Department of Conservation
Te Papa Atawhai

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20 December 2018

[redacted]

REQUEST FOR INFORMATION – EFFECTS OF 1080 ON NESTING AND FERTILITY OF KŌKAKO AND OTHER BIRDS

I refer to your email of 6 December 2018 to Shona Bradley, Bronwyn Barnard and Susan Woodhouse, who are solicitors with the Department.

I have been asked to provide a response to parts of your email which are being treated as a request under the Official Information Act. These are (1) your comment about kokako survey data, and (2) your request for information on possible effects of 1080 on fertility and re-nesting for kokako and other species, as follows:

> "I note that the kokako survey data from the Hunuas identified infertile kokako eggs after the 2015 Hunua 1080 poison drop, and also reduced re-nesting attempts."
> ...
> "I would also be grateful (or your DoC colleagues) if you could provide any analysis that has been done to assess any correlation and/or causation between 1080 and reduced fertility and/or re-nesting attempts for kokako, and other species which are known to eat cereal poison baits such as kea, kiwi and kaka ,and the impact this has or may have on the trajectory of these birds."

1. *"I note that the kokako survey data from the Hunuas identified infertile kokako eggs after the 2015 Hunua 1080 poison drop, and also reduced re-nesting attempts."*

I assume that you are referring to the document entitled "Annual Kōkako Report" for the Hunua Kōkako Recovery Project for 2015-16 dated 18 July 2016, which was referred to in paragraph 9 of, and attached and marked (B) to, the affidavit in reply of Karla Allies prepared for the Hunua RMA enforcement order proceedings.

That report at page 3/7 includes a statement in the section on nesting success that "One failed due to egg fertility..."

There is no evidence to suggest that the egg fertility issue associated with the nest referred to in the 2015-16 report was due to 1080. Rather, it is likely that it was due to the residual effect of inbreeding that has been addressed through a series of translocations to supplement the kōkako group's gene pool.

In terms of your assertion that the 2015-16 report refers to "reduced re-nesting attempts", I cannot find any such reference.

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However, the 2016-17 report (page 6) refers to the kōkako not having a second successive clutch that season, and that this was probably due to the lack of ripe food. It also notes that there were in fact successive clutches in 2015/16, as follows:

> The mean number of nests located from the six target pairs was 1.2, which is lower than the number located in the 2013-14 or 2015-16 seasons (2.2 and 2.3 nests detected per season respectively), but was greater than the number of nests in the 2014-16 season (0.67 attempts detected per pair). The reason for this relatively low number of nest attempts is because pairs did not attempt to have a second successive clutch following the fledging of their first clutch, and because five of the six first clutch nests were successful. The lack of double clutching this season is probably due to a lower abundance of ripe fruit, particularly of pigeonwood (*Hedycarya arborea*) which fruits abundantly biennially. As with the 2015-16 season, all monitored pairs successfully fledged chicks, indicating that the predator control methodologies employed each season have been successful. It is recommended that these methodologies continue in their current form in future years to maintain the high productivity at this site and to retain rare alleles within the population.

I can confirm that the Hunua Ranges pest control programme has led to a significant increase in the kōkako population. There are now 106 breeding pairs of kōkako, in 2000 hectares of pest managed forest - the Kōkako Management Area - compared to 55 breeding pairs counted in the 2014 census.

When pest control began in 1994, only one breeding pair of kōkako remained in the Hunua Ranges. Rats were tracking at 91.6% saturation across the Hunua Ranges, with possum numbers also high. Pest species have since dropped dramatically. Possum species currently track at zero percent and rat densities between two and three per cent.

The kōkako population in the Hunua Ranges, is now the fifth largest in New Zealand. It is also well above the target of 50 pairs by 2020, set by the national Kōkako Recovery Group.

As well as leading to a booming kōkako population, the programme has resulted in a thriving eco-system and an increase in other native wildlife species in the Hunua Ranges. Kākā, miromiro/tomtits, korimako/bellbirds, kereru, koekoeā, long-tailed cuckoo, ruru/morepork and long-tailed bats populations have all benefited from the pest control programme in the Hunua Ranges.

2. *"I would also be grateful (or your DoC colleagues) if you could provide any analysis that has been done to assess any correlation and/or causation between 1080 and reduced fertility and/or re-nesting attempts for kokako, and other species which are known to eat cereal poison baits such as kea, kiwi and kaka ,and the impact this has or may have on the trajectory of these birds."*

Kōkako
As noted above in my response on fertility and re-nesting issues, there is no evidence to suggest that there is any correlation or causation between 1080 and reduced fertility or re-nesting attempts of kokako.

There is in fact no evidence suggesting that there are reduced fertility issues for kōkako, and the translocations of kōkako from other areas under the Kōkako Recovery Project are being undertaken to enlarge the kōkako gene pool and address this type of issue, which could otherwise come as a result of the small original gene pool.

As noted above, there is no evidence of 1080 negatively affecting re-nesting attempts, as this is dependent on available ripe food sources. The removal of predators such as possums and rats, increases food sources for our native birds, and therefore 1080 operations are likely to assist re-nesting, contrary to your suggestion that it may be a hindrance.

In addition to the Kokako Recovery Reports which you have already been provided, you may also be interested in the 1999 paper on kokako entitled: "Successful recovery of North Island kokako *Callaeas cinerea wilsoni* populations, by adaptive management", authored by John Innes, Rod Hay, Ian Flux, Philip Bradfield, Hazel Speed, and Paul Jansen.
https://www.sciencedirect.com/science/article/pii/S0006320798000536

Kākā
DOC scientists have undertaken significant monitoring of kākā located in areas subject to pest control involving 1080. They have monitored kākā nests in breeding seasons from 2010 to 2015 after aerial 1080 treatment and in an area where 1080 had never been used.

Results show on average 55% of kākā nests were successful up to a year after 1080 treatment but less than 2% of nests produced chicks in the comparison (untreated) area.

This result shows that 30 times as many kākā chicks were produced in the area after 1080 treatment as the area where no 1080 was used.

Adult birds also had a much higher survival rate in the area where predators were controlled with 1080 - only 3% of adult kākā died in the 1080 treated area, whereas 20% died in the area that was not treated.

This result is significant for this relatively long-lived parrot.

You may also be interested in further information on the benefits of 1080 on kākā at

http://createsend.com/t/i-5547367217149CC2

https://www.doc.govt.nz/our-work/battle-for-our-birds/battle-for-our-birds-monitoring-results/south-island-kaka/

Kiwi
There have been no recorded 1080-related deaths of any kiwi.

DOC scientists have monitored 583 kiwi throughout 1080 operations since 1990. Over that time, not one has died as a result of 1080 poisoning.

Kea
In terms of effects of 1080 on kea, as you are aware, there has been some recorded mortality as a result of kea ingesting 1080 baits.

A recent peer reviewed paper has been published in the New Zealand Ecology Journal, reporting on the results of data collected from monitoring 222 kea between 2008 and 2016 at 12 sites where 1080 operations have been undertaken, some sites having multiple treatments.

The results of the study support the theory that DOC scientists had developed that "scrounging" by kea could be a potential influence on 1080 poisoning risk.

Kea in areas where there is human activity adapt to "scrounging" human food by stealing, soliciting and scavenging food directly from people, or indirectly from rubbish bins and open landfills. At scrounging sites, kea are constantly exposed to rewarding novel foods and become familiar with the wider range of food types than is normal in the wild. The hypothesis is that these experiences could lead to suppression of innate neophobic (cautious behaviour toward anything new) behaviours that might otherwise protect kea from 1080 poisoning risk.

The results of the study demonstrate that of the 222 monitoring occasions covering 205 kea over this 2008 to 2016 period, of the 24 kea deaths that occurred, 21 of those birds lived adjacent to a scrounging site (ie within 20 km), and only three kea lived remote from scrounging sites (i.e. within 40 km of a scrounging site).

It is also noted that while this study supports the theory that kea that live closer to scavenging sites are more at risk of 1080 poisoning, it also records that the kea adjacent to scrounging sites were greatly overrepresented in the study, and kea living 20 – 40 km were not represented at all.

As the paper notes, in reality, over two thirds of kea live in the "remote" range (i.e. greater than 40 km from scrounging sites), and over 80% of the recent aerial 1080 use between 2014 – 2016 has been applied to "remote" areas.

There are several possible approaches to managing 1080 poisoning risk near scrounging sites outlined in the paper, some of which would also have additional benefits of reducing mortality from other hazards such as lead and cars. The paper also includes a series of recommendations, including specific management techniques and further identified research. Further work in this important area will continue.

As the earlier June 2018 peer reviewed paper concludes, aerial 1080 greatly improves kea reproductive success. In the BACI study reported in that paper, the results showed that aerial 1080 improved the odds of daily nest survival by a factor of 9.1 at the treatment site, with nest survival increasing from 46.4% to 84.8% at the Impact site, but survival declining from 21% to 12.2% at the untreated Control site.

This shows a positive effect on kea nest survival, and thus 1080 is a valuable, if not essential, tool for kea conservation. As the later paper confirms, these benefits are more than sufficient to offset any mortality from ingestion of 1080 by kea in remote areas.

For these peer reviewed papers referred to above, see:

> Joshua R. Kemp, Corey C. Mosen, Graeme P. Elliot and Christine M. Hunter, 2018. "Effects of the aerial application of 1080 to control pest mammals on kea reproductive success", New Zealand Journal of Ecology, Vol. 42, No2. https://newzealandecology.org/nzje/3341.pdf

> Joshua R. Kemp, Corey C. Mosen, Graeme P. Elliott, Christine M. Hunter, Paul van Klink, 2018.
> "Kea survival during aerial poisoning for rat and possum control", New Zealand Journal of Ecology, Vol 43, No1.
> https://newzealandecology.org/nzje/3351

Conclusion
In conclusion, the Department is not aware of, nor holds, any publications or data supporting a correlation between reduced fertility and/or re-nesting attempts by any of the species mentioned in your request.

To the contrary, there are several peer reviewed publications demonstrating a positive correlation between pest management involving the use of 1080 and other toxins and increased breeding success of indigenous threatened species.

Please note that this letter (with your personal details removed) and enclosed documents may be published on the Department's website.

Yours sincerely

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Amber Bill
Director Threats - Biodiversity Group
for Director-General