

Tokoeka Kiwi a story about a name

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What's in a name?

- When an animal is first described by science it is given a scientific name.
- Today all specimens are also given a type specimen (or series) and a type locality but that was not always the case.
- A single type specimen is known as a *Holotype*
- A *Holotype* specimen “owns” the name of a species

Kiwi Rescue Program Genetics

Program Rationale

- DOC requires a formal publication describing each of the Operational Taxonomic Units (OTUs) they should be conserving. They also need robust rationales for the maintenance of current impediments to interbreeding between populations.

There are two major issue to address:

- The status of the Tokoeka populations - i.e are they species or subspecies?
- The status of North Island Brown Kiwi Populations – i.e are they subspecies or not and if not are they O.T.U.s that need to be conserved?

The Team

Manaaki Whenua – Landcare Research

- John Innes - Kiwi Rescue Leader
- Jamie Wood - DNA extraction
- Lea de Nascimento - DNA extraction

University of Canterbury

- Vanesa De Pietri – Sampling and morphometrics

Te Papa Atawhai Department of Conservation

- Hugh Robertson – project advice, kiwi capture
- Rogan Colbourne - project advice, kiwi capture

University of Toronto

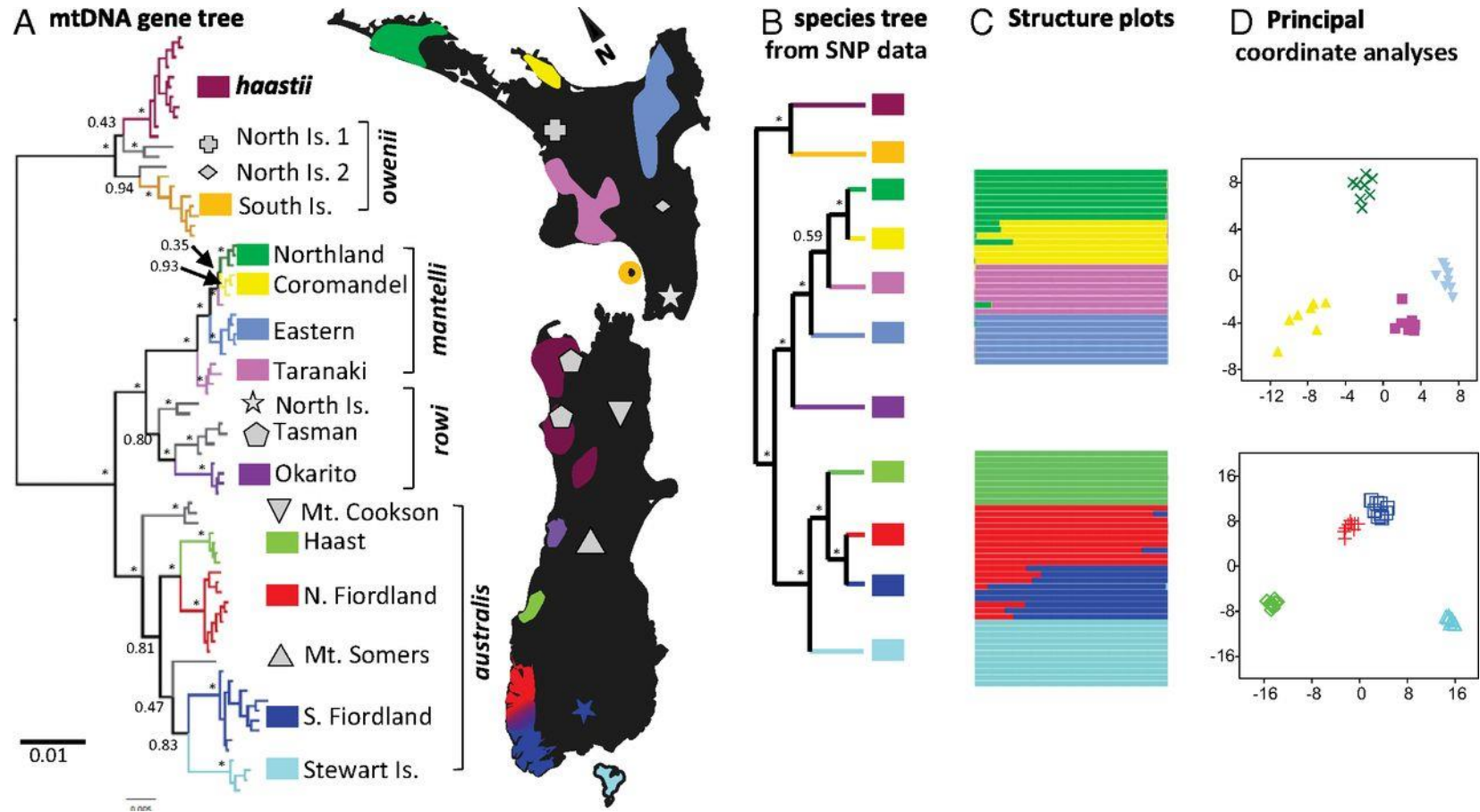
- Jason Weir – Sequencing and bioinformatics

Toronto Sick Kids Hospital

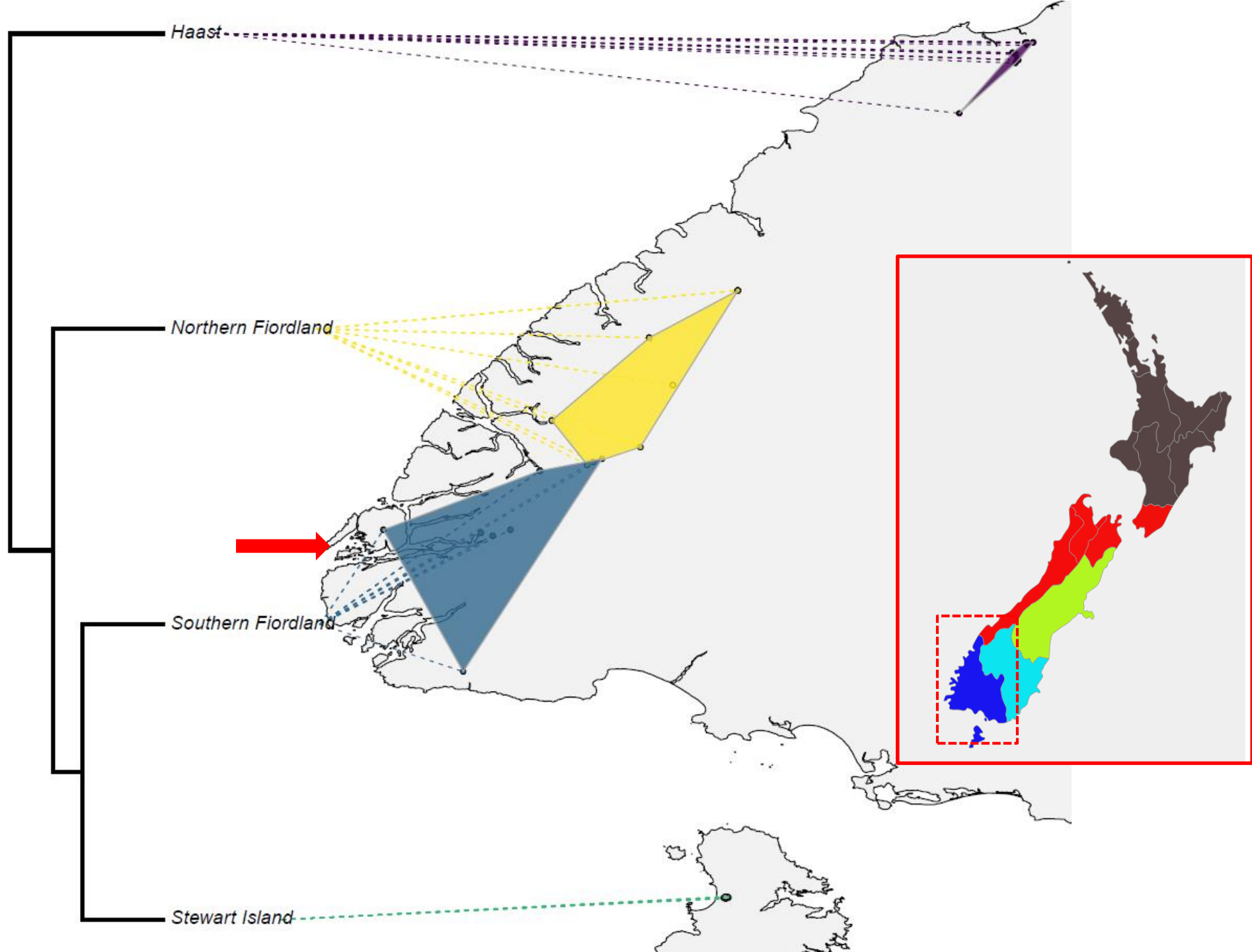
Support by Tangata Whenua

- Iwi and hapu that hold mana whenua over kiwi breeding areas have active involvement with the Kiwi Recovery Program of the Department of Conservation.
- Annual hui with iwi partners to discuss progress and to receive guidance and recommendations for future direction on all aspects of kaupapa kiwi.

A framework for genetic conservation



Jason T. Weir et al. PNAS 2016;113:E5580-E5587



Captain Andrew Barclay

- letters of marque from George III
- later became the first European settler to Evandale, northern Tasmania



Barque Providence

Arrived Port Jackson NSW

6 July 1811

“with prisoners of both sexes from
Ireland”

Sailed 20 Oct 1811 for China

Cargo: seal skins and soldiers

Arrived UK 15 Sept 1812

Cargo: tea and china

Later became an “East Indiaman”
in the tea/ opium trade



Barclay bought the skin of a kiwi from sealers at Port Jackson in Sydney

Six sealing vessels worked in NZ and visited Sydney in 1811 and 1812
but only one was working in the Rakiura area

Sydney Cove

An infamous ship that
started the “Sealing Wars”
with Ōtākou Māori.



Described by George Shaw

Given by Captain Barclay to **William Evans**

Evans gave it to

George Shaw of the British Museum

He described it in his Naturalists Miscellany

He died shortly afterwards





SOCIETATI VERNERIANÆ,
IN INCREMENTUM SCIENTIÆ NATURALIS
FAUSTIS,
UTI SPERARE FAS EST,
OMINIBUS
APUD EDENBURGUM INITÆ,
HUNC
VICESIMUM PRIMUM
NATURÆ VIVARII
FASCICULUM
D. D. D.
GEORGIUS SHAW,
E. NODDER.

TO
THE WERNERIAN SOCIETY
OF
EDINBURGH,
INSTITUTED FOR THE LAUDABLE PURPOSE
OF
PROMOTING THE SCIENCE
OF
NATURAL HISTORY,
THIS TWENTY-FIRST VOLUME
OF THE
NATURALIST'S MISCELLANY
IS INSCRIBED
BY
GEORGE SHAW,
E. NODDER.

Sold at Auction 1813



Edward Smith-Stanley, 13th Earl of Derby

- politician, peer, landowner, builder, farmer, art collector and naturalist. He was the patron of the writer Edward Lear
- Knowsley Hall, Near Liverpool



Derby collection given to Merseyside County Museum

- Becomes World Museum



European and U.S. Museum visits.

- Examined 280 kiwi specimens collected in 19th c.
- Unfortunately most without data
- Scute, wing and mensural data collected.
- Have seen all kiwi types
- Collected a sample from the Holotype of *Apteryx australis* in Liverpool

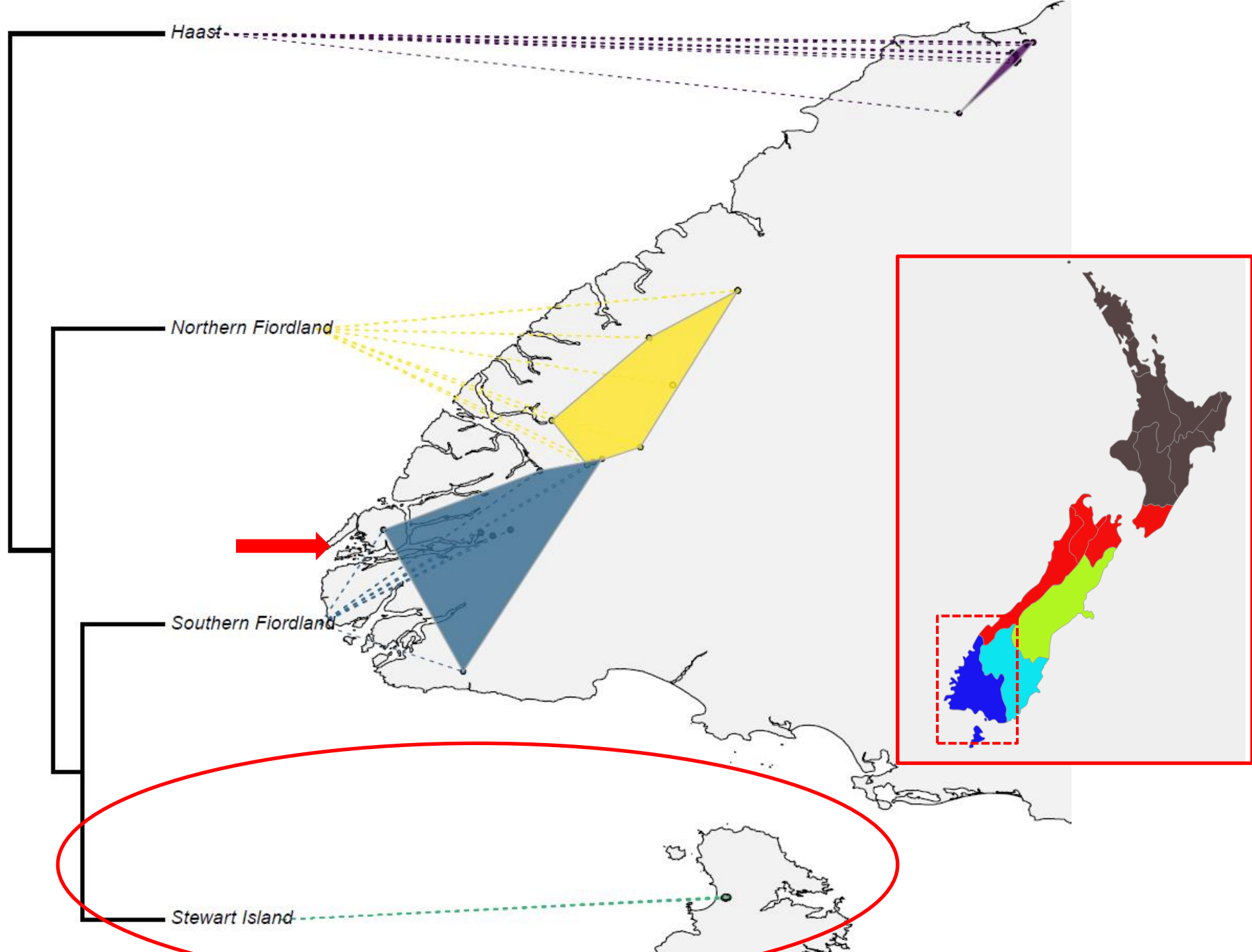


Holotype *A. australis*

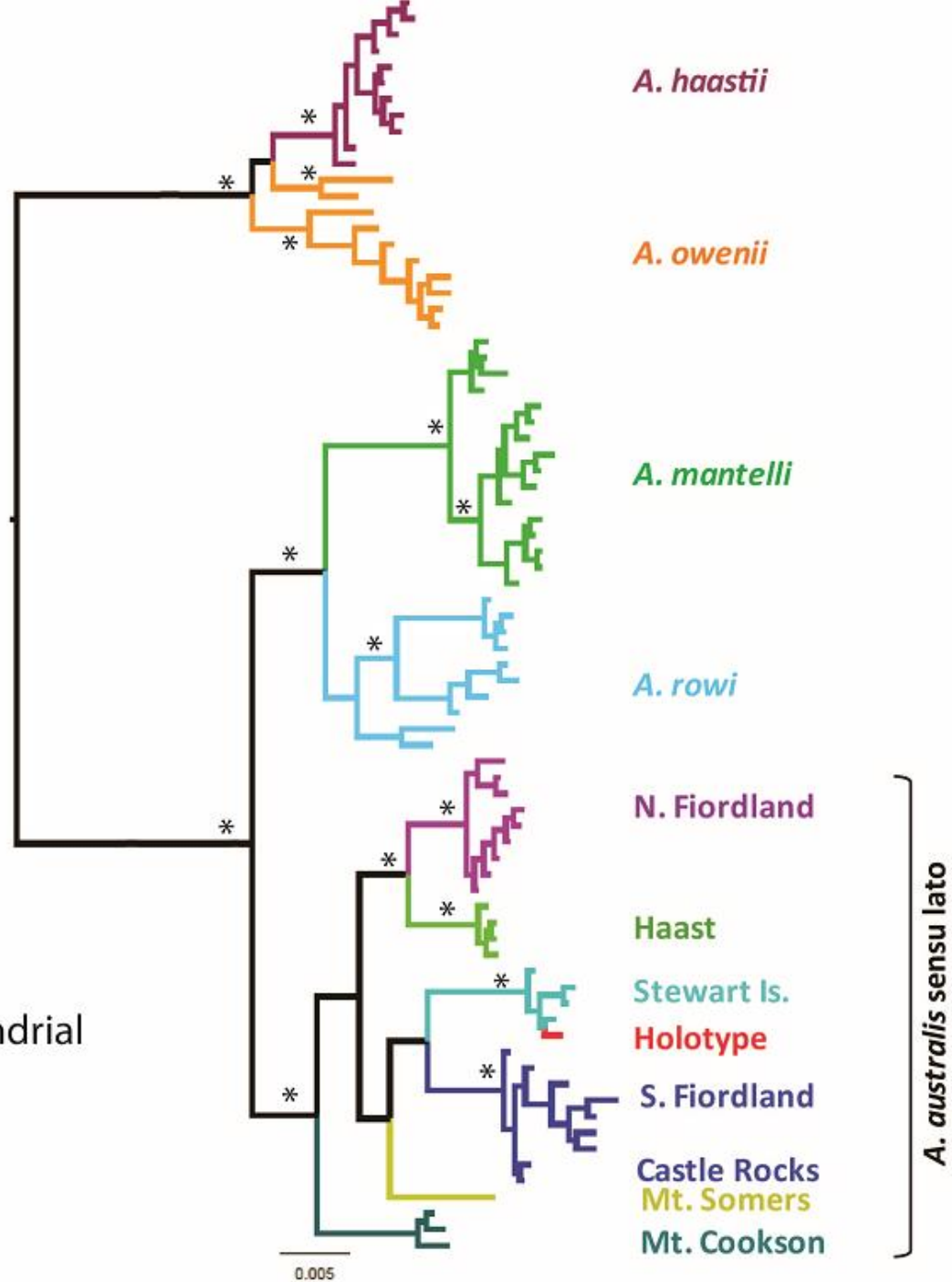
North Island Kiwi *A. mantelli*

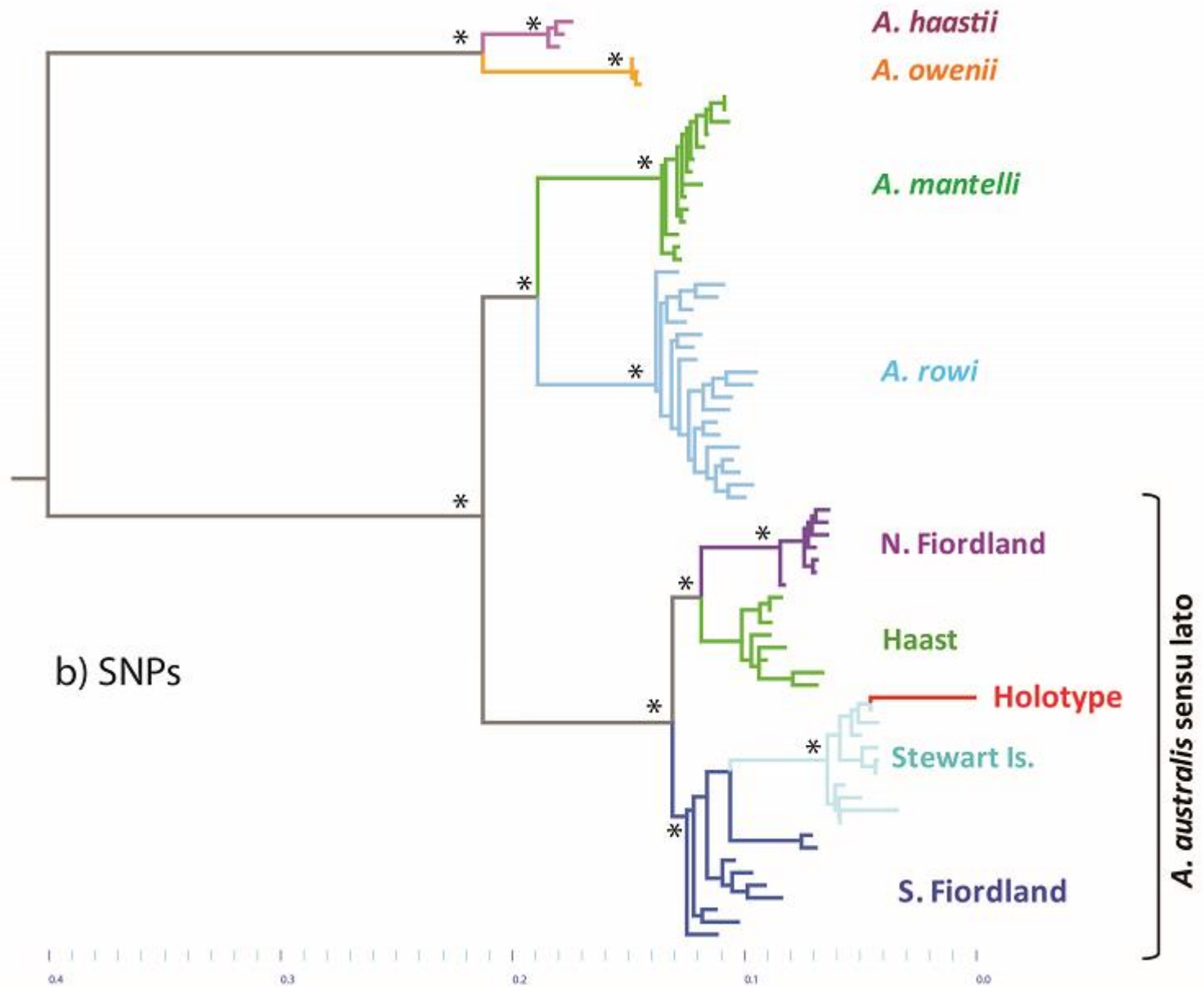


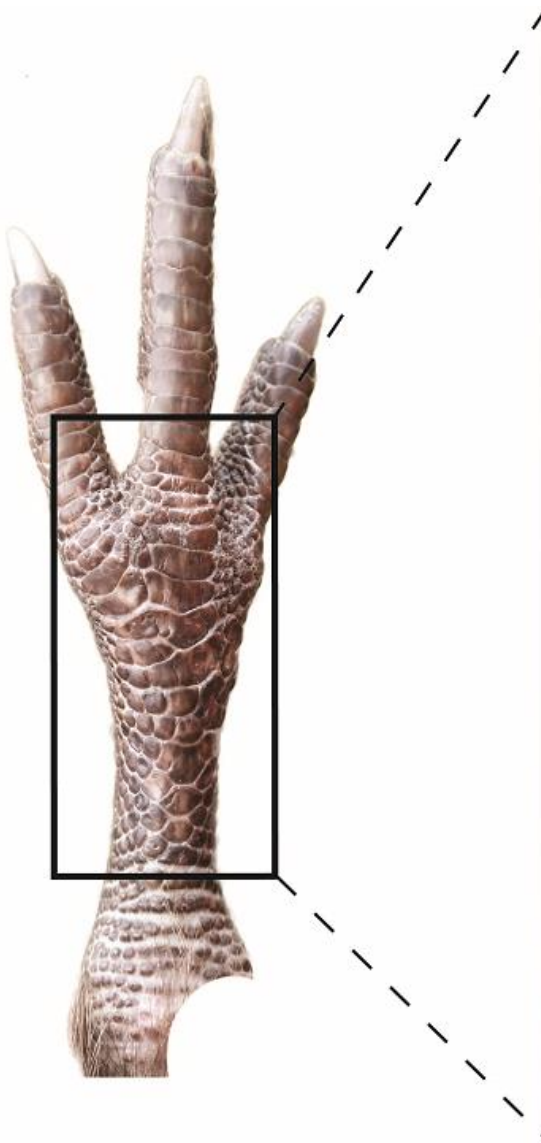
180 *Apteryx australis*, Shaw
From New Zealand
The original of Shaw's description
Garnett
V. a. do do
Purchased of Mr. John Smith July 1837.
From New Zealand



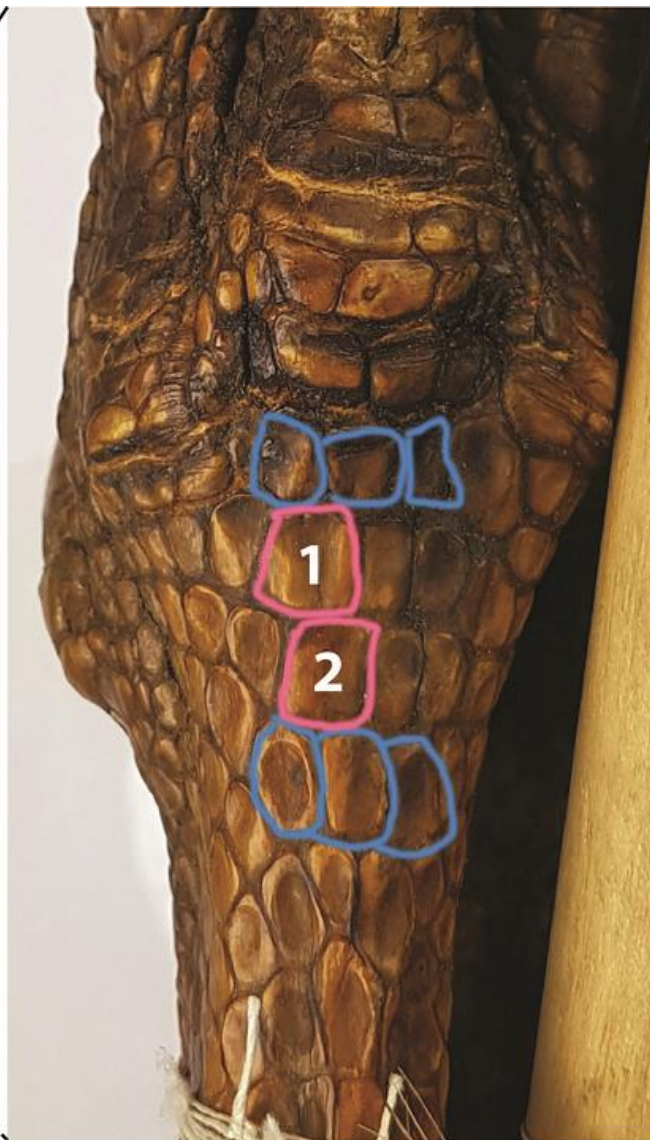
a) Mitochondrial



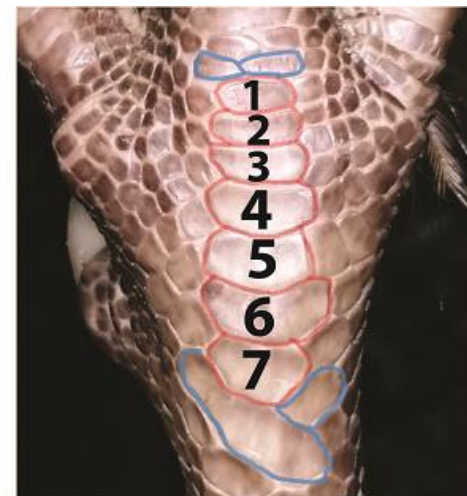




Position of scales on tarsus



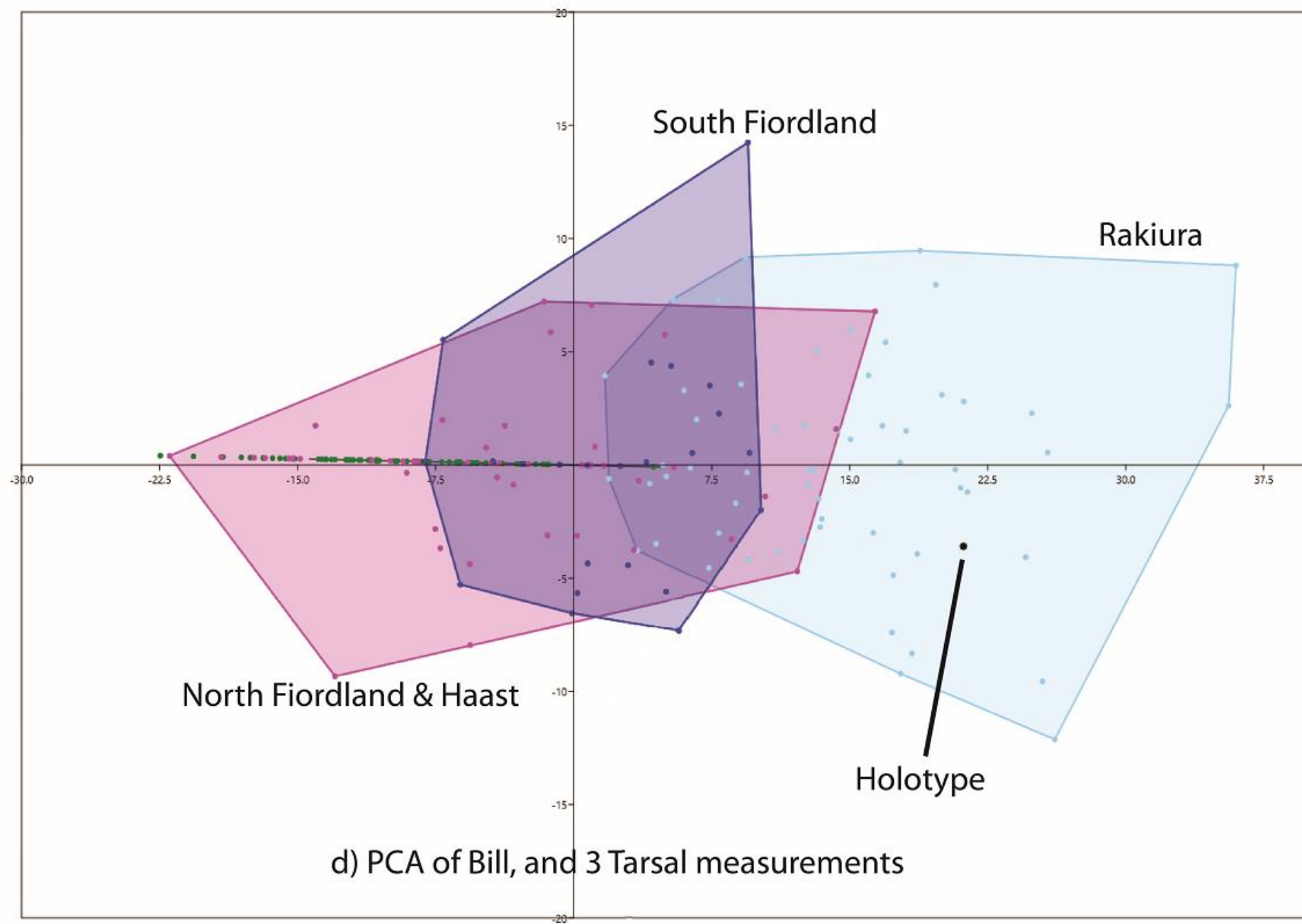
a) Holotype LIV D180



b) Haast Tokoeka



c) Rakiura/ Stewart Island



Paper Published

Conservation Genetics

<https://doi.org/10.1007/s10592-021-01349-y>

SHORT COMMUNICATION



Identification of the type locality of the South Island Brown Kiwi *Apteryx australis*

A nomenclatural framework for the Southern Tokoeka and an insight into the movements of sealers in the early 19th century

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CONCLUSIONS

Question: Where is the holotype of *Apteryx australis* from?

Answer = Stewart Island

Question: What becomes of the name *Apteryx australis lawryi*

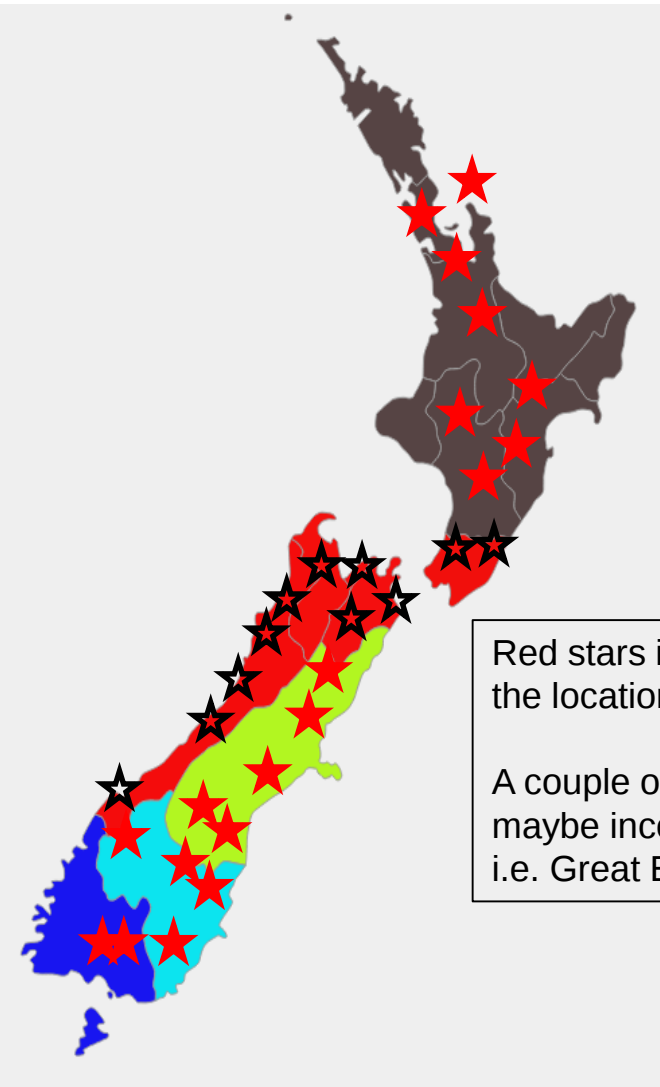
Answer = It is a junior synonym of *Apteryx australis australis*

Question: Which new taxa need new scientific names

Answer = All Tokeka except those on Stewart Island

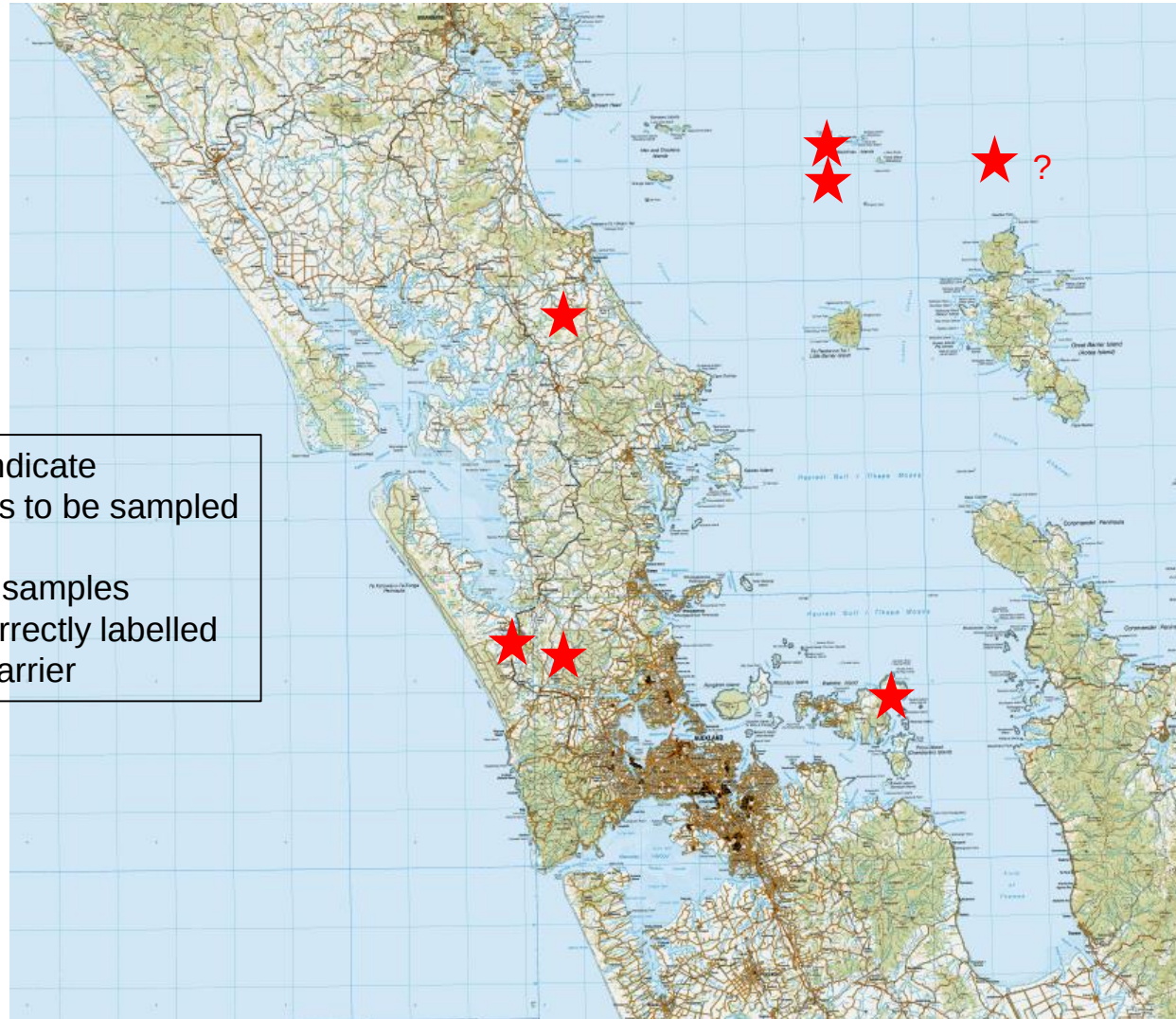
Next Steps (1)

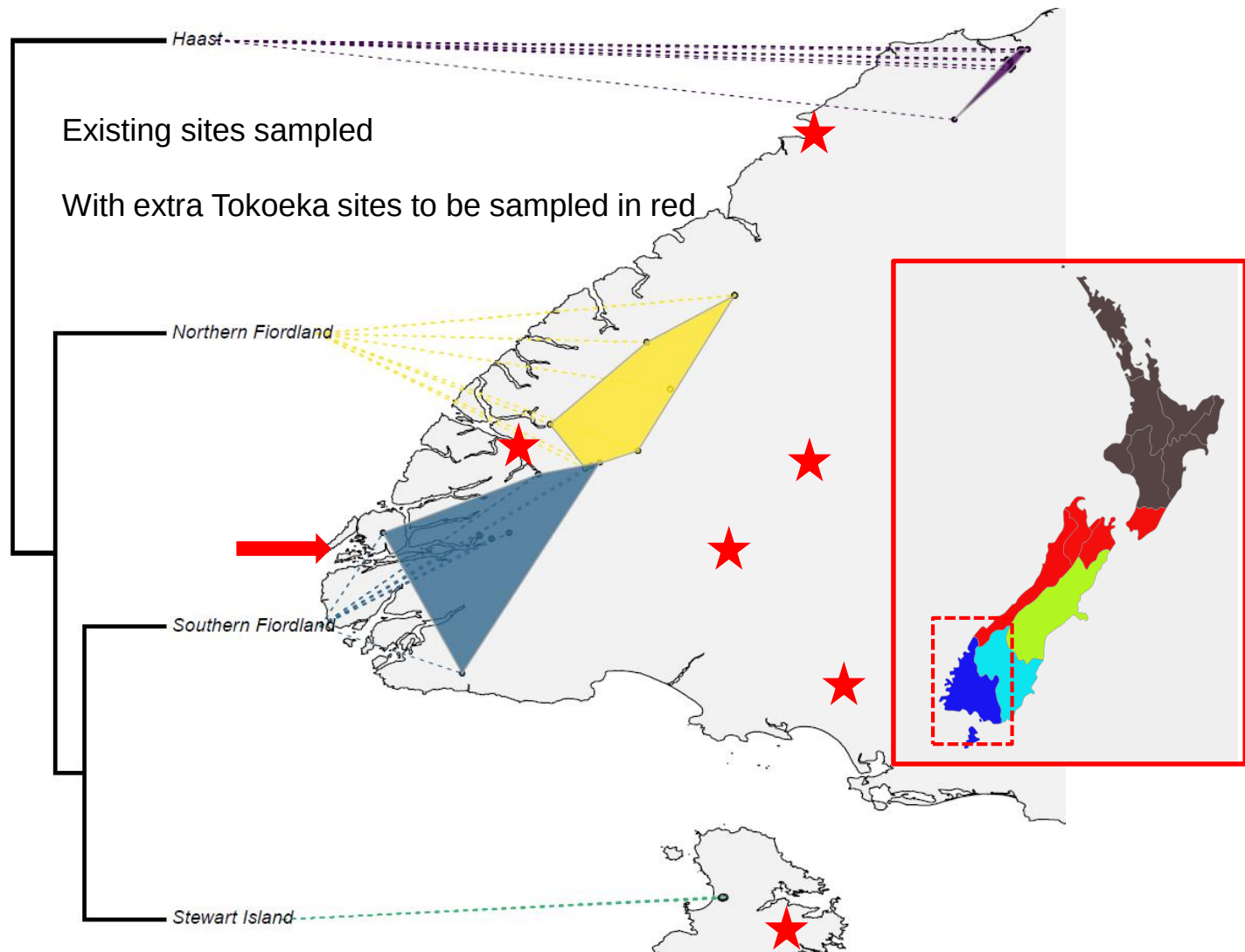
50 samples of ancient bone & historic skins



Red stars indicate
the locations to be sampled

A couple of samples
maybe incorrectly labelled
i.e. Great Barrier





Next steps (2)

- 50 samples ancient bone & historic skins ✓
- Extract DNA ✓
- Design baits (Arbor Biosciences myBait) to harvest the entire genome from each sample based on complete genome assembly ✓
- Use baits to extract all DNA ✓
- Sequence DNA (in Toronto)
- Assemble genomes (at variable coverage c.2x-55x)
- Produce complete mitogenomes and a 40,000 SNP dataset from each sample