Australia's National
Science Agency

Green CREST Award

Science: Biodiversity

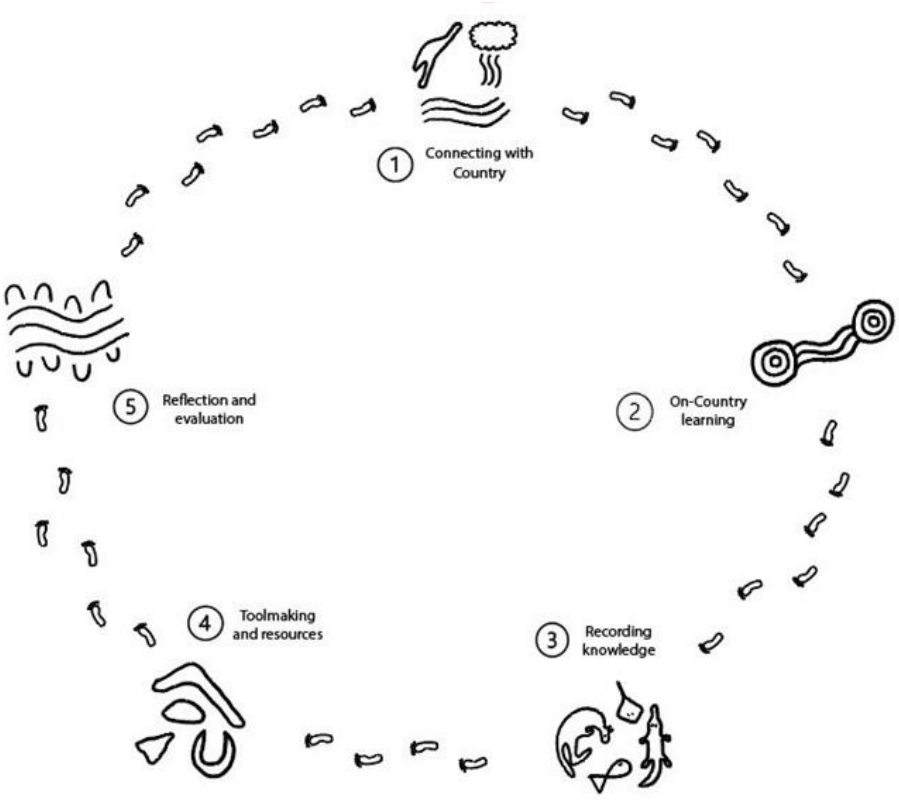
Created in collaboration with the Narran Lakes Aboriginal Joint Management Committee and CSIRO's Drought Resilience Research.

Image: Family of emus at Lake Angledool, May 2025

Green CREST Award

Science: Indigenous Research Methodology – Biodiversity

Background information: Indigenous Research Methodology



Indigenous Research Methodology[1]

Safety considerations: weather appropriate attire

'Our Culture is old. It's ancient. It is the essence of this country, connects us all to living things such as place, flora and fauna, our waterways and skies, our ceremonies and lores, it's part of who we are as Murri people.

Our rivers flowing and filtering on through to our lakes are the bloodline and life forms that run through our country, this creates the holistic importance of connection of all living things for survival."

- Rhonda Ashby, Yuwaalaraay and Gamillaraay

[1] Fabila M, Moggridge B, Braedon P, Akeroyd M, Connolly M, Court Z, Gilbey S (2025). Indigenous research methodology for drought resilience, CSIRO, Australia.

CSIRO researchers and Indigenous Scholars are looking at how to decrease the effects of drought in Australia as they become more frequent and more severe. A key part of this research project is recognising Aboriginal and Torres Strait Islander (Indigenous) People's deep understanding of Country to collaboratively collect and share Indigenous knowledges in a way that both respects Indigenous Cultural Intellectual Property and is recognised by the western scientific community. CSIRO researchers and a Kamilaroi Scholar have worked closely with the Narran Lakes Joint Management Committee to apply an Indigenous Research Methodology (IRM) that captures their understanding of drought resilience.

Coolamon scar tree along the Narran River, May 2025. The tree trunk shows how high the water level has risen in the past

The IRM is based on Moggridge et al. (2022)[2] . In this activity, it will scaffold an investigation exploring biodiversity on Country, embedded in Indigenous ways of knowing, being and doing. Your students will consider their perspectives and positionality with reference to science, and conduct an investigation based around Indigenous Australian's deep connection to and understanding of Country.

"Country encompasses land, waterways, seas and skies, as well as the energy and space in between. It also encompasses relationships. **Relationships with plants, relationships with animals and relationships with Ancestors (to name a few)[3]."**

Aboriginal and Torres Strait Islander People's cultures are diverse, with more than 250 language groups, however, one commonality is connection to Country, seeing people as part of Country and enduring cultural practices of observing and understanding Country. "Indigenous Peoples have been observing Country since time immemorial. They comprehensively understand all elements of Country, including Land, Water and Sky Country."

Take a moment to consider your own connection to and perspective of Country, and how your culture has influenced how you see the world around you.

[2] Moggridge, BJ, Thompson, RM, & Radoll, P (2022) 'Indigenous research methodologies in water management: learning from Australia and New Zealand for application on Kamilaroi country,' Wetlands Ecology and Management, 30(4): 853–868, doi: 10.1007/s11273-022-09866-4
[3] Common Ground First Nations (n.d.) What Is Country? | Common Ground [website], accessed 5 June 2025.

Background information: Biodiversity

Biodiversity describes variety in living things. It can be explored at different levels:

- **Genetic –** the diversity of genes within a species
- **Species –** the diversity of species present in an area or habitat
- **Ecosystem –** the variety of ecosystems in a region

The Creation story of Dharriwaa (Narran Lakes) describes the inherent cultural value of a diverse ecosystem. Humans are a part of and are responsible for caring for the biodiversity on Country.

"We don't own the land, we all belong to the land, it is part of us as much of us being part of it. In a family setting, it's like mother with her child, she will nurture its growth by being responsible for providing the care and this will continue on generation after generation. It's a cycle of respect, look after one another, look after our trees and waterways, our animals, we all have a place in this, we all have a responsibility with our mother, as she will always look after us and in return, we look after our mother. Take what you need, not what you want, as greed is a form of selfishness, you take, you give back, it's that simple!'

- Rhonda Ashby, Yuwaalaraay and Gamillaraay

This poses a complementary value of biodiversity as compared to western values, which highlight the impacts on humans – where the focus is often on the aesthetic, recreational and economic value. CSIRO's e-book: Biodiversity: Science and Solutions for Australia list five categories that describe the benefits biodiversity provides. These are:

- **Economic –** the provision of raw materials for direct consumption and production. Harvesting timber and fish are examples of this.
- **Ecological life-support –** healthy, functional ecosystems provide essential services to humans and other organisms, such as oxygen, clean water, habitat and food.
- **Recreation –** although this may seem by some to be frivolous, the ability to relax, exercise and take enjoyment in nature has very tangible outcomes for human wellbeing. It can also feedback to economic values, with the opportunity for eco-tourism, for example.
- **Cultural –** individuals will have very different cultural links to nature through art, spirituality, education and historical connections. This is demonstrated particularly strongly through Indigenous relationships with land.
- **Scientific –** scientists are driven to collect ecological data to help understand the natural world. This can lead to the ability to make predictions, prevent natural disasters, or add to economic value, as well as to sate natural human curiosity

In this inquiry, you will use the Indigenous Research Methodology (IRM) based on Moggridge et al. (2022) to investigate the diversity of life in your local environment (e.g. school grounds, local

parkland). You will examine the evidence of different life forms on site and take time to understand and be part of the Country you are on, by paying attention to the life that inhabits it.

Activity guide

Connecting with Country

What place in nature makes you feel connected or calm?

Introduce students to the deep, spiritual connection Aboriginal and Torres Strait Islander Peoples have with Country, and to reflect on their own sense of place.

- Acknowledgement of Country – find out the Traditional Owner and language groups of the Country you are living and learning on the Map of Indigenous Australia
- Class Discussion – What does 'Country' mean to Aboriginal and Torres Strait Islander Peoples?
  - Record key words, e.g. land, water, sky, spirit, family, language, care, belonging.
  - See Appendix 1 for activity ideas and links
- Watch the first two minutes of Dharriwaa Living with Climate Change
  - Part 3 - Dharriwaa Living with Climate Change
  - What did the story tell you about some of the life forms at Dharriwaa (Narran Lakes)?
- Class discussion/small group discussion e.g. Think, Pair, Share What is biodiversity and why is it important to Country?
  - Discuss how Aboriginal and Torres Strait Islander Peoples protect plants, animals, and ecosystems through traditional knowledge and sustainable practices.
  - Brainstorm how we can understand biodiversity in our local area.

On-Country learning

Students will learn on Country by conducting a biodiversity survey on their school grounds. They select different locations in the school to observe and quantify the evidence of life. They consider how development and planting choices impact biodiversity and how they could improve the biodiversity of their environment.

Equipment (per group)

- Biodiversity survey

		• Tape measure • Magnifying glass • Site map e.g. school map or google maps
	**Recording Knowledge**	Students can collect knowledge in the forms of taking notes, collecting data in a table, for a more detailed survey, see School Grounds Audit. They may also like to: map their observations, learn Indigenous Languages, or generate sound recordings.
	**Toolmaking and resources**	Students create biodiversity overview of school grounds. May also create site map, sound recordings, rubbings or collage of plants.
	**Reflection and evaluation**	• Students reflect on how they could positively impact the diversity of life on school grounds. • Where did you see the most/least diversity? • Were there any surprises? • How does the biodiversity on school grounds impact us and other living things that use the school?

Additional Resources

- Bedtime Stories | Common Ground
- What Is Country? | Common Ground
- Sounds of Narran: waterbirds calling at Narran Lakes (Dharriwaa) on the Lower Balonne floodplain - Flow-MER
- Fact sheets - Field of Mars Environmental Education Centre
- Bird profiles - BirdLife Australia
- Explore by location – Atlas of Living Australia
- Invertebrate Key

Videos

Dharriwaa Living with Climate Change videos

- Part 1 - Dharriwaa Narran lakes living with climate change
- Part 2 - Dharriwaa Narran lakes. Living with climate change
- Part 3 - Dharriwaa Narran lakes living with climate change

CSIRO Science Links

- Indigenous Research Methodology for drought resilience - CSIRO
- Sharing knowledge of drought resilience on Country - CSIRO
- Cultural indicators for drought resilience - CSIRO

Professional Development

- 8 Ways online
- Narragunnawali - Caring for Country
- Professional Development for Educators | Ngarrngga | Ngarrngga
- Narragunnawali - A Matter of Perspective

Risk assessment

- A risk assessment has been provided for this activity; however it is recommended to hold a class discussion regarding the possible risks and mitigation strategies prior to starting the activity.
- Appropriate PPE should be worn during this activity.
- Caution: students should be supervised while collecting data outside.

Activity	Inherent risk	Elimination or control measures
Collecting data outside	Weather exposure	Take appropriate precautions according to weather conditions, eg. rain coat, hat, sun lotion, minimal skin exposure.
	Slips, falls, abrasions, insect bites	While outside, students be advised of possible risks- slipping on wet ground, trips and falls etc, advise all students to observe insects, arachnids and other animals but not to touch. Adults supervise students during collection.

Appendix 1: Connection to and observation of Country - Activities

Observe Country

- Sit or lie down in an open area and close your eyes. What do you notice? Smells, sounds, light? Create art upon 'waking'.
- Make a soundscape, sit in silence with a book/sheet of paper. Position yourself in the centre of the paper and sketch/note the natural sounds you hear, positioning them on the page in the same relative position. If weather does not permit, consider a recording e.g. Sounds of Narran: waterbirds calling at Narran Lakes (Dharriwaa) on the Lower Balonne floodplain - Flow-MER
- Choose a feature of the ecosystem to draw – a tree, animal, rock formation. Make rubbings of rough bark, leaves or rock-faces.
- Go on a traces hunt. Some animals are hard to find, but you can see their traces – look for scratches in the dirt, chew marks in leaves or gumnuts or scat. Try to work out which animals left them.

Consider

"I grew up around the Walgett district with five brothers and four sisters, we spent a lot of time around the Namoi River with family and friends. I remember the river water being clear and you were able to see the bottom where we used to dive for mussels, fished, played water games and bathed. We collected snotty gobbles and gum sap off the trees nearby. Being on the riverbank was also a form of meditation, listening to the bird life, hearing the water flow and the smell of eucalyptus and gum trees. Rivers and lakes like the Narran provided life for the natural environment and its habitat, most importantly, the wellbeing of the people."

- Rhonda Ashby, Yuwaalaraay and Gamillaraay

- What non-living things did Rhonda pay attention to?
- What living things did she notice?
- What things did she know how to use?
- Consider the Country you grew up on – what did you notice? Are there similarities/differences?

Watch:

Dharriwaa Narran Lakes Living with Climate Change

- What did you notice about how Jason, Allan and Brenda spoke about Country?
- What plants/animals did you notice in the video?

Through Our Eyes - Native Foods At Narran Lake with Brenda McBride (Dharriwaa)

- What living things does Brenda notice?
- Do you see Country the same way as Brenda? What is similar or different to the way you look at Country?

Link:

What Is Country? | Common Ground