32 attendees were; Ed Abraham (Dragonfly Science), Ian Angus (DOC), Karen Baird (F&B, BLI), Sandy Bartle (Te Papa retired), Mike Bell (WLMI, Taiko Trust, Hutton's Shearwater Trust), David Cornack, Shane Cotter (OSNZ), Ursula Ellenberg (Eudyptes EcoConsulting & University of Otago), Denise Fastier (DOC), Megan Friesen (University of Auckland), Chris Gaskin(F&B & BLI), Stefanie Großer (University of Otago), Helen Gummer (Independent contractor), Rod Hitchmough (DOC), Annette Harvey (OSNZ), Grant Humphries (University of Otago), Ken Hunt (DOC), Sarah Jamieson (Te Papa), Jorge Kaestner, Chris Lalas (Dunedin), Bruce McKinlay OSNZ vice president (Monday only), Kyle Morrison (NIWA, Massey University), Pascale Michel, Kris Ramm (DOC), Nic Rawlence (University of Otago), Yvan Richard (Dragonfly Science), Paul Scofield (Canterbury Museum), Ben Sharp (MPI), Karin Sievwright (Massey University, Sunday only), Neville Smith (MPI, Monday only), Chris Smuts-Kennedy (Maungatautari) (Sunday only), Owen Spearpoint (GWRC), Graeme Taylor (DOC), Alan Tennyson (Te Papa), David Thompson (NIWA), Susan Waugh (Te Papa), Vince Wanders (DoC contractor), Richard Wells (ResourceWise Ltd), Kerry-Jayne Wilson (chair) (ASG, OSNZ) Michelle ?? (MPI)

Apologies were received from; Barry Baker, Biz Bell, Rachel Buxton, Martin Cryer, Igor Debski, Lorna Deppe, Graeme Elliott, Georgie Hedley, Micah Jensen, Todd Landers, Dave McFarlane, Colin Miskelly, Ralph Powlesland, Matt Rayner, Stephanie Rowe, Paul Sagar, Phil Seddon, Kath Walker, Cath Wallace

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Some websites to look at.

Papers relevant to New Zealand to be discussed at the fifth meeting of the ACAP Seabird Bycatch Working Group, 1 to 3 May 2013 in La Rochelle, France
http://www.acap.aq/index.php/en/documents/working-groups/cat_view/128-english/59-working-groups/60-seabird-bycatch-working-group/417-seabird-bycatch-wg-meeting-5

For the latest information on bycatch in NZ <http://data.dragonfly.co.nz/psc/>

The world seabird net www.seabirds.net

For the report from the August 2012 meeting <http://www.osnz.org.nz/news/nz-albatross-and-petrel-report>

Next seabird conference Oct 2015 in Cape Town.

Section 1 Presentation summaries and abstracts

Overviews

Keynote address Conservation of New Zealand Seabirds – DOCs current work programmes, objectives and key findings. By Graeme Taylor

In NZ there are 86 breeding species of seabirds, 53 threatened with extinction, 3 species with <200 individuals (Fairy Tern, Taiko, South Georgian Diving Petrel (Codfish Island)). DOC is now working closely with volunteers and scientists from other agencies. Some current DOC seabird projects are:

- a. Taiko, 150 total population, 80 chicks reared since 2007.
- b. Chatham Petrel – translocations to two predator fenced exclosures completed.
- c. Taiaroa Head – monitoring royal albatross, shags, penguins and shearwater populations.
- d. Huttons shearwaters – population estimate by mark-recapture c400,000 birds.
- e. South Georgian Diving Petrel (Codfish island), 2002 numbers appeared stable, but a huge storm in 2003 killed a large percentage of the birds. Weed encroachment is also a problem.
- f. Yellow-eyed penguins, habitat protection, survival tracking, working with volunteer groups.
- g. Fiordland crested penguins, breeding success and monitoring in South Westland and Fiordland.
- h. Rockhopper and erect crested penguins, monitoring of population sizes going.
- i. Blue penguins, PIT tag study to see if the flipper bands were having an effect on the birds' survival and breeding outputs.
- j. Monitoring & protection of mainland and inshore island petrel colonies at Bethells Beach, Hawkes Bay and elsewhere.
- k. Habitat restoration – Campbell Island rat eradication,
- l. Restoring communities of seabirds through translocations, eg Mana Is, and Kaikoura Peninsula,
- m. Training of people in handling and specialist techniques.
- n. Geolocation tracking studies, especially on smaller species of petrel.
- o. Indirect effects of fishing on seabirds, through competition for food resources, some examples, plastic pollution in the ocean, tidal power stations, aquaculture, climate change leading to changes in ocean acidity, changes in temperature, rainfall and storm frequency.
- p. General advice and support for New Zealand seabird research and monitoring projects

Keynote address. Conservation Services Plan (CSP); annual plan for 2013-14. By Ian Angus and Kris Ramm

Primarily concerned with fisheries interactions and mitigation, funded by cost recovery from the fishing industry. Part of the Marine Species & Threats team managed by Ian Angus, the CSP group has 2.4 FTE. DOC wants to work more closely with others in particular MPI and research institutes when setting priorities.

Programmes for 2013:

- a. Identification of seabirds caught on commercial fisheries (autopsy to determine; sex, age and cause of death if possible, stomach contents to be collected, 3 years proposed).
- b. Optimising observer data collection protocols.
- c. Assessment of cryptic mortality in trawl and longline fisheries.
- d. Find alternative methods to monitor yellow-eyed penguin captures in setnet fisheries.
- e. Salvin's albatross – population estimate and at-sea distribution
- f. Auckland Island's white-capped albatross population estimates (aerial survey).
- g. Auckland Islands Gibson's albatross population study (ground & aerial surveys)
- h. Black-petrel population project.
- i. Sea trials of longline-setting devices.
- j. Mitigation projects (3x projects e.g. line setters, bird bafflers).

DOC to send links to the meeting participants to enhance consultation. Questions from the floor concerned the need for offal discharge studies and the need for DOC to put efforts into researching indirect effects of fishing. Why aren't known effective fishing mitigation measures implemented for some species that are strongly affected by fisheries?

Seabird bycatch data website; informal presentation. by Ed Abraham

The latest information on bycatch in NZ is presented at <http://data.dragonfly.co.nz/psc/>. This user-friendly website allows users to download and review data on bycatch by species, fishery, fishing method or by area.

Keynote address. National Plan of Action – Seabirds (NPOA). By Neville Smith

There is both an international and national obligation to look after biodiversity but the NPOA is policy not law. The NPOA-2013 (MPI 2013) has recently been issued. It consists of a nested hierarchical framework of documents, on risk assessment, policy, legal instruments, fisheries plans etc within the single publication. Led by MPI the Stakeholder Advisory Group responsible for the NPOA includes members from DOC, MFAT and NGOs. The Seabird Advisory Group (SAG) which meets regularly includes government and NGO representatives.

The objective is to achieve reduced bird bycatch in fisheries and the development of mitigation measures, for foreign and NZ vessels within NZ waters. It considers all seabirds that interact with fisheries including recreational fishers. It is important that it has buy in from all fisheries and concerned NGOs. The long term objective is that NZ fisheries are recognised internationally as seabird friendly. The aim is to ensure that the biological risk is less than the sustainable catch for all seabird species; that species currently at moderate to high risk move to low risk.

One of the highest priorities for 2013 is to reduce uncertainty in the risk assessment framework, by increased observer coverage in some fisheries or further biological research where key ecological factors are unknown or uncertain in other fisheries.

The black petrel is the most high risk species with species specific action planned for the next breeding season.

Question, where are we with the recreational fishery, answer at this stage education.

Reference.

MPI 2013. National Plan of Action – 2013 to reduce the incidental catch of seabirds in New Zealand fisheries. Ministry for Primary Industries, Wellington.

**Keynote address. The updated Risk Assessment for Seabirds in Commercial Fisheries.
By Ben Sharp, MPI.**

There is a need for risk assessments that are quantitative, absolute not relative, biologically meaningful, fishery specific, easily updatable, species specific, spatially explicit, which distinguish between risk and uncertainty. This risk assessment meets more of these criteria than any previous exercise and is incorporated within the NPOA (above).

This risk assessment only covers New Zealand fisheries, it does not include risks faced by New Zealand seabirds beyond the New Zealand EEZ. Global risk assessment is a long term objective. Some risk scores reflect uncertainty.

The calculated Risk Ratio =Potential Fatalities/Potential biological removal). The Black petrel comes out as the most at risk seabird, far ahead of second placed Salvin's albatross.

The most at risk species are; very high risk black petrel, Salvin's albatross, flesh-footed shearwater, southern Buller's albatross, Chatham albatross, white-capped albatross; High to medium risk northern Buller's albatross, Gibson's albatross, cape petrel, northern royal albatross, Antipodes albatross, northern giant petrel, Westland petrel, southern royal albatross, white-chinned petrel, spotted shag, Campbell albatross, yellow-eyed penguin (mainland population only).

Keynote address. Hauraki Gulf seabird plan. Chris Gaskin

The area being surveyed is much wider than the Hauraki Gulf, extending from Cape Brett to south to the Alderman Is, also including the Auckland west coast. The Hauraki Gulf Forum includes DOC, MPI, 6 Tangata Whenua and the local councils. The plan is to firstly present a review of the biology status, distribution of seabird secondly a summary of role of seabirds in the wider Hauraki Gulf Region.

A breeding colony database will present information on distribution, size of populations, with total population estimates for high priority species. A ground survey of all islands is underway. The New Zealand storm petrel is a species of special concern, now that a breeding site has been found management of this critically endangered species can begin. Legal description of key biodiversity sites is in progress. Concerns for seabirds in the Gulf region include the designation of shipping lanes, risk of ship wreck, windfarms and lights on overland flyways, and island biosecurity.

<http://www.aucklandcouncil.govt.nz/SiteCollectionDocuments/aboutcouncil/committees/haurakigulfforum/meetings/haurakigulfforumite11c20130325.pdf>

NIWA Seabird Projects. by David Thompson

Between them the NIWA seabird scientists, Paul Sagar, David Thompson, Leigh Torres and Matt Rayner (now Auckland University) have recently completed or are currently undertaking the following seabird research projects;

- a. White-capped albatross at Auckland Islands, population demography and at sea tracking.
- b. Antipodes Is – demography and at sea tracking of white-chinned petrels and grey petrels.
- c. Population biology and tracking of Salvin's albatross at Snares Western Chain (completed) and Bounty Islands (begun 2012).
- d. Work on Chatham Island albatross species with Paul Scofield.
- e. Demographic Modelling using SEABIRD population models (with Chris Francis)

- f. Foraging ecology of rockhopper penguins at Campbell & Antipodes
- g. Seabird autopsy programme.
- h. Long term studies of Buller's albatrosses at the Snares Island includes, demography, population counts, survival, recruitment, at sea tracking.
- i. Tracking and population demography of southern royal albatross, Campbell albatross and grey-headed albatross at Campbell Island.

Forest and Bird advocacy. By Karen Baird.

Forest and Bird was one of the NGOs that had Input into the NPOA with MPI. The Society has some concern as to how it will be implemented; the plan itself only provides a strategic overview with no specific fisheries level objectives or targets to reduce bycatch. Implementation will be needed through the 5-year National Fish Plans and through the Annual Operating plans for each fishery group- Inshore, Deep water and Highly Migratory Species (HMS). Forest & Bird along with other stakeholder NGO's is providing input into these processes through the newly formed Environmental Engagement Forum (EEF) and existing fisheries stakeholder groups such as for HMS working group. MPI also have an Aquatic Environment Working Group where research into fisheries issues is reviewed by the group before it is finalised as advice. DOC have a similar process for the Conservation Services Programme.

Karen also represents Birdlife International (F&B is a partner) at Regional Fisheries Management Organisation meetings (in particular Western Central Pacific Regional Fisheries Management Organisation (WCPFC <http://www.wcpfc.int/>); Commission for the Conservation of Southern Bluefin Tuna (CCSBT <http://www.ccsbt.org/site/index.php>) and the newly formed South Pacific Regional Fisheries Management Organisation (SPRFMO <http://www.southpacificrfmo.org/>) Most of our seabird species move out of the New Zealand EEZ and are exposed to fishing pressures beyond our jurisdiction. Seabird research and tracking data is critical to assist in informing RFMO's and other organisations such as ACAP of potential risks to seabirds from overlap with fishing activity. Through Birdlife's tracking database (through data submitted by many researchers), papers have been prepared and presented at these fora to assess risk and development of the Ecological Risk Assessment process has been key in getting conservation and management measures agreed.

Translocations, community groups and trusts

Developments in NZ burrow-nesting seabird translocations and impacts of chick translocations on source colonies. By Helen Gummer

9 species of petrels have been translocated to date (excluding recent trials with mottled petrels and white-faced storm-petrels).

- i. Those species where chicks are fed nightly and don't emerge from the burrows prior to the night of fledging. Diving petrels - well known techniques but prone to heat stroke. Fairy prions – diet well known, no major problems. Diving petrel translocations seem to have low return rates (Mana I. establishing colony has large proportion of immigrants); need to wait for more results on two recent projects (Motuora and Cape Sanctuary) before doing further translocations of these. Fairy prion transfers didn't work well in terms of return rates, but survival rates were similar to non-translocated birds. Supplementary transfers to Mana I. are to be undertaken before trying fairy prions elsewhere.
- ii. Those species where chicks are fed nightly and do emerge from the burrows prior to the night of fledging. Fluttering shearwaters & Hutton's shearwaters—both species tend to wander away from their 'natal' burrows. Fluttering shearwaters are a challenge to manage at unfenced sites, where it is harder to find the chicks that disappear prematurely, and where there is no tracking dog available; therefore, strict burrow blockade removal criteria have been developed.
- iii. Those species where chicks are not fed every night and do emerge from the burrows prior to the night of fledging. Cook's petrel, Pycroft's petrel, Chatham petrel and other small gadflies. It seems to be easier to manage these chicks because the feeding regime is less intense, and chicks have a strong affinity to their 'home' burrow and rarely disappear prematurely. Need to be extra vigilant with tree climbing species, as injuries can occur to fledglings during their night excursions between first emergence and fledging. Data on return rates are becoming available, with some colonies established and then either stabilising or declining slightly after an initial recruitment phase (e.g. Pycroft's petrels on Cuvier I.; Chatham petrels on Pitt – for both these projects nearly all the translocated chicks will

have been recaptured by now and we are now waiting to see if recruitment of second generation birds is sufficient to promote growth of these new establishing colonies).

- iv. Those species where chicks are not fed every night and do emerge from the burrows prior to the night of fledging. Large gadflies – Taiko (diet & techniques well known and in a sense close to the small gadflies in terms of ease of management). Grey-faced petrel – diet has proved extremely challenging for these summer breeders and issues have only recently been completely ironed out following trials replacing soy oil (from the tinned sardines) with fish-oil (at Cape Sanctuary) as recommended by vet Masters student Micah Jensen of Massey Uni. Return rates unknown as yet for grey-faced petrels (only 7 2005 and 2006 birds have returned to Matakohe-Limestone Island to date), but some excellent return rates for 2007 and 2008 taiko.
- v. DOC are now developing best-practice documentation for the gadfly petrels. Current methods for fluttering shearwater are formally documented by DOC/Friends of Mana I.
- vi. Top-up transfers may be needed to keep new colonies viable.
- vii. A lot of groups want to do transfer projects which may result in competition for birds and impact on the source colonies. In addition, a projects success may be compromised by a similar neighbouring project. Coordinated approach needed.
- viii. Are transfers necessary when there are birds flying past the proposed colony site? Can sound-system based colony establishment do the job as effectively?

Helen Gummer is concerned about birds being transferred to fenced areas, where chicks can find themselves accidentally outside fenced areas during pre-fledging practice take-offs, and are unable to return to safety of their burrow. Not only may chicks be vulnerable to predators and/or exposure (e.g. to hot sun if there is limited shade), but some light chicks may still require food and can no longer be hand-fed, and other heavy chicks may be forced to fledge to sea before they have the appropriate fitness. Need to think carefully about minimum fence area requirements and design/position of fence in relation to land features (e.g. likely take-off points).

Boundary Stream seabird translocations. By Denise Fastier

This is one of DOC's mainland island projects with extensive predator control over 800ha, surrounding a 1.9 ha, pest-proof fence, c24 km from the sea. Intensive predator control outside fence. Translocated 50 Cook's petrels and planned translocation of mottled petrels. Close association with the Cape Sanctuary.

Waikato seabird projects. By Chris Smuts-Kennedy

Maungatautari Ecological Island Trust – Pest fence around a forested mountain in the Waikato. Removals of mammalian browsing and predator species within fence completed except for mice on the main mountain block. 12 native forest species remained. Reintroduced: falcon (self-introduced), stitchbird, whitehead, kaka, robin, saddleback, yellow-crowned parakeet, giant weta, takahe, kiwi, tuatara, giant & banded kokopu. Plans to introduce other species including, Cook's petrel, black petrel, kokako, kakapo, rifleman, snipe, fernbird, lizards.

Karioi Maunga ki te Moana project (between Kawhia & Raglan Harbours) - Involves Iwi and DOC with strong community engagement. Intensive predator control around existing grey-faced petrel coastal colony and less intensive predator control on surrounding areas. In the future wanting to reintroduce seabird species (e.g. black petrel & Cook's petrel) to Karioi maunga, and perhaps also attract gannets to a coastal headland through use of decoys.

Hutton's Shearwater Trust & Chatham Islands Taiko Trust by Mike Bell

Chatham Islands Taiko Trust – transfer of taiko and Chatham petrel chicks into the Sweetwater Covenant predator-fenced area. High survival rates of birds fledged from this population for the first 2 years, 60% survival of translocated taiko. Two pairs of Chatham petrel now breeding in the fenced

area. This project has played a significant role in shifting attitudes of the community towards conservation. Wanting to set up a second colony of Chatham Albatross on main Chatham Island. Hutton's Shearwater Trust - over five years 500 chicks have been translocated to the fenced site on Kaikoura Peninsula from the large high altitude colony. Fifteen pairs are now breeding at the translocation site, and two chicks fledged in 2013, the first year birds have bred at the transfer site. GLS tracking studies underway.

An important challenge for community groups is maintaining going funding. Communities are an important resource for conservation but they need support from professional science groups with review of and undertaking of their research. Conversely, research institutions, in particular universities can tap into and work with community groups.

Fluttering shearwater translocation Long Island to Matiu Somes Island. By Shane Cotter

Translocated 80 chicks, 74 of which fledged in 2012, plus 80 chicks all of which fledged in 2013. Sound system also in place. Problems with heat-stroke for some chicks. Several birds have been found in urban areas after fledging, perhaps disorientated by the city lights, an issue for an island in an almost landlocked harbour with city surrounds.

Katiki Point Penguin Charitable Trust, penguins and petrels on the mainland at Moeraki. By Chris Lalas

Two projects on Moeraki Peninsula, Otago.

Okahau Pt - 1983 yellow-eyed and blue penguins were already nesting, some on open grazed land despite the absence of scrub or forest. Scrubby vegetation has been planted but here they have found the provision of nestboxes and shade more effective at conserving both penguin species. Predator control in carried out at this site. Yellow-eyed penguin numbers have increased, now 25 pairs nest there.

Katiki Point - no penguins or petrels nesting there initially. Flax, trees, tussock were planted and birds did prefer areas with taller vegetation. Now they just install nest boxes. Dogs are prohibited and the area is closed to visitors at dusk. Yellow-eyed penguin numbers increased over 15 years, up to 25 currently (30 in some years). Blue penguins, up to 40 nests in 2004. Sooty shearwaters colonised naturally, 70 – 80 nests in 2000s, 220 in 2012-13 plus about 500 red-billed gulls. Natural colonisation of the area by white-fronted terns, white-faced storm petrels and broad-billed prions, but all storm petrels and prions have been killed by predators. This is the site of Janice Jones penguin hospital.

West Coast Blue Penguin Trust. By Kerry-Jayne Wilson

The Trust was formed by local people concerned by the decline in blue penguins on the West Coast. Over time we have expanded our field of interest to all West Coast seabirds. Monitoring of penguin colonies with and with no stoat control has shown that on the West Coast, stoat trapping does not increase penguin breeding success. Dog predation is a big problem on many beaches, and road-kill on parts of the Coast Road is a major cause of mortality. A simple penguin mortality database has shown what kills penguins and where most penguin deaths occur, and guided much of our management. A short penguin proof fence at Punakaiki has prevented further road kills at that colony and a 2.5km fence to be built in 2013-14 should prevent deaths at several other trouble spots. Much of our work is in advocacy and education. We are currently developing an education package for West Coast schools and have published a leaflet on West Coast Seabirds. We are working to enhance blue penguin and sooty shearwater colonies at Cape Foulwind where eventually there should be free public viewing of both species.

Petrels and albatrosses

Canterbury Museum seabird projects. By Paul Scofield

Paul Scofield is currently working on the following projects;

- a) Incidence of plastics in the stomachs of bycatch specimens.
- b) Demography of Fiordland crested penguins (with Helen Otley), blue penguins (with Graeme Taylor), black petrel (with Biz Bell), and Hutton's shearwaters (with the Hutton's Shearwater Trust),
- c) Taxonomy; grey-faced petrel (with Landcare), Cookkilaria petrels (with Matt Rayner and others), penguins and shags (with Otago University researchers).
- d) Northern royal albatross at the Forty-Fours; very low fecundity in 1990s resulted in high proportions of the population attempting to breed each year. The counts from the 2005-10 period suggests a fairly stable population comparable in size to that of the 1970s.
- e) Chatham albatross at the Pyramid; mark-recapture studies indicate c5300 pairs breed annually, with the population fairly stable over time. Suggest censuses are repeated at 5 – 10 year intervals to reduce disturbance at the site.
- f) Northern Bullers albatross at the Forty-fours, population appears stable at around 17,000 pairs.

Spatial tracking of petrels and shearwaters to improve understanding of at-sea ecology, migrations and breeding behaviour. By Graeme Taylor

Recent seabird tracking studies include;

- a. Taiko – PITT tag programme (see NZ journal of ecology) to get individual movements, burrow attendance etc.
- b. TDRs –to determine dive depths, grey-faced petrel maximum depth 6m, Sooty shearwater 70m, flesh-footed shearwater 20m, Buller's shearwater 5m, Chatham Taiko 2m, common diving petrel 16 m, blue penguin 29m, Australasian gannet 14m.
- c. Geolocation devices– 17 species tracked including; sooty shearwater (Shaffer et al.), Chatham petrel (Taylor et al. Emu), Chatham I taiko, grey-faced petrel (184 tracks), little shearwater.
- d. GPS tracking; grey-faced petrel, blue penguin, taiko, flesh-footed shearwater and Buller's shearwater.

Numbers of shearwaters in NZ, prion genetics and more, Te Papa seabird projects. by Alan Tennyson

Te Papa seabird projects include;

- a. Puffinus study - Brings together population information for the 9 taxa, and shows that our knowledge of the species is very poor. Sets out the recommended monitoring sites for the future. Paper in press.
- b. Prion genetics study – ongoing work, fairy & fulmar prions closely related to one another but distant from the broad-billed, thin-billed, Salvin's & Antarctic prion clade. Antipodes fairy prions seem distinct from other fairy/fulmars.
- c. Vanuatu petrel studies.
- d. Lord Howe I seabird genetics.
- e. Antipodes Is *Pterodroma* hybrid.
- f. Wilsons storm petrel taxonomy.
- g. Hutton's shearwater type specimens.
- h. Spotted shag counts in Wellington harbour.
- i. Vagrant long-tailed skua.
- j. Macquarie I fossils.
- k. Pitt Island fossils.
- l. NZ birds online website & NZ Checklist.

Bethells Beach seabird research and monitoring. By Graeme Taylor

This study began in 1989 and involved annual monitoring of every burrow of all four species, grey-faced petrel, sooty shearwater, flesh-footed shearwater and diving petrel on two privately owned

inshore islands at Bethells Beach, West Auckland. About 6000 grey-faced petrels and about 1000 birds from the other three species have been banded. Grey-faced petrel numbers have increased, sooty shearwaters showed an initial increase to the year 2000 with a decline thereafter. The study site has been used for testing new techniques, tag attachments, development of artificial burrows, GPS tracking methods and chick rearing trials. One tracked sooty shearwater travelled 126,000 km in a year.

Black petrel monitoring and WMIL work. By Mike Bell (on behalf of Biz Bell)

Black Petrel work at Great Barrier Island has now continued for 17 years, with 400 study burrows followed annually. The need to keep the project going is widely acknowledged, however only through the commitment shown by the researcher has this been achieved. Funding is particularly difficult to maintain long-term. Recent work has included GPS and GLS tracking of the petrels.

Distribution, breeding & population studies of Westland petrels 1969-1993. By Sandy Bartle,

Long-term studies help us monitor the health of the planet and lack of support for long term studies weakens our understanding of science and of the natural world. Jim Mills' study of red-billed gulls at Kaikoura is the longest running seabird study in NZ. Bartle's study of Westland petrels ran from 1969-1997. Initially (1969 – 77) it was a study of the biology of the species. Logging in the Westland petrel breeding area was occurring in the 1960s and initially it was important to determine population sizes and colony distributions. Counts of birds flying in to colonies at dusk, daytime estimates of birds in all colonies, night time surveys to find new colonies were all undertaken. Banding continued throughout. The population was increasing in early 70s. Major threats at the time were dog predation and human-based threats such as logging, mining and habitat destruction. Stoat predation was not significant, habitat damage by goats was an issue. Breeding phenology & at-sea distribution were studied. A second phase of the study (1977 – 1997) was more management orientated. Set up 100 study burrows with the aim to measure breeding frequency, recruitment rate and survivorship (female survival was lower than male). He found a high frequency of non-breeders at the colony. Chick banding began in 1977 and it would have been very useful had it started earlier. Migration studies showed that both breeding and non-breeding Westland petrels went to South American seas, from Peru south to Cape Horn and even to the Patagonian Shelf between breeding seasons.

Current Westland petrel studies. By Sue Waugh

Reported on current demographic studies make extensive use of Sandy Bartle's earlier banding data plus current banding data. Due for publication in 2013.

Predicting ENSO events with Titi (*Puffinus griseus*): recent trends and a brief look at the future. By Grant Humphries

This PhD study asks if we can use seabirds as predictor of upcoming oceanic events and relates climate and oceanographic data to changes in seabird populations, breeding success and mean size of fledglings. The focus of the study is the sooty shearwater, making use of muttonbird diaries, analysis of one which allowed retrospective 'prediction' of ENSO events. 2012/13 has been a disastrous year for sooty shearwaters with very low breeding success. Grant is also active with the Seabirds.net which provides a data hub for seabird research.

Short term population changes in flesh-footed shearwaters. By Sarah Jamieson

This post-doctoral study will investigate recent and historical population changes in flesh-footed shearwaters on three islands. Preliminary results suggest that there have been declines at all three islands, at Lady Alice Island only 11% of burrows had flesh-footed shearwaters, competition with grey-faced petrels may be an issue. At Ohinau Island only 23% of burrows were occupied by flesh-footed shearwaters with 5% of eggs laid abandoned. On Titi Island only 11% of burrows were

occupied by flesh-footed shearwaters, with those parts of the island dominated by sooty shearwaters having fewest flesh-footed shearwaters. In addition to fisheries bycatch, a known threat for this species, some were killed during the Rena oil-spill and many forage near Fukushima so radiation is potentially a threat.

New Zealand storm petrel. By Chris Gaskin

The New Zealand storm petrel was first sighted in the Hauraki Gulf in 2003. Initially there was wide spread scepticism as to the identity of the Hauraki Gulf storm petrels, were they really the virtually unknown New Zealand storm petrel or a plumage variation of something more common. The first bird was captured off Little Barrier in 2004, it was indeed the New Zealand storm petrel, which had been assigned to an incorrect genus, it was found to belong to the genus *Fregetta*. The first known breeding site on Little Barrier Island was found in 2013 after 25 birds captured at sea had a 1gm radio transmitter fitted to their tail. Automated radio receivers on Little Barrier detected the breeding site NE of the Ranger Station. The first chick was discovered in April 2013. There is also interest in *Fregetta* storm petrels in New Caledonian waters which could be a new species.

Sensory ecology of petrels (PhD proposal). by Megan Friesen

Procellariiforms are known to have very complex olfactory chambers but the use of olfaction in these birds is little studied. This PhD study will investigate olfaction and other senses in petrels and compare scents, colours and calls between petrel species. It will try to find ways that scents, colours and calls can be used to attract petrels to new sites and to use nest boxes. There will be chemical analysis of odorant deterrents. Anne Gaskett is supervisor at University of Auckland.

Penguins

Prehistoric audit of New Zealand's seabird species. By Nic Rawlence

Sea lions and yellow-eyed penguins colonised, or recolonised, the New Zealand mainland after local extinctions following the arrival of Maori. Part of this study will determine, by use of modern and ancient DNA and radiocarbon dating, when the mainland breeding Waitaha penguin become extinct, and when it was replaced by the colonising yellow-eyed penguin. The research will also investigate the past distribution and relatedness of crested penguins in the New Zealand region and investigate the taxonomic status of the extinct Bass Strait crested penguin *Tasidyptes hunteri*.

Nic (in collaboration with Martyn Kennedy and Hamish Spencer, University of Otago) is also investigating the phylogeny of *Leucocarbo* shags in the New Zealand region. Preliminary work sets the King shag apart from Stewart Is shags, the latter apparently being very close to the Chatham Is shag.

Eudyptula penguin taxonomy. By Stefanie Grosser

The taxonomy of the *Eudyptula* penguins has been debated since the first description of the species, with two species proposed in 1970, one species with six subspecies (five in NZ and one in Australia) in 1976, but in 1990 only a single taxa was recognised. Recent molecular work suggests two taxa, one found in Australia and Otago, the other the rest of New Zealand and the Chatham Islands. The current study supports the Australian/Otago and New Zealand/Chathams clades. Banks et al. 2002 suggested that Australia was colonised from New Zealand about 2.4 million years ago, then Otago was recolonised from Australia about 0.1 mya following local extinction. Based on knowledge about extinction-recolonisation events seen in *Megadyptes* penguins and NZ sea lions Stefanie will test the hypothesis that *Eudyptula* penguins likewise underwent a more recent local anthropogenic extinction and subsequent recolonisation. Stefanie will use ancient DNA analysis and carbon dating of *Eudyptula* bones to pinpoint the time of arrival of the Australian lineage in NZ and investigate gene flow between parts of New Zealand.

Is Campbell Island's Eastern Rockhopper Penguin population still in decline?

By Kyle Morrison

The numbers of rockhopper penguins at Campbell Island have declined dramatically since the 1940's. Based on anecdotal evidence climate change and sea water warming have been suggested as causes. This PhD study will investigate cause of the decline and determine if the decline is continuing. The situation is more complex than generally thought. While most colonies, in particular the Penguin Bay colony, have continued to decline during the last 25 years, others including the Azimuth and Cattle bay colonies have increased while some large colonies seem to be relatively stable. Possible causes of declines include; changes in sea surface temperature, decreased productivity, competition with/ predation from recovering fur seal and sea lion populations, skua predation, researcher or bander disturbance.

Fiordland crested penguin, Snares crested penguin and yellow-eyed penguin research.

By Ursula Ellenberg

Ursula Ellenberg and Thomas Mattern are currently working on the following conservation and management focused projects;

1. Penguin responses to human disturbance, measuring heart rate, stress hormones, behaviour, reproductive success and survival, and how stress coping styles vary between species (Fiordland, Snares, yellow-eyed), populations, and individuals.
2. Foraging ecology of yellow-eyed penguins and the impact of commercial fisheries on these penguins. These birds are bottom foragers generally feeding in waters <100m deep.
3. Investigating the cause of sudden death events of yellow-eyed penguins (56 died on Otago Peninsula in 2013) – probable cause toxins (all deaths were down current from Dunedin city), no evidence of disease was found and birds were in good body condition.
4. Foraging and behaviour of Snares crested penguins.
5. Fiordland Penguins - nest count methodologies.

Survival and productivity of rehabilitated Little Blue Penguins from the Rena oil spill.

By Karin Sievwright

Following the Rena oil spill 112 oil contaminated blue penguins were found dead and 389 were recovered alive and taken into care. Of those taken into care, 95% survived and were pit-tagged before being released back into the wild. This graduate student project is comparing the survival and behaviour of the rehabilitated group with that of a pit-tagged control group of birds that were never oiled.

Shags and Gulls

Foraging of Pitt Island shags. By Mike Bell

TDRs were successfully deployed on Pitt Island shags from two colonies on the main Chatham Island last summer.

Inverse long-term fluctuations in population sizes between Stewart Island shags and red-billed gulls in Otago. By Chris L alas

Long term declines in red-billed gulls at Kaikoura were only detected after 10 or even 15 years of annual monitoring as ENSO influences decade long population changes. Red-billed gull numbers in Otago have increased during the last 10 years. Between the 1970's and 1985 Stewart Island shag numbers increased by 12% per year but have decreased by 2% per annum from late 1987 until 2012. In South Otago three new colonies have developed since 1995.

Recommendations regarding seabird translocations

By Helen Gummer

As one of the outcomes from this meeting, the group recommended that DOC sets up a 'Seabird Technical Group' which will include some non-DOC members. A Seabird Technical Group could be used to provide advice to those wanting to undertake new acoustic attraction projects and translocation projects to ensure:

Suitability of establishing the species at a specific site/location in relation to species biology, threat status, historical range, ecological restoration goals, etc.

Appropriateness of commencing a species colony establishment project with respect to other projects in the region. There may be projects aiming to establish colonies of the same species within relatively close proximity (e.g. <100 km), and there are several issues that need to be carefully considered. For example, such projects should not be broadcasting the same recordings. Even if projects are broadcasting different vocalisations, they should appreciate that some birds (translocation or non-translocated) may be attracted into other sites in the region when they return as adults, i.e. the success of a project may be compromised if the birds find another site in the region more attractive or are lured into other sites by birds looking for partners. For example, in the Wellington Region there are two fluttering shearwater colony establishment projects, one on Mana Island and the other on Matiu/Somes Island. Six of the chicks released on Mana Island have been attracted as returning adults to the new colony on Matiu/Somes Island (Helen Gummer, seabird translocation specialist, pers. comm. 2013); this is likely to be attributed to the fact that both islands are broadcasting the same calls.

Timing (year) of the transfers associated with a project are appropriate with regard to removing chicks from the recommended source colony. This is particularly important if there is only one recommended source colony (e.g. Pycroft's petrels on Red Mercury Island/Whakau). The project must be considered alongside all past, present and known future proposed projects involving the same species. Priority must be given to the most appropriate project(s) ; this may be a series of transfers in a new translocation project, or it may be a series of supplementary transfers to top-up an establishing colony (i.e. past translocation project). Source colonies should not be exhausted in any way by repeated removal of chicks for translocations, often from the same pairs in marked burrows. Where source populations are fragile (e.g. threatened species), it may be deemed necessary to 'rest' the source colony between projects for a certain number of years, to allow a fuller and more genetically diverse recruitment of chicks fledging in those 'rest' years to the source colony in subsequent years. Some colonies may also be more vulnerable to disturbance caused by human activity (e.g. friable sites where burrows can easily be damaged or collapsed disrupting breeding success and potentially pair bonds), and these impacts may need to be minimised by limiting access to the colonies in certain years.

Translocation techniques are the most appropriate for the species. It may be that a delay in further translocation projects is required to assess the success of transfers attempted to date for a particular species, in order to assess both return rates of transferred chicks as well as their breeding fitness.

Project proposals have a high likelihood of resulting in the establishment of a new seabird colony (i.e. will have good conservation outcome) and therefore make good use of fund raising efforts required to support these rather costly translocation projects.

Such a group could also help design a national colony establishment strategy if there is continued and growing interest from community groups in restoring seabirds to their former breeding range.

Petrel translocations recommended

- White-naped petrel to Raoul Island. High priority
- Kermadec petrel to Raoul Island. Low priority
- Cook's Petrel (Codfish Island to Chalky Island). Medium priority
- Chatham albatross to Chatham Island. Medium priority
- Northern royal albatross to Pitt Island. Low priority
- Buller's shearwater to Rakitu & Fanal Islands. Medium priority

- Cook's petrel (from Little Barrier Island) and black petrel to Maungatautari. Low priority

Abstracts from those presenting at the Seabird workshop, Wellington, 5-6 May 2013

Conservation of New Zealand seabirds – a review of current work programmes by Department of Conservation

Graeme Taylor, Department of Conservation, gtaylor@doc.govt.nz

The Department of Conservation is the government agency responsible for the management of New Zealand's biodiversity including its special seabird fauna. New Zealand has more endemic and more threatened seabirds than any other country. DOC funding has been reduced in recent years and the number of staff working on seabirds has declined since 2004. There are two major work streams. Work on ACAP species is largely run through the Conservation Services Programme funded by fishing industry levies and crown funding. This programme supports research and monitoring of albatrosses, *Procellaria* petrels and a few shearwaters, mainly by contractors and CRI's. It also covers the fisheries observer and autopsy programmes for monitoring fishing impacts on protected species of seabirds and marine mammals. The other crown-funded work stream covers mainly land-based threats to seabirds although recently there has been at-sea tracking done on non-ACAP species to examine foraging range and behaviour. The programmes funded by DOC in general represent those species most at risk of extinction. These include:

- Chatham Island taiko and Chatham petrel recovery programmes,
- protection of NZ fairy tern nesting pairs and incidental protection of other tern and gull colonies at the same sites
- safeguarding the Taiaroa Head albatross colony and other seabirds at that site
- monitoring and protection of the mainland nesting Hutton's shearwaters and Westland petrels
- monitoring of the Codfish Island population of South Georgian diving petrels
- monitoring and predator control to protect mainland populations of yellow-eyed penguins
- monitoring of Fiordland-crested, Snares-crested, rockhopper and erect-crested penguins in southern NZ and sub-antarctic islands
- assessment of effects of flipper bands on blue penguins
- protection of some black-fronted tern and black-billed gull colonies as part of the back stilt recovery programme
- monitoring and protection a of a few mainland and near-shore island colonies of grey-faced petrels and sooty shearwaters
- eradication of mammalian pests from various offshore islands
- support for seabird translocations to restore populations
- mentoring of student research projects and general advice to public about seabird issues
- training in bird capture, handling and marking techniques

Very little effort is going into monitoring seabird populations, census of seabird populations or studying population trends except for the projects above. The latest DOC model is to encourage greater collaboration and involvement of community groups, business interests, iwi and other government agencies in the planning and implementation of biodiversity work. To improve the conservation status of seabirds we will need to attract a large number of external parties to work on seabirds as the current DOC staffing levels and funding will not permit an expansion of the work programmes above.

Poutiri Ao o Tane (Boundary Stream Mainland Island) seabird translocations.

By Denise Fastier, Department of Conservation, dfastier@doc.govt.nz

Boundary Stream (Hawke's Bay) is one of DOC's 6 mainland island projects which has had intensive predator control over 800ha since 1996, and increasing predator control in the surrounding areas. 2300 ha has been under intensive predator control for cats and mustelids for upwards of 5 years and in the last year this has been extended to 8800 ha under the Poutiri Ao o Tane project. The seabird

release site is within a 1.9 ha, pest-proof fence, c24 km from the sea on the top edge of Boundary Stream Mainland Island. Fifty Cook's petrels were translocated in March 2013. Plans are underway for a trial transfer 50 mottled petrel from Whenua Hou to the site (and also Cape Sanctuary) following a successful feeding trial last year.. It has also been suggested as a site for Black petrel under consultation from seabird experts. These translocations have been undertaken under the Poutiri Ao o Tane project (<http://www.facebook.com/poutiri>, <http://www.poutiri.co.nz/>) a collaborative community restoration project, and in close association with the Cape Sanctuary.

Two Waikato seabird projects,

by Chris Smuts-Kennedy, I68 Burns St., Cambridge 3432.

1. Maungatautari

This restoration project started in 2001 with the establishment of the Maungatautari Ecological Island Trust (MEIT). In 2006 the 3,400 ha forested mountain (~12 km SE of Cambridge) was enclosed by a 47 km pest fence, and all pest mammals except mice were eradicated. Mice were eradicated from 4 sub-exlosures within the main fence, so a total of ~100 ha is now free of all pest mammals. Introduced mammals had reduced the number of forest-dwelling native bird species to 12. Reintroductions have now increased that number to 20, and at least a dozen additional bird species are being considered for reintroduction. That list includes 2 seabird species, Cook's petrel and black petrel. In the early years of the project discussions were had with seabird experts, and these 2 species were recommended as appropriate and potentially valuable for the conservation of the species and for the ecological restoration of the site. MEIT staff have undertaken one field trip to Little Barrier with Matt Rayner to scope the logistics of undertaking a Cook's petrel translocation. Helen Gummer has provided very detailed guidance for undertaking such a project, with estimates of costs. MEIT has so far focussed on reintroducing species that might provide more immediate indications of success, and species that might draw short-term visitors (the project increasingly relies on public support and funding). But a point will be reached when these seabirds are the next species in the queue, and further discussions will then need to be had with experts and stakeholders to develop a translocation proposal. We understand that best practice protocols exist for the translocation of Cook's, but not yet for blacks – and Maungatautari might be a useful trial recipient site for the latter. See www.maungatrust.org.

2. Karioi

Karioi is a forested 1,800 ha mountain rising to 756m asl on the Waikato west coast just south of Raglan. Most of it is managed as part of the Pirongia Forest Park, and the rest has other reserve status with some Maori-owned and private land. It has important conservation values, with significant pest management being undertaken by NZ Forest Service and then by DOC since 1981. A community conservation project was started in 2009, called the 'Karioi Maunga to Moana' project. It is a community-led partnership between A Rocha Aotearoa New Zealand (see <http://www.arocha.org/nz-en/index.html>), Te Whakaoranga O Karioi (a local conservation incorporated society), local hapu, DOC, the Waikato Regional Council (Environment Waikato/EW) and the local community. Their initial aim is to protect 500 hectares of habitat for a small remnant breeding colony of oi (grey faced petrels) on steep coastal faces, and also for forest birds in general. They plan to progressively restore more of the mountain (and eventually all of it), and this can include reintroductions of locally extinct species including seabirds. Nineteen km offshore lies 3 ha Gannet/Karewa Island, which has a breeding population of ~8,000 pairs of gannets (one of the largest in NZ), and this is a potential source for the establishment of a mainland colony on the rugged Karioi coast (using decoys and call playback). The group has already commenced some significant pest control, to add to the already existing control undertaken in the area by DOC and EW. An estimated 6,000 volunteer hours have been contributed to this work so far. A forest bird monitoring programme has been in place since 2009. More than 20 oi have been banded at the colony (banding is happening right now as the 2013 breeding season commences), and some successful breeding has recently been recorded. Their intention now is to establish firm restoration goals according to a timeline (following discussions with e.g. seabird restoration experts), and to better focus their efforts to achieve those goals. They are currently raising funds for the production of an Operations Plan which will describe how this can best be achieved.

Katiki Point Penguin Charitable Trust—penguins and petrels on the mainland at Moeraki

By Chris Lalas

Conservation management of seabirds on the mainland near Moeraki, North Otago, began in 1983 with the aim of protecting a small colony yellow-eyed penguins. Their nest numbers subsequently increased from five nests at one location (Okahau Point) in 1983 (15% of the North Otago total) to a total 50 nests at two locations in 2012 (80% of the North Otago total). Depredation of chicks by introduced predators was immediately eliminated by trapping. A shortage of nest sites was rectified by the deployment of nest boxes. Two 1 hectare blocks of forest 1 km apart were created by planting in 1984–1989 on retired pasture at Okahau Point and Katiki Point. Studies elsewhere indicated that yellow-eyed penguins prefer nest sites beside ecotones rather than within forests. Consequently, plantings since 1990 have concentrated on creating ‘vegetation islands’—a few shrubs planted around a nest box—rather than creating forest. Nesting by yellow-eyed penguins at Katiki Point began in 1991 following the first soft release of rehabilitated penguins. Numbers subsequently rose to a peak of 30 nests in 2008, with 25 nests in 2012. The public has free access to Katiki Point and, with an estimated 30,000–40,000 visitors annually, human disturbance is an ongoing problem. Increase in nest numbers of yellow-eyed penguins at Katiki Point can be attributed to good luck and (in order of decreasing importance): control of introduced mammalian predators; prohibition of dogs; deployment of nest boxes; mitigation of human disturbance; rehabilitation of compromised penguins; revegetation; and grazing of grassland by sheep. During the 1990s burrow-nesting seabirds began colonising the forest created at Katiki Point. Sooty shearwaters are most abundant with ± 200 nests in 2012. Two smaller species, broad-billed prions and white-faced storm-petrels are also present but suffer mammalian depredation. Advice is desperately needed in order to eliminate these losses.

The West Coast Blue Penguin Trust

Kerry-Jayne Wilson, West Coast Blue Penguin Trust.

The West Coast Blue Penguin Trust is a charitable trust formed in 2006 by local residents concerned at the decline in blue penguin populations. The aim of the Trust is to conserve the South Island West Coast blue penguins. While our initial focus was restricted to blue penguins we are expanding our activities to include other West Coast seabirds.

The Trust acknowledges that effective conservation must be underpinned by robust research yet our efforts to conserve penguins are dependent on the support of the local community. To this end education and advocacy are equally important as research and population monitoring. The Trust undertakes problem solving research into the ecology of West Coast blue penguins and monitors colonies subjected to differing types and degrees of threat. On the West Coast, the major threats to blue penguins are road kill and uncontrolled dogs. Papers in scientific journals are important in maintaining our credibility, but to achieve effective conservation our messages must reach the community within which we work. We visit local schools and are currently developing an education package for use in primary schools and youth groups. We regularly give public talks and workshops, and attend local events.

In 2011, with financial support from the New Zealand Transport Agency (NZTA), a trial fence was erected to prevent penguins at one colony straying onto the highway. We are currently working with NZTA to build a 2.5km fence along that stretch of highway where most road-kills have occurred.

We have projects close to each of the main coastal towns. At Cape Foulwind, near Westport, we are working to enhance blue penguin and sooty shearwater colonies adjacent to the popular Fur Seal Colony Walkway so that in future there will be free public viewing of these birds. At Greymouth the Trust is working with the Grey District Council to protect penguins as part of their larger conservation project. At Hokitika we work with youth groups to improve penguin habitat and protect penguins that breed on the northern edge of the town. The West Coast extends along 500 km of coast; it has a small population and much of the area is remote with limited access. This is a particular challenge for us.

For more information visit our website <http://www.bluepenguin.org.nz/> or follow us on facebook. <http://www.facebook.com/pages/West-Coast-Blue-Penguin-Trust/>.

Seabird tracking projects

Graeme Taylor, Department of Conservation, gtaylor@doc.govt.nz

This is a long-term collaboration between Department of Conservation and various associates including University of Auckland, NIWA and British Antarctic Survey started in 2008. Between 150 and 200 tags were purchased by DOC including geolocators (GLS tags), time depth recorders (TDR)

and a few GPS tags. Additional tags have been supplied by the other agencies. The aim of the project is to sample as many of the non-ACAP species as possible to determine the foraging range, movements, activity hotspots, foraging behaviour, activity patterns on the colony and attributes of the breeding cycle. Geolocaters have been applied to 17 species since 2008, TDRs to 8 species and GPS tags to 5 species. The collation of metadata alone is a massive undertaking with so many different species and individuals, project sites, tag types and various collaborators. Where possible multiple species have been tracked from the same study sites to reduce the logistic costs associated with capture, tagging and recovery of the tags in subsequent field trips. To date 8 *Pterodroma* spp, 5 *Puffinus* spp., 3 *Pachyptila* spp, common diving petrel, Australasian gannet and blue penguin have been tracked.

Data cleaning is a massively time consuming aspect of the project, especially for the GLS tags, with over 600 tags deployed and 400 tags recovered to date. Many tags are currently out on birds. The largest datasets are from grey-faced petrels (184 birds at 3 sites), sooty shearwaters (109 birds at 3 sites), flesh-footed shearwaters (74 birds at 2 sites), and CI taiko (35 birds). Several publications have been produced to date or are in prep. These tracking data are generating some surprising new findings such as the unexpected post-breeding migration of little shearwaters to the SE Pacific and CI taiko visiting the Tasman Sea.

Bethell's Beach seabird monitoring project

Graeme Taylor, Department of Conservation, gtaylor@doc.govt.nz

The Bethell's Beach (west Auckland) project started in July 1989 and has been run annually ever since. The project has limited DOC funding, mainly covering the logistics for the main field trips each year (3 main trips in April, July-Aug and Nov-Dec) and I also do a few opportunistic visits each year. All data entry and analysis is done in a volunteer capacity outside of normal work hours. The field programme has been largely justified as the opportunity to test and develop new techniques for endangered species programmes and to train DOC staff and volunteers in seabird capture, handling and marking techniques.

A major strength of the project is in the consistent data collection over a long time period by one observer with volunteer helpers. The two study islands are both small (<2 ha), privately owned, with limited public access due to surrounding cliffs and a locked gate on one island. The islands are connected at low tide making researcher access relatively easy and the owners have a bach available for accommodation. There are four breeding petrel species: grey-faced petrels (c400-450 pairs), sooty shearwaters 25-50 pairs, flesh-footed shearwaters 15-25 pairs and common diving petrels (10-30 pairs). These islands are the only sites in New Zealand where four petrel species nest on an island connected to the mainland.

All burrows on both islands are monitored annually except for diving petrel burrows (many of which nest on inaccessible cliff ledges). The key attribute of the study is that all the larger petrels are monitored (breeders and non-breeders on both islands) and all chicks reared each year are banded or at least identified as present. Nearly 6000 grey-faced petrels have been banded and about 1000 of the other species. The majority of the birds are sexed by DNA, calls or behaviour. Each year at least one adult and often both partners in the nests are identified and night capture is used to identify non-breeders. Study access holes are present on most burrows and a burrowscope is used to check a few longer deep burrows.

Key information being collected includes:

- Annual productivity and burrow occupancy rates
- Adult survival rates and longevity
- Chick recruitment rates from each annual cohort (24 years of banded chicks to date)
- Juvenile survival and dispersal
- Rates of immigration and emigration between the two colonies and non-natal sites
- Nest and pair fidelity
- Inter-colony and within colony movements (distances moved as every capture event is identified by site)
- Interaction between species
- Causes of mortality

- At-sea tracking of sample of adults to determine foraging range and breeding cycle, and land-activity patterns from the GLS tags.

A comprehensive picture of how a seabird breeding community interacts and changes over time is emerging from this study. The major challenge is maintaining the various species databases while maintaining family life and finding time to begin publication of the many aspects of this long-term study. The project will be scaled back from 2013 to allow more time to analyse data and produce publications.

Distribution, breeding, & population studies of Westland petrels 1969-1997

Sandy Bartle, sandy.bartle@inspire.co.nz

During a scoping phase 1969-1978 the main aim was to determine the limits of burrow distribution and estimate the population sizes of the subcolonies. Techniques included counts of birds flying in, daytime surveys and estimates of numbers of occupied burrows in each sub-colony; and night surveys and banding for capture-recapture population estimates on 4 major sub-colonies.

Secondary aims were to determine population trend and major threats, and that remedial measures be taken by regulatory agencies and landowners. Results showed that the population was increasing at about 5% per year and that there was a low rate of mammalian predation on all colonies except for an illegal harvest of young.

Further aims were to determine key breeding dates, 1977 being the first year when monthly colony visits could be made. At-sea distribution in NZ waters and relationship to trawl fisheries was determined from observations from commercial & research trawlers throughout the EEZ 1966-1978, plus Abernethy's data 1956-58.

Standardised sampling (3 periods of field work per year) extended from 1977 to 1997, focussing on population dynamics and behaviour. 100 study burrows were established and monitored. Objectives were to determine breeding frequency, breeding success, recruitment rate and age at first breeding. Recruitment rate was found to be very high, with the earliest birds returning at age 4 or 5, and mean breeding in males at age 10. Survivorship varied by gender, with females recruiting younger, but surviving less well. The lower survival of females limited population growth. The percentage of non-breeders on the colonies was found to be high (around 30%), but inter-colony movement and hence gene flow was found to be very low. From both the scientific & conservation viewpoints each sub-colony is effectively a closed population.

Synchronous breeding dates suggested that Westland Petrels were migrants, and regular band recoveries and sightings from 1984 between Peru & Cape Horn confirmed that juveniles spend their early years in South American waters, and that both breeders and non-breeders migrate during the austral summer to moult there.

Proposed PhD research: Seabird conservation through sensory ecology: understanding petrel scents and sounds

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This project proposes a multidisciplinary approach to research on one of the world's most at risk animal groups - seabirds. Birds were once thought to have very poor sense of smell, but recent research indicates scents can be used in a range of behaviours including navigation, foraging, and recognition of mates and chicks. Procellariiform seabirds such as petrels are renowned for their

extreme journeys across featureless oceans, nocturnal behavior, and burrow-nesting in large colonies - activities that suggest they rely on scents and calls much more than visual cues. This PhD aims to combine 1) chemical, sonographic and spectral analyses of bird scents, vocalisations and visual signals, 2) in situ experiments in active bird conservation and translocation zones, and 3) chemical analysis of odorant deterrents that could be used in seabird bycatch mitigation. We believe that understanding and integrating this sensory ecology into management practices is key to improving seabird conservation.

Prehistoric audit of New Zealand's seabird species

Nic Rawlence

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Recent research suggests that native species can respond rapidly and dynamically to human impacts. Yellow-eyed penguins, for instance, apparently arrived in New Zealand only recently, replacing a prehistoric penguin species that was wiped out shortly after humans arrived here. Intriguing new data also hint at similar extinction-recolonisation scenarios for New Zealand's sea-lions and little blue penguins. These rapid 'replacement' events, where offshore populations apparently benefitted from the extinction of their mainland relatives, seem unprecedented in the history of ancient-DNA research. This project will use carbon-dating, and state-of-the-art DNA analysis of prehistoric bones, to shed light on New Zealand's dramatic biological history. By conducting a biological 'audit' of prehistoric New Zealand, we will test the new idea that human arrival led to the extinction of a previously unrecognised 'treasure trove' of unique coastal animal species around our coast. The study will also determine how many of our iconic coastal species are actually new arrivals from overseas.

Three of the taxa I'm focusing on are *Megadyptes* and *Eudyptes* penguins, and blue eyed shags (*Leucocarbo* spp.).

Waitaha/yellowed eyed penguin: Research by Boessenkool *et al.* (2009) found three archaeological yellowed eyed penguins (*Megadyptes antipodes*) from southern New Zealand that may represent the first recolonisers after the extinction of the Waitaha penguin (*Megadyptes waitaha*). Using radiocarbon dating of previously tested and new specimens, and ancient DNA analysis, we aim to constrain the timing of this extinction-colonisation event. In addition, *Megadyptes* bones from the North Island will help determine how much phylogeographic structure is present in this genus.

Crested penguins: The current distribution of the Fiordland crested penguin is probably a relict distribution as a result of anthropogenic impacts. Using ancient DNA and morphological analysis, and radiocarbon dating of crested penguin bones from throughout New Zealand and the Chatham Islands, we aim to determine how widespread the Fiordland crested penguin was before human colonisation, and what additional species of crested penguin may have been present in New Zealand and the Chatham Islands. Modern specimens and historical bird skins will also provide vital data on the amount of genetic variation in Fiordland crested penguins. I'm interested in talking to people about collaboration and obtaining modern specimens (e.g. tissue, DNA) of crested penguins.

Blue eyed shags: In collaboration with Martyn Kennedy and Hamish Spencer (University of Otago), I'm using modern and ancient DNA to examine the phylogeography and taxonomy of blue eyed shags (South American, Antarctic, subantarctic, and New Zealand taxa), especially how it relates to the taxonomic status of the King Shag (*Leucocarbo carunculatus*) and what its closest relatives are, and the pre-human distribution of *Leucocarbo* shags in New Zealand and the subantarctic islands. I'd be interested in talking to people about collaboration and obtaining modern specimens (e.g. tissue, DNA) of blue-eyed shags, especially Stewart Island (*Leucocarbo chalconotus*) and King shags, and morphometric analysis.

Taxonomy and population structure of Blue Penguins.

Stefanie Großer, Otago University,

Ph.D. Study in progress.

The overall aim of my project is to examine the population structure of NZ Little Blue Penguins and reconstruct the history of the "invasive Australian lineage" in the Otago region. The research will also provide a multitude of new genetic information in an attempt to resolve the long standing question of

E. minor taxonomy (subspecies, esp. white-flipped penguin). A large set of nuclear DNA markers (microsatellites) has been developed for this species and will be applied to samples from contemporary animals, subfossils and archaeological specimens to shed light on the spatial as well as the temporal changes in population structure. Carbon dating will be used to determine the age of subfossil material to pin-point the time of arrival of the Australian lineage in Otago.

So far I have gathered a large number of samples from all over NZ. Most of the samples were contributed by other researchers who are or have been working on Little Blue Penguins. For a large number of those samples I have done DNA extractions and sequenced the mitochondrial Control Region using previously published protocols. I have also developed and optimised a set of microsatellite markers and already analysed them in some individuals. However, at this stage I don't have any results that could be of interest for the current meeting.

I just wanted to let you know that I am working on this project and am very happy for people to contact me in that matter. I am still looking for more samples from certain regions, especially Catlins/Southland, Chatham Islands and Fiordland. If anyone knows of existing samples from those areas it would be great if they got in touch with me.

I am also interested in collaborating with people who are interested in other aspects of *E. minor* genetics or biology in general.

Is Campbell Island's Eastern Rockhopper Penguin population still in decline?

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Over the 43 year period from 1942 to 1985 the population of Eastern Rockhopper Penguins (*Eudyptes chrysocome filholi*) on New Zealand's sub-Antarctic Campbell Island declined by an estimated 94%, from ~800,000 to ~51,500 breeding pairs. Concurrent and on-going population declines of a similar proportion have been documented at multiple other breeding sites throughout the species' range, resulting in an IUCN threat ranking of 'vulnerable' and 'nationally critical' in New Zealand. The most important cause of these declines is likely reduced food availability related to ocean warming.

I estimated colony-specific population changes over the 27 year period from 1985 to 2012 by comparing colony areas and nest densities from photographs and physical measurements. I found a huge degree of inter-colony variation in recent population change from a decline of ~60% to an increase of ~30%. This variation appears related to how the physical characteristics of some colony sites facilitate predation, rather than being linked to differences in food availability. The current overall population trend on Campbell Island appears relatively stable compared to the previous period of rapid decline. The mean air temperature at Campbell Island was warmer in the past 27 years than during the previous 43 years, so that the relative stability of the Eastern Rockhopper Penguin population in recent years is unexpected. Additional research on oceanographic conditions and how they relate to food availability is required.

New Zealand Penguin Research

Ursula Ellenberg & Thomas Mattern

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Since more than 10 years we have been studying New Zealand penguins with a focus on Yellow-eyed, Snares and Fiordland crested penguins. We analysed their marine ecology, breeding biology and stress physiology always with the aim to help achieve conservation goals. Therefore, we work closely together with managers on conservation relevant questions that can inform management action.

Our research resulted in improved visitor management around Yellow-eyed penguin breeding areas, and lead to less impacting yet more reliable nest monitoring practices in Fiordland crested penguins. We found that Yellow-eyed penguins are almost exclusive bottom foragers that use under-water cues for orientation. We proved they rely on an intact benthic ecosystem and are thus particularly vulnerable to benthic habitat degradation. We could also show that Yellow-eyed penguins are among the more timid penguin species and together with the Fiordland crested penguins are most at risk from human disturbance. Snares penguins, in contrast, are less affected by human proximity; however, previous individual experiences with humans resulted in increased stimulus-specific stress responses.

Currently, we study the marine ecology of Yellow-eyed penguins on the Otago Peninsula relating foraging strategies to individual quality, life-time reproductive success and survival, as well as to oceanographic parameters. A seafloor survey in February 2013 with a ROV (remotely operated vehicle = dive robot) in Yellow-eyed penguin foraging habitat revealed considerable interactions with the commercial fisheries. This survey also gave us the opportunity to collect water and plankton samples in penguin foraging habitat during the recent Yellow-eyed penguin die-off. We are currently involved in epidemiological research aiming to better understand and ultimately mitigate such adult mortality events.

As long-lived top-predators, penguins have life-history traits that make them particularly vulnerable to unnatural adult mortality. We believe, penguin bycatch in the commercial inshore fisheries can and must be considerably reduced to safeguard penguin populations particularly around the New Zealand mainland.

Currently, we are seeking funds for a study on Fiordland crested penguin marine ecology as well as for a more detailed assessment of human disturbance effects on Fiordland crested penguin breeding colonies. Such research will provide a solid basis for effective and anticipatory management decisions.

Post-release survival and productivity of rehabilitated Little Blue Penguins from the Rena oil spill

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Little Blue Penguins (*Eudyptula minor*) were one of the species most affected by the Rena oil spill. 112 dead penguins were collected during the Oiled Wildlife Response (OWR) and 383 live oiled penguins were admitted to care facilities where they were treated, cleaned, washed, and rehabilitated by members of the National Oiled Wildlife Response Team. 95% of the rehabilitated (de-oiled) penguins survived to be released back into the wild. Pre-release the penguins were chipped with an individually identifiable microchip as was a control group of penguins (non-oiled and non-rehabilitated) from within the area to enable a post-release survival and reproduction study to be conducted. This study aims to determine if the de-oiled penguins were able to survive the transition to the wild and thereafter have survival and reproductive rates equivalent to control penguins. Estimating post-release survival involves a mark-recapture study where the presence of de-oiled and control penguins detected during shoreline surveys will be used to provide minimum estimates of survival. Post-release productivity will be assessed by comparing hatching, fledging and egg success of de-oiled and control breeding pairs. The results of this study will be used to assess the overall effect of the oil spill on the penguins and the effectiveness of the OWR.

Importance of long-term census data exemplified by nest numbers of red-billed gulls and Stewart Island shags at Otago

Chris Lalas

The implications and applications of long-term monitoring are addressed for two threatened seabird species. These two species have low public appeal—gulls are a nuisance and shags are vermin. Three problems are highlighted in assessing population trends. First, nest numbers in any one year are not reliable indicators of population size because there can be large variations in the proportion of the

total population represented by breeders. Second, comparisons with broad temporal gaps may miss dramatic fluctuations through the missed years. Third, nesting distribution may spread to unmonitored locations. These problems are rectified by comprehensive long-term monitoring. There has been a large increase in red-billed gull nest numbers at Otago since comprehensive surveys began in the 1990s. This trend is the reverse of a concomitant decline at Kaikoura. Food availability for red-billed gulls, and subsequent nest numbers, at Kaikoura are correlated to the El Niño Southern Oscillation index with highs numbers likely during positive anomalies (el Niño conditions) in sea surface temperature (SST) and lows during negative anomalies (la Niña conditions). SST anomalies off Otago are the reverse of anomalies off Kaikoura. The recent increase in red-billed gull nest numbers at Otago may reflect long-term fluctuations in marine perturbations rather than more direct changes in anthropogenic effects. Chronological trends in Stewart Island shag nest numbers at Otago have matched those of red-billed gulls at Kaikoura, with increases leading to a peak around 1990 followed by a decline thereafter. These long-term data can be used to show that this decline was not caused by changes in terrestrial habitat, fisheries interactions or seismic oil exploration.

Abstracts from people unable to attend the workshop

Population trends, demography and at sea distribution of Antipodean and Gibson's wandering albatrosses.

Kath Walker and Graeme Elliott.

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Since 1991 and 1994 we have been monitoring populations of Gibson's and Antipodean wandering albatrosses on Adams Island (in the Auckland Islands) and Antipodes Island respectively. At both islands we made counts of nesting birds within representative blocks, studied survival, productivity and recruitment of a population of banded birds within defined study areas, and tracked the bird's at-sea movements using satellite tags and geo-locator data-loggers. These studies provide information on survival, productivity, recruitment, population trends and at-sea distribution.

Before 2005 both populations were increasing – Antipodean at about 8% per year, and Gibson's at about 3.5% per year. However, since 2005 both have declined substantially, and Gibson's and Antipodean wandering albatross populations are now c. 50% of their size in 2005. For both populations the decline has been caused by several years of low survival, particularly for females, and a drop in productivity. The breeding populations of both taxa are now very male biased.

The most recent analysis of the population data indicates the Antipodean wandering albatross population is continuing to decline at a rapid rate, whilst the rate of decline of Gibson's wandering albatross has slowed. A comparison of at sea distribution in 1994–2003 and 2006–2013, shows that both species are foraging more often in the most distant part of their ranges than they were before the population declines. More Antipodean wandering albatrosses now travel to the coast of Chile, including females which we had not previously recorded visiting South America, and more Gibson's wandering albatrosses travel to the Great Australian Bight.

At Sea movements of Chatham Island albatross species.

Lorna Deppe University of Canterbury.

Ph.D. ABSTRACT

Albatross populations are currently in decline around the world. Survival and reproduction of these large pelagic birds depends mostly on the conditions they encounter in their marine environment. Their ability to range far across ocean basins exposes them to a variety of anthropogenic threats. It is thus crucial to understand spatial and temporal patterns in the distribution and habitat use of each albatross species during different stages of their annual cycle in the context of seasonally changing demands as well as environmental constraints, in order to develop effective conservation measures.

Using Global Location Sensing (GLS) loggers I investigated the non-breeding movements and habitat associations of three threatened or near-threatened albatross species breeding in New Zealand's Chatham Islands, the Chatham Albatross (*Thalassarche eremita*), Northern Buller's Albatross (*T. bulleri platei*) and Northern Royal Albatross (*Diomedea epomophora sanfordi*), within South American waters. Chatham and Northern Buller's Albatrosses mainly occupied waters with mean sea surface temperatures (SST) of 17-18°C along the coasts of Chile and Peru, while Northern Royal Albatrosses were mostly found in 10-12°C waters off southern Chile and Argentina. Monthly movement patterns were linked to seasonal shifts in temperature range, suggesting SST was an important environmental factor in explaining the observed spatial and temporal patterns. GLS loggers were also applied to study the patterns of movement and habitat use of Chatham Albatrosses when migrating across the South Pacific between breeding and non-breeding grounds. The route and timing of migration were consistent over the three year period of the study, although subject to individual variation. Stopovers on migration were found to be common, lasting between 3 and 26 days. Activity patterns suggested that birds stopped in order to forage *en route*. Lastly, I used high resolution Global Positioning Sensing (GPS) loggers to address the fine-scale movements and habitat selection of foraging Chatham Albatrosses over three years during early chick rearing. This is a time when their behaviour is expected to respond to increased energetic demands as they are feeding young chicks. Foraging trips lasted between 1 and 6 days and the foraging range rarely exceeded 400 km. The location of potential foraging spots varied between years, but followed non-random patterns in bathymetry, slope, SST and Chlorophyll a. The results presented here suggest that albatrosses rely on predictable habitat features but are flexible to respond to fine scale changes within their marine environment. The dynamic nature of both birds and environment may prove challenging but has to be taken into account in conservation planning.

Long Point – a mainland seabird restoration project Yellow-eyed Penguin Trust and Seabird Conservation

David McFarlane -Yellow-eyed Penguin Trust – Field Manager, yepttrust@gmail.com

Overview / Introduction:

Since its establishment in 1987 the Trust has focused on the conservation of coastal fauna & flora, with a primary focus on yellow-eyed penguins.

The purchase of Long Point / Irahuka, (20km SE of Owaka) in the Catlins in 2009, marks a significant departure with an explicit focus on the conservation of other sea birds in addition to yellow-eyed penguins.

Vision for Long Point:

“The proposed vision comprises a mix of conventional restoration objectives and introduces more highly focused reintroduction activities, both reinstating the natural habitat of the area but catering explicitly for yellow-eyed penguins and a small range of ecological associates in the pelagic seabird fauna in the short term. In the longer-term, other flora and near-shore fauna associates will be accommodated in order to augment biological diversity and processes.” (Long Point / Irahuka Ecological Restoration Project – Vision Document – March 2011)

This process will involve the expansion of existing seabird habitats and the construction of a mosaic of new ones, designed to suit specific seabird species.

A list of sea birds for conservation at Long Point has been developed, based upon a combination of threat classification, contribution to ecosystem processes and advocacy potential.

Current Seabird List:

Penguins

Yellow-eyed penguin (*Megadyptes antipodes*)
Fiordland crested penguin (*Eudyptes pachyrhynchus*)
Little blue penguin (*Eudyptula minor*)

Shags

Spotted shag (*Stictocarbo punctatus*)
Stewart Island shag (*Leucocarbo chalconotus*)

Albatross & petrels

Southern royal albatross (*Diomedea epomophora*)
Southern Buller's albatross (*Thalassarche bulleri*)
Sooty shearwater (*Puffinus griseus*)
Mottled petrel (*Pterodroma inexpectata*)
Cooks petrel (*Pterodroma cookii*)
New Zealand white-faced storm petrel (*Pelagodroma marina maoriana*)
Grey-backed storm petrel (*Garrodia nereis*)
Fairy prion (*Pachyptila turtur*)
Broad billed prion (*Pachyptila vittata vittata*)
Common diving petrel (*Pelecanoides urinatrix*)

The Trust is seeking partner organisations to develop the project and researchers investigating questions contributing to conservation management at the site, and seabird conservation generally.

Currently we are partnered with Forest & Bird (Dunedin Branch) – (substantial funders of the Long Point purchase) and Landcare Research.

Long Point / Irahuka is also part of Forest & Bird (Dunedin Branch) :Bring Back the Seabirds : Otago Coast Seabird Restoration Project”

Mapping Project:

The Trust is currently seeking funding for a GIS mapping project to map existing features including fauna, flora and topography and then identify the most appropriate sites for the conservation of the selected sea bird species at Long Point.

Section 2 Research, monitoring and management priorities for New Zealand breeding seabirds.

Both August 2012 and May 2013 workshops highlighted the need for DOC to establish a seabird technical group to facilitate and coordinate seabird conservation in New Zealand. High priority

Major threats to seabirds

The main threats to seabirds are;

- Introduced predators
- Habitat loss
- Fisheries
- Oil, gas & marine minerals exploitation
- Climate change

Of these the impact of introduced predators, habitat loss and large scale factory fishing are well known and have been largely addressed. In assessing research/management priorities those actions that addressed inshore and recreational fishing, oil, gas & marine minerals exploitation and climate change are given priority here.

Taxonomic studies

Taxonomic studies underway

- Codfish Island population of South Georgian Diving Petrel (B Robertson)
- Status of southern and northern populations of Cook's Petrel (in progress, translocations maintain separation of the populations T Stevens, M Rayner)
- Grey-faced Petrel (in progress, NZ and Australian taxa probably different)
- Blue penguin complex (underway, S Großer ,J Waters/P. Scofield/ N Rawlence) need samples from Catlins & Southland.
- Origin of Otago blue penguins (S Großer)
- Taxonomic status of crested penguins (underway N Rawlence, K Morrison)
- *Leucocarbo* shags, (underway M Kennedy/ N Rawlence)

Taxonomic priorities, albatrosses & petrels

- NZ White-chinned petrel. Very high priority
- Common/South Georgian diving Petrel complex. High priority
- Gibsons & Antipodean albatrosses; are they separate species. Medium priority
- White-capped Albatross, status of NZ and Australian populations. Low priority
- *Pterodroma*; status of *cookalaria* petrels. Medium priority
- Kermadec petrel, are winter/summer breeders distinct taxa. Medium priority
- Wedge-tailed Shearwater. Low priority.
- Kermadec Storm Petrel, new accepted as a full species. Low priority

Taxonomic priorities, Penguins

- Genetic variation, population trajectories and ability to respond to environmental change for all crested penguin taxa (N Rawlence needs samples). High priority

Taxonomic priorities, shags

- *Stictocarbo* shags. Medium priority
- Pied shag, medium priority if significant bycatch.
- *Leucocarbo* shags, taxonomy & phylogeography (J Waters/P Scofield/ N Rawlence) underway

Taxonomic priorities, gulls and terns

- Taxonomic status NZ fairy tern. Very high priority

- Taxonomic status sub-Antarctic white-fronted terns. Medium priority
- Red-billed gull, apparently discrete taxa from Australian & New Caledonian populations. Medium priority
- Taxonomic status NZ Antarctic terns. Medium priority
- Taxonomic status NZ White tern. Low priority

Seabird surveys

The recently published survey of seabirds breeding throughout the wider Hauraki Gulf region (Cape Brett to Bay of Plenty) (C Gaskin & M Rayner) sets the bar for regional seabird surveys. Detailed systematic surveys in this region continue. Two national seabird colony databases funded by Forest and Bird and Te Papa respectively should soon be made available to seabird researchers and managers. These will provide a location for seabird workers to make unpublished data available, as well as being a resource for researchers and conservation managers. A detailed Otago seabird colony database is in progress (K Hand, C Gaskin).

Regional surveys, mainland NZ

- Fiordland, Ruapuke Is, Stewart island and offshore islands, Three Kings Islands. High priority
- Marlborough Sounds, Catlins Coast. Medium priority.
- New surveys with locations with major seabird colonies. High priority
- Resurveys at colonies with prior quantitative data. High priority
- All colony surveys are of value.
- Poor abundance data for burrow-breeding petrels at most localities

Regional surveys, out-laying islands

- Macauley Island, (Kermadec Islands) after rat eradication in 2006. High priority
- Survey seabirds recolonising Raoul Island (Kermadec Islands) every 5 years. Medium priority
- Resurvey seabirds on Rangatira Island, Mangere Island and the Star Keys (Chatham Islands). Medium priority
- Resurvey sooty shearwaters, Antarctic terns (top priority), skua, mottled petrels diving petrels and Cape Petrels (low priority) on The Snares.
- Population trends for all penguins on Auckland, Campbell, Antipodes and Bounty Islands.
- Baseline surveys of petrels on Auckland (high priority) and Campbell (medium priority) groups
- Collate available information for the Auckland Is. High priority.

Priorities for predator eradication

- Auckland Island (pigs, cats). High priority
- Chatham Island (pigs, cats, rats, possums). High priority
- Pitt Island (cats, pigs, weka, mice) High priority
- Arid I (ship rat, weka) (Auckland Council/DOC proposal). Medium priority
- Great Barrier Island Medium priority
- Great Mercury Island. Medium priority
- Stewart Island. Medium priority
- Antipodes Island (mice). Low priority

Recreational and inshore fishing impacts on seabirds

Recreational & inshore commercial set-netting and presumably also other fishing methods pose threats to penguins, shags and some petrels. Despite extensive research into the impact large scale fisheries pose to seabirds and management implemented to reduce their impact, there has been

little consideration given to the threats posed by inshore and recreational fisheries. The following actions were recommended;

- Form a fisheries impact sub-group lead by Ian Angus. High priority.
- All fresh flesh-footed shearwater, black petrel, Huttons shearwater, sooty shearwaters, yellow-eyed penguin, blue penguin, Fiordland crested penguins, pied shags and spotted shags found during beach patrols should be autopsied, paid through the DOC contract with Massey. High priority.
- The seabird autopsy programme to identify & analyse Snares and nominate cape petrels separately; this species was coming up in terms of priorities for by-catch concern.
- Karen Baird to approach MPI to pay for autopsies of all fresh specimens in the top 25 of their NZ seabird risk assessment recovered dead. (Annex II, National Plan of Action 2013). High priority.
- Propose Setnet exclusions zones through MPI planning processes and other means from The Snares and Otago coast to protect penguins. High priority
- Ask Chris Robertson for his autopsy data. Medium priority.
- Request OSNZ beach patrollers record any evidence of fishery mortality and collect any hooks/fishing gear found with beach-cast birds. Make sure beach patrol forms have space for recording this data. Medium priority.
- Survey fishers to determine which recreational fishing methods catch which seabird species. Medium priority.
- Enhance awareness of seabirds and recreational fishing impact through TV fishing shows and fishing magazines. Medium priority

Role of community groups/NGOs, advocacy and capacity building

The reliance of community groups, trusts and NGOs is set to increase with the new DOC framework, whether we like it or not it is important that we make this new structure work. The Yellow-eyed Penguin Trust will be holding a conference investigating the role of non-government groups in conservation in Dunedin 17-18 October 2013. It is important that community and other groups working in conservation attend.

The general public is less familiar with seabirds than terrestrial species; greater advocacy for seabirds is a priority. Community groups can play a key role here. As seabird workers we need to give lay people, in particular young New Zealanders opportunities to see and experience seabirds.

Recently there have been very few New Zealand students undertaking thesis or post-doctoral research on seabirds, most of the current graduate students being from overseas. While we are delighted that foreign students come here to study seabirds to maintain local expertise and ensure the future health of seabird research and conservation there is a need to facilitate and fund tertiary student projects with scholarships for Kiwi students. To facilitate collaboration and communication between seabird researchers and to raise the profile of seabirds amongst the research community regular seabird symposia should be held at the biennial Australasian Ornithological Conferences and at OSNZ annual conferences.

The following seabird projects are run by community and other non-government groups;

- Whangarei Heads, various species
- Tawaharanui Open Sanctuary, Auckland, various species
- Rapanui Point, Taranaki, grey faced petrels
- Young Nick's Head, gannets, grey-faced petrels, sooty shearwater, fluttering shearwater, fairy prion and blue penguin (S Sawyer)
- Hawkes Bay: Cape Kidnappers & Ocean Beach Wildlife Preserve, various species.
- Yellow-eyed Penguin Trust, 4 reserves, 3 managed for Yellow-eyed Penguin, one at Long Point for several seabird species.
- Hutton's Shearwater Charitable Trust, Hutton's shearwater translocation to Kaikoura Peninsula.

- West Coast Blue Penguin Trust, blue penguin conservation.
- Stony Bay, Banks Peninsula, pest proof fence for sooty shearwater.
- Forest & Bird, Otago Branch, Otago Coast Seabird Restoration Project, incorporates several sites, including fairy prions at St Clair cliffs
- Moeraki Peninsula, (Otago), several species (C Lallas)

Climate and sea temperature change

Climate change and associated changes in the marine ecosystem will affect New Zealand seabirds causing declines in some species increases in others. There was no agreement as to which species would be affected and little consensus as to research priorities. This is an area that needs much deeper consideration. The workshops suggested the following actions;

- Collaborate with Australian and Pacific ornithologists.
- Collaborate with climate scientists on various measures of climate such and ecosystem modelling.
- Review existing census information to identify candidate species for monitoring. High priority
- Identify key species susceptible to climate change. High priority
- Population trends, at sea distributions/foraging for erect-crested and rockhopper penguins. High priority
- Species most likely to be effected by climate change are those with limited foraging range such as red-billed gulls, marine shags, sub-Antarctic breeding penguins.
- Sooty shearwaters have proven links to long term climate factors.
- Research into the foods and foraging of monitored species is needed to make the link between population and climate changes.

Oil and gas exploration & production, marine mining

The current government is encouraging the search for oil, natural gas and minerals of the coast of New Zealand with scant regard to the threats this poses to seabirds and other marine life. Oil and gas exploration and production pose new and potentially major threats to seabirds. Below are basins where exploration is likely with those in bold areas where exploratory leases are currently being sought, listed in estimated descending order of importance to seabirds.

- **Great South Basin**
- Chatham Slope
- **Reinga/Northland**
- East Coast/ Raukumara
- **Taranaki Basin**
- Bellona Basin
- **Canterbury Basin**

In addition the Chatham Rise and Kermadec Arc, areas of major importance to seabirds have high potential for marine mining. We strongly recommend that seabird experts to have input into oil spill preparation plans, that we adopt a precautionary approach to exploration and exploitation and avoid oil and gas exploitation in seabird rich sites.

In addition to the obvious threats posed by an oil spill exploitation of marine minerals poses the following threats to seabirds;

- Gas flares put birds at risk of incineration.
- Light pollution from vessels.
- Mining process puts enormous volumes of sediment into the water column, disturbs benthos and greatly reduces productivity.

Oil, gas and marine minerals recommendations;

- Publication and subsequent overlay of at sea tracking studies to identify areas of key concern. Very high priority
- Use Marine IBAs to help identify areas of importance for seabird. High priority
- Study impact of seismic surveys on seabirds. Medium priority
- Undertake at sea distributional surveys as opportunity allows. Medium priority

Research priorities, albatrosses and petrels

Albatross priorities

- Salvin's Albatross, demography, productivity, adult & juvenile survival. High priority
- Correlation between the distribution of most albatross taxa with the distribution of fishing vessels. High priority
- Juvenile survival data required for most albatross species. Medium priority
- At sea ecology of black-browed albatross at Campbell Is. Medium priority
- Tracking of juveniles of all albatross species. Medium priority
- Note, there is a need to distinguish between real non-breeders opposed to failed breeders in at sea tracking studies.
- Continue regular monitoring of; Buller's albatross, grey-headed albatross, Gibson's albatross, Antipodean albatross,

Burrow breeding petrel surveys

The group of petrels with the poorest data on distribution and abundance is the burrow-breeding petrels with poor to very poor knowledge for most species at most localities. Priorities are;

- Develop survey methodologies (in progress, R Buxton, see also PhD outputs of Schumann, published papers coming out soon on short-tailed shearwaters). High priority
- Population trend data essential for all *Procellaria* species. High priority
- Flesh-footed shearwater, population trend data throughout range (underway, Te Papa). High priority
- Kermadec storm petrel. High priority
- Resurvey sooty shearwaters at colonies throughout their range with previous count data High priority
- White-chinned Petrel, Auckland Is and Antipodes Islands, population estimates. Medium priority
- Grey Petrel, population estimates at all breeding sites. Medium priority
- Surveys on islands with differing predator histories. Medium priority
- Surveys before & after predator removal Medium priority. Data for Pycroft's petrel, diving petrel and little shearwater to be obtained by R Buxton.
- Northern giant petrel, population size and trends. Low priority
- In Hauraki Gulf continue monitoring; Buller's shearwater, Pycroft's petrel, grey-faced petrel, little shearwater, fluttering shearwater, black-winged petrel, white-faced storm petrel.

Research priorities, penguins

Yellow-eyed penguin

- Population trends (mainland & sub-Antarctic). High priority
- Marine ecology and role in marine ecosystem dynamics. High priority
- Fisheries interactions. High priority
- Recovery plan. Medium priority
- Auckland Islands, where penguins threatened by pigs priority to estimate population size, trends and develop monitoring priorities. High priority
- Research to validate current terrestrial management. Low priority

Blue (little) penguin

- Population monitoring at selected colonies throughout New Zealand and Chatham Islands. Medium priority
- Foraging ecology/tracking West Coast Hauraki Gulf and Wellington. Medium priority

Fiordland crested penguin

- Population trends. High priority

- Survey methodology; double count method for nests is OK but are there better methods, try crèche counts or at sea counts. High priority
- Factors affecting productivity and causes of decline. High priority
- Impact of fisheries. High priority
- Impact of Predation. High priority
- Marine ecology including over-winter tracking. Underway (D Thompson)
- Impact of human disturbance. Medium priority
- Impact of marine pollution. Low priority

Eastern rockhopper penguin

- Study of population trends, population modelling, population genetics, predation, foraging and diet on Campbell Island. Underway (K Morrison).
- Survey Auckland Is colonies. High priority
- Prey distribution and temporal trends. Medium priority
-

Erect-crested

- Population trends (aerial count possible October 2013, B Baker). High priority
- Foraging ecology. Medium priority
- Diet analysis. Medium priority
- Prey distribution and temporal trends. Medium priority
- Over-winter tracking on the Bounty Is (D Thompson) underway

Snares crested

- Population trends. Medium priority
- Fisheries interactions. Medium priority
- Over-winter tracking, (D Thompson, P Sagar) underway,
- Taxonomy of the Western Chain population. Low priority

Research priorities, shags and gannet

Census and population monitoring

- King shag (R Schuckard & M Bell). Underway or recent
- Stewart I shag (C Lallas, Otago 2012). Underway or recent
- Chatham shag (underway I Debski & M Bell). High priority
- Auckland Is shag, aerial count January 2012 and 2013, (B Baker). High priority
- Bounty I shag (B Baker will try to count from October 2011 and 2013 albatross census photos). High priority
- Campbell shag. Medium priority
- Pitt Island shag (I Debski & M Bell). Underway or recent
- Blue Shags, (K-J Wilson Buller). Underway or recent
- Pied shag where regional populations have declined (M Bell). Low priority
- Review of existing (published and unpublished data) on status and trends of all species. High priority

Other shag priorities

- Advocacy for people/shag conflicts High priority
- Impact of set net & pot fishing (commercial and recreational) on shag mortality, productivity and the proportion of population breeding each year. High priority
- King shag, impact of salmon farming (foraging study planned). Medium priority
- Pitt I shag (foraging study underway, M Bell). Medium priority

Australasian gannet

- Population monitoring at Cape Kidnappers and Hauraki Gulf. Medium priority
- Monitoring at Young Nick's Head and on Motuora (colony attraction projects). Low priority

Research priorities, skua, gulls and terns

Black-billed gulls and black-fronted terns were not considered by this forum, they are both important and threatened species but more appropriately considered by a braided river specialist group.

- Continue monitoring NZ fairy tern population size and breeding success. High priority
- Monitor skuas at Rangitira and Mangere Islands (Chatham Islands) (high priority) and The Snares (medium priority)
- Red-billed gull, identify the cause of recent declines. Medium priority
- Continue monitoring red-billed gulls at Kaikoura (high priority) and Otago (C L alas) (medium priority)
- Hauraki Gulf; monitor breeding colonies of white-fronted terns, red-billed gulls and spotted shag. Medium priority
- Monitor sooty tern colonies at Raoul Island (Kermadec Is). Medium priority
- Monitor grey noddy breeding populations New Zealand mainland. Low priority