Kiore: their impact on two small seabird species in the Hen and Chickens Islands

Conservation issue

The endemic Pycroft’s petrel (Pterodroma pycrofti) and little shearwater (Puffinus assimilis) now occur as relict populations on a small number of islands in northern New Zealand. Their breeding success is usually low, almost certainly because of predation.

Two predator species occur on the islands:
- **Kiore or Pacific rat** (Rattus exulans), a small (<100 g) rodent introduced to New Zealand many hundreds of years ago.
- **Tuatara** (Sphenodon punctatus), a medium-sized (<500 g) endemic reptile.

The systematic removal of kiore from the Hen and Chickens Islands provided an excellent opportunity to measure the relative impacts of kiore and tuatara on Pycroft’s petrels and little shearwaters.

Research objectives

To identify the cause of low productivity of Pycroft’s petrels and little shearwaters and, specifically, to determine whether:

1. **Kiore impact on the breeding success of Pycroft’s petrels and little shearwaters.**
2. **Tuatara impact on the breeding success of these seabirds.**
3. The two seabird species are in competition with each other.

Experimental design

On Coppermine Island, kiore were controlled to very low levels in spring/summer (1992/93), but had recovered across the island over the next four years. They were finally removed in July 1997. On Lady Alice Island kiore were removed in October 1994.

Up to 50 study burrows were checked on each island early and late in the breeding season to determine breeding success. Contemporaneous samples on the two islands enabled food supply to be eliminated as a confounding variable.

Key findings

1. **Kiore impacts**
   - **Little shearwater**: productivity was low, (average 16%), in the presence of kiore, but increased significantly (average 61%) on both islands once the rats were removed. The extremely low breeding success on Coppermine Island in 1995 and 1996 contrasted with high success on Lady Alice Island in the same years.
   - **Pycroft’s petrel**: productivity averaged 38% in the presence of kiore and 57% in the absence of kiore. In most years productivity was significantly higher on the kiore-free or kiore-controlled island than on the island in the presence of kiore.

   High rainfall, especially in 1998, caused the failure of some nesting attempts of both species.

2. **Tuatara impacts**
   - Nesting success was little different between burrows used or not used by tuatara.
   - A single tuatara has been observed in a petrel burrow.

3. **Competition**
   - Late-fledging little shearwater chicks can interfere with Pycroft’s petrels causing them to abandon nesting. Observations suggest that increased productivity of little shearwaters following kiore removal has caused a small proportion of Pycroft’s petrels to abandon nesting in some years.
   - Numbers of breeders of both species, however, are increasing on the Chickens Islands.

![Image of kiore and tuatara](image-url)