

## Embracing Indigenous Environmental Knowledge: A narrative journey from an old(ish) white scientist supported by a young(ish) Aboriginal scientist

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### Key points

- Western science has not proved effective in protecting or restoring our riverine systems
- At a global scale more systems are declining than improving.
- Indigenous Environmental Knowledge systems provided a way forward that can help us to preserve and maybe restore these systems.
- The knowledge and systems are there, we just have to be open to working with Aboriginal people to implement them.

### Abstract

This paper documents Paul's evolving engagement with Indigenous environmental knowledge as a critical component of river landscape restoration. It presents a reflective narrative of relationship-building and developing understanding, with the intention of encouraging other scientists and practitioners to consider similar pathways toward respectful engagement with Indigenous knowledge systems.

Over the past decade, Paul has increasingly sought to listen to and learn from Aboriginal people and their knowledge of land, water, and ecological relationships. These knowledge systems provide important perspectives for the restoration and stewardship of river landscapes. This journey has unfolded gradually and has been supported by the generosity, patience, and guidance of Aboriginal mentors who have encouraged ongoing learning and reflection.

The paper reflects on this largely informal and iterative learning process, highlighting key moments and activities that facilitated deeper engagement and understanding. The approach that emerged from this experience can be broadly characterised through four interconnected steps:

- Listening with openness, humility, and respect
- Co-developing activities or events, fostering trust through consistent participation and follow-through
- Reflecting on both process and outcomes to support learning
- Repeating and adapting, with the aim of continual improvement

Although the narrative focuses on the collaboration between Paul and Brooke, we acknowledge the many Aboriginal mentors whose knowledge, guidance, and support have been fundamental to this journey and to the development of this presentation.

### Keywords

Indigenous knowledge systems, Aboriginal knowledge systems, indigenous science, Aboriginal science

### What you can do

Take the first step to engage with Aboriginal people and knowledge systems

- Open your mind and heart to the people
- Be prepared to take the time to develop trusted relationships

- Build your cultural awareness – as this context is crucial
- Remember it is a living culture that is continuing to grow
- Then do that all again and do it better

If you are uncertain look around and find someone who can help with your first step.

### Paul's story

Until relatively recently I was fairly convinced that reductionist science could solve any of our problems. In the last 10-15 years I started to wake up. Clearly it can't. Global warming is an existential crisis; species extinction rates and 'nature' loss have never been higher; pollution and contamination of land and water is also at crisis levels. Science and scientists have been highlighting these issues for decades. We have not been effective in creating meaningful change. If anything, I suggest that scientist are contributors to the problems: presenting conflicting reports; speaking in probabilities that most people can't understand; and developing new things that inadvertently (I hope) create new problems – just consider PFAS.

Closer to my work I have been part of large science-based programs for the last 3 decades monitoring the outcomes of restoration and rehabilitation actions. Since the *Water Act 2007* and Basin Plan 2012 a lot of this work has been in the northern Murray-Darling Basin focusing on the outcomes of the delivery of water for the environment in rivers, floodplains and wetlands. Let me note that the intent of the *Water Act 2007* and Murray-Darling Basin Plan 2012 is to maintain or improve the riverine environment within the Murray-Darling Basin.

The teams I have been with have meticulously monitored these intervention outcomes using solid and rigorous reductionist science methods. We have diligently monitored the decline of these systems over the last 15-20 years. The Darling River fish kills that started to occur in 2018 at the commencement of the tinder-box drought and have continued through both drought and floods are very well documented. Our monitoring evidence shows that there is not a viable population of Murray Cod in the Darling River between Bourke and Louth. Thirty years ago this reach was a Murray Cod hot spot, now fish surveys often find not a single Murray Cod. I suggest the system in this reach at least has collapsed, we have a new riverine regime with different species communities. I believe that we know how to restore it or at least preserve what is left. Reductionist science is a really small part of the answer, perhaps; our social and economic and political systems are the impediments.

OK that sounds all a bit gloomy, and some of it is, but there is a way that I see forward. Imagine if we had access to a knowledge system so developed and advanced that it was embedded in the way we live. A system that actively sought to reward balanced use of resources and sharing. Imagine that.

Guess what. We do. A knowledge system that has taken tens of thousands of years to develop. A system that is so advanced the knowledge gathering, understanding and sharing isn't isolated from life, it is part of life.

So how did I end up with this position on the way forward? I didn't always have it, I had a lot of faith in science and the data and in some ways I still do. But to make meaningful change in the areas I love (and that is the environment of the planet), western science isn't enough.

My journey really began by being more open to different knowledge systems and approaches and to value them more and more deeply. This wasn't an instant epiphany but a growing realisation, shaped strongly by the Aboriginal mentors who have been kind and patient enough to work with me. Little by little, opening my mind.

This journey has been at least 10 years so far and is a gradual process that I can best illustrate with a few key moments that act for me as stepping-stones along the way.

I have met with Prof Brad Moggridge and Mr Jason Wilson many times over the past 10-20 years. They are both Kamilaroi/Gomeri men who have taken the time to share a few ideas with me, and I think encouraged me to look further and do better. During several stages of the Commonwealth

Environmental Water Office/Holder Long-term Intervention Monitoring (LTIM) and Monitoring, Evaluation and Research projects (Flow-MER), I was lucky enough to work with both of these men and have received the honour of them being willing to share elements of their histories and perspectives.

A key moment from Brad was when we were discussing engagement with Aboriginal people in these programs and Brad said

‘we want to be married, not engaged’

I took that to mean the people in these communities need to be involved and paid to be involved not just talked to.

Working with Brad and Jason was my first major stepping-stone into my working with Aboriginal people.

My next stepping-stone also came through the Flow-MER project where I was able to employ (taking Brad’s message to action) Uncle Kevin Knight a Kurnu Baakandji man, and Kamilaroi/Gomeroi women Liz Taylor and Kerrie Saunders. Spending time with each of these people to better understand their histories and the knowledge they can bring to western scientific monitoring programs has been a great privilege and has presented me with many, many key learning moments. I just have to be open enough to take them in. An example of a key moment with Uncle Kevin was developing an Aboriginal scientist-western scientist knowledge sharing event at Toorale (Argent et al, 2025). Each of the western-scientists present, reported the feeling of the great honour to be part of the knowledge sharing event, especially given that we clearly had the most to learn. The generosity of the Traditional Owners in sharing their knowledge was felt and appreciated by everyone.

There have been many stepping-stones (if I haven’t over laboured the metaphor), small and large over the last decade but they have all led to something further and more meaningful for me. The process is simple:

- Listen with openness, humility, and respect
- Co-develop activities or events, fostering trust through consistent participation and follow-through
- Reflect on both process and outcomes to support learning
- Repeat and adapt, with the aim of continual improvement

Now I have to mention Brooke, my co-author for this paper. I have used the terms honour and privilege a lot in this narrative, so one more time won’t hurt. For the last 4-5 years I have been able to work with Brooke on a number of projects and that has been my honour and privilege. Travelling together, sharing ideas and ambitions, Brooke has continued to broaden my point of view. Gently (mostly) letting me know when I could do better. Sharing knowledge on culturally appropriate ways that I can interact and understand better. So that I can do better. And I intend to.

My concluding messages are:

- The current world presents many critical issues for the environment and environmental scientists
- These are hard and take an emotional toll on us all
- In Australia the knowledge, methods, wisdom and approaches of Aboriginal peoples provide us with an opportunity to work together to preserve and hopefully enhance what we can.
- My experience is that Aboriginal people are very willing to share their trust and knowledge in appropriate ways, when that trust is respected and reciprocated.

For me this is where I find my optimism and hope.

### **Brooke’s story**

Paul speaks of the toll this work takes. I feel that toll in my bones every time I walk into a community or stand on the banks of a river that is being treated like a plumbing system rather than a living being. In

this field, we are often taught to be 'fish people' or 'waterbird people,' as if the river is a collection of separate parts that don't touch. But my culture doesn't allow me to see it that way.

The river doesn't stop at the water's edge. A fish isn't separate from the tree that shades the bank, and the bird isn't separate from the cultural stories that flow through the current. They are all one.

My contribution to this paper, and to this field, is to take that 'willingness to share' that Paul identifies and turn it into a standard of practice. It's about making sure that when we work together, we aren't just 'integrating' data points, but respecting the sovereignty of the people who have understood the river as a whole, breathing system for millennia. This is how I lead my research—not from a distance, but from within the circle of reciprocity he has described, where the health of the water is inseparable from the health of the Country it sustains.

We have to be honest: this shift is hard. It is uncomfortable because it asks us to step out of the roles we've been trained into and admit we don't have all the answers. I see so many scientists standing at the edge of this transition, frightened to take the first step because they don't want to cause offence or 'get it wrong'. That fear is real, and it's valid, but it often keeps us stuck in the very silos that are failing our rivers.

We are all at different stages of this journey. Some are just starting to look up from the water's surface to see the trees and the people on the banks; others have been walking this path for years. But staying still out of fear isn't an option anymore—not for the river, and not for us.

As Paul has found, and as I live every day, Aboriginal people are often incredibly willing to share the weight of this knowledge. We want to see the river healthy just as much as you do. But that door only opens—and stays open—where there is reciprocity. It's about showing up with a heart that is ready to listen, a mind that is ready to be challenged, and a commitment to ensuring that the benefits of our work flow back to the communities and the Country that sustain us. You don't have to be perfect to start; you just have to be real, and you have to be ready to give back as much as you take.

I joined the Flow-MER project during the transition to Flow-MER 2.0—a moment where the seeds planted by people like Paul and his Aboriginal mentors finally began to take root in the way we do things. It was the start of a First Nations strategy designed to move Indigenous science from the margins and embed it into the very bones of the project. A Cultural Outcomes theme was created, not to be another separate box for 'fish people' or 'water people' to tick, but to recognise that the health of the river is measured by more than just data points on a spreadsheet.

For us, the success of a watering event isn't just about reaching a target flow or a certain dissolved oxygen level. It's about something much deeper and more visceral. A river is truly healthy only when it can sustain the people who belong to it—when a Grandmother can take her grandchildren down to the banks and show them that the Country is still providing everything they need to be who they are.

She sees the medicine in the plants, the fish that will sustain her family, and the old trees that have always provided the wood for survival—shaping the tools for their travel and the strength for their combat. It's the knowledge that the water isn't just 'flowing'; it is the life-force sustaining every living thing in that system and the adjoining ecosystems beyond the banks. When a river is healthy, the grandmother doesn't just see a resource; she sees the survival of her culture and her kin.

But! At the moment she feels heartache, as she does not see these things when she looks at our rivers.

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