

Kākāpō Recovery programme update

JULY 2015

Kākāpō population update

	Adults	Juveniles (<5 years old)	Total
Females	50	9	59
Males	59	7	66
Total	109	16	125

Table 1: Current kākāpō population

	Known age	Unknown age	Total
Females	45	14	59
Males	48	18	66
Total	93	32	125

Table 2: Current known-aged birds

HEALTH

Two potentially new cloacitis cases have been found since December 2014, both occurring in chicks that hatched in 2014. Cloacitis is the inflammation of the cloaca in birds and other animals with a common opening of the urinary and gastrointestinal tracts. Mahli was found with a suspected mild case of cloacitis in December 2014. Taeatanga had a case in February 2015 and a mild recurring case in May. All three cases were treated at the New Zealand Centre for Conservation Medicine (NZCCM) at Auckland Zoo, and both birds were returned to Codfish Island/Whenua Hou.

Smoko was found with a severe wing injury on 22 April 2015. A stick had got under his transmitter harness and twisted, reducing blood circulation to his wings, in particular his right wing. Smoko was flown to NZCCM

at Auckland Zoo and underwent eleven weeks of treatment before being returned to the island.

MORTALITY

The mortality rate of founder kākāpō (birds removed from Stewart Island/Rakiura to Codfish Island/Whenua Hou) has increased in the past 5 years

(11 birds died from 2010 to 2014 inclusive = 2.2/year; 20% mortality for females and 24% for males). Quite a jump up from the 5 years prior to that (three birds died in 5 years = 0.6/year). Prior to 2005 the last founder death was in 1998. It's unclear if the increase in mortality is due solely to an aging population or to another factor such as the reduction of regular supplementary feeding.

This highlights the importance of producing chicks from each founder to ensure genetic diversity is not further reduced. Ideally each founder would produce at least six offspring in order to pass on more than 98% of their genes. Of the 19 living Stewart Island males, nine have yet to produce chicks and six have only produced one to four offspring. Of the 16 living Stewart Island females, one has yet to produce chicks and nine have only produced one to four offspring. Richard Henry's three offspring, now 17 years old, have yet to produce any of their own. They are the only kākāpō to carry his valuable Fiordland genes.



Smoko soon after he was found with his injured wing.



Updated breeding predictions 2016



Rimu fruit.

The new rimu fruit crop that was counted on Codfish Island/Whenua Hou and Anchor Island during February and March 2015 shows there is enough fruit to induce kākāpō breeding on both islands in 2016 (when the fruit is due to mature). The fruit is dormant over winter and begins growing again in the spring. This period of resumed growth in spring appears to be a period of risk for the fruit if the weather is too cold. It seems likely that severe cold spells of up to 10 days may cause acute fruit abortion (as occurred in 2010). Or general cold spring weather may cause gradual fruit abortion during spring and summer and/or prevent fruit from fertilising (in January) and ripening (February to May). If spring temperatures on the islands are average or above, we can expect kākāpō breeding at the following estimated rate:

CODFISH ISLAND/WHENUA HOU

The fruit crop is 24.4% so we might expect about 40% of the 5- to 10-year-old females (10) to breed and about 75% of the 22 older females to breed. If the hatch rate remains similar to breeding since 2009 then about 25 chicks are likely. The amount of hand-rearing will depend on whether the rimu fruit ripens and the success of the trial of Yvette's kākāpō breeding pellets.

ANCHOR ISLAND

The fruit crop is 13.3% so it might be expected about 15% of the 5- to 10-year-old females (12) will breed and about 60% of the 10 older females will breed with a production of about 10 chicks. However, Anchor Island also has the potential for beech mast (mountain and silver beech). If beech masting occurs and kākāpō use this in addition to rimu as a breeding trigger – and as food for chicks – then productivity may be increased to an unknown extent.

TE HAUTURU-O-TOI/LITTLE BARRIER ISLAND

To date it is thought that kauri, hard beech and kahikatea are the breeding triggers on Hauturu. Although the cues for kauri mast are unknown, cones take a year-and-a-half to develop. Plant monitoring on the island suggests that there will be insufficient kauri cones to trigger kākāpō breeding in 2016. Previously observed masting of kahikatea on Hauturu and in Southland suggests that it has the same temperature cue and fruit development time as beech.

Artificial insemination and sperm storage

Producing more offspring using AI is a high priority in order to retain genetic diversity before further founders die. This should also improve fertility. The priority of either management or research on artificial breeding is to be the following:

- A** – Confirm best sperm extraction method.
- B** – Produce more chicks with AI (priority sperm donors are Richard Henry's sons and Stewart Island males with few or without offspring).
- C** – Understand / refine best practice for successful AI.
- D** – Work on improving short-term storage (to ensure maximum sperm viability is retained between collection and insemination over a period of up to 48 hours).
- E** – Work on cryopreservation to develop the most appropriate storage media, cryoprotectant and freezing protocol, to preserve sperm from each founder male for future use. This can help retain maximum genetic diversity.

We believe that resources in 2016 will best be used in AI to increase fertility and male representation, as we know that AI can be effective.

Planning for the 2016 breeding season

Planning is underway for the 2016 season and how breeding will be managed across three potential sites. As a result, significant changes are being made to the breeding season management plan. This will ensure the maximum use of the technology that has been developed during the past two breeding seasons.

The team is confident that 'Checkmate' and 'Eggtimer' transmitters will pick up all mating/nesting events. This means track and bowl systems will not need to be monitored and daily checking of transmitter pulse rates will be reduced.

In order to increase reliability, existing technology is being upgraded including smarthoppers, electronic scales and radio snarks (nest monitors). This will reduce the number of people required on the islands over the breeding season. Only the chicks of the highest genetic importance will be nest-minded by people. All others will be monitored electronically.

New technology is also being developed including 'Errols' and a 'smart egg'. 'Errols' is a solar-powered satellite station that downloads data from the birds' transmitters as they pass by and sends this data via satellite to the hut. This will significantly reduce the staff time required to record data out in the field and will ensure that data is at the hut early in the morning, which will assist with artificial insemination decision-making. The 'smart egg' will be a moving, cheeping

egg that is given to each mother in the final days of incubating a dummy egg. It is hoped it will better prepare her for the arrival of a chick and reduce the issues currently experienced, where mothers take a few days to change from incubation to chick-feeding mode.

As many eggs as possible will be artificially incubated from 7 days of age to ensure safe incubation. The majority of incubation issues happen in the nest, e.g. cracked eggs, mothers off nests for too long. Artificial incubation after the 7 days will minimise these issues. All mothers will have dummy eggs during this period. Effective protocols for artificial incubation have been developed and are highly reliable and this process will be followed in 2016.



Incubator.

ICC hand-rearing unit

Plans are progressing with the 'kākāpōrium' – the kākāpō chick hand-rearing facility at the Southland Museum. This project is being developed by the Invercargill City Council as part of a wider museum upgrade.

Recovery plan 2016–2026

Writing the Kākāpō Recovery Plan 2016–2026 is underway but has been delayed. Draft goals have been written.



Research

AGING STUDY

Two attempts were made to determine the age of the 32 kākāpō of unknown age by measuring the levels of pentosidine (a chemical in the skin for which concentration changes with age in some birds). Unfortunately testing the levels of pentosidine doesn't work for kākāpō. Results show an enormous variation between individual kākāpō of various ages. This follows on from a previous unsuccessful aging study of kākāpō that found no correlation with the length of telomeres on the end of chromosomes. Pentosidine samples were processed at labs in New Zealand (Landcare) and in the United States (West Virginia University).

CLOACITIS

Development of a targeted test to find a virus that is associated with cloacitis is under way, conducted by Dan White at Landcare. The test will allow quick and inexpensive tests to determine for presence of the virus, which will help determine whether it is a possible cause of cloacitis.