

SHORT NOTE

Acoustic attraction of grey-faced petrels (*Pterodroma macroptera gouldi*) and fluttering shearwaters (*Puffinus gavia*) to Young Nick's Head, New Zealand

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Burrow-nesting and surface-nesting petrels (Families Procellariidae, Hydrobatidae and Oceanitidae) in New Zealand have been severely affected by human colonisation, especially through the introduction of new predators (Taylor 2000). Of the 41 extant species of petrel, shearwater and storm petrels in New Zealand, 35 species are categorised as 'threatened' or 'at risk' with 3 species listed as nationally critical (Miskelly *et al.* 2008). In conjunction with habitat protection, habitat enhancement and predator control, the restoration of historic colonies or the attraction of petrels to new sites is recognised as important for achieving conservation and species recovery objectives (Aikman *et al.* 2001; Taylor 2000).

Grey-faced petrels (*Pterodroma macroptera gouldi*) and fluttering shearwaters (*Puffinus gavia*) exhibit a strong natal philopatry that is common in long-lived seabirds. Fledglings disperse widely after leaving their natal nesting sites, and return 3-6 years later to breed (Miskelly *et al.* 2009). The philopatry of petrels has important implications for the establishment of

colonies at sites following extirpation or at novel nesting habitats, as the attraction of prospecting non-breeders to a novel site is unlikely and the probabilities of recolonisation further decrease as the remaining populations diminish (Gummer 2003).

Both active (translocation) and passive (social attraction) methods have been used in attempts to establish or restore petrel colonies (e.g. Miskelly & Taylor 2004; Podolsky & Kress 1992). Methods for the translocation of petrel chicks to new colony sites are now fairly well established, with fledging rates of 100% achievable, however, the return of translocated chicks to release sites is still awaiting full analysis (Miskelly *et al.* 2009). Following translocation, social attraction mechanisms that encourage unbanded pre-breeders to release sites are recognised as an important aspect of colony establishment (Miskelly *et al.* 2009).

Acoustic social attraction methods have been used in a variety of projects involving both nocturnal and diurnal species. Acoustic attraction is seen as especially important for nocturnal species and is generally used in conjunction with the provision of artificial nesting sites (Gummer

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2003). The playback of vocalisations was used successfully to attract Leach's storm-petrels (*Oceanodroma leucorhoa*) to several islands off mid-coastal Maine, which eventually led to breeding in artificial burrows on-site (Podolsky & Kress 1989, in Podolsky & Kress 1992). Podolsky & Kress (1992) also recorded a significant increase in the passing and capture rates of endangered dark-rumped petrels (*Pterodroma phaeopygia*) while recorded vocalisations were being broadcast in the Galapagos Is. Calls used by established pairs may be more effective for attracting prospecting individuals than aerial calls (Kress 1997, in Gummer 2003).

Young Nick's Head Peninsula (177°58'E, 38°45'S) was selected as a site to trial the acoustic attraction of petrels and shearwaters. Anecdotal records indicated that grey-faced petrels were historically present at this site, and the re-establishment of pelagic seabirds and a range of reptile species were identified as a key management objective for this site during 2004. This prominent headland is protected by a 550 m long, 2 m high, pest-proof fence across the neck of the peninsula. Although harvesting of grey-faced petrel (titi) was traditionally undertaken by the local Ngai Tamanuhiri Iwi on the peninsula prior to 1930, no seabirds had been recorded at Young Nick's Head since this time (M. Pohatu, *pers. comm.*). Extensive ground searching and night listening during 2004 confirmed their absence.

An acoustic attraction system was installed and activated during Nov 2005. It was positioned on an elevated grass terrace c. 40 m vertically above sea level. This terrace comprises an area of c. 400 m² with a southerly aspect and slope of c. 5°. Two speakers were positioned on either side of the terrace facing east and south. A compact disc drive, amplifier, battery and solar panels were situated at the centre of the site.

Six seabird recordings were purchased from the Les MacPherson Natural History Unit sound archive and copied onto compact disc in the following order: grey-faced petrel, sooty shearwater (*Puffinus griseus*), fluttering shearwater, black-winged petrel (*Pterodroma nigripennis*), common diving petrel (*Pelecanoides urinatrix*) and white-faced storm petrel (*Pelagodroma marina*). A solar switch triggered the play function at dusk and play stopped at dawn each day.

Twenty-eight large, artificial petrel burrows were installed within 20 m of the 2 speakers during 2006. The chambers were positioned deep enough to allow for a 300 mm deep layer of topsoil above each to help stabilise burrow temperature, and minimise the risk of flooding.

The first grey-faced petrels were confirmed at the site on 3 Jun 2006, 7 months after the acoustic

system was activated. Fluttering shearwaters were first confirmed on 20 Oct 2006, when 11 separate calls were heard in response to the acoustic recording, c. 100 metres south of the speakers, 11 months after activation of the acoustic system.

During 2007, petrel activity at the site appeared to be frequent as indicated by guano deposits and the interference of burrow entrance stick hazes throughout Jul, Aug and Sep. A single grey-faced petrel egg was observed by burrow-scope in burrow 1, on 28 Sep 2007. However, breeding was not successful. An adult fluttering shearwater was also observed by burrow-scope in burrow 11, on 28 Sep 2007. However, no breeding of fluttering shearwater has been recorded.

Throughout Mar and Apr 2008, a total of 7 burrows were regularly visited by birds: stick hazes were regularly disturbed and nest material was found inside burrows. A night visit on 26 Apr 2008 confirmed 20 grey-faced petrels on the ground and 1 fluttering shearwater was heard calling overhead whilst in flight.

The first grey-faced petrel chicks were discovered on 28 Nov 2008, in burrows 5 and 11. This was 3 years after the project commenced. Two large down-covered chicks were confirmed via burrow-scope. The colony was not monitored over the fledging period; however, we believe both chicks departed successfully.

One large chick was observed again in burrow 5 in Nov 2009. Equipment malfunction prevented us from monitoring more burrows that season. By 10 Sep 2010, 20 grey-faced petrel burrows were recorded as regularly visited.

Eighty adult grey-faced petrels have now been banded at Young Nick's Head including breeders and prospectors. On 13 May 2010, 40 adult birds were banded at the site: 10 were recaptures, including 1 bird originally banded as a chick on Whale I in 1997. The banding of chicks will commence at Young Nicks Head during 2010.

This project shows that a combination of acoustic attraction and the provision of artificial nesting burrows can be a successful method to attract some petrel species back to historic breeding sites. It may take longer to establish a breeding colony using these methods, but the financial outlay is approximately one tenth the cost of an active translocation project.

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