



Marine scientist Kura Paul-Burke

NZASE
scientist
profile

Born

Whakatāne, 1966; grew up in Kawerau.

Affiliations

“Both my iwi – Ngāti Whakahemo and Ngāti Awa – are coastal people. I whakapapa to several islands in the Bay of Plenty: Whakaari (White Island), Te Paepae o Aotea (Volkner Rocks), Moutohorā (Whale Island), Rūrīma Islets, Motunau (Plate Island), and Mōtītī. Mum’s side is from County Cork in Ireland.”

Schools and subjects

“I did Science, Māori studies, and Te Reo Māori. I got a scholarship to Turakina Māori Girls’ College in Marton from fourth form.”

How she got into science

“When I was a child in Kawerau, we spent all our time at the river, Tarawera, which had lots of smooth polished stones. They were all different colours; I wondered if the colour went all the way through. I longed for a microscope but the whānau couldn’t possibly afford one.”

“Asking a question and figuring out how to solve it is the heart of science. Science is practical, hands on, and it aims for solutions. Science is part of different knowledge systems.”

Training and jobs

1997 Bachelor of Education (BEd), University of Waikato; **2009 Bachelor** of Applied Science (BASc), AUT; **2011 Master** of Indigenous Studies, and **2015 PhD**, both at Te Whare Wānanga o Awanuiārangī; **2011-2013 Manager**, environment and research for a Māori Treaty settlement trust; **2013-6 Senior Lec-**

Kura diving at Whakaari (White Island) collecting kina for a field research project. Image by Joe Burke.

turer/Doctoral Fellow, Te Whare Wānanga o Awanuiārangī; **2017-22 Pou Hononga**, Programme Leader Māori and the Marine Environment, NIWA; **2019-22 Associate Professor**, Professor, University of Waikato.

After a lightning moment, observing fish while snorkelling off Whakaari, “I resigned from lecturing in early childhood and at age 39 re-enrolled as a first-year student studying marine science – with five children.”

“When I first went to university in the 1980s, there were no Māori lecturers or professors in the sciences, so the only science I heard came from a Western perspective and it didn’t really resonate. Fish and oceanography is very male-dominated. I used to bring my husband to meetings and the men would talk to him.”

“There are still only three Māori professors of Marine Science in the whole country. We need to change that.”

Kura is a [Vision Mātauranga Leader](#) for the Sustainable Seas National Science Challenge, which brings together scientists and experts from different organisations and disciplines.

Fields of science

Marine Science, mātauranga Māori, Ecology, Environmental restoration.

Research examples

Action plans for river restoration

Kura has supported the co-development of management plans to revive and sustain



Kura Paul-Burke.



taonga species, such as tuna/eel in the Rangitāiki River catchment. In 2016, she wrote *Te Hekenga Nui o te Tuna*, an action plan for assisting the migration of tuna upriver and back out to sea.

Ngā tohu o te taiao

A current project – [Is the kina still fat when pōhutukawa bloom?](#) – studies changes in tohu, environmental cues. According to Ngāti Whakahemo whakataukī, kina are ready to be harvested when pōhutukawa flower, and when the flax bush flowers it's time to stop harvesting.

However, kaumātua say these tohu are no longer in sync. The mātauranga Māori-led project is based at Motunau (Plate Island), and hopes to show how climate change may alter such tohu or create new ones. It includes training for young people in diving, marine science, kaitiakitanga, and field technology.

How she finds things out

Kura says: “All of our research starts with talking with the old people, asking ‘Well, what do you want to know?’”

Methods include interviews with expert Māori sources, and taking them to ocean sites; counting taonga species in dive surveys; mapping species with GPS; co-developing technology such as spat lines with mātauranga experts such as weavers; and trialling and comparing different solutions.

Most valuable results

Kuku/mussels in Ōhiwa Harbour

Kura has been studying taonga species in this harbour with iwi for over 15 years, finding that its kuku population fell from ~112 million in 2007 to just 80,000 in 2019. This was due to an over-abundance of the 11-armed pātangaroa or seastar, a voracious predator of kuku.

In 2014, Kura wrote a Mussel Management Action Plan for restoring kuku in the harbour, prioritising mātauranga Māori.

Kura's research compared the effectiveness of commercial plastic lines to recruit and grow spat (baby mussels) with taura kuku (mussel grow lines) woven from dead fronds of different native plants. Both were sited over former



Ōhiwa Harbour, showing new mussel sites (orange: K1, K2, K3), near restoration stations, blue 1–4. K4 is the last remaining traditional mussel site. By Reihana & Ranapia, 2020.



Left: Taura kuku woven from dead ti kouka fronds. Right: A commercial plastic mussel ocean spat line, from local supplier Donaghys.

mussel beds identified by mana whenua. The researchers found that taura kuku made from ti kouka/cabbage tree fronds and pirita/supplejack vine lasted the longest of the plant lines before falling to the sand with intact mussel colonies.

“Mussels have increased tenfold since we started. In 2022 there were 745,000 mussels and four new beds, which are self-generating. The project includes many hands, and different knowledge systems working beautifully together. Many people have contacted our team about the project from around Aotearoa and other countries, all looking for successful ways to restore shellfish.”

Working with young people

“In every project we train young people, helping them to access science and showing how



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it's fun and creative." For the first 10 years Kura did that voluntarily, then she got funding. She provides free-diving courses at no cost for young Māori in the research area, and shows them how to do basic marine monitoring.

"Some are now in polytech or university, some have gained their skippers' ticket, trained as divers, or gone into education or health, all areas relevant to science."

"They become whānau; if they see our boat, they text asking to come out with us, and we always have room for our youth."

Mātauranga Māori

Kura's projects aim to restore environments. "You can lament all you want about our declining world, but if you don't do something you're just lamenting." She told *NZ Geographic* that -tanga indicates action and "if there's no action, then it's not kaitiakitanga".

"We celebrate and prioritise relevant mātauranga Māori," she says, including ngā tohu o te taiao and maramataka, Māori lunar calendars. For the Ōhiwa Harbour taura kuku, renowned weaver Roka Ngarimu-Cameron led a team that experimented with combinations of harakeke, tī kōuka, kiekie, pīngao, and neinei, thickly plaited, with pirita for strength.

Kura believes that the knowledge systems of mātauranga Māori and Western science have a lot in common. They both aim to understand our world, and use established teaching and learning processes. They're both systematic and changing, gaining knowledge from close observation of natural processes.

"I believe that we're better working together, including everyone and their knowledge systems and skills."

She advises teachers who are approaching mātauranga experts for the first time to read the environmental management plans of local iwi and hapū. "They're a good starting place for what their priorities are and why, as every hapū and iwi has a different context."

What she likes about science

"Science is so creative – and we learn cool stuff about ourselves and our world. My favourite thing is bringing together mātau-

ranga Māori and marine science to develop hands on, pragmatic and innovative ways to understand and restore our moana."

Links

Showdown Productions, 2021, [Mussel ropes, Rural Delivery](#) (7min video).

Radio NZ, 2021, [Saving mussel beds with a bi-cultural approach](#) (article & 4min podcast).

Kudos Science Trust, 2020, [Bilingual with bivalves](#) (2min video).

Sustainable Seas National Science Challenge, 2022, [Awhi mai awhi atu – kuku restoration](#), Science Learning Hub (article & 7min *Rural Delivery* video).



Pātangaroa, Coscinasterias muricata, 11-armed seastar. Photo by Kura Paul-Burke.

Reference

Kura Paul-Burke et al., 2022, [Taura kuku: prioritising Māori knowledge and resources to create biodegradable mussel spat settlement lines for shellfish restoration in Ōhiwa harbour](#), *NZ Journal of Marine & Freshwater Research*, 56(3), 570-584.

Ngā Kupu

Kiekie – *Freycinetia banksii*, a native vine

Mātai moana – Marine research

Pīngao – Golden sand sedge, *Ficinia spiralis*

Rāhui – Temporary prohibition

Ruku moana – Ocean diving

Rukuruku ngongohā – To snorkel, snorkelling

Taonga – Treasure, treasured

Taura kuku – Mussel lines made of natural materials

Tī kōuka – Cabbage tree, *Cordyline Australis*.

From Paekupu and Te Aka Māori Dictionary



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