



OIA 20-E-0220 – DOC-6280869

5 May 2020

fyi-request-12599-709d30a1@requests.fyi.org.nz

Dear Mr. Atkinson

Thank you for your Official Information Act request to the Department of Conservation, dated 9th April 2020. You requested the following:

A copy of an unpublished DOC correspondence to see if there is any information on the origins of the current kiwi population on Little Barrier Island and whether that might explain the number of white kiwi that have hatched at Pukaha/Mt Bruce from kiwi transferred from Little Barrier Island.

The citation given is as Allendorf, A., Gemmell, N., Ramstad, K., Taylor, H., Weir, J., and White, D. 2016. Response to DOC ref: Request for Advice -- Expert Genetic Advice Regarding the Use of Ponui and Little Barrier Islands as Kiwi Translocation Founders. Unpublished document DOC-2754937, 1 May 2016.

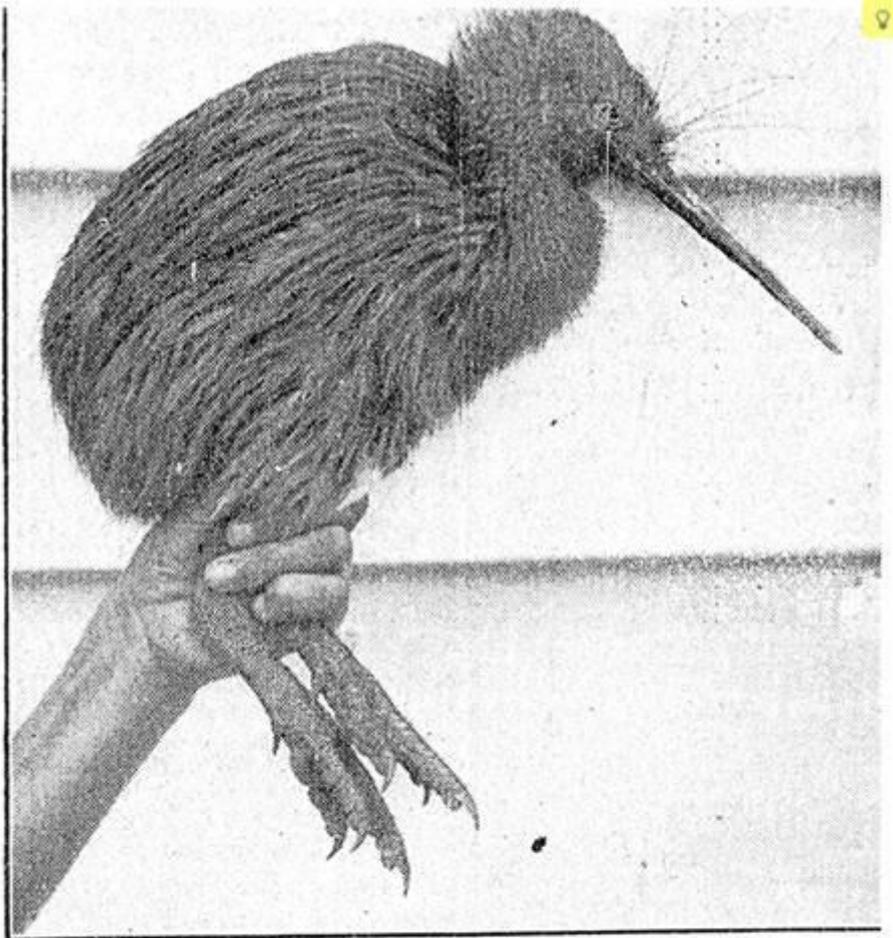
The correspondence has been released in full and includes the original request from the department listed in the above citation (Appendix 1 and 2).

As you will note, the original request briefly summarised some of what is known about the make-up of the founders on Hauturu/Little Barrier Island.

'It is thought that Hauturu/Little Barrier Island, which now has close to 1000 birds, was founded by a minimum of 3 western brown kiwi (two transferred in 1902 and one white bird from the Taupo area released in 1913), perhaps 16 birds of unknown provenance liberated around 1919, and an unknown number of native Northland-type birds that had persisted on the island for hundreds or thousands of years. The latter species was considered extinct in the late 1800s, but Oliver Haddrath has identified the presence of Northland-type mtDNA in one of 15 samples.'

To expand and slightly correct some of the information included above, brown kiwi were certainly on Hauturu/Little Barrier Island in the 19th century, and a specimen collected from there is now in the Vienna Museum. This population was thought to have died out by the time the two Taranaki birds were introduced in 1902, but given that the island population has a unique louse not known from mainland populations, it seems very likely that a few birds remained.

We also believe that birds may have been taken directly from Northland to Hauturu/Little Barrier Island in the 20th century, such as the bird in this Auckland Herald report of 17 November 1931 (see "Papers Past" website <https://paperspast.natlib.govt.nz>):



KIWI FOUND ON A NORTH AUCKLAND FARM.

This **kiwi**, a fully-developed bird in splendid condition, was found by Mr. H. Draper on his farm at Maungaturoto and is at present awaiting transfer to the bird sanctuary on Little **Barrier** Island.

In the Poverty Bay Herald on 11 September 1903 there is a report of a “fine grey kiwi from Milford Sound” being taken to Hauturu/Little Barrier Island along with four kakapo from Dusky Sound. This was likely a little spotted kiwi. Whether these birds, or others, actually got to the island is not known. As an aside, nineteen great spotted kiwi were also translocated to Hauturu in 1915, but failed.

It seems most likely that the white birds now at Pukaha/Mt Bruce are descendants of the Taupo bird released in 1913.

We hope this information is useful to you.

Yours sincerely,

Fathima Iftikar
Director – Terrestrial Ecosystems Unit

13th May 2016

Re: Response to DOC ref: Request for Advice – Expert Genetic Advice Regarding the Use of Ponui and Little Barrier Islands as Kiwi Translocation Founders DOC-2754937

Signatories: Professor Fred Allendorf, University of Montana, USA
Professor Neil Gemmell, University of Otago, New Zealand
Dr Kristina Ramstad, University of South Carolina, Aiken
Dr Helen Taylor, University of Otago, New Zealand
Dr Jason Weir, University of Toronto, Canada
Dr Daniel White, Landcare Research, Auckland, New Zealand

We have been asked to provide an expert opinion as geneticists on a proposal to use North Island brown kiwi (*Apteryx mantelli*) (NIB) from Hauturu and Ponui Islands to found or supplement mainland or pest-free island NIB populations.

Our overall message is that the Hauturu and Ponui Island NIB populations have no genetic value whatsoever for use in restoration due to:

- 1. the population bottlenecks associated with their founding**
- 2. the genetic admixture within these populations due to their mixed provenance**

Given the known histories of these populations, we are quite confident in these assertions, even in the absence of genetic data from these sites. To be clear, the genetic diversity of most or all NIB populations would be reduced by the addition of Hauturu or Ponui kiwi, likely with harmful effects on population viability. Further, establishing new populations with Hauturu or Ponui birds would be a poor use of the few islands and sanctuaries suitable for wild kiwi conservation. A detailed genetic analysis is unlikely to reveal anything about the Hauturu and Ponui populations that is not already known (i.e., they each experienced a bottleneck and subsequent admixture). Thus, money and effort put into genetic work on Ponui or Hauturu would be better spent managing the remnant wild NIB populations that are not already known to have experienced bottlenecks or admixture.

If birds need to be taken off Hauturu or Ponui, then they should not be mixed with remnant mainland populations or used to start new populations. The best 'conservation' use of these birds would be to move them to a secure captive facility and use them for advocacy, or to leave the birds *in situ* and use these populations for scientific research (e.g., the consequences and dynamics of hybridization between NIB taxa).

If there are specific remnant NIB populations that show low genetic variation (e.g., due to bottleneck effects) or evidence of inbreeding depression, then we recommend that birds from populations that do not show evidence of admixture,

inbreeding or bottleneck effects be used for translocation into those populations for genetic rescue. Additional genetic work for mainland NIB kiwi is required to implement any genetic rescue required for these populations. This would include a detailed analysis of the genetic divergence among and genetic diversity, inbreeding and bottlenecks within remnant NIB populations. Such an analysis would allow K4K to design translocation and genetic management for NIB that is focused on non-admixed remnant populations.

Work currently being conducted by Dr Jason Weir will begin to address these questions. Unfortunately, the 62 NIB samples Dr Weir has access to may not be representative of the total genetic diversity across the current population of 25,000 NIB. More samples from a representative number of birds across the range of each population will be required to adequately assess the population genetics of NIB. Establishing how much inbreeding is present within and how much divergence exists between NIB populations is key to their effective genetic management.



Department of
Conservation
Te Papa Atawhai

Our ref: Request for Advice – Expert Genetic
Advice Regarding the Use of Ponui and Little
Barrier Islands as Kiwi Translocation Founders
DOC- 2754937

18 April 2016

TO: Kristina Ramstad, University of South Carolina Aiken
Jason Weir, University of Toronto
Helen Taylor and Neil Gemmell, University of Otago
Kevin Parker, Massey University
Fred Allendorf, University of Montana
Daniel White, Landcare Research

cc: Kiwi Recovery Group
Rob Fenwick, Chairman Kiwis for kiwi
Bruce Parkes, DDG Science and Policy
Carol West, Director Terrestrial Ecosystems

FROM: Jen Germano, Kiwi Recovery Group Leader

SUBJECT: Request for Expert Genetic Advice Regarding the Use of Ponui and Little
Barrier Islands as a Kiwi Translocation Founders

Context:

The Kiwis for kiwi Trust is a non-profit organisation set up to fund and support community groups and iwi, hapu and whānau working to increase kiwi numbers. The Trust is currently writing their 5 year investment strategy. They are aiming to be both proactive and strategic, as well as exploring ways to increase cost and time efficiencies in recovering the numbers of North Island brown kiwi. This is part of a wider partnership between the Department of Conservation, community, iwi/hapu/whānau, captive institutions and others to turn the national decline of kiwi into a 2% increase. We are seeking an opinion from you, as an international panel of conservation genetics experts, on one aspect of the plan as outlined below. Kiwis for kiwi, the Kiwi Recovery Group, and the Department of Conservation would greatly appreciate advice on this proposal.

Translocation Permitting Process

Any kiwi translocations currently carried out in New Zealand require a Wildlife Act Permit. Consideration for any decision maker in this process will be the viability of newly established populations. In order to avoid questions that may arise at the time of decision-making, it is proposed to explore this with relevant experts now to:

1. Enable Kiwis for kiwi to ensure they have a viable 5-year investment strategy
2. Avoid unnecessary planning costs for translocation applications that are unlikely to be approved
3. To provide direction on how LBI and Ponui birds can contribute to conservation efforts

Current Kiwi Taxonomic and Conservation Status:

Brown kiwi (*Apteryx mantelli*) is the most common of the five species of kiwi, with a total estimated population of 25,000 birds in 2008. The species is split into four geographical populations/ Evolutionary Significant Units/Conservation Management Units/taxa (Northland, Coromandel, Eastern, Western) which Allan Baker's lab in Canada has identified from mtDNA and nuclear DNA work. Jason Weir's recent SNP study and Oliver Haddrath's additional mtDNA work has confirmed that these four "regional" populations are distinctive and are likely to have diverged from one another 100-200,000 years ago, perhaps as a result of volcanic activity in the central North Island. Three "regional" populations (Northland, Eastern and Western) numbered about 8000 birds each and Coromandel had about 1000 birds in 2008. Jason Weir's work has established that none of the four "regional" populations is significantly inbred and they are not in need of genetic rescue.

Mainland populations of brown kiwi are under threat from introduced predators (especially dogs and stoats) and are declining at the rate of 2-3% per annum in unmanaged areas, but they are increasing by up to 10% per annum in an increasing number of managed sites, through predator trapping, aerial 1080 poison operations, Operation Nest Egg (ONE: a head-starting programme), or by translocations from pest-free islands or fenced sanctuaries on the mainland (kohanga kiwi).

Little Barrier and Ponui Island Kiwi:

There are currently two island populations of brown kiwi on Little Barrier Island (LBI) and Ponui that are both at or near carrying capacity. Kiwis for kiwi has a desire to use a large number of these island birds to found new populations of kiwi on the mainland in sites where pests are being controlled, and to establish a new population on a pest-free island.

The information we currently have on these populations is:

- The two island populations are founded from a mix of birds from at least two different "regions" (Northland and Western).
- The founder numbers for these islands is believed to be very low.
- It is thought that LBI, which now has close to 1000 birds, was founded by a minimum of 3 Western birds (two transferred in 1902 and one white bird from the Taupo area released in 1913), perhaps 16 birds of unknown provenance liberated around 1919, and an unknown number of native Northland-type birds that had persisted on the island for hundreds or thousands of years. (The latter species was considered extinct in the late 1800s, but Oliver Haddrath has identified the presence of Northland-type mtDNA in one of 15 samples.)
- The Ponui population, which now has c.500 birds, was founded in 1964 by 6 birds from LBI and 8 birds from Northland, but the current genetic composition of the population is unknown.

Modelling done with Allele Retain has suggested that for brown kiwi, founder sizes for translocation populations should be a minimum of 40 unrelated birds, and so both island populations are presumed to have been derived from well under this target number of founders, though liberations of birds from two or more "regional" populations may have promoted outbreeding.

Advice requested:

- 1) Could these two island populations be used to found or supplement mainland or pest-free island kiwi populations?
- 2) What are the genetic benefits and risks of establishing or supplementing kiwi populations from these particular "mixed-provenance" populations with low founder numbers? Do the benefits outweigh the risks?

- 3) Is the current historical information held sufficient from a genetic perspective to assess Question 2 or do we need to assess the genetic composition of the two island populations? If the current information is not sufficient, what information do we need, how much would this cost, what sort of samples would be required and how long would the analysis take?
- 4) Could the Ponui and Little Barrier kiwi populations be made into useful conservation assets from a genetic perspective and if so, please provide some suggestions (e.g. genetic rescue of these populations, supplementation of widespread mainland populations, other uses)?

It would be greatly appreciated if you could respond to me with a summary of the group's collective advice by May 13th.