NGAPARRTJI NGAPARRTJI

Two-way science education in the northern Goldfields

Two-way science, or ngaparrtji ngaparrtji meaning 'give and take' or 'in return' by Martu Traditional Owners, is growing in interest among remote Aboriginal communities thanks to the drive of a network of teachers, Aboriginal rangers and scientists to encourage learning among children in schools.

by Dorian Moro, David Broun, Lena Long, Annette Williams and Rita Cutter

Ngaparrtji ngaparrtji is about recognising the relationships that bind groups of people together. It is about respect, sharing knowledge, listening and learning, and brings together the different frameworks for thinking (Martu and western knowledge) for the benefit of people and Country. Two-way learning is a system that requires a strong connection between rangers, the community and schools.

Wiluna Remote Community School, together with the Wiluna Martu Rangers from the land management branch Mantjiljarra Yulparirra of the Tarlka Matuwa Piarku Aboriginal Corporation, have been progressing this approach over five years in the town of Wiluna, approximately 950 kilometres north-east of Perth, and at the Matuwa Kurrara Kurrara Indigenous Protected Area, a further 160 kilometres or a two-hour drive north-east from Wiluna. The school and rangers work together to develop a culturally and environmentally responsive integrated two-way science learning program connecting Martu cultural knowledge with the Western Australian science curriculum.

CLASSROOM AND COUNTRY

Wiluna Martu Rangers come into the school and work alongside Department of Education teachers and cultural educators to share Martu language and cultural knowledge of Country across the seasons. Rangers have become significant role models for the younger generation. This approach has led to improved outcomes in student engagement, attendance and achievement. Martu Elders and rangers, including a local Martu Aboriginal education officer, work with the school to ensure that the two-way learning process is respectful of Martu cultural knowledge and intellectual property.

Learning occurs not just in the classroom of the school, but on Country. The Matuwa Kurrara Kurrara Indigenous Protected Area covers 569,754 hectares of exclusive possession native-title determined Martu Country in WA. The area is managed by the Martu Traditional Owners who work with partners such as the Department of Biodiversity, Conservation and Attractions (DBCA), and their collaborative efforts have seen the former Lorna Glen and Earaheedy Pastoral Stations begin landscape-scale restoration back to pre-pastoral conditions.

Matuwa has been an iconic outdoor classroom for a recent initiative called Warlawurru Week as it recognises the importance of the warlawurru or wedge-tailed eagle (*Aquila audax*) as a totem animal for some local Martu.

Warlawurru Week involves a three- to four-day program of learning-on-Country activities at both the local school in Wiluna for junior students, and at Matuwa for senior students. It involves teachers, rangers and wildlife scientists working together to teach students about the cultural importance and diversity of local wildlife, their diets and important habitats, and also how to survey them.

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Main Landscape at the Matuwa Kurrara Kurrara Indigenous Protected Area.
Photo – Jennifer Eliot/DBCA
Inset left Wedge-tailed eagle (*Aquila audax*).
Photo – Simon Cherriman
Inset right Teaching students what barn owls eat by dissecting owl pellets.
Photo – Dorian Moro/TMPAC

Top Collared sparrowhawk (*Accipiter cirrocephalus*).
Photo – Simon Cherriman

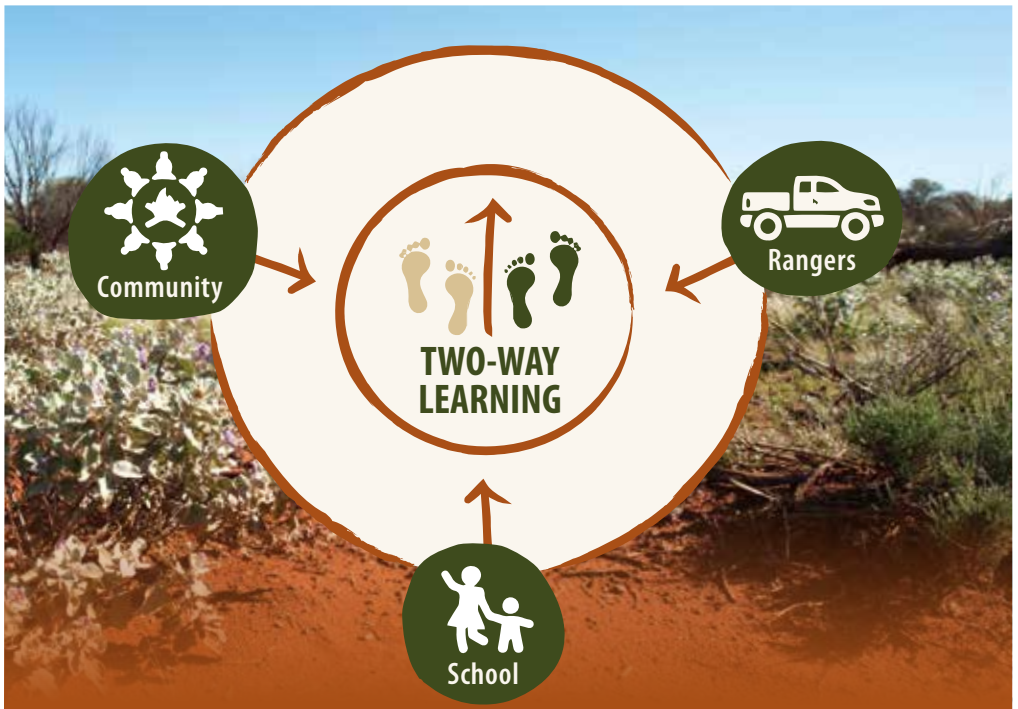
Above Recording the location of bilby burrows on tablets by Wiluna Martu Rangers.
Photo – Dorian Moro/TMPAC

Book of knowledge

The CSIRO Indigenous STEM Education project underwent a co-design process with several remote desert schools and communities to develop a book of educational resources *Two-way Science: an integrated learning program for remote Aboriginal desert schools* (downloaded free from publish.csiro.au) that describe two-way science activities under the main themes of animals; plants; water; seasons, weather and astronomy; and places, maps and Country. These activities highlight opportunities to involve rangers and traditional knowledge holders in the community. Learning is shared in a respectful, cross-cultural manner that emphasises care for Country and conservation.
In 2017, Wiluna School, in partnership with the Wiluna Martu Rangers, won the nationwide School Award in Indigenous STEM (Science, Technology, Engineering and Mathematics) from CSIRO.

Main Eagle eye view of Country, now called Matuwa Kurrara Kurrara by the Traditional Owners of the area.
Main below Sunset on Country, a special outdoor classroom. *Photos – Simon Cherriman*

Inset, from top left:
Teaching Indigenous students about old boodie warrens at Matuwa. *Photo – Dorian Moro/TMPAC;* Wedge-tailed eagle (*Aquila audax*). *Photo – Jennifer Eliot/DBCA;* Wiluna Martu Ranger measuring the foot (pes) of an endangered boodie during a scientific monitoring program at Matuwa. Dinner plate turtle (*Chelodina steindachneri*). Boodie or burrowing bettong (*Bettongia lesueur*) are now abundant inside the predator-proof enclosure at Matuwa. *Photos – Simon Cherriman*



"We want to work with the scientists… teach them Martu names and look for tracks, and we can learn from them too. We gotta try two-way learning more. Education is about teaching our young people bush way too. We can also teach white fellas."

Lena Long, Martu Elder, Wiluna

Top left Two-way teaching in the classroom during Warlawurru Week at Matuwa.
Photo – Dorian Moro/TMPAC

Top right Two-way learning aims to connect Indigenous rangers with their community and local school.
Photo – Indigenous Desert Alliance.

Background Matuwa vegetation looking healthy after rainfall in the desert.
Photo – Jennifer Eliot/DBCA

Above Mantanalgu (bilby) at night.

Inset Bilby scats.
Photos – Simon Cherriman

SHARING SCIENCE

Scientists come to Wiluna to exchange knowledge with Wiluna Martu Rangers and get involved in a series of projects with students—spotlighting for mammals, searching for signs of mantanyulku (bilby) using tjina (tracks) and kuna (scats) and recording these digitally on tablets. They are also involved in birdwatching, bird banding, learning Martu names for local animals and plants, examining some of Matuwa's warlawurru nests for remains of eagle prey and to monitor breeding activity, and dissecting the regurgitated pellets of barn owls to identify the diversity of animals they have been eating.

Wiluna Martu Ranger presence and leadership fosters a dialogue and collaboration between Martu rangers and students, teachers and scientists, which is a key to the program's success.

Scientists such as ornithologists Simon Cherriman and Neil Hamilton have been working with the Wiluna Martu Rangers and school for several years to share experiences and enthuse students to learn alongside rangers and scientists.

"By monitoring the 44 resident pairs of warlawurru that live at Matuwa, we learn to see Country from an 'eagle-eye' perspective. That is, looking down from high above," Simon Cherriman said.

"This is how the old Martu people developed and maintained such a broad, landscape-scale perspective on Country for thousands of years. It helps us understand its vastness and get to know it."

Teaching young people cultural knowledge is of great importance to Martu and is fundamental to maintaining a connection to Country. Maintaining this connection is also key to healthy ecosystems across Australia where, in remote areas, Indigenous rangers are involved in land management, and looking after Country as their ancestors have done for millennia.

Moving with the heartbeat of the land

Being in the presence of Aboriginal people on their Country is always a special experience. But sometimes you find yourself in a 'goose bumps' moment, so immensely powerful that any sense of alignment with 'normal' hourly or daily occurrences completely vanishes, and you become swallowed up by the land and thrown into a deep sense of timelessness.

I remember one such moment arose as I handed a large, nestling warlawurru (wedge-tailed eagle) to respected Martu Elder Rita Cutter at Matuwa Indigenous Protected Area. As I explained the process of banding and taking morphometrics, my simultaneous contact with the eagle's talons and a person connected to an unbroken bloodline of the world's oldest Indigenous culture suddenly whisked my mind into a flight spanning tens of millennia. Instead of imagining what it would be like to understand the wide spectrum of human knowledge about Matuwa and its surrounds, I could feel it, like I felt the wind in my face.

For western scientists, working together with Aboriginal people on Country isn't just about sharing an experience with a wild plant, animal or other organism. It's about considering an important perspective that gives one's research a wider context.

In science, researchers are taught to carry out a literature review—a comprehensive analysis of all previous research in a particular field. An understanding of what is already known helps shape the direction of new research. But if one piece of this pre-research puzzle is left out, the scope changes. So, failing to consider a cultural viewpoint is like leaving a vital, long-term study in a peer-reviewed journal off the reference list.

Then there is basic etiquette—you don't go onto someone's land and do anything without seeking their permission and endorsement first. Long, long before 1788, Aboriginal Australians had integrated their lifestyle with the very fabric of the land by making lifestyle changes in accordance with its seasonal change over time. By moving with the heartbeat of the land, and if we are to truly know, feel and, in the words of the 2021 NAIDOC theme, 'Heal Country', we westerners must not draw a line in the sand, but start following the footsteps of the First Australians to leave their footprints in it.

Simon Cherriman, Ecologist, iNSiGHT Ornithology

Wiluna Remote Community School worked with the CSIRO *Science Pathways for Indigenous Communities* program from 2016 to 2020, and is now working directly with local Native Title holders. The Department of Education has an agreement with the CSIRO to scale and adapt a two-way science approach across Western Australian schools through the *Two-way Science Initiative* using the material developed during the program. The initiative supports schools to build partnerships with local Aboriginal communities and to develop integrated, culturally responsive learning programs that connect the science curriculum to Aboriginal knowledge.

Two-way science provides an opportunity for all students to learn about science from the world's oldest continuing culture and ensure that knowledge carries through and informs future generations.

Top Wedge-tailed eagle in flight.
Photo – Simon Cherriman

Above Indigenous learning with Wiluna Martu Rangers on Country at Matuwa.
Photo – Dorian Moro/TMPAC

Above right Seasonal wetland at Matuwa.
Photo – Simon Cherriman

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Lena Long, Annette Williams and Rita Cutter are Martu Traditional Owners and Elders from the Wiluna Martu Native Title area in the northern Goldfields. They and other Elders have deep connections to Country and play an important role passing traditional learnings down to the next generations of children.