



Associate Professor John Perrott at Horotiu marae at AUT. Courtesy: John Perrott

*A mātauranga Scientist/communicator and Associate Professor/Research Ecologist at the AUT School of Science, specialising in Conservation Biology of endangered species and Kaitiakitanga, John Perrott possesses a rich volume of knowledge on the flora and fauna of Aotearoa New Zealand. In conversation with NZASE science communicator Sneha Pillai, Associate Professor John Perrott reflects on his journey as a kaitiaki and conservation biologist.*

## BORN

Born in 1967 in Māngere, Auckland.

## AFFILIATIONS

"Our whānau trace their whakapapa back to Te Arawa, Demark and Ireland. While we were brought up with family stories about our whakapapa, there wasn't anything prominent until I got into my 20s, that's when I started hihi (stitch bird) research on Mokoia Island, Lake Rotorua."

## SCHOOLS AND SUBJECTS

John studied at the Robertson Road and Favona Primary Schools, Māngere Intermediate and later at the Ngā Tapuwae College and Ōtāhuhu College, all in South Auckland. "When I was around 10 years old, I developed a real interest in chemistry," recalls John. "Being dyslexic, I used to find reading and writing difficult. But I found chemistry equations easier to follow. With the help of my mum and dad, I built my own chemistry lab in our garage." John admits that some of the experiments he held at his garage lab as a teenager under his father's supervision would now

not be permitted owing to increased awareness about health and safety regulations.

"I was broadly interested in two things growing up – science and art. During my intermediate school days, I developed a strong interest in music and carving thanks to my teacher at the time Matua John Tapene, and I still carve and play/sing today. In fact, I am a proud member of the AUT Whānau Choir led by Matua John Tapene and have been for many enjoyable years."

## HOW HE GOT INTO SCIENCE

John acknowledges his grandparents for influencing his interest in the environment. "My grandparents and I (with my brothers Alan and David) would often go on these caravan trips, to different places around the North Island, in the bush. This gave me exposure to native animals as well as hunting expeditions with my dad during that time."

"When I got to college, around the age of 14, I grew more interested in animals and biology, with links to chemistry as well. I used to try and bleach cicadas and try and pass them off as albino cicadas,"

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says John.

### TRAINING AND JOBS

"I spent quite a few years working as a zookeeper before entering university. I was interested in becoming a vet initially, but I didn't get in. Quite luckily for me, I met Professor Doug Armstrong at Massey University. Doug introduced me to conservation biology, and he was quite strong on Mātauranga Māori and science. He introduced me to the relevance of indigenous knowledge around science practices. I was very lucky to have met him and developed a close association with him. After completing my undergrad degree in zoology from Massey University, I decided to do my Master's with Doug on Mokoia Island in Lake Rotorua. This also gave me the opportunity to meet my extended whānau there and people I was related to, whom I hadn't known before."

### FIELDS OF SCIENCE

John describes his field of science as conservation biology and disease ecology. While conservation biology refers to a holistic approach to protecting Earth's biodiversity including native species and habitats, disease ecology specifically focuses on how different pathogens (disease-causing microorganisms) and parasites spread and impact on endangered wildlife populations and habitats.

### RESEARCH EXAMPLES

In 1994, John accompanied the first group of hihi (stitch bird) during its translocation to Mokoia Island. "I did my Master's thesis in monitoring the birds and their feeding habits, to understand why previous translocation efforts had failed. I was quantifying the nectar and the abundance of fruits on the island in terms of carbohydrates per hectare, and we weighed the birds and banded them. We were trying to correlate their weights with the flowering season to

see if the seasons had any effect on the birds' weight. We found that while the birds were not starving at any point, we discovered that their weights were already low because of a fungal disease called aspergillosis."

John graduated with a Master of Science degree under Doug's mentorship and went on to do his PhD from Massey University with a doctoral scholarship. "I became interested in phenotypic diseases," says John. Phenotypic diseases occur when parasites manipulate the behaviour of hosts to increase their biological fitness i.e. ensuring their ability to reproduce and sustain their population, which

can have significant ecological consequences. An example of such a disease is when parasitic Horsehair worms induce crickets and other terrestrial insects to commit suicide in water. This enables the parasite to exit from the insects' body into an aquatic environment. The worms do this as they can only complete their lifecycle and reproduce in water.

During his time on Mokoia Island, John had observed adult cicadas developing a phenotypic disease, which he found to be caused by the fungus *Massospora*. "We found that the hihi would take the infected cicadas back to the nest to feed their chicks. The hihi would leave the leftovers of the cicada in the nest, which were then overgrown by another pathogenic fungus called *Aspergillus fumigatus*. This fungus was identified as the primary pathogen responsible for killing hihi on the island. We were able to link this disease (aspergillosis) to the diet and nesting environment, and since there hadn't been much research into it, I decided to focus my PhD on the ecology of aspergillosis in hihi. I have visited the island regularly since 1993 in different capacities. But as aspergillosis continued to affect the hihi population, the Mokoia Island Trust and the Department of Conservation decided to take the last remaining birds off the island."



John during bird survey on Mokoia Island, 2008.

Courtesy: John Perrott

After completing his PhD, John started working with EcoQuest, Unitec, and AUT and went on to study the Mokomoko/skinks (*Oligosoma infrapunctatum*) on the island and the Weka (*Gallirallus australis*) that are eating them. "As we eradicated the rats and mice off the island to restore the mauri and native ecology of the island, we found that birds like Kāhu (hawk, *Circus approximans*), Ruru (*Ninox novaeseelandiae*) and Weka started targeting native species."

### HOW HE FINDS THINGS OUT

"There are several ways in which we go about conducting our research. In the field I'm currently working on, I like to start by collecting debris samples from nesting environments and also soil and water samples, and we screen them using eDNA techniques to look at the diversity of life forms within them. Then we use specialised culturing methods to isolate microbes, so we can look at microbial interactions and measure spore densities; that could be from air, water, soil or nesting debris samples," explains John.

Outside the lab, most of John's work is done through bird observations. The birds are banded for identification and monitored to study their whakapapa and any changes in their observable traits.

### MĀTAURANGA MĀORI

"Even when I thought I was just doing science, I was doing it through a mātauranga Te Arawa lens. In that sense, I was fortunate to be among an early group of people who were tutored in the ways of kaupapa Māori methodologies, building relationships with kaitiaki and their knowledge and practice systems.

Science in Aotearoa, I believe, is guided by mātauranga Māori and the relationship building that's needed when engaging te ao Māori. Identifying problems and finding solutions collectively helps in making sure that we have the people on board with the projects that need community support, like in the case of biodiversity conservation. Everyone's being properly informed so they can make decisions around value and

engagement for themselves."

"At AUT, we run a course called SCIE606 Vision Mātauranga: Science Practice in Aotearoa where a number of speakers, all indigenous scientists from the Pacific and within Aotearoa, deliver lectures on all things science." This course embodies all the lessons

passed on to us from our tuakana (mentors) and tipuna (ancestors), especially the late (Major) Matua John Marsh who assisted me greatly in my journey and coined the phrase "old ways of knowing, new ways of doing science" which embodies the primary kaupapa of our course."

### WHAT HE LIKES ABOUT SCIENCE

"What I like about science is the discovery and the creative aspect of it. There are always new discoveries waiting to be made and that makes it quite a humbling environment to be in, especially when you find out those 'new' discoveries were already known hundreds of years prior. I think it's one of the last bastions of honesty as well. Especially in my field, which is all about manaakitanga, we're trying to care for the mana of all taonga to make sure they stay strong for everyone now and for those



John observes a skink collected from pitfall trap.

Courtesy: John Perrott

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yet to join us."

"It's understanding the whakapapa and the familiar links we have with the taonga around us. It's not just a way of knowing or a list of facts. It's a way of doing and being connected at a personal level. It's important to look back at what has transpired before us to go forward and make sure that when we do that, we get the people on board. Because it's when you get people on board that you can demonstrate your work as important and sustainable going forward."

### RELEVANT LINKS

#### *John's Articles*

Why is it important to publish an abstract in the indigenous language of the research country? (2018). Retrieved from <https://www.researchgate.net/publication/325746410> [Why is it important to publish an abstract in the indigenous language of the research country](https://www.researchgate.net/publication/325746410)

A single fungal strain was the unexpected cause of a mass aspergillosis outbreak in the world's largest and only flightless parrot (2022). Retrieved from <https://www.researchgate.net/publication/365041057> [A single fungal strain was the unexpected cause of a mass aspergillosis outbreak in the world's largest and only flightless parrot](https://www.researchgate.net/publication/365041057)

#### *Learning Resources*

eDNA: Retrieved from Science Learning Hub <https://www.sciencelearn.org.nz/resources/3209-environmental-dna>

Investigating soil samples: a science experiment. Retrieved from Macmillan Education International Curriculum <https://youtube.com/watch?v=bNTbuptW6tg>

### Ngā Kupu

Aotūroa: natural world

Hihi: Stitch bird

Kikihi: Cicada

Manaakitanga: Showing respect, generosity and care for others

Whakapapa: Genealogy, lineage

Whāomoomo: Conservation

*Source: Te Aka Māori Dictionary*