NZASE scientist profile

# **Hokimate Harwood**

### Born where and when

Tāmaki Makaurau/Auckland, 1975

## Affiliations

Ko Tauanui me Whakatere ngā maunga, ko Punakitere me Te Maata-awa-rere ngā awa, ko Ngāpuhi te iwi, ko Te Māhurehure, Ngāti Moerewa me Ngāti Rangi ngā hapu.

## Schools and subjects

Hokimate spent her childhood in rural Victoria, Australia, going to Churchill Primary and Kurnai College, and Catholic Regional College in Traralgon, studying Maths, Chemistry, Biology and Physics.

## How she got into science

"I was naturally inquisitive. I loved sports and music, but my favourite subjects were science – I didn't like English or Social Studies. I used to enter national chemistry and maths competitions; I saw science as something I enjoyed and could make a career of. There were no real issues being Māori and female studying science in school."

## **Training and jobs**

**BSc**, Biological Sciences, 1998; **Master's** in Environmental and Marine Science, 2002, both at University of Auckland

**PhD** in Environmental Studies, Te Whare Wānanga o Awanuiārangi, 2020

Bicultural science programme developer and science researcher, Te Papa

**Postdoctoral Research Fellow**, Te Whare Wānanga o Awanuiārangi, from 2020.



## **Fields of science**

Ornithology; NZ bird ecology; plant phenology (timing of seasonal events); Taonga Māori research, environmental and marine sciences, taxonomy (classification of organisms, Māori and Latin).



### Topics

#### Kererū

Her Master's research on the tree fruit diet of kererū on Auckland's North Shore "set me up to create my own methods, and analyse results appropriately, so other people can build on them. It helped me identify birds in the field and on taonga in museums."

#### Kererū Discovery Project

Hokimate co-ordinated and contributed a Māori perspective on this citizen science project between Te Papa and other Wellington organisations, encouraging people to monitor kererū in their backyards.

#### Analysing feathers in kākahu

Hokimate studied feathers in Te Papa's kākahu collection from 2007.

## How she finds things out

Hokimate read research about ways to



identify feathers microscopically, and created a feather photo database of bird species used by Māori, taken from preserved bird skins in Te Papa's collection. She studied the size, shape, pattern, and colour of whole feathers in Te Papa's kākahu, comparing them with feathers on the bird skins. Then, using a photo programme with a light compound microscope, she magnified the feathers of native and introduced birds up to 1,000 times.

She photographed and measured microscopic details of the fluffy down at the base, middle and end of several of these feathers for each different bird, and the patterns of nodes and prongs on the tiny down barbules, and created a database of those structures. When cloak feathers were black, brown or white and had no pattern, she used these microscopic structures to identify the order and sometimes species of feathers the weaver had used. She also interviewed expert Māori weavers of kākahu about their techniques and historical knowledge.

"I used multiple sources where possible – feather microscopy, interviews and earlier research. If one source provides information and the other two back that up, it's consistent."

#### Most valuable results

Hokimate identified the feathers in more than 100 feathered kākahu in Te Papa's collection, from more than 20 native and 10 introduced birds. "Some of the species, including the ruru and matuku, had not been recorded in Māori weaving before." She also created the first national reference database of the microscopic features that identify the feathers of native bird species.

Kākahu included feathers from between one and eight different birds. At least 30 kākahu had hidden feathers under the visible layer, or included other materials such as wool. "These were possibly signatures of the weavers or messages to the wearer."

"The point was to reconnect these taonga with iwi, hapū and whānau. I ran one wānanga up north and planned more, but they have been postponed due to Covid. I've held several



Hokimate's images – top: (a) barbules and (b) nodes at the barbule base from a kererū, Columbiformes; middle: from a North Island brown kiwi, Casuariiformes; bottom: from a kāhu, Accipitriformes.

hui in other museums and marae, sharing what I found about their kākahu, and recording their knowledge about these taonga."

There are an estimated 600 kahu huruhuru in 100 national and international museums, and the feathers in more than 300 have not been positively identified. Hokimate has been funded for a project to do that, but it is also on hold. "Recording the materials and techniques of kahu huruhuru in museums around the world could possibly reconnect some cloaks to weavers, whānau, and their origins."

In 2019, Hokimate used her database to identify the kākā, kāhu and kererū feathers in Te Rā, one of the oldest remaining Māori woven sails, in the British Museum. Her database will continue to identify feathers in other other historical and contemporary pieces of Māori, Pacific, and European origin.

#### Mātauranga Māori

"Science is part of Mātauranga Māori. Reconnecting our history using the language of feather cloaks showed how important our



natural surroundings are for Māori. Māori have needed to know and understand our environment for generations, but that is rarely recognised by Western science. Our scientific knowledge is just as valid as Western science. There's been a history of Pākehā conducting research on Māori, which we never see again. Instead, I use microscopy as a tool to answer questions that can help us."

"I'm very keen for Māori girls, especially, to have confidence in studying science in school, so it is normalised. There were very few women, let alone Māori, in my Master's programme; that was a big change in how I was perceived."

"When thinking about a career, make sure you study what you enjoy and what excites you, then plan your study carefully around this. My career in bicultural science research has centred around my love for scientific understanding and traditional Māori knowledge. Don't let yourself be limited by what the media, public, and people around you think you can do."

#### What she likes about science

"Science seemed to have no ambiguity, no grey areas; equations are either right or wrong, unlike English which is all interpretation. I like the visual patterns in science – the barbules on feathers look like leaves on a tree."

"I like to inject myself into science, rather than be objective. We never separated ourselves from the natural world."

### Ngā Kupu

<u>Atua</u> – God, supernatural being	
<u>Kāhu</u> – Harrier hawk	
<u>Kahu</u> – Cloak, cloth	
<b>Kahu <u>huruhuru</u> –</b> Feather cloak	1114
<u>Kahu kiwi</u> – Kiwi feather cloak	
<u>Kahu tāniko</u> – Fine flax cloak with taniko	
border	
<u>Kākā</u> – Native forest parrot	Ļ
Kākahu – Cloak, clothing, costume	
Matuku – Bittern.	



Hokimate examining feathers under a microscope. Photo with permission of Te Papa.

#### Links

Madalyn Weston, 2019, <u>Celebrating women in</u> <u>STEM: Hokimate Harwood</u>, *UMKC Roo News*.

- Matiu Workman, 2018, <u>Setting sail for Te Rā</u>, University of Otago Magazine
- Te Papa, 2016, <u>Feather identification</u> <u>workshop</u> Whanganui Regional Museum, includes workshop podcast.
- Te Papa, 2012, <u>Hokimate Harwood: Identifying</u> <u>feathers</u>, includes 5m video.
- Te Papa, 2011, Feather signatures, 4m video.

#### See our <u>suggestions for activities with</u> <u>NZASE scientist profiles</u>.

Hokimate leading a feather identification workshop at Whanganui Regional Museum in 2016. Photo with permission of Te Papa.





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