**KERERU NEWS No. 71 (15 June 2009)**

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An email newsletter of views and information about and observations of kereru / kuku / kukupa / kokopa / New Zealand pigeon / parea / Chatham Islands pigeon by Ralph Powlesland

**1. A couple publications that may be of interest**

a) Campbell, K.J.; Wilson, K-J.; Ogilvie, S. 2008. Notes on the breeding biology of kereru (New Zealand pigeon, *Hemiphaga novaeseelandiae*) on Banks Peninsula, South Is, New Zealand. Notornis 55: 98-100.

Some points of note from the publication:

- Male kereru were observed doing display flights from August to February
- First nests were found in September
- A snowstorm resulted in nest abandonment
- Up to 3 nesting attempts per pair
- Only 2 pairs reared chicks (2 of 12 nests from several pairs), and they did not re-nest afterwards
- Most nests failed at the egg stage
- Two radio-tagged kereru were found dead
- Pairs bred successfully when fruit was not available, instead feeding on protein-rich foliage of plants, such as legumes, or the new growth of deciduous species.

b) Blanchard, B. 1992. Hand-rearing a New Zealand pigeon *Hemiphaga n. novaeseelandiae* at the Wellington Zoological Gardens. International Zoo Yearbook 31: 49-53.

This publication managed to evade my notice until now, and in case you also are not familiar with it here are a few points of note:

- An c. 4 week old abandoned chick was provided to the zoo after the nest tree was felled
- It developed a severe louse infestation that was treated with pyrethrum powder
- Chick always defecated over the side of the artificial nest so hygiene not a problem
- Weighed c. 300 g initially, and was force-fed 4 times a day with pieces of food (pieces of fresh soft fruit, Farex-Roudybush mix, powdered cuttle-fish bone).
- Peach, nectarine, thawed frozen carrot and sweetcorn were fed to the chick but passed through undigested and so were discontinued
- Steady weight gain to 582 g by day 24 in captivity, and started perching on a branch near its nest; fledgling
- Chick noticed panting at 25oC in shade; overcome with a fan operated near the cage and occasional misting with cold water
- The fledgling took some time to learn to feed itself, doing so when estimated to be 5 months old
- More details given about diet supplied after nest-leaving, and the use of a feeding perch to determine when it was hungry or not

**2. Kereru – continuation of where various topics of information about kereru are available, and where gaps in our knowledge about kereru are (full listing available to DOC staff at docdm-117328)**

Threats to kereru and / or parea from research and / or management procedures

> Much has been achieved since the 1980s in increasing our understanding of the ecology of these two species through research (such as long distance seasonal movements made by some kereru, vulnerability of eggs, chicks and adults to a variety of introduced mammalian predators) (Higgins & Davies 1996), and improving

management procedures, particularly pest control, to promote their conservation. Many regional populations of kereru have benefitted during the past decade from pest control operations carried out by a variety of organisations, including Department of Conservation, Animal Health Board, regional councils, and city councils, as well as the public operating individually or as landcare groups on public and private land. As a result of these efforts the threat status of the kereru has improved from 'gradual decline' in 2005 to 'not threatened' in 2008 (Miskelly et al. 2008). Over the same period the status of the parea has remained as 'nationally critical'.

However, various procedures carried out to undertake research on kereru / parea or to improve the status of populations through management have not been without their risks to individuals. Mishaps have been few, and procedures have been promptly modified or culminated when it has become apparent that birds have been injured or killed. Given some attributes of kereru and parea (large, fast flight, prone to stress when handled), it is inevitable that if large numbers are exposed to research procedures involving capture and handling, an occasional individual may suffer an injury, but it is expected that the benefits that accrue to the population far outweigh such negative impacts.

Capture using mist-nets

Mist-nets, either as a single net attached to poles, or as a series of nets attached to rope pulleys suspended from a tall canopy, has been the main method of capture. Usually, the mist-net is set up next to a food tree that a pigeon is regularly coming to feed in. Ideally the net is in shade, although this is not necessary. The important point is that the net is close to the food tree and at 90 degrees to the bird's usual approach so that a kereru flying into the net is about to land and so flying slowly, and approaches the net from directly in front rather from an angle. Because of their bulk, kereru or parea hitting mist-nets at speed (if a net is set in a flight path) or from an angle can result in injuries.

Handling

Because of their size, weight and tendency to struggle when being extracted from a net, it is best if this operation is carried out by two people, one person restraining the bird and the other untangling it. Like some other pigeon species (Goodwin 1967), kereru and parea may readily shed feathers on hitting a net, flapping about in it, or when handled. Generally these are small contour feathers, but the loss of all tail feathers has happened! Kereru held in captivity with an injury, and so having to be handled regularly, become much less prone to shedding feathers. This ability to readily loose a few feathers seems to be a trait of many pigeon species, and perhaps relates to their frequent targeting by raptors. Like the dropping of tails by lizards during encounters with predators, better for a pigeon to loose a few feathers to the talons of a falcon and so survive the encounter.

Once removed from the net, the bird needs to be restrained in the lap of one person, while another carries out any required procedures, such as measuring, banding, jessing, or radio-tagging. Kereru often attempt to escape handling by flapping their powerful wings, and as a result often have to be held quite firmly. This handling procedure may have resulted in some birds remaining perched on release for an hour or more. It was considered that such kereru may have suffered heat stress during handling, and as a result became dehydrated. Kereru in a study in Taranaki and Southland that involved radio-tagging (Powlesland et al. 2008) were therefore tube fed with a dilute glucose solution in an effort to overcome this problem. While some tube-fed birds on release resumed normal activities within a few hours, others did not, and so the tube-feeding did not always solve the problem. Thus, we always regularly checked kereru after they were radio-tagged, twice daily for the first couple of days after release, and then once daily until we were confident that they were behaving normally (at least for a week). Any

radio-tagged birds found on the ground unable to fly were held in captivity until they were active again before being released.

Banding

In early studies, kereru were banded with K-sized metal leg bands (9 mm diameter). Although no banded birds were subsequently seen having problems associated with bands, it seemed that for some kereru there was little room between the band and the leg. As a result subsequent birds were banded with S-sized bands (10 mm diameter), and none of these birds experienced problems associated with the use of the larger diameter band. The S band is now the recommended band size for use on kereru and parea (G.A. Taylor, Banding Office, Department of Conservation, pers. comm.).

Jessing

The legs of kereru are well feathered, and so the use of colour-bands to identify individuals is not practical. As a result Mick Clout and his associates, during their early studies of kereru in the Marlborough/Nelson region, developed the technique of attaching jesses to birds, similar to jesses that falconers have attached to raptors for hundreds of years. In the case of falconers, a jess is a long strip of leather spliced around a raptor's leg that enables the person to retain the raptor on their arm until he/she is ready to release the bird. For kereru, jesses are short strips of coloured cloth and PVC material that are attached to one or both legs using the falconer's splice (Kereru News no. 9). Each jess extends from the back of a leg by about 50 mm, enabling them to be seen beyond the leg feathering when the bird is perched on a narrow branch. It is important to ensure that each jess fits appropriately, not too loosely or tightly. If a jess is fitted and found to be too tight (does not swivel readily) or too loose, it should be removed and another fitted.

Radio-tagging

Many kereru have been radio-tagged since the 1980s. The main threat to kereru of radio-tagging is during capture and handling, as indicated above. In addition, it's important to ensure the correct attachment of the harness to the bird so that the bird is not inconvenienced by having to carry the transmitter and harness for several years.

Three types of radio-tags or transmitters have been fitted to kereru to date: tail-mounted VHF transmitters, back-mounted VHF transmitters, and back-mounted satellite transmitters. Few tail-mounted transmitters (< 2% of body weight) have been attached to kereru to date (mainly because back-mounted transmitters with a longer battery life have been favoured). This mode of attachment means that the transmitter is moulted off the bird within a year. This is advantageous as the recapture of tagged kereru to remove defunct transmitters can be very time-consuming, and usually it is difficult to capture a particular individual. The disadvantage of using this attachment method is that a full annual cycle of activities of an individual cannot be monitored.

A few hundred kereru have had back-mounted VHF transmitters attached to them during several studies. The advantage of using such a transmitter, compared to a tail-mounted one, is that being heavier (≤ 3% of body weight) the battery life of the transmitter can last for 3-4 years depending on the duty cycle incorporated (e.g. 12 hours on / 12 hours off). In addition, a few satellite transmitters have been attached to kereru. Both types of transmitters have been attached using harness design developed initially by Karl & Clout (1987), incorporating a weak-link. Most radio-tagged kereru have experienced no problems with carrying transmitters, undertaking long-distance movements and breeding successfully. As long as the harness is fitted correctly, no skin damage occurs where the harness loops run over the front at the base of each wing. However, a few kereru have become entangled by the harness when, for example,

a dead twig has become skewered between their body and the harness. Unfortunately the weak-links have been too strong for the birds to break. As a result of such deaths, it has been decided by the Animal Ethics Committee of the Department of Conservation that no further back-mounted transmitters should be attached to kereru until a weak-link mechanism has been developed that breaks reliably when a kereru becomes ensnared by the harness.

Cameras at nests

Small surveillance cameras, connected to time-lapse video recorders and batteries, have been set up to record kereru nesting activities and predator visits to kereru nests. The threat to kereru from the use of such equipment is abandonment of the nest during installation, especially early in the nesting cycle. Unless a pair has experienced such equipment being set up and operated close to their nest previously, it is best to wait until the birds are well into incubation before installing the equipment. Even then, it is important to initially set up the camera below nest height and perhaps 20 m from it, moving it closer to the nest gradually at intervals of several days. A long cable (> 30 m) can be used to connect the camera to the recorder and battery so that tape and battery changes can be undertaken well away from the nest.

Possum and cat trapping

Soft-jawed leg-hold traps set to capture possums or feral cats have been responsible for some kereru (Sherley 1992) and parea deaths (D. Palmer, Chatham Islands Area Office, Department of Conservation, pers. comm.). Even though traps have been set on raised boards or on the ground, either as walk-throughs on a track or at the base of a tree just off a track, several kereru and parea have been trapped. Parea are particularly vulnerable to these traps because they forage on the ground within forest to feed on the leaves of tree seedlings and ground plants. Solutions tried have involved ensuring that walk-through traps are not set along bush edges or fencelines, in areas that have an open canopy, where herbs known to be parea foods or palatable seedlings are common, and in open areas near waterways, instead using cage traps at such sites. Even raised set-traps situated 700 mm or more above the ground in weka- and kiwi-inhabited areas may be used as perches by kereru when foraging in the understorey (Sherley 1992).

Bait stations

On one occasion, bait stations positioned along a forest edge and baited with brodifacoum (anticoagulant) baits resulted in kereru deaths (Kereru News no. 27). It seemed that the birds had fed on bait fragments about the stations left after feeding by rats and possums. It is difficult to image why kereru bothered to feed on bait fragments unless they were already used to feeding on clover or some other ground plant in the immediate area before the bait stations were set up, or food was very scarce at the time. However, it does indicate that in some circumstances wild kereru will feed on novel foods, including manufactured items.

Aerial 1080 pest control operations

Kereru are known to eat fragments of carrot and cereal-based baits (Spurr & Powlesland 1997). They obtain most food while foraging in shrubs or trees, but kereru do forage on the ground. Thus, it is possible that kereru could encounter baits and bait fragments in the canopy and on the ground. At least eight have been found dead incidentally after 1080-carrot operations, but none after 1080-cereal operations (Spurr & Powlesland 1997). The one kereru submitted for 1080 analysis that was found dead after aerial application of screened carrot baits in Pureora Forest Park in 1996 tested positive for the toxin. There was not detectable effect of 14 aerial 1080-poisoning operations for possum control (9 using screened carrot and 5 using cereal baits) on

kereru populations monitored by 5-minute counts (Spurr & Powlesland 1997). One attempt has been made to monitor radio-tagged kereru during an aerial 1080-poisoning operation. This was carried out in Whirinaki Forest Park, central North Island, in May 2000 and involved the use of carrot baits. None of 15 radio-tagged kereru in the treatment area died after the poison operation, but one of 11 died in the non-treatment area (Powlesland et al. 2003). Further monitoring of radio-tagged kereru during aerial 1080 possum control operations would be required to have confidence in our knowledge about the impacts of such operations on kereru.

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