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## Great Barrier: Black Petrel haven

By Dr Emma Cronin

The life history of the Black petrel, *Procellaria parkinsoni*, was revealed in a captivating presentation at the recent seabird hui held at Motairehe marae at Great Barrier Island. Elizabeth Bell (Wildlife Management International Limited) presented an overview of the extensive research work she and colleagues have been doing since 1995 for the Department of Conservation.

Great Barrier Island represents the stronghold for Black petrels in Hauraki Gulf, with approximately 5000 birds present, predominantly on the slopes of Hirakimata (Mt Hobson). This compares with just 250 petrels on nearby Little Barrier Island. This is surprising given that the Great Barrier population is subjected to predation by rats, cats and pigs, whereas on Little Barrier all non-native predators have been eradicated. Their predominance on Great Barrier is likely to result from natal homing, whereby adults (particularly males) return to the nest site they were fledged from. Extensive cat control by DOC has minimised predation on petrels, however the birds' distribution was likely to be far more extensive prior to the presence of rats, cats and pigs.

Black petrels are migratory birds, arriving in New Zealand in late October after spending their winter in South America. Here they briefly return to 'spring clean' their burrow before departing again for a short honeymoon period, returning in late November to lay a single egg. The egg is incubated alternately by both parents, and may sit unattended for several days yet still remain viable during the first few weeks of incubation. Chicks hatch 57 days later in late January and throughout February. A further 107 days of feeding and growing is required until chicks fledge in mid April to late June. Banded birds have been captured as 2 year olds in South America, and return to the breeding colony within 3-5 years. Birds reach maturity at 6-7 years, and are known to live for at least 29 years. Birds form monogamous pairs however some 'divorces' do occur (12.7% per year). Breeding is evidently a taxing activity as 37% commonly have a rest year which results in improved breeding success.



Black petrel launching from rock. Photo: Dave Boyle



Petrel Chick





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During the breeding season the population is monitored in an area encompassing 35 ha surrounding the summit of Hirakimata. Research involves;

- identifying petrels using the mark/recapture of adults at the breeding colony
- monitoring of 396 study burrows to identify burrow usage and track breeding success
- estimating the population using a census grid and random transects
- deploying tracking devices which record the paths of birds foraging at sea.

In the past 12 years there has been a steady decline in both the percentage of burrows used for breeding and the proportion of chicks fledged from eggs (Figure 1). In 2011, 66% of burrows were used for breeding and 61% of chicks fledged from eggs laid, a declining trend of 1.5% per year since 1999. This is of great concern, especially considering their Nationally Vulnerable status owing to their restricted range and relatively small population.

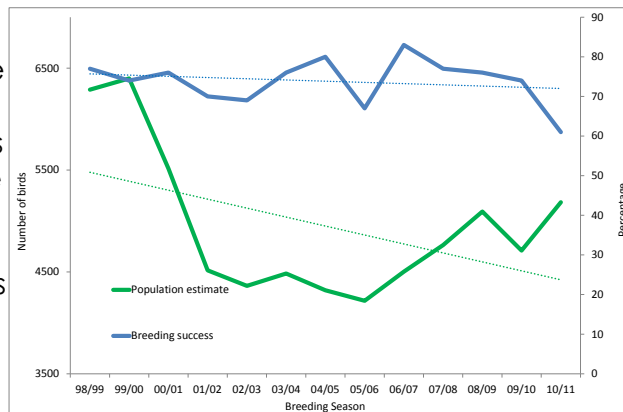


Figure 1: Decline in population estimate and breeding success in the past twelve years

Since 1995, between 60 and 220 chicks have been banded each year. Of these 2575 chicks, only 6-12% have been recaptured at the breeding colony. Survival of juveniles during their first year of life is remarkably low at just 3%, however this increases substantially after their first year to 78% and reaches 90% for adults. Banding of birds has revealed that females do immigrate to new breeding grounds, as a female fledged on Little Barrier is now breeding on Great Barrier.

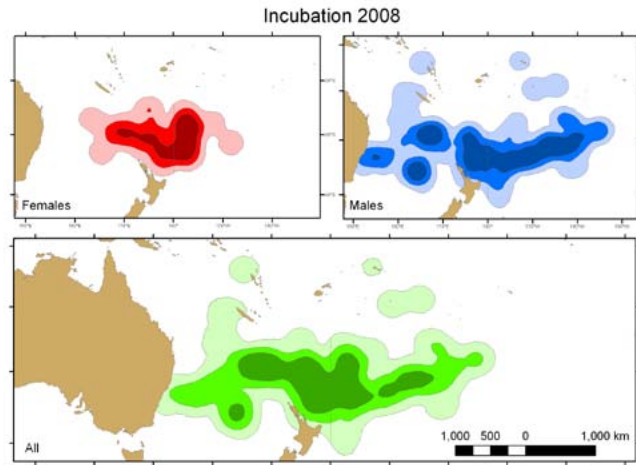
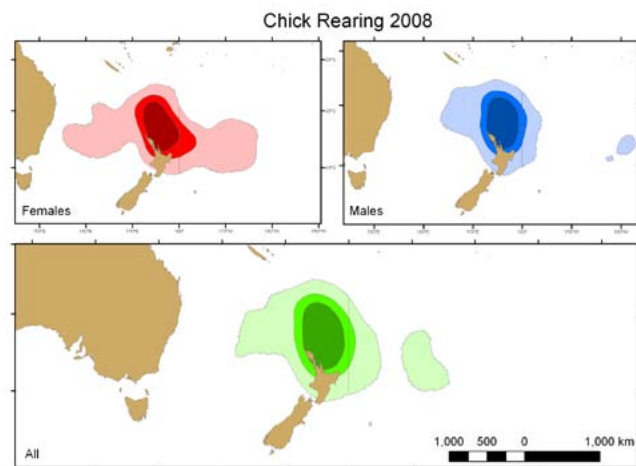


Figure 2: Foraging extent of females (red), males (blue) and all (green) during incubation (above) and chick rearing (below).

Tracking devices deployed on 92 birds have provided in-depth information on foraging trip speeds, locations and durations, and migratory pathways. Foraging extent is greatest during incubation and reduces during chick rearing (Figure 2). The logging devices have enabled the migratory paths both to and from New Zealand and potential overlap with fisheries grounds to be identified.





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In New Zealand it is well established that petrels succumb to losses resulting from swallowing bait and/or fish caught on long lines or entanglement in trawl nets, however the impact of this on the population is unclear. Offshore fishing impacts during migration and overwintering in South America are also unknown. Future research will continue to assess the Hiramata colony and hopefully will be extended to encompass breeding pairs identified at Glenfern Sanctuary. In the previous season (2010/2011), five breeding pairs were located in Glenfern Sanctuary. Prior to this, a pair of black petrels has been breeding under an old puriri tree near Glenfern walk for the last 10 years. During that time the parents and five successful fledglings have been monitored and banded. In the summer of 2009/2010 only one bird returned for a brief period and this season the burrow remained empty. Considering that four of the five newly located pairs are very close to the original burrow, we hope that at least one will be a banded fledgling. The presence of more breeding pairs is very promising for improving the breeding success of these Nationally Vulnerable birds.

Further information on this study can be sourced from the following website;  
<http://www.niwa.co.nz/our-science/fisheries/research-projects/all/is-the-black-petrel-at-risk-from-commercial-fisheries>

