Slide 1 - Title

Rediscovering seabirds: Why the wider Hauraki Gulf is so important to our avian fauna

I'm going to talk about the importance of the Hauraki Gulf to seabirds, what the gulf provides in terms of food and breeding habitat, where they go when they are not here, visiting seabirds, and how much we know or don't know about the lives of seabirds of the Hauraki Gulf.

Slide 2: There are seabirds…

Gulls, gannets, shags and penguins, these are amongst the more familiar seabirds.

Slide 3: …& seabirds

There is a whole group of seabirds that many people are not really aware of. These are the tubenose birds, so called because of the structure of the nostrils on the top of or side of the bill: shearwaters (flesh-footed shearwater), petrels (Cook's and Pycroft petrels), prions (fairy prion), storm petrels (white-faced storm petrel). This group also includes the albatrosses.

These are birds that spend most of their life is at sea; they do not come ashore to roost.

Slide 4: Importance of islands

The only time when they come ashore is to breed (black petrel). They nest in burrows (Cook's petrel). They all are nocturnal over and on land, and as you can see from this photo (black petrel) fairly adept at getting about on the ground. Here's another photo of a Pycroft's petrel climbing a tree at the Poor Knights.

Successful breeding is all about raising a chick through to its fledging and departure from the colony. This is a little shearwater at Burgess Island in the Mokohinau Group.

Habitat varies from dense forest (here Little Barrier) to ice plant and sedge at the Mokohinaus. Burrows can be very small (storm petrel) or very large (black petrel on GBI).

Seabirds play a key role through the input of marine nutrients into soils.

Slide 5: Gulf waters provide food…

For a number of species the Gulf waters provide food.

Fish schools, trevally in this case, boil at the surface, vacuuming up krill-like *Eupausiids*. Seabirds – Buller's shearwaters – feed around the fringes of these mobile schools; often joined by other species – other shearwaters, prions, terns and gulls.

Fluttering shearwaters commonly follow fish schools, chasing whatever the kahawai or kingfish are driving to the surface. Shearwaters (and petrels) catch most of their prey underwater.

Prions and the storm petrels here specialise in picking up small planktonic prey including fish larvae and fish eggs

These are mostly birds that feed across the continental shelf, and if you think of the Gulf as a wide gently sloping plain stretching from the mainland right out to the continental shelf edge, studded with islands and the occasional foul ground or reef, washed with tidal currents; a dynamic environment in which to find food patchy in distribution and ephemeral by nature.

Slide 6: Stretching the boundaries – Cook's petrels

Some Gulf's seabirds don't feed in shelf waters and travel large distances from their island homes to find food.

Tracking studies by Matt Rayner of NIWA/University of Auckland confirm that Cook's petrels feed in areas off eastern North Island, in the eddy systems off North Cape, and in the Tasman.

Picture shows a datalogger fitted to the leg of bird. Attached during breeding season, then retrieved the following year when the bird returns to its colony (and the same burrow).

Slide 7: Stretching … Black petrels

Similarly data from tracking work by Biz Bell on black petrels breeding at Great Barrier Island shows them ranging far and wide.

Slide 8: Stretching … Grey-faced petrels

This tracking work on grey-faced petrels by Catriona MacLeod and Phil Lyvers at Landcare Research, and Josh Adams (USGS) through the Ruamaahua (Alderman) Islands Working Group. These maps show birds tracked in July/August 2007 and September/October 2007

Taking this bigger picture, we can see how the Gulf islands are important as centres for ecological processes that stretch well beyond the Gulf's boundaries, with birds foraging and feeding across 1000s of sq kms of ocean.

With the current Government's fixation about getting closer to Aussie, it's nice to see some kiwis (well, in this case grey-faced petrels) crossing the Tasman, scooping up marine resources and bringing back loads of nutrients to feed their kids and enrich our soils at the same time!

Slide 9:

A number of the seabirds breeding in northern NZ migrate across the Pacific Ocean during non-breeding months. The remainder will either stay locally in NZ waters, or in the SW Pacific.

Cook's petrels along with Buller's and flesh-footed shearwaters head across the Equator into the North Pacific. There was a lot of excitement last year when small groups of Cook's petrels turned up off the Californian coast, much to the delight of seabird aficionados.

Black petrels head for the eastern tropical Pacific.

The bird that most impresses me is the diminutive white-faced storm petrel which, come February through to April depart our waters and hop, skip, flutter and glide their way across to the eastern Pacific (off Ecuador). There they feed in the rich waters of the Humboldt Current before making the return journey in September.

Slide 10: Birds on migration, heading south

The Gulf waters also provide opportunities for birds that breed elsewhere on migration south.

Sooty shearwaters (southern muttonbirds) breed on southern NZ and Chatham Islands in large numbers. There are some small colonies in the Hauraki Gulf. These birds migrate to the North Pacific. They migrate south again in October. A tracking study was undertaken by Josh Adams in the States (USGS/ NOAA) where birds were caught at various locations between California and Oregon and satellite tags were fitted.

This map shows the track shows the track of a particular bird (SOSH 223) heading south to NZ.

This second map shows the bird has come down from the Kermadecs and spent time foraging just outside the Mokohinaus. It then moved close to those islands before moving NW to the Poor Knights area, then heading to the shelf edge NE of GBI where it must have been feeding.

There's a nice coincidence here, I took some birdwatchers to the outer Hauraki Gulf at the same time and we observed three sooties feeding with Buller's shearwaters over schools of trevally at Maori Rocks (Mokohinau Islands). From the timing it is very likely one of these birds was 223.

Slide 11: Seasonal visitors

And were this all not enough, the Gulf receives (and feeds) other seasonal visitors – albatrosses, storm petrels, sub-tropical species like these grey ternlets photo'd at the Mokohinaus. These birds migrate south as southern waters warm in November and December. They'll turn up here when the sea temperature hits 18 Celsius.

25 visiting species have been recorded for the inner Gulf. There are a good number more that by pass the Gulf and move up and down the shelf edge.

There are about 300 species of seabirds in the World.

Slide 12: How important?

Just how important is the Hauraki Gulf for seabirds? You have seen that they breed and feed here, but let's put that in sharper perspective.

- The world population of Buller's shearwaters breed at the Poor Knights (2.5 million birds, est 1981)
- The world population of black petrels breed on Great and Little Barrier Islands (c. 10,000 birds)
- The world population of Pycroft's petrels breeds on Hen & Chickens, Poor Knights and Coromandel Islands (between 10,000 & 20,000 individuals)
- 98% of Cook's petrels breed on Little Barrier (1.3 million birds, est 2008)

- 18 other species of seabirds breed in the wider Hauraki Gulf including a number which are considered northern NZ specialties
- The Hauraki Gulf and its islands is a very Important Marine Bird Area.

Slide 13:

At this point you really have to pinch yourself. We're not talking about some remote islands here; NZ's subantarctic Islands or the Kermadecs.

Stand on Maungawhau/Mount Eden and you can survey (albeit from a distance) practically everything I've covered so far. Such is the nature of the Hauraki Gulf.

In fact should Auckland be challenging Dunedin for that (self-claimed) title of seabird capital of NZ?

Slide 14: What do we know?

Most of our baseline data on seabird breeding is over 20 years old; a lot of it dates back to when Graeme Taylor and others (notably Alan Tennyson and Paul Scofield) conducted an island-by-island survey in the late 1980s, early 1990s.

There has been other seabird work done on islands. This photo is from Sandy Bartle's study of Pycroft's petrels on Poor Knights (1960s). We do not know what the current status of that colony is today. More recently there have been a handful of notable studies of single species:

- Biz Bell = Black petrel
- Matt Rayner = Cook's petrel
- Robyn Gardner-Gee's work on Motuora with Grey-faced petrels

Other information has come from island visits usually in association with other fauna projects. Also from island invasives work.

At Burgess Island in the Mokohinau Group we have begun a survey taking more of an ecological approach – starting ground up, looking at soil depth, vegetation, burrow density and so forth.

- This can lead to working in some spectacular sites.

But tellingly, despite this work, there have been no systematic island and seabird surveying undertaken since those early surveys of Taylor and co. Our knowledge is fragmented, we do not have a good handle on the current status of Hauraki Gulf seabirds overall.

Slide 15: Risky business – coming to land

Why it is important to know what is going on with seabirds on islands? Times are a changing, and they are changing fast.

Life for seabirds has not been easy. Seabirds are at risk on both land and sea. Seabirds are caught at sea by fisheries: albatrosses, large petrels, some shearwaters. But on land predators (rats, cats, stoats, dogs and even

avian fellows like harriers, pukeko and weka) have taken a heavy toll, working upward taking out the smallest, easiest birds first – storm petrels, diving petrels, small shearwaters & petrels, and prions. Chicks of many species cannot survive ongoing predation. Seabirds have been, in some places still are, harvested for food.

All up, it's been a relentless and steady annihilation of birds. Added to that the destruction of habitat, trampling of land by livestock, erosion of soils…

Where seabirds have survived, it is mostly on predator-free islands, on islets and stacks; there are just a handful of (larger) species left on mainland sites around NZ.

The Wildlife Service, NZ Forest Service and Lands & Survey Department introduced programmes of eradication stretching back to the 1970s when, for example, cats were eradicated on LBI and goats from the Mokohinaus. This programme continues today through DOC. In 1990 rats were eradicated at the Mokohinaus. Motutapu and Rangitoto were the latest to be done.

What has this meant for seabirds? And, also, what has this meant for people studying them?

Slide 16: Success after success…

For seabirds, that's easy… here's one example. Little Barrier was cleared of rats in 2006. Cook's petrels' fledgling success or survival rate went from 5% to 65% in 2 years. Also, other species of seabirds are returning to the island, grey-faced petrel, fluttering shearwater and common diving petrel bringing the list confirmed to five. Black petrels are also there on the high ridges.

On each island where rats and other predators have been removed those working with seabirds can delight in new discoveries as seabirds recolonise. You can see that in this photo of Matt Rayner with the first grey-faced petrel chick on LBI for many years.

Islands, and even headlands made free of predators, with an ongoing commitment to keeping them clear, allow opportunities for human assisted techniques – using sound broadcast systems to encourage birds to investigate particular locations and the more labour-intensive translocation work.

Here's an example of Pycroft's petrel translocation to Cuvier Island (Graeme Taylor), and the diving petrels to Motuora (Helen Gummer and the Motuora Trust)

Slide 17: Back from the dead

Then in midst of all this we get something completely unexpected! A bird flies in from the dead!

On 25 January 2003 there was sighting of a single black and white storm petrel off Coromandel Peninsula by Brent Stephenson, Sav Saville and others. Initially identified as a black-bellied storm petrel (*Fregetta tropica*), but subsequently Alan Tennyson (who works with extinct birds at Te Papa/MoNZ) suggested New Zealand storm petrel. This was followed by some more sightings in November in the Hauraki Gulf itself, just north of Little Barrier.

Slide 18:

This wee storm petrel has become something of the holy grail for ornithologists - certainly amongst the seabird fraternity. Birdwatchers too, from within New Zealand but especially from overseas.

Slide 19: What's the fuss?

For over 100 years NO NZ storm petrels had been seen alive until that day off Whitianga. Three birds had been collected in the 1800s – two during D'Urville's expedition in 1827 off East Cape, and one in 1895 which landed on a vessel somewhere between Great Barrier Island and Lyttleton.

This photo shows the type specimen at the British Natural History Museum, you get a sense of scale. This second photo shows one of the two specimens at the Paris Museum of Natural History.

This 1932 illustration appears with Mathew's description of *Pealeornis maoriana* – what became known as the "NZ storm petrel" later on, a name coined by Oliver of the Dominion Museum in 1955.

Slide 20: Ongoing sightings

How could these birds have eluded observers until now?

It is likely they have been here all the time. More people are out looking at seabirds in northern NZ waters than previously. It could be that reports of black and white storm petrels were misidentified, after all they look quite similar to Wilson's storm petrels and black and white-bellied storm petrels, at a distance. Advances in optics (great binoculars) make it easier to see identifying features more clearly. The ease and quality of digital photography has certainly helped. It is also possible NZ storm petrel numbers are on the increase making them easy to find; a bird released from predation pressure. Also, using berley-ing (or chumming), basically mimicking a fishing boat. These storm petrels, like other tubenose birds, have a remarkable ability to detect potential food through smell. Chumming brings these birds in close.

What we have learnt is that NZ storm petrels have been present in Hauraki Gulf waters between end of September and end of April each year since 2003. I was observing some just week or so ago at a time when other Gulf breeders have departed these waters and headed off on migration.

Slide 21: Fortuitous landing

After that rediscovery in 2003 there were attempts to capture the bird – to find out exactly what it was, confirm that it was in fact the same bird as the specimens; and to ultimately find out where they are breeding. These birds are not easy to catch at sea. Then in November 2005 there was a fortuitous landing of one a fishing boat anchored next to Little Barrier.

Slide 22: Captures & tracking

In the years which followed 12 NZ storm petrels have been caught: January 2006 – 3 birds; October and November 2007 – 3 birds; November 2009 – 5 birds. This photo shows the technique – a lot of time spent watching for birds to come close. Brent Stephenson and Halema Jamieson in December 2006, Neil Fitzgerald in November 2009 when he and caught five birds in one memorable day.

Transmitters have been fitted to eight of the captured birds. Attempts have been made to track birds from boats, including navy vessels; from planes; from islands using hand-held receivers; and also using remote receivers set up on islands. The birds with transmitters proved for the most part elusive. Only once was a bird detected and that was at sea, in the area where it was caught (Jan 2006).

With this work we have to be mindful of what is most important here. Aside from not injuring them when catching or handling them (none have been injured during the programme so far). Small storm petrels are extremely vulnerable to predation. Remember they are among the first to disappear if rats or other predators invade their islands. Finding their breeding site (or sites) is of paramount importance so that we can ensure the ongoing biosecurity of their hideaway. Until we do, we must consider them at risk.

Slide 23: A dash of kiwi ingenuity

I couldn't resist including this shot. The photo typifies something of the effort that has gone into this project to date, some seabird expertise with some official backing, but a lot of volunteer time and effort. This is Harvey Carran with the net guns he built for the project. Another fellow worth mentioning is Brett Rathe, a Warkworth-based fishing charter operator. When I first stepped into his shop in Warkworth he was busy organising a campaign against marine reserves. Would he like to go and look at seabirds? Of course he would. Today, he's a seabird enthusiast. He and I rival each other for the most sightings of NZ storm petrels. We discuss the merits of marine reserves from time to time. He's a lot better at catching fish!

Slide 24: Island searches

What we are after is to see one bird on land, preferably in a burrow or wherever they nest; either a chick or an adult. Island searches have included the use of spotlights and floodlights to try and attract birds as well as playback of other storm petrel calls. While we don't know what a NZ storm petrel call is like, storm petrels have been known to respond to the calls of other species.

Spotlighting from vessels, on a number of occasions working from navy vessels. We use zodiacs close in to the islands. It means working along cliffs, checking out ledges with vegetation. But as you can see from this photo there are many possibilities for a small seabird to hide itself. And it is quite possible they breed in scattered locations.

This summer I have run a programme of acoustic monitoring on islands starting with two of the Mokohinau group and Little Barrier.

Slide 25: Bio-acoustic signatures

Seabirds (like land birds) have their own distinctive calls. I am currently working through (thankfully with the help of acoustic software) some 2500 hours of recordings to eliminate known species and see if I can detect something different. This is a black-winged petrel call.

Slide 26

The big advantage of this work on islands – as distinct from catching a single species at sea – is that we can learn a lot about seabirds and the islands where they breed while we're there. Here working with white-faced storm petrels.

Slide 27: Calling for a mate

This is a recording of a white-faced storm petrel. Picture this, a male sits at the entrance to its burrow and makes a repetitive, quail-like, advertising call, trying to attract a potential mate. In this recording another bird lands and they 'duet'.

Slide 28: Do NZ storm petrels breed in the Hauraki Gulf? The search continues

Back with our target species, we know they forage and feed in northern NZ waters, especially in and around the Hauraki Gulf from spring to autumn.

Has a NZ storm petrel been seen over land? Yes, once in 2007 by Mike Imber and Derek Bettesworth on Burgess Island when a bird flew into the floodlight, Mike was able, using a spotlight to bring the bird down to about head height before it spooked and flew away. None have been seen over land since.

Have we found a NZ storm petrel chick in a burrow? The answer is no.

Can we be sure that the NZ storm petrel breeds in the Hauraki Gulf? Until we find them on islands we can't be sure.

However, at least two banded birds have been photographed in the Gulf (in 2006 and 2007 at a time when only four birds had been captured and single metal band fitted). The chances of this happening are very slim, suggesting that the numbers of NZ storm petrel are small.

If we take the converse argument, that these are birds breeding somewhere else? Afterall, there have been two, possibly three sightings of NZ storm petrels elsewhere – one of New Caledonia in late March 2008 and the others just two days ago off NSW.

So, the search continues…

Slide 29: Celebrating an anniversary

This symposium is all about celebrating an anniversary, that's 10 years of the Hauraki Gulf Marine Park.

It would have been great to say we can confirm another seabird species for the Gulf; I'm afraid we can't - just yet. What we can say is that there is another seabird making use of the HG and its food resources for a significant part of its life.

But I'd like to end this presentation by suggesting there is another anniversary worth celebrating this year. It is 20 years since rats (kiore) were eradicated from the western Mokohinau Islands, amongst the first islands subject to aerial poisoning.

This is Burgess Island, a highly modified island which had lighthouse keepers, livestock (including goats) from 1882 to 1980; a radar station during WW2. It had rats from early Maori visits and in 1990 they too were

eradicated. The island was practically devoid of seabirds at that time. So what has happened in 20 years without further assistance from humans other than checking to make sure predators haven't found their way ashore and some weed management.

Moving around parts of the island during the day you get an appreciation of the island's transformation. The buffalo grass and the drifts of Muelhenbeckia have grown taller. Elsewhere revegetation is gradually taking place. At the northern end of the island there's mixed vegetation; of flax, sedge, rushes, herbaceous plants, ice plant, grass and drifts of Muelhenbeckia and bracken. This mosaic of plants is networked in places by thousands of burrows – large and small. With each year the seabirds appear to be extending their hold on the island. This is what you see during the day.

Like many seabird islands this island is best appreciated at night…remember these are nocturnal birds when they come ashore.

Slide 30: Come nightfall …

Seven species shearwaters, petrels, diving petrels and storm petrels breed on the island – there are four calling in this audio clip.

Slide 31: Auckland Seabird Seminar

Slide 32: Acknowledgements

- DOC for persisting with their island eradication programmes, for funding, and for island and other support
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- ARC for funding the Burgess Island survey
- NZ Defence Forces (Navy and NZ Customs)
- Maritime NZ
- Volunteers on surveys and catching trips
- Seabird colleagues: We live in an increasingly competitive world where information can be jealously guarded. It is refreshing to have colleagues who willingly share their knowledge, give their time and enjoy discussion. I'd like to thank Mike Imber, Graeme Taylor, Sandy Bartle, Jean-Claude Stahl & Matt Rayner especially.

Slide 33:

Photo: Mike Imber releasing a NZ storm petrel 27 November 2009

Photo: NZ Storm petrel captured 27 November 2009