SHORT NOTE

"Hard release" of captive-reared New Zealand Pigeons (*Hemiphaga n. novaeseelandiae*)

Some regional populations of the New Zealand Pigeon (*Hemiphaga novaeseelandiae*) were in decline or at very low numbers in 1992 (N.D. Langham unpublished, Pierce *et al.* 1993). Captive-breeding of the New Zealand Pigeon (*H. n. novaeseelandiae*) or Kereru and the Chatham Island subspecies, Parea (*H. n. chathamensis*), and the release of captive-reared progeny might be needed in the near future to bolster or re-establish populations. The release of a wide range of captive-reared animal species into the wild to establish self-sustaining populations has been less successful (38%, N=34 release attempts) than the release of wild-caught animals (75%, N=163; Griffith *et al.* 1989). To improve the chances of success when releasing captive-reared animals, especially of threatened or endangered species, 'soft release' techniques have been used. For example, birds have been placed in aviaries at the release site to allow them to recover from the stress of the translocation and to acclimatise them to the release site. In addition, food is often provided to the birds for a period after their release (Jones *et al.* 1992, Brown *et al.* 1995). The problem is that such a technique requires aviaries and staff to care for the birds, and so is much more expensive than a 'hard release' technique, whereby animals are released into suitable habitat immediately following translocation and without supplementing food. Therefore, it is important to assess first whether a species can cope with this, and under what conditions. This was the aim of a preliminary study of Kereru in 1993.

Two immature Kereru (named 'Green' and 'Pink') at the National Wildlife Centre, Mount Bruce, Wairarapa were available for the trial. They were 14 and 17 months old when radio-tagged in January 1993, and had been raised by the same captive parents, one of which was originally a wild bird. The two Kereru were held in separate aviaries at the National Wildlife Centre that were planted with native species. The birds occasionally fed on these plants. Additionally, during the three months prior to their release, they were offered foods intermittently that were obtained from the intended release site, such as ripe maire (*Nestegis lanceolata*) and pigeonwood (*Hedycarya arborea*) fruit.

A release site was chosen at Rocky Hill Station (41° 12'S, 175° 47'E), eastern Wairarapa, about 60 km from the National Wildlife Centre. This was within a 118 ha block of protected native forest containing a variety of fruiting hardwoods, podocarps and lianas. This forest block was surrounded by pasture and pine (*Pinus radiata*) plantations (containing some native shrubs and trees), and scattered areas of native forest. The covenanted forest had been fenced to exclude stock, and signs of brushtail possums (*Trichosurus vulpecula*) were rare following recent private hunting and trapping efforts. No effort was made to reduce mustelid (*Mustela* spp.) or feral cat (*Felis catus*) numbers before the release.

On 29 January 1993, a metal numbered band, two coloured jesses (strips of 120 x 13 x 0.7 mm plastic-coated cloth spliced around the leg so that a 50 mm length trailed from the back of the leg), and a back-pack two-stage transmitter (20 g, 1-year field life)(Sirtrack Ltd.) were attached to each bird, after which they were returned to their respective aviaries.

Following the handling, one bird did not feed for about 48 h and the other for about 60 h. This reaction to radio-tagging has been noted of some wild Kereru (RGP, pers. obs.). The two Kereru were transferred to smaller (1 m^3) cages in the late afternoon of 21 February and held overnight, with food and water provided. Early the next morning they were transferred into separate compartments of a travelling box and taken by vehicle to the release site, and were released at 09:25 h. During the following five days both birds were sighted at least twice daily. Subsequently, until 25 March 1993, they were checked about twice a week.

The weather at the time of the release and for the next three days was misty drizzle and mild temperatures, after which it became clear, warm and relatively calm. Following release, both birds flew about 20 m to nearby trees and roosted for several hours. During the first few days, both birds remained within 200 m of the release site and were occasionally seen roosting and feeding with wild Kereru. Such behaviour is similar to that of wild birds. For example, fledgling Parea follow their parents and, once independent, follow other adults and so learn what to eat (RGP, pers. obs.). During the third day after its release, 'Green' flew about a kilometre to an area of tauhinu (*Cassinia leptophylla*) scrub, and on 2 March was located 3.5 km from the release site in native shrub-hardwood forest among pines, roosting in a kaikomako (*Pennantia corymbosa*) tree containing ripe fruit. Subsequently, it returned to the release area, where it was repeatedly found up until 25 March. 'Pink' also moved outside the native forest block during the second week after release, but had returned by 11 March. On 25 March, 'Pink' was feeding on ripe cabbage tree (*Cordyline australis*) fruit and 'Green' was roosting in a miro (*Prumnopitys ferruginea*) containing ripe fruit.

After 25 March 1993, the birds were monitored monthly and both were always found in the Rocky Hill Station forest where they were released. During April and May 1993, 'Pink' was seen with a wild Kereru feeding on pigeonwood and miro fruit. However, on 15 June 1993 all that was found of the bird were fresh feathers, broken lower leg bones and the wings. The distance between paired canine marks in the foam base of the transmitter suggested that the bird had either been killed or scavenged by a stoat (*Mustela erminea*). 'Green' was last seen alive and well on 10 December 1993, after which its transmitter stopped functioning.

We suspect that the following factors in combination, rather than any particular one, were important for the survival of the two Kereru during the first month after release:

a) one recognised an Australasian Harrier as a predator and reacted appropriately while captive at the National Wildlife Centre;

b) they had the opportunity to feed on foods present at the release site during the three months before release;

c) they had time to get used to carrying a radio-tag before release;

d) they were released when a variety of tree species were fruiting heavily (very visible and often energy rich food sources); and

e) wild kereru were present which the released birds could follow and so learn what to feed on.

Given the initial survival of the two birds, further hard releases of captive-reared Kereru are warranted to determine which, if any, of the factors is crucial to the survival of released Kereru, and whether they subsequently breed successfully to boost the number of wild birds. It also should be investigated whether captive-reared or wild-caught Kereru would survive and breed following their release in suitable habitat devoid of Kereru to see whether the hard release technique is suitable for establishing new populations.

ACKNOWLEDGEMENTS

We thank Colin Miskelly and Peter Moore for comments on a draft of this note.

LITERATURE CITED

BROWN, P.B.; HOLDSWORTH, M.C.; ROUNSEVELL, D.E. 1995. Captive breeding and release as a means of increasing the Orange-bellied Parrot population in the wild. Pp 135-141 *in* Reintroduction Biology of Australian and New Zealand Fauna. M. Serena (Ed.). Surrey Beatty & Sons, Sydney.

GRIFFITH, B.; SCOTT, J.M.; CARPENTER, J.W.; REED, C. 1989. Translocation as a species conservation tool: status and strategy. Science 245: 477-480.

JONES, C.G.; SWINNERTON, K.J.; TAYLOR, C.J.; MUNGROO, Y. 1992. The release of captive-bred Pink Pigeons *Columba mayeri* in native forest on Mauritius. A progress report July 1987-June 1992. Dodo, Journal of the Jersey Wildlife Preservation Trust 28: 92-125.

PIERCE, R.J.; ATKINSON, R.; SMITH, E. 1993. Changes in bird numbers in six Northland forests 1979-1993. Notornis 40: 285-293.

KEYWORDS: New Zealand Pigeon, Kereru, *Hemiphaga n. novaeseelandiae*, captive rearing, hard release

R.G. POWLESLAND, *Science & Research Division, Department of Conservation, P.O. Box 10420, Wellington, New Zealand*

M. WILLANS, *Mount Bruce Wildlife Centre, Department of Conservation, R.D. 1, Masterton.* Present address: *Te Anau Field Centre, Department of Conservation, P.O. Box 29, Te Anau, New Zealand*

Manuscript received 8 November 1996, revised & accepted 8 March 1997