

BEHAVIOUR OF *PTERODROMA* PETRELS IN RESPONSE TO “WAR-WHOOPS”

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ABSTRACT

Four species of *Pterodroma* petrel (*P. macroptera*, *P. cervicalis*, *P. pycrofti* and *P. nigripennis*) responded strongly to human calls (termed by us the “war-whoop” method). This response was greater in the larger species and included the following behaviour: more frequent calling, movement towards the observer, and fighting. The level of response in *P. macroptera* was greatest during courtship and incubation and decreased during the chick rearing stage. Our findings support Warham’s (1988) hypothesis that mainly unpaired birds respond to human calls and that the birds associate these sounds with sexual advertisement.

INTRODUCTION

Warham (1988) discussed the use of the human voice and other unnatural sounds to attract *Pterodroma* petrels to the observer. He reported that the Mottled Petrel (*P. inexpectata*), Providence Petrel (*P. solandri*), Hawaiian Petrel (*P. phaeopygia*) and Bermuda Petrel (*P. cahow*) can be lured from flight to the ground by these means, e.g. see photo in Hindwood (1940). Warham suggested that human calls act as powerful sexual advertisement stimuli.

The main sound used by Warham (1988) and ourselves resembles the Indian “war-whoop” noise used in Hollywood western films. Rapidly tapping the mouth while making a medium-pitched continuous *worr* or *waa* noise produces a *wor-wor-wor...* sound. On still nights a loud war-whoop can be heard at least 1 km away.

We investigated the responses of five previously untested *Pterodroma* species to the war-whoop method. We also examined seasonal variation in the level of response. *Pterodroma* species are normally active ashore at night and most tests were made between dusk and midnight. However, on Macauley Island in the Kermadec group, where *Pterodroma* species are partly diurnal, especially the Kermadec Petrel (*P. neglecta*), we made some daylight tests.

RESULTS

GREY-FACED PETREL *P. macroptera*

We tested war-whooping at the following large colonies: Red Mercury (Whakau), Double (Moturehu) and Stanley (Kawhitihu) Islands (Mercury group), and Hen (Taranga) Island, which have many thousands of breeding pairs. We also visited the small colonies (fewer than 200 pairs) on Motutara Island (inner Hauraki Gulf), Ihumoana and Kauwahaia Islands (West Auckland), the mainland at Mount Maunganui and at several places in Taranaki.

Grey-faced Petrels responded remarkably to war-whoops. The following was a typical response: birds on the surface, in burrow entrances and in flight called immediately after stimulation. Some birds continued to call excitedly for several minutes after we had stopped calling. Some birds in flight landed, often crashing through canopy trees, within seconds of our making a war-whoop call. Usually, these birds landed nearby but some landed up to 30 m away. These and other birds on the surface scrambled towards us. When they came together, they often fought. Others inspected burrow entrances, where they were sometimes attacked by the occupants. Surprisingly, several birds responded to our war-whoops when they were in holding bags or while being handled, and many were attracted straight back to us just after they had been released.

The level of response was strongest in the early evening. For example, at dusk (1800 h) on 12 July on Stanley Island, we attracted 40 birds while giving a continuous series of war-whoops for 5 minutes, whereas on 15 July at 2230 h we attracted only 23 birds during 5 minutes. The likely reason for this difference is that earlier in the evening many birds are attracted from flight as they circle over the island. Some birds already on the ground also respond. Later in the night, fewer birds are flying overhead and most of those responding are on the ground close to the observer.

We made regular visits to several Grey-faced Petrel colonies to investigate seasonal variation in the level of response. We also checked the breeding status and the sex of birds responding. We did this by counting the number of filoplumes on the head to age birds (Imber 1971); noting the kinds of call; inspecting the cloaca at laying time (Serventy 1956) and taking measurements (Imber 1971) to sex birds; and checking burrows for eggs or chicks. We also noted such behaviour as aggression in response to war-whoops.

At Stanley Island on 19 June, Paul Scofield and AT examined 17 birds which responded to our calls, hoping to determine their sex and breeding status. We counted filoplumes about the heads of birds and found from 0 to 20 on any one bird. We also measured culmen lengths and took weights but were unable to sex any birds because of limited sexual dimorphism in this species (Imber 1971).

We distinguished two main calls given by *P. macroptera*. An *orr-wikiu* (? = Warham's (1956) *quaw-er, kik, kik*) is the main call given in response to war-whoops. We consider that *orr-wikiu* calls are used for sexual advertisement because the only birds giving it were not occupying burrows. We heard *orr-wikiu* calls being given only by birds on the surface and in flight and by some that were inspecting burrow entrances. Presumably these birds are unpaired and are looking for mates.

The second call sounded like a squeaky wheel or a donkey braying (? = Warham's (1956) *eee-aw* and *si si si* calls). It was commonly given by birds on the ground and was occasionally given in response to war-whoops. We suggest that the "squeaky wheel" call is aggressive or territorial because it is commonly given by birds fighting or defending burrows.

Seasonal responses

Few Grey-faced Petrels are at the breeding colonies during late January and February. The first breeders return in February and large numbers are present in April and May. They lay from late June to late July after a pre-laying exodus of two months. Eggs hatch from mid-August to mid-September and the last chicks leave in January (Imber 1976).

The level of response to war-whoop calls varied seasonally. The typical strong response was given throughout the period from the pre-laying exodus to hatching. The following detailed observations demonstrate the level of response during different periods of the breeding season. Some other observations made at these times are also included.

Pre-laying period: On Red Mercury Island on 17 March 1989, a pair of birds engaged in an aerial chase circled close overhead but did not land when GT gave war-whoops. On 15–21 March, GT found very few Grey-faced Petrels in flight or on the ground and heard little calling.

At the small Mt Maunganui colony on 3 April 1989, GT found many adults in burrows but heard little calling. Birds in burrow entrances and on the surface gave a good vocal response to war-whoops. A few birds in flight swooped low and almost landed.

GT checked several breeding sites on the Taranaki coastline from 30 April to 2 May 1989. There was a strong response from birds at all sites. Some birds on the surface were attracted from up to 50 m away and many engaged in fights. Birds in flight were lured in overhead, from up to 100 m away and possibly further; some landed near him. War-whoops were successful in locating previously unknown and sometimes inaccessible small colonies. Usually, on arrival at very small colonies, he heard no calling but birds called immediately after war-whoops.

Birds on Stanley Island responded strongly during visits on 16–21 May 1989. GT found them common at the beginning of the trip but noticeably fewer by the end.

Pre-laying exodus period: On Hen Island on 6–10 June 1989, AT noted very few birds at night until he gave war-whoop calls. Then the number of birds flying overhead increased and they became more vocal. A few crashed through the canopy and scrambled towards him.

On 13–20 June 1988 on Stanley Island, AT found reasonable numbers of birds, which responded strongly.

Laying period: On Motutara on 26–27 June 1989, we found that aerial calling was common and the first eggs had been laid. Two breeding females on the surface, sexed by their distended cloacas, showed no obvious response to our war-whoops. That is, they did not approach us, call vociferously or fight other birds. However, another breeding female gave a single "squeaky wheel" call at its burrow entrance in response to our calls. In contrast, other birds on the surface and in flight reacted strongly.

On Ihumoana Island on 5 July 1989, GT found over half the burrows occupied by incubating birds. Five breeding females (sexed by cloaca) were seen on the surface. None responded to war-whoops. Another bird on the surface, thought to be a breeding male (small cloaca and a heavy 670 g), did not respond. However, some other birds on the surface gave the typical response.

On Stanley Island on 11–18 July 1989, we found that most birds on the surface responded strongly to war-whoops but others did not. Cloacal inspection of these birds did not reveal sex or breeding status. We gave war-whoops beside the burrow entrances of 50 incubating birds. Only two responded, giving a “squeaky wheel” call from the burrow. Two other incubating breeders gave “squeaky wheel” calls and attacked birds that were inspecting their burrow entrances after being drawn there by our war-whoops. One bird on the surface that had responded to war-whoops was found several times, later in the season, in a nearby burrow, even though this burrow was occupied by an incubating pair. At least one breeder tolerated the visiting bird, which gave “squeaky wheel” calls from the burrow entrance in response to war-whoops.

Incubation period: On Motutara on 30 July 1988, we had the typical strong response from birds. About 10 landed near us within a few minutes in reply to our war-whoops, even though no burrows were nearby. Later that night, birds on the ground near burrows ran towards us from up to 15 m away.

Hatching period: On Double Island on 16–21 August 1988, GT had a strong response from birds on the surface. Adults attending chicks or incubating did not respond.

On Stanley Island on 16–24 August 1989, most surface birds responded strongly to our war-whoops. One petrel which landed in response to our war-whoops on 15 June 1988 was recaptured on the surface after responding to war-whoops on 21 August 1989. The capture sites were 200 m apart.

Nestling period: On Ihumoana Island on 12 September 1989, GT noted only three breeders ashore. He noted no non-breeding birds in flight or on the ground, heard no calls and had no response to his war-whoops.

On Kauwahaia Island on 21 September 1989, GT saw 5 or 6 birds in flight. The only calls he heard in the evening were from one bird on the ground. Two birds, one later found to be a breeder, landed soon after his war-whooping but did not call on the ground or approach him.

On Motutara on 14–15 October 1988, we found only a few birds ashore feeding chicks. They did not respond to our war-whoops.

On Double Island on 1–6 November 1988, we found very little activity – most birds seen ashore were feeding chicks. Very few birds were resting on the surface, and we heard few calls. Two of these surface birds showed a slight reaction to our war-whoops.

WHITE-NAPED PETREL *P. cervicalis*

We visited Macauley Island from 23 November to 6 December 1988, where we estimated that there were 50 000 pairs. The birds were common on the surface and many pairs were in burrows. They were engaged in pre-breeding courtship activities, and copulation was seen on 24 November.

White-naped Petrels responded very strongly to war-whoops throughout our visit. Their response was similar to that of Grey-faced Petrels. At night, birds in flight rapidly dropped to the ground and approached us. The volume of calling from birds, both in flight and on the ground, increased markedly. During the day, birds in burrows called in response to our war-whoops. Whenever we gave a sustained war-whoop call at night, large numbers landed

around us. For example, on 2 December, at least 55 birds landed within 10 m of us (Figure 1). On this part of the plateau, there were no White-naped Petrels on the surface before we called. The site was over 50 m from the nearest large nesting concentration. The birds on the ground came towards us, pairs or groups sparring frequently.



FIGURE 1 — White-naped Petrels attracted by war-whoops, Macauley Island, 2 December 1988

Photo: G.A. Taylor

KERMADEC PETREL *P. neglecta*

On Macauley Island on 15–24 September and from 23 November to 6 December 1988, we estimated that fewer than 50 pairs were present. We found freshly laid eggs on 25 November. Up to 10 birds were engaged in daytime aerial chases near the island's summit during both visits. They did not respond to our war-whoops during the day. One or two seemed to fly closer to us but none tried to land and vocal activity did not increase.

PYCROFT'S PETREL *P. pycrofti*

Our observations were made during visits to the Mercury Islands during 1988–1989. Pycroft's Petrels return to the breeding islands in October, they lay in November–December, and their young depart in March and April (Dunnet 1985).

Double and Stanley Islands were visited on 1–7 November 1988. Both these colonies contain hundreds of birds. Birds gave a good vocal response to war-whoops. Most birds in burrow entrances responded immediately with a series of loud calls. Further stimulation produced a mixed result: some birds continued to call whereas others became silent. Birds in burrow entrances did not move, and although some surface birds began to move towards us, none approached closely. Although birds in flight hovered or circled overhead, none landed in clear response to our war-whoops. This method was very useful for finding birds at their burrow entrances, and it enabled us to find many of their sparsely distributed burrows.

On Red Mercury Island on 15–21 March 1989, GT found that very few Pycroft's Petrels were present, although some were calling in flight. Skegg (1963) reported several hundred pairs on the island. Birds did not respond to GT's war-whoops during this visit.

BLACK-WINGED PETREL *P. nigripennis*

On Mangere Island (Chatham group) from January to March 1988, AT found only 16 occupied burrows, probably most of the Mangere Island population. He estimated laying in mid-January and hatching in late February-early March. During the incubation period, birds in burrows, in particular, called in response to war-whoops. AT found most nests in this way. Some birds in flight circled over him and a few landed, but many gave no clear response.

On Macauley Island from 23 November to 6 December 1988, where we estimated 2–3 million pairs, we noted a similar response. We were there during the pre-laying period and saw several pairs copulating. During the day, birds in burrows and on the surface called strongly in response, but few birds approached us. We found war-whoops very useful for finding occupied burrows in thick vegetation. At night, few of the large number of Black-winged Petrels landed in response to our war-whoops and few approached us. This weak response was in direct contrast to the strong response of White-naped Petrels at the same time.

DISCUSSION

The larger species of *Pterodroma* petrels seem to react most strongly to the human war-whoops. Of the birds that we tested, Grey-faced and White-naped Petrels gave the most dramatic response. Warham (1988) noted that Providence, Hawaiian and Bermuda Petrels gave the greatest response. All five species have body lengths 38 cm or above (Harrison 1983).

Warham (1988) reported that Mottled Petrels (34 cm) were lured to the ground but did not approach him. However, on 16 December 1986, AT found that several Mottled Petrels on The Snares did approach when he gave a war-whoop call.

The smaller species (30 cm or less, Harrison 1983), such as the Black-winged and Pycroft's Petrels, clearly increased their calling in response to war-whoops but were less likely to land or move towards the callers. Scofield (this issue) has found a similar response in Cook's Petrels (*P. cookii*). War-whoops were very useful for finding Black-winged and Pycroft's Petrels on the ground.

Although the Kermadec Petrel is large (38 cm), its response to war-whoops was poor. However, our tests were made only during the day. Night testing would be useful. Other *Pterodroma* species on Macauley Island gave their strongest response at night.

Our observations show that Grey-faced Petrels respond strongly to war-whoops from the pre-laying period to the hatching period. Although we could not sex the birds that responded, we suspect that both sexes reply because most birds nearby on the surface reacted.

We believe that the birds attracted towards us when we gave war-whoops were only non-breeders or unpaired birds for six reasons:

1. Non-breeders are virtually the only birds present in colonies from late May to late June (Imber 1976). We recorded a strong response during this period.
2. The birds attracted towards us were not obviously associated with a burrow. All were on the surface or in flight.
3. Birds that were incubating or attending chicks did not leave their nesting chambers in response to our war-whoops, during visits from July to November, although a few responded vocally.
4. Breeding birds that responded gave only "squeaky wheel" (aggressive/territorial) calls from burrows, whereas other birds usually gave *orr-wikiu* (sexual advertisement) calls. We suspect that only unpaired birds give sexual advertisement calls.
5. Breeding females found on the surface during the laying period gave no apparent response.
6. The birds that reacted on 19 June had few filoplumes and so were probably immature. Breeding birds are said to have more filoplumes than immature birds (Imber 1971).

During the early chick stage (August/September), Grey-faced Petrels begin to respond less to war-whoops. By mid-October, they show very little reaction, many fewer birds are seen on the surface and all vocal activity has declined. Presumably this is because few non-breeders are in the colonies.

Like Grey-faced Petrels, other *Pterodroma* species that we tested showed a strong response to war-whoops from the pre-laying to the incubation periods. Some of these species gave a poor response towards the end of the breeding season. This finding is supported by information on Providence and Hawaiian Petrels (Warham 1988) and Cook's Petrels (Scofield, this issue), but more information is needed.

Many other species of Procellariiformes were on our test islands. Some, especially prions, occasionally called in response to war-whoops, but others, e.g. storm petrels, showed no reaction. Only *Pterodroma* petrels have been

found to move towards human calls. However, vocal lures such as war-whoops could be useful for finding petrels (other than *Pterodroma* species) nesting in concealed sites.

We agree with Warham (1988) that human vocal lures could be useful for finding the burrows of rare species of *Pterodroma* petrel, such as Chatham Island Taiko (*P. magentae*) and Chatham Island Petrel (*P. axillaris*). We have already shown that war-whooping works well for locating Pycroft's Petrel, which is sparsely distributed on its breeding grounds. We have found very small, previously unknown and inaccessible colonies of Grey-faced Petrel by this method.

We have found that some other loud noises, such as a "wolf howl", will elicit a strong response from *Pterodroma* petrels. However, the war-whoops are easily used, carry well, and produce consistently strong responses. We recommend the war-whoop method as useful and practical in field studies of *Pterodroma* petrels.

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