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Merging Indigenous and Western Research Methodologies

Reflections on a Journey

Abstract: We would like to acknowledge the traditional custodians of Country across Australia and the Torres Strait Islands. Indigenous knowledges are and have been used to support us to sustainably exist with Australia's fragile ecology for thousands of years but are only recently being valued for their role in creating a sustainable future for Australian fauna. Indigenous Ecological Knowledges can play a vital role in the future management, and recovery of Australian native species. But the value of this knowledge needs to be recognised by those in decision-making roles. Here, I present these concepts using my family totem, the Koala, as a case study for how these two knowledge systems can be merged. As part of my Honours research year, I completed reflections that were centred around the experience and challenges that I, as an Indigenous person, would experience when merging Indigenous and Western research methodologies. The key reoccurring findings of my reflections were categorised into 1) my growth as an Indigenous person, 2) gaining a deeper sense of ecology, 3) Indigenous Ecological Knowledge, and 4) incorporating culture into a Western science system. This experience overall showed that it is possible to bring your own cultural experience and way of conducting science into the current dominant scientific practice.

Acknowledgement of Country

My name is Teresa Cochrane, and I am a proud Indigenous woman of the Dunghutti and Gumbaynggirr mob on the Mid North Coast of Australia. I want to acknowledge the lands that I have grown up on as these are the places where I have learnt knowledge and that have shaped me into the person I am today. These places are Dunghutti Country for the first 10 years of my life, a place I have continually returned to because this is the land where my Indigenous family (father's side) was raised on and continue to live on. Birpai/ Birripi Country is a place that has had the most significant impact on me with regards to my personal growth, and connections to Traditional Owners and Elders, as well as other local Indigenous people because it is the Country I have lived on for the majority of my life. I am also acknowledging Bundjalung Country, the lands on which my non-Indigenous family (mother's side) was raised on and a place I have a strong connection to. I would also like to acknowledge my connection to Gumbaynggirr mob and Country which are the lands which my Indigenous family and my great-great Grandfather King Bennelong and his family/children belonged to before they were forcibly taken to Burnt Bridge mission/reserve on Dunghutti Country. My final specific Acknowledgement of Country is Wiradjuri which is

a place that I visited while completing the laboratory analysis and data analysis for my Honours project.¹

All authors would also like to acknowledge Indigenous peoples as the traditional custodians of Australia and we would like to pay our respects to Traditional Owners and Elders both past, present, and emerging. We would like to extend this respect to all Indigenous people who read this work. We would like to acknowledge the Birpai / Birripi peoples, biodiversity, and their Country because this is the land on which most of my reflection and work was undertaken. Additionally, we would also like to acknowledge Ngiyampaa Country, Wiradjuri / Wiradyuri Country, Kamilaroi and Gimuy Country where we all currently work, live, and have connection to.

Prior to Invasion, Indigenous people had been living as an integrated part of the Australian environment for more than 65 000 years scientifically and also culturally 'time immemorial'. They had an important and integral role in the interactions of ecosystems' fragile, interrelating relationships,² were the caretakers of the environment and viewed themselves as equal to all environmental processes, features, flora and fauna.³ They hold a traditional ecological knowledge that has helped assist in the environmental management and conservation of Country for tens of thousands of years.⁴

I would also like to acknowledge my fellow authors who have been vital in the conceptualisation, writing, editing and key supports of my journey and publishing this paper. Without them I would not have been able to complete my research project and find my place in academia. This journey is just as much mine as it is theirs.

Introduction

An Acknowledgement of Country was included in this paper because it is important for Indigenous peoples of Australia to develop a sense of connection, which can be achieved in conversation, by Acknowledgement and discussion of Country as well as family groups and mob associations.⁵ It was important to me to include an Acknowledgement of Country because it is a significant protocol in Indigenous lores and is a sign of respect to any Traditional Owners, Elders and Indigenous people who read this work. This also allowed me to pay my respect to Ancestors who despite the odds survived a cruel colonial genocide, as well as pay respect to those fallen.

- 1 Cf. Teresa Cochrane, Gaye L. Krebs, Scott Mcmanus, Scott Castle, Peter G. Spooner: Effect of Soil Treatment on the Growth and Foliage Chemistry of Three Eucalyptus Species Grown in a Plantation as a Food Source for Koalas.
- 2 Cf. James L. Kohen: Aboriginal Environmental Impacts; Derek John Mulvaney: Aboriginal Man and Environment in Australia.
- 3 Cf. Natalie Stoeckl, Diane Jarvis, Silva Larson, Anna Larson, Daniel Grainger: Australian Indigenous Insights into Ecosystem Services.
- 4 Cf. Rosalie Schultz, Tammy Abbott, Jessica Yamaguchi, Sheree Cairney: Australian Indigenous Land Management, Ecological Knowledge and Languages for Conservation.
- 5 Cf. Reconciliation Australia: Acknowledgement of Country and Welcome to Country.

This paper is set up as a yarn about who I am, where I come from and allows me to share my story of what led me to undertaking my Honours journey, and also was heavily inspired by Sue Green, Jessica Russ-Smith and Lauren Tynan's paper 'Claiming the space, creating the future'.⁶ My Honours journey was the first step into my academic career as an Indigenous researcher in the predominantly Western dominated discipline of environmental science and ecology. Since starting on this new journey, I thought it was important to reflect on the lessons learnt and experiences of using both Western and Indigenous methodologies.

The purpose of sharing them is to hopefully encourage and inspire other Indigenous people to follow their own cultural expression, as well as highlighting its potential to be used as a tool for other Indigenous researchers or supervisors who may be undertaking a similar experience. It is important in Indigenous culture to share our cultural experiences through storytelling and yarning, which has been a teaching practice used for tens of thousands of years for survival and guidance,⁷ and this is the main purpose of this paper. In the absence of written language, storytelling and yarning are the main (and very critical) forms in which information was passed from generation to generation.⁸ These conversations were not only critical for survival, but they also really acted in the same way as a Western encyclopedia.⁹ They were the source of truth for all aspects of life.

Yarning the Journey of the Authors

In this paper I acknowledge that my learning journey has been a shared and relational approach where I have learnt with and co-produced understanding with others. This knowledge production has occurred within Indigenous, Indigenist and Western worldviews. Yunkaporta and Moodie state: "Indigenous Knowledge is only valid if it is produced in groups or pairs; individual analysis is considered to be invalid and lacking intellectual rigour",¹⁰ therefore, my approach to learning in my Honours journey has been a form of Indigenous knowledge production.

The knowledge, cultural journey and developed understandings gained through the Honours project, was not done siloed and neither was the development of this paper. It was the combined experience of both Teresa Cochrane, Elders and Indigenous knowledge holders, and the supervisory team. It is important to share our collective journey within this experience and each of our own singular journeys to date to build trust and rapport with the reader and the work presented in this paper.

6 Cf. Sue Green, Jessica Russ-Smith, Lauren Tynan: Claiming the Space, Creating the Future.

7 Cf. Lynore K. Geia, Barbara Hayes, Kim Usher: Yarning / Aboriginal Storytelling.

8 Cf. Dawn Bessarab, Bridget Ng'andu: Yarning About Yarning as a Legitimate Method in Indigenous Research; Ranjan Datta: Traditional Storytelling.

9 Cf. Nepia Mahuika: Rethinking Oral History and Tradition.

10 Tyson Yunkaporta, Donna Moodie: Thought Ritual., p. 90.

Teresa Cochrane

As a Wiradjuri Elder once shared with me, I am an individual that has her feet in two camps, to have both Australian Indigenous and non-Indigenous heritage. Both of these heritages have influenced both who I am, and my educational journey. Both sides of my family have a strong connection to the conservation of Country, protection of the environment and preservation of biodiversity because they see the values and importance of the environment, its features, its processes, flora and fauna. My need to pursue a Bachelor of Environmental Science and Management (Honours) at Charles Sturt University and a career in the environmental sector is a passion that had been passed on to me by my family. As I progressed through my degree it became evident that this was to be my calling in life because it incorporated my culture, my family's passion to conserve the environment and my need to help the world.

In my studies I majored in Conservation Ecology because the rate of extinction of native biodiversity through human urbanisation, deforestation, agriculture and introduced species in Australia, as well as internationally is important to me, but also of significant concern nationally.¹¹ My Indigenous Ancestors have lived on Country with the ecosystem by ensuring the sustainable conservation and longevity of biodiversity,¹² and I believed it was important for me to take on this responsibility for the environment to continue the work of my Ancestors.

Indigenous cultures use totems as a main practice for conservation and preservation of species, because the totem system dictates how Indigenous peoples interact with plants, animals, the landscape, water, and each other.¹³ In Indigenous culture, a 'totem' is an Entity which an Indigenous person's "spirit came from",¹⁴ it is also often related to a species, a totemic site, a sacred site, in the landscape, or is connected to the Ancestor.¹⁵ The totem systems used differ depending on the Country and its unique culture, customs, lores and ceremonies, but the common understanding is that totems or the totemic system comes from the 'Dreaming' spirituality.¹⁶

Totemic systems and totems often derive from 'Dreaming' stories used as part of learning, initiation and ceremonies,¹⁷ as well as being located in a place that an individual spirit comes from.¹⁸ The totemic systems and totems also play a role in the different relationships between Indigenous people and their responsibilities

11 Cf. Emily Burton, Andrew Tribe: The Rescue and Rehabilitation of Koalas (*Phascolarctos Cinereus*) in Southeast Queensland.

12 Cf. Heather J. Aslin, David H. Bennett: Wildlife and World Views.

13 Cf. Deborah Bird Rose: Indigenous Ecologies and an Ethic of Connection.

14 Daniel F. Robinson, Margaret Raven: Recognising Indigenous Customary Law of Totemic Plant Species, p. 33.

15 Cf. Vicki Grieves: Aboriginal Spirituality.

16 Cf. Heather J. Aslin, David H. Bennett: Wildlife and World Views.

17 Cf. Robyn Heckenberg: 2014 Australian Association for Research in Education Betty Watts Award Winning Paper.

18 Cf. Daniel F. Robinson, Margaret Raven: Recognising Indigenous Customary Law of Totemic Plant Species.

to Country.¹⁹ They can be the physical embodiment of an Ancestor,²⁰ or they can be kin or family member.²¹

The koala is a significant totem of the Birpai / Birripi people and was the focus fauna of my Honours research project.²² On 16th May 2022, Uncle Richard Dacker, a proud Birripi Traditional Owner and Elder stated that “Goola (Birripi word for koala) is the name of my grandfather, he was Goola / koala, that was his totem. He was given that very young – 10-year-old”,²³ and he also goes on to say that when “your totem being koala, then you don’t kill koala or ancestry, so koalas were very important for protection”.²⁴ The conservation and preservation of Country, koala and Eucalyptus (the main food source of the koala) is important to Auntie Rhonda Radley who stated in a yarn on 17th May 2022 that she has a “responsibility to look after, more so Guula [Gathang (Birpai) word for koala], getting close to him, to nurture him but also the tree itself”, along with discussing conservation of Country by saying “we are all connected, and we are all in this oneness together”.²⁵

It is important to also acknowledge my family for the totems they have given me. I have three totems: my personal totem is the koala and was also a significant totem of my great-great grandfather King Bennelong’s people; one from my father’s side which is a praying mantis; and one from my mother’s side which is an Australian magpie. My mother’s family is not Indigenous, but one day I was having a discussion with my (maternal) grandparents where I was sharing with them knowledge of culture and discussing totems. My grandfather, who has a strong personal connection to magpies, respectfully passed this totem on to me to be my totem for my mother’s side of the family. It was a big moment in my life because it acknowledged the connection between both cultural sides of myself. It also showed that my grandparents recognised my Indigenous culture, one that is so different to their own. My grandparents grew up in a cultural norm and society that typically viewed Indigenous knowledge and culture as ‘primitive’ or ‘lower’ on a societal hierarchy,²⁶ and this was to no fault of their own but was represented through Australian historic and institutional norms since Invasion/Colonisation.²⁷ For them to accept and recognise my Indigenous cultural heritage and its importance to me, despite their own cultural heritage highlights the respect, acceptance and love they have for me.

Connection to Country and its conservation are a vital part of who I am, and it stems from my cultural standpoint from both sides of the family,²⁸ I also know

19 Cf. Heather J. Aslin, David H. Bennett: *Wildlife and World Views*; Deborah Bird Rose: *Indigenous Ecologies and an Ethic of Connection*.

20 Cf. Birripi Traditional Owner and Elder Uncle Richard Dacker, pers. comm., 16 May 2022.

21 Cf. Birpai Traditional Owner and Elder Auntie Rhonda Radley, pers. comm., 17 May 2022.

22 Cf. Teresa Cochrane: *Effect of Soil Treatment on the Growth and Foliage Chemistry of Three Eucalyptus Species Grown in a Plantation as a Food Source for Koalas*.

23 Birripi Traditional Owner and Elder Uncle Richard Dacker, pers. comm., 16 May 2022.

24 Ibid.

25 Birpai Traditional Owner and Elder Auntie Rhonda Radley, pers. comm., 17 May 2022.

26 Cf. Patience Elabor-Idemudia: *Identity, Representation, and Knowledge Production*.

27 Cf. Quentin Beresford, Paul Omaji: *Our State of Mind*; Susan Green: *Colonisation, Post-Colonialism and Decolonisation*.

28 Cf. Jay Phillips: *Indigenous Australian Studies, Indigenist Standpoint Pedagogy, and Student Resistance*.

that I am not alone in the feeling with many other Indigenous people both in Australia and internationally sharing similar personal connections, as well as non-Indigenous people in their own cultural experience. My culture also plays an important part in my career and research interests of using Indigenous methodologies of science, pursuing a career in environmental / ecological science and conserving my personal totem the koala. The cultural perspective of having both Indigenous and non-Indigenous ancestral lines influences the format of my research and this paper; incorporating both these cultural perspectives is a crucial factor in my story and journey.

Scott McManus

I am a Ngiyampaa man, although I also acknowledge my Wiradjuri, First Fleet and Settler heritage (including Irish, Scottish, English and Ashkenazi Jewish ethnicities). After 25 years as a consultant in the Mining and Geoinformation fields, I completed a PhD that focused on uncertainty assessment of spatial domains in early-stage mining projects using pXRF and Bayesian methods. My current research interests include implementing Machine Learning in Health Administration, Responsible AI, Digital Data Sovereignty, Ethical considerations with First Nation's Statistics, Deep learning techniques to identify river blockages in Southeast Asia, Geostatistics to quantify uncertainty in geological models and fire impacts on mangrove vegetation and regeneration on the mid-north coast NSW. When I first met Teresa, I was still completing my PhD and working as a sessional academic in spatial science. During that time, I began to work on updating the Australian Indigenous modules in two of my subjects to the Charles Sturt University Indigenous Curriculum expectations. Through this work, I began understanding and researching Indigenous Data Sovereignty and participatory mapping. I felt privileged that Teresa asked if I would assist her in her Honours Journey by providing cultural support to the supervision team. I have a strong geochemistry background, so I did understand the chemical part of her Honours work and, of course, the statistics and data methods, but I had little knowledge of the vegetation and Koala diet selection. Teresa was very keen to include her culture in her science-dominated dissertation.

This led to us (Teresa and others in the supervisory team and those who supported her from outside) looking for examples of dissertations or other work that was science-based but included culture. We were able to find lots of examples of qualitative studies and Honours situated in the humanities, health and social work disciplines. I was close to completing the write-up of my own thesis and took the strategic decision to delay my submission via a leave of absence so that I could fully appreciate the material and Indigenous scholars we were referencing in support of Teresa's work, so I could then decide how I wanted to approach culture in my own Thesis. We were lucky that Peta was happy to freely provide her time to talk and yarn with us and help us along this journey. I had met Peta in the Spatial subject's revitalisation work and really valued her thoughts and advice. I thought Teresa could gain insights for her work from Peta as well. This meant we

enjoyed many yarns, with the most important being around Ethics in Indigenous research. One work that I found very helpful in visualising how Teresa could include culture in her science dissertation was 'Research is Ceremony' by Shawn Wilson.²⁹ In addition, I found that the chats I had with Uncle Rick and with Dr Aunty Rhonda, also helped consolidate my understanding and new knowledge gained through this process. Throughout the process, there were high and low sections. Some of the high sections were the respect for culture that many of the team brought, as well as the connections and relationships. Yunkaporta and Moodie³⁰ make it clear that knowledge is never an individual process and that the relatedness of data and thoughts and our connections are very important to the process of analysing data.³¹ In the end, I chose to include a one-page Acknowledgement of Country in my thesis, which situated me within the Ngiyampaa and Biripai Countries. I felt that was sufficient for my work, which was both National and International in scope, compared to Teresa's, where the context was very much tied to Biripai Country and thus deserved much more cultural contextualisation as well as having sections of the work written in a format that anyone, no matter their education level or reading age could understand the research that had been done. This is something we all felt strongly about: reciprocity in research when working on Country.

So now I am working with another Indigenous Honours student and again am honoured to be working with Teresa with her MPhil and DPhil. Through Teresa's work in her Honours, I feel much better prepared and more understanding of the kind of blockages that will be thrown up by the dominant research nomenclature for those wishing to include culture in their research. I also now know of literature-supported ways to navigate those blockages (using the system to fight the system). However, it goes beyond that; not all Indigenous researchers will have done Indigenous Research or include culture as an aim, but all of them will need cultural support, and very few non-Indigenous supervisors can provide the needed support or understand some of the issues an Indigenous researcher will face without some deeper reading or understanding. Understanding the kind of issues that can impact an Indigenous person in their work and study is important. For example, Teresa and I were from different families, different peoples and different Country and Teresa grew up in culture, whereas I did not. However, despite these differences as Australian Indigenous people, we still had a shared knowledge and experience of intergenerational trauma and an understanding of the kinds of issues our families and we had faced and continued to do so. So, this shared understanding and lived experience allowed us to support each other. Through programs like the Charles Sturt University Indigenous Cultural Competency program and the desire of non-Indigenous people to educate themselves about the issues, they are also able to effectively support Indigenous researchers. It was pleasing and comforting to see the array of support from non-Indigenous people (many of whom are contributing to this paper) who

29 Cf. Shawn Wilson: *Research is Ceremony*.

30 Cf. Tyson Yunkaporta, Donna Moodie: *Thought Ritual*.

31 Cf. *ibid*.

educated themselves and reflected on their standpoint and continually developed their cultural responsiveness:

From the heart
It's a start, a work of art
To revolutionize make a change nothing's strange
People, people we are the same
No we're not the same
'Cause we don't know the game
What we need is awareness, we can't get careless.³²

Peta Jeffries

My identity is not fixed. I have both colonised and colonising heritage in my family history and although this does shape my ways of being and doing, it does not currently define who I am because I do not fit into one identity more than the other. Out of respect for those who survived, and because of the current dominant cultural norms within Australia (and elsewhere) that continue to situate identity as fixed I do not feel safe or comfortable to identify as Indigenous or non-Indigenous. However, I do respectfully and proudly acknowledge Indigenous heritage in my direct maternal family line on both my grandmother's and my grandfather's side of the family. My father's ancestry is currently unknown to me, yet it is that name that I carry with me. The long and slow process of learning about this heritage has shaped my adult education and research because it supports me in truth-telling, speaking out, understanding, and healing from my family history of forced separation, silencing and erasure. My story is not unique, because it reflects the pernicious violence of colonialism and the long-standing nature of its associated harmful logics and those who maintain them. The intersectional nature of oppression is what I am standing up against.

As a young person returning to my hometown after travelling Australia in search of family and a sense of belonging, I wanted to study what was then known as 'Aboriginal Studies' and / or anthropology because I thought this might provide insight into my own family history. I have oral history of this family history, and some family members have samples of material artefacts but the evidence or truth according to the Western tradition is difficult to locate and therefore disputed. From day one of my experience at the university I was threatened by what I now recognise as the patriarchal, logocentric, and hierarchical nature of the Western tradition so dominant in an academy that did not recognise oral history and the visual as evidence or truth.

This led me to study visual arts where I could explore my history and the associated theoretical and conceptual understandings of what has happened through making, doing and creating. Furthermore, my studies of visual arts led me to being awarded artists in residencies in geographical areas close to what I was learning about my own family history, with most of this being situated within what is today recognised as the Murray Darling Basin, Western Victoria

32 Public Enemy: Fight the Power.

and Tasmania. The residencies included working with ecological scientists, and I began to question why they did not consider the history of the land and its inhabitants prior to 1788 and or if they did it was only a brief note within the final write-up or publication of their research. The visual, the artefacts and oral histories were again dismissed. My art practice as research then began to focus on histories and geographies of ecological knowledge beyond the Western tradition.

This then led me to work for Gunditjmara peoples, the traditional owners of Budj Bim, to carry out extensive archival research into what was then considered to be 'traditional Indigenous ecological knowledge'. This research contributed to the Budj Bim geographical area becoming recognised as a World Heritage Listed Cultural Landscape. This work was an example of Indigenous-led research that I am still very proud to be involved with. I have also supported First Nations students from the beginning of their undergraduate journey to completion of their higher degree by research projects. Most of these projects focused on cultural revival or revitalisation and family history, with many using the archives and visual methods to support their work.

This work helped me to recognise the value and importance of adjusting curriculum to better align with the aspirations of Indigenous students and also the benefit of these methods and methodologies to healing from transgenerational trauma. This led me to study social work focusing on trauma, and ecological or environmental social work within an Indigenist practice framework. I also completed a PhD in history, which considered the co-production of social and ecological knowledge (the merging of Euro-centric / Western knowledges and Indigenous knowledges) during colonial scientific exploration along major rivers through Country that is today recognised as the arid / semi-arid centre of Australia.

Then I became a full time lecturer and researcher in critical Indigenous studies, where I have been involved in developing subjects, curriculum and courses in critical Indigenous studies; the complex and contested teaching and coordination of more culturally responsive approaches across the disciplines; an active member of the Indigenous Board of Studies where we embed Indigenous content across the entirety of Charles Sturt University; and supporting Indigenous students as they navigate their way through the academy. I still practice art and continue to learn about my family history, and every day I feel great privilege and respect for the work the authors and I continue to do to enact positive change.

Alexandra Knight

I am committed to care for Australian water- and land-scapes, the plants, animals and fungi that live within them, and the interactions, connections, intricacies and spaces that make them. This has been a lifelong passion, developed within my family's arms and thoughts, and communicated to me as a child. My extended family's care and respect for the river we lived and worked on was

transmitted to me early on, and that care continues in the next generations.³³ I do not know why my father was so interested in Australian plants and water quality - he immigrated to Australia in the 1950s as a 10-pound pom, but perhaps it came from his feelings of connection to the country he grew up in - the New Forest of southern England, and he wanted to feel that way in his new country. He was a persuasive and thoughtful community environmental activist. Mum too, born in Australia, was knowledgeable and careful of the beautiful bushland she grew up in, and I grew up in too, and shared her knowledge with urban young people and the local community through hands-on nature restoration projects.

Early in my career as a park ranger, I lived and worked on Ngiyampaa Country in central NSW, Australia, and was allowed to listen and learn from Ngiyampaa Aunties and Uncles and other Elders as they shared their knowledge about the plants, their properties and uses and the tracks of Baiami across the Country. I felt and continue to feel very welcomed and privileged to learn on Country this way and am grateful for the much deeper level of understanding it brought to my Western scientific university-earned knowledge of plants, animals and processes.

Now working as an academic I have been able to sit myself within feminist science³⁴ and ecofeminism,³⁵ in my ecological endeavours I am an intentional ecologist who uses multiple methods, acknowledges boundaries, reflects and relies on reflexivity and does her work care-fully.³⁶ I have been deeply influenced by the works of Deborah Bird Rose in understanding our native fauna and flora and our cultural relationships with them.

I have been very privileged to work with and support Teresa as she journeys through academia, and the yarning and sharing the team does together inspires me to think deeply about differences and connection and to act with kindness and strength. There are profound differences between the ways that Teresa, our first author, and I understand the world. In particular, these differences are around our life-experiences of First Nations' culture and also our beliefs about the relative roles of Western scientific and religious paradigms in understanding and responding to the devastation of Australian plants and animals since Colonisation. And so, I have reflected on why Teresa asked me to be a co-author on this paper, which is predominantly her own story. A few years ago, before Teresa started her Honours, we worked together on Teresa's special project which investigated the use of eucalypt leaves in feeding captive koalas. Since that time, I have continued in a mentoring and friendship role with her and the other authors of this paper. I consider the strength here is in the ongoing yarning, sharing and learning, where we continue to weave our ways and thoughts and share our learning with one another, building stronger, healthier and more meaningful approaches to the future of Australian culture and water- and land-scapes.

33 Cf. Heather Goodall: *Georges River Blues. Swamps, Mangroves and Resident Action, 1945-1980*.

34 Cf. Helen E. Longino: *Can there be a Feminist Science*.

35 Cf. Carolyn Merchant: *Ecofeminism and Feminist Theory*.

36 Cf. Alexandra R. Knight, Catherine Allan: *Intentional Ecology*.

Gaye L. Krebs

My involvement in this journey initially started as a co-supervisor for Teresa's Honours project in the context of my expertise in animal nutrition. Teresa is the first Australian Indigenous student that I have supervised but I have previously supervised several Papua New Guinea Indigenous students. Part of supervising any Honours students goes beyond the reach of just educating them on scientific methods, how to write a dissertation etc.; it is about establishing a good relationship with these students, gaining their trust and establishing a two-way relationship built on open communication, respect and trust. This was how I wanted my relationship as one of Teresa's supervisors to evolve. Beyond my experience with Indigenous students in Papua New Guinea, my sister's three sons acknowledge their paternal Ngiyampaa heritage, so I am no stranger to Indigenous cultures and have always undertaken journeys of discovery about any culture.

When Teresa wanted to broaden her approach to undertaking her Honours project to include chats with Uncle Rick and Dr Aunty Rhonda and to reflect on her Honours journey, I realised we needed to think 'outside the square' somewhat in terms of how to present her actual Honours dissertation. Being an Honours Advisor within the Faculty, I was familiar with 'mixed mode' presentation of Honours dissertations, where the ultimate dissertation included both written and audiovisual components, so I knew we were not constrained to this concept of 'there is only one format'. So, in respect of Teresa's wish to be able to effectively acknowledge and showcase not only her own Indigenous heritage but also Australian Indigenous culture, we then embarked on the 'how to'. Inclusion of a preface is very common in written works, and so this was an obvious solution as to how to include the importance of koala conservation from an Indigenous perspective. Being a Preface, this was written in first person.

The classic Western science approach to writing a dissertation was applied for the usual literature review, methodology, results and discussion chapters of the dissertation. There is no formal 'restriction' on how many chapters can be included in an Honours dissertation imposed by the university, so an additional 'concluding' chapter was included where Teresa was able to reflect on her Honours journey. Similar to the preface, this 'reflections'-chapter was written in the first person. The change in effective writing styles through the dissertation was introduced in the Preface and so the reader was made aware of these different styles at the onset.

Ultimately, many things were achieved. I expanded the ways by which I could respect Teresa's wishes by looking 'outside the square', Teresa's dissertation format became a means of merging different communication styles, and the content of the dissertation provided any reader the opportunity to learn something about Australian Indigenous culture.

Lee J. Baumgartner

I am a non-Indigenous person who was born on Wathaurong Country but has spent most of my adult life on Wiradjuri Country. I have been passionate about nature, specifically our coasts and rivers my entire life. My earliest memory of being on Country is catching a fish with my dad when I was two years old. It was my first fish but sparked a lifelong journey. My classical training is in the ways of Western Science and the value of fish as a conservation concern. But more specifically, my entire professional career has been focused on cleaning up the various problems associated with river development, which has been a dominant feature of our rivers and streams since European settlement in Australia, on our waterways.

Only recently, and through a long career in the Mekong region, I have learned that fish are more than something to be conserved. The Mekong citizens have taught me that fish are a food source, a spiritual totem, a mechanism for social cohesion, a teaching resource and a source of physical and spiritual health. They are also a 'canary in a coalmine', often serving as a warning when river health has declined. This is a knowledge system which was not taught at university. It is handed down generationally. In that storyline, fish are so much more than a conservation concern. And in fact, when the rivers are healthy, fish are not a conservation concern at all, they sustain life! Seeing our waterways through the eyes of both Indigenous knowledge and Western science has allowed me a greater understanding of my 'fish' world. And so, when the opportunity arose to extend that knowledge to other forms of nature, here 'Koalas', I was extremely enthusiastic. The land and the waterways are connected. Removing water from rivers is removing water from the land. And removing water from the land is removing water from trees. And harming trees is harming koalas. And who does not love a koala? So even though I started my journey late, I am grateful for the new knowledge I have acquired and a new way of seeing ecological processes with a new perspective. I look forward to applying a new way of thinking to a range of different situations in the future.

An Overview of Indigenous Culture and Science in Australia

Since time immemorial (Indigenous Australian perspective), or 65 000 years (Western Science perspective) Indigenous peoples have lived on the lands we currently refer to as Australia.³⁷ During this time Indigenous peoples have developed a strong spiritual, physical, and emotional connection to Country and view themselves as part of the environment alongside animals, plants, land, climate, seasons, soil, stars, water, and fire.³⁸ Country is central to Indigenous customs,

37 Cf. James L. Kohen: *Aboriginal Environmental Impacts*; Derek John Mulvaney: *Aboriginal Man and Environment in Australia*.

38 Cf. Natalie Stoeckl, Diane Jarvis, Silva Larson, Anna Larson, Daniel Grainger: *Australian Indigenous Insights into Ecosystem Services*; Mardie Townsend, Rebecca Phillips, David

lore, culture, and protocols, and continues to play a vital role in the survival of Earth's oldest living culture. The concept of Country is complex and is difficult to define as it is different to each and every Indigenous Australian. It is both the cultural place or boundary that separates different communities (or mobs), but it is also the spiritual and emotional connection felt, as well as Country being regarded as family / kin.³⁹

Embedded in Indigenous lores and cultures is the sustainable use of natural resources, conservation of the environment, and land management practices. Indigenous peoples were Australia's original ecologists and scientists. Their developing knowledge of Country and the environment has been passed down through generations via verbal communication and ceremony.⁴⁰ This knowledge is known as 'Traditional Ecological Knowledge' or 'Indigenous Ecological Knowledge'⁴¹ and in modern-day application is also known as Indigenous Science.⁴² Referring to Indigenous Ecological Knowledge as 'Traditional' places it in the past or as a 'static' knowledge system that does not evolve to work within current / contemporary times and spaces. Indigenous Science and Ecological Knowledge has continuously changed throughout the time and has played a significant role in the ongoing thriving of Indigenous Australians.⁴³ Some examples of the continuing cultural adaption of Indigenous Science and Ecological Knowledge can be attributed to survival after extinction of megafauna, an Ice Age,⁴⁴ and Indigenous resistance since Invasion / Colonisation.⁴⁵

Indigenous Ecological Knowledge (IEK) is unique to each of the five hundred Indigenous mobs that live on the lands of Australia and the Torres Strait Islands.⁴⁶ Each mob has their own set of cultural protocols, lore, language, and environmental features of animals, plants, climate, soil, water, and fire use.⁴⁷ While there is uniqueness between each Indigenous mobs' knowledge and culture, many mobs do share similarities of lores, customs, protocols, and IEK. As a result of Invasion in 1788, a great deal of Indigenous culture and IEK has been lost or eradicated because of the Stolen Generation, Assimilation Policies, and Frontier Wars.⁴⁸ The impacts of Invasion prohibited practicing culture, language and rituals, which lead to many storylines becoming broken or lost.

Aldous: "If the land is healthy... it makes the people healthy".

39 Cf. Teresa Cochrane: Conservation through the Eyes of Indigenous Australian Culture; Alfred Michael Dockery: Culture and Wellbeing.

40 Cf. Peter J. Usher: Traditional Ecological Knowledge in Environmental Assessment and Management.

41 Cf. Liz Cameron: Indigenous Ecological Knowledge Systems.

42 Cf. Gloria Snively, Loran Wanosta'sa7 Williams: Knowing Home.

43 Cf. Helen Appleton, Maria E. Fernandez, Catherine L. M. Hill, Consuelo Quiroz: Claiming and Using Indigenous Knowledge.

44 Cf. James Charles, Lewis O'Brien: The Survival of Aboriginal Australians through the Harshest Time in Human History.

45 Cf. Yaqoot Fatima, Anne Cleary, Stephanie King, Shaun Solomon, Lisa Mcdaid, Md. Mehedi Hasan, Abdullah Al Mamun, Janeen Baxter: Cultural Identity and Social and Emotional Wellbeing in Aboriginal and Torres Strait Islander Children; Liam Sutherland: The Survival of Indigenous Spirituality in Contemporary Australia.

46 Cf. Damien Short: Reconciliation, Assimilation, and the Indigenous Peoples of Australia.

47 Cf. Mardie Townsend, Rebecca Phillips, David Aldous: "If the land is healthy... it makes the people healthy".

48 Cf. Nsw Public Defenders: The Bugmy Bar Book.

In my understanding, the theory and practical application of Western science or culture practice has governed the way that the Australian environment has been managed and conserved the past 250 years. The shift from Indigenous sciences or IEK and land management practices to dominant Euro-centric application has resulted in dramatic changes to Country and the Australian environment.⁴⁹ Over the past 250 years, Australia's once healthy ecosystems have become severely degraded, with the mass extinction and endangerment of many native animals and plants.⁵⁰

In Australia, Western culture and science have not always had a strong connection to the conservation of the environment or its species. The predominant aim for alteration of the environment in early days of Invasion was to use Australia's natural resources, make the land arable and to support agriculture, as well as to establish a penal colony that could sustain the populations brought across the seas from England and Europe to then be developed into a larger community.⁵¹ Many of the forests were cut down to make way for emerging towns or farmland, or timber was used to build houses or shops. The environment was altered and developed to match the lands which the colonists came from.⁵² This alteration had flow-on effects to the ecosystems and the ecological balance that had been sustained for tens of thousands of years,⁵³ and native species population of plants and animals began to become endangered and extinct. In early colonial Australian history, koalas were culled by invaders for their pelts so they could be exported to the United States of America to be used to make hats, gloves and coats.⁵⁴

This degradation of the environment makes it more important than ever for Indigenous peoples of Australia to become involved in conservation of Country as well as sharing their knowledge and experience of doing so. But it is important that the way in which Indigenous peoples are conserving Country, culture or people is reflective of them, rather than the Euro-centric cultural norm.⁵⁵ The ways in which Indigenous peoples of Australia have conserved Country has been significantly impacted through Invasion / Colonisation and thus there is need for our ways of knowing, being and doing to be present and to decolonise Australian Euro-centralism in particular in academia and research.

My Honours project, which started out not being centralised to Indigenous culture and IEK, shifted as I started to understand the role which my culture had in the ongoing conservation of Country and how Indigenous peoples sustainably managed the land for 65 000 years.⁵⁶ I started not only a research project, but I

49 Cf. Duncan E. Cook: *Anthropogenic Environmental Change on the Frontiers of European Colonisation in Australia*.

50 Cf. John Cz. Woinarski, Andrew A. Burbidge and Peter L. Harrison: *Ongoing Unraveling of a Continental Fauna*.

51 Cf. Brett M. Bennett: *a Global History of Australian Trees*.

52 Cf. Bill Gammage: *The Biggest Estate on Earth*; Auntie Rhonda Radley, pers. comm., 17 May 2022.

53 Cf. Auntie Rhonda Radley, pers. comm., 17 May 2022.

54 Cf. Isobel Roe: *Koala Cull*; Uncle Richard Dacker, pers. comm., 16 May 2022.

55 Cf. Cissy Gore-Birch, Oliver Costello, Teagan Goolmeer, Bradley Moggridge, Stephen Van Leeuwen: *A Call to Recognise and Grow the Indigenous-Led Stewardship of Country*.

56 Cf. Bruce Pascoe: *Dark Emu*.

started a personal journey of gaining a deeper understanding of my own cultural identity and the role it played in my passion for environmental science, ecology and koala conservation. Conservation of Country is sustainable land management and at its essence is environmental science and conservation. It plays a significant role not only in the survival and management of Country but also for Indigenous people's own health and wellbeing.⁵⁷

To me it was about bringing my two camps together and showing respect for both my Indigenous and non-Indigenous cultures, exactly like my grandparents did. My Honours project focused on the conservation of koalas (my personal totem), and as a cultural responsibility I knew it was vital that I focused my research on developing ways to ensure their ongoing survival. It was heightened by the understanding that koalas on Birpai / Birripi Country in Port Macquarie-Hastings Council areas were estimated to go extinct by 2050.⁵⁸ This threat of extinction is a significant concern to not only the broader Port-Hastings Council and its community, but it is also a significant concern to the local Indigenous peoples and their Country.⁵⁹

My non-Indigenous cultural heritage reflective of the Euro-centric cultural norms that are present in Australia, and the scientific knowledge I was using in my project is referred to as 'Western science'. Unfortunately, Western science often discredits IEK and culture, because Western science places itself on a higher level on the hierarchy of knowledge and status.⁶⁰ This mentality that Western science and knowledge is on a hierarchy higher than IEK plays directly into the narrative of Invasion / Colonisation and influences the "delegitimization of Indigenous knowledge by Western scholars".⁶¹ Through this delegitimization of IEK and Indigenous culture, Invasion / Colonisation could inflict its Euro-centric cultural norms while imposing that the other forms of knowledge are "savage, superstitious, and primitive".⁶² This line of thought is representative of a quote by Michel Foucault: "the way in which knowledge circulates and functions [has] its relations to power".⁶³

My research came with a lot of challenges, trying to navigate a way in which Western science and IEK could complement each other to show a more reflective and holistic understanding of how we can conserve Country, koalas and the Australian environment. While some of the challenges came from ways to merge both together into a research project,⁶⁴ there were also external measures at play that created challenges and these at the core were reflective of academia and

57 Cf. Yaqoot Fatima, Anne Cleary, Stephanie King, Shaun Solomon, Lisa Mcdaid, Md. Mehedi Hasan, Abdullah Al Mamun, Janeen Baxter: *Cultural Identity and Social and Emotional Wellbeing in Aboriginal and Torres Strait Islander Children*.

58 Cf. Port Macquarie-Hastings Council: *Koala Recovery Strategy* 2018.

59 Cf. Uncle Richard Dacker, pers. comm., 16 May 2022; Aunty Rhonda Radley, pers. comm., 17 May 2022.

60 Cf. Patience Elabor-Idemudia: *Identity, Representation, And Knowledge Production*.

61 Francis Adyanga Akena: *Critical Analysis of the Production of Western Knowledge and Its Implications for Indigenous Knowledge and Decolonization*, p. 600.

62 Ibid.

63 Michel Foucault: *The Subject and Power*, p. 781.

64 Cf. Francis Adyanga Akena: *Critical Analysis of the Production of Western Knowledge and Its Implications for Indigenous Knowledge and Decolonization*.

research hierarchies.⁶⁵ My research was ‘breaking the mould’ of how an Honours was being completed or can be completed, and I think with this brought challenges, but it also allowed for a space to reflect and share my experience for other Indigenous researchers, or researchers who are wanting to bring in their own cultural identity or diverse ways of knowing, being and doing into academia.⁶⁶

Background of Honours Research Objectives

For the research reported in my Honours dissertation both Indigenous and Western research practices were used to allow for a transdisciplinary understanding of what is needed to conserve and preserve the koalas of Birpai / Birripi Country. For Indigenous understandings, approaches and practices, also known as Indigenous methodologies – the merging of theory / knowledge and practice – the focus was not just addressing the research questions and objectives but also the reciprocity, relationality and respect of Indigenous peoples, their culture and relationship to Country.⁶⁷ Western scientific methodologies are mainly structured around predictions and answering the hypotheses in a logical manner that is objective and analytical.⁶⁸ Western science is a ‘set of rules’ that are commonly applied as a control mechanism to ensure scientific / academic integrity and are the dominant methods used globally.⁶⁹

The main objectives of the research reported in my dissertation were to: (1) investigate the effects of soil treatments on the growth and foliage chemistry of three Eucalyptus species grown under plantation; and – the focus of this paper – (2) reflect on the experience and challenges as an Indigenous person of merging Western and Indigenous research methodologies.⁷⁰

Reflection on Merging Indigenous and Western Research Methodologies

To keep to the theme of incorporating both Western and Indigenous sciences, it was important to understand how personal reflections can be used to advance both sciences. Indigenous cultures and sciences can use methods of storytelling and yarning to share personal experiences and reflections through verbal discussion.⁷¹ Storytelling is a foundation of all human learning and teaching,

65 Cf. Patience Elabor-Idemudia: Identity, Representation, and Knowledge Production.

66 Cf. Jay Phillips: Indigenous Australian Studies, Indigenist Standpoint Pedagogy, and Student Resistance.

67 Cf. Julieann Coombes, Caroline Lukaszuk, Cathie Sherrington, Lisa Keay, Anne Tiedemann, Robyn Moore, Rebecca Ivers: First Nation Elders’ Perspectives on Healthy Ageing in NSW, Australia; Evelyn Steinhauer: Thoughts on an Indigenous Research Methodology, p. 69.

68 Cf. Charlotte Chambers: Mixing Methodologies; Fulvio Mazzocchi: Western Science and Traditional Knowledge.

69 Cf. Amy Massey, Ray Kirk: Bridging Indigenous and Western Sciences.

70 Cf. Teresa Cochrane: Effect of Soil Treatment On the Growth and Foliage Chemistry of Three Eucalyptus Species Grown in a Plantation as a Food Source for Koalas.

71 Cf. Nerida Blair: Researched to Death.

and in Indigenous culture it used more formally to teach Indigenous knowledge, cultural safety, as well as to share the knowledge of our history.⁷² Storytelling is often informative, meaningful, linear or non-linear, and the knowledge holder may share different stories to different people or audiences.⁷³ Some stories of cultural significance to Indigenous peoples and communities are sacred, and it is therefore an honour to have these stories shared with you from Elders, Traditional Owners and knowledge holders.⁷⁴

Additionally, yarning is an approach to storytelling that allows connection to culture and is a research method being increasingly used in social science and Indigenous studies.⁷⁵ It is a process of relating and connecting to each other or groups of people through open and holistic communication, as well as being used to pass on history or knowledge.⁷⁶ Yarning has no time tense and conversation topics can occur in the past, present and future.⁷⁷ It generally happens in a casual setting that is multi-way and is a circular journey meaning that people sit around in a circle or more typically around a fire.⁷⁸ Yarning protocols can be slightly different depending on the situation and location, and since the rise of technology with online communication, yarning has been occurring on digital platforms.⁷⁹ Storytelling and yarning can differ because yarning can be compared to a conversation with friends, family or work mates, while storytelling can be compared to a lecturer or teacher sharing knowledge.⁸⁰ For both it is important to have respect and listen to the person talking and hold space, as well as it being important to note that both storytelling and yarning can work together in conjunction.

From the Western tradition of research, one of the methods I used to support my personal reflections which allowed connection to Indigenous research and methodologies is autoethnography, which is an approach commonly practiced by social scientists and anthropologists.⁸¹ The autoethnographic approach involves critical and reflexive analysis of one's personal reflections as documented in 'field notes' in the context of broader social and cultural factors at play to develop greater understanding and insights into the identified phenomena or experience.⁸² Autoethnography considers the cultural, spiritual, emotional, political, or physical factors, which also allows for incorporation of previous experience and current experience, to create one's story.⁸³ My personal reflections were conducted during the period of July 2021 to July 2022. During the time of

72 Cf. Ranjan Datta: Traditional Storytelling; Thungutti Bundjalung Woman Aunty Kara Westaway, pers. comm., 18 September 2024.

73 Cf. Thungutti Bundjalung Woman Aunty Kara Westaway, pers. comm., 18 September 2024.

74 Cf. Aunty Kara Westaway, Merinda Walters, pers. comm., 18 September 2024.

75 Cf. Lynore K. Geia, Barbara Hayes, Kim Usher: Yarning / Aboriginal Storytelling.

76 Cf. Dawn Bessarab, Bridget Ng'andu: Yarning about Yarning as a Legitimate Method in Indigenous Research.

77 Cf. Aunty Kara Westaway, Merinda Walters, pers. comm., 18 September 2024.

78 Cf. *ibid.*

79 Cf. Karen Pinder Klemenchic: Aboriginal and / or Torres Strait Islander Students' Success in Higher Education.

80 Cf. Aunty Kara Westaway, Merinda Walters, pers. comm., 18 September 2024.

81 Cf. Heewon Chang: Autoethnography as Method; Sue White: Auto-Ethnography as Reflexive Inquiry; Carolyn Ellis: Heartful Autoethnography.

82 Cf. Sue White: Auto-Ethnography as Reflexive Inquiry.

83 Cf. Carolyn Ellis, Tony E. Adams, Arthur P. Bochner: Autoethnography.

personal reflections, regular digital yarns were conducted between and with the co-authors to further the critical and reflective analysis.

Cultural Protocols

To ensure that my research adhered to Indigenous lore and protocols, the first step was to get permission from the local Aboriginal Lands Council to allow me to complete fieldwork on Birpai / Birripi Country.⁸⁴ After a phone conversation with the President of the Bunyah Aboriginal Lands Council, I was granted permission to go ahead with my Honours project and fieldwork. This was an important step because it pays respect to the local Birpai / Birripi people and their Country using Indigenous methodologies.⁸⁵ For this step, it was important to be reciprocal by sharing the knowledge and findings of the research back to the local Indigenous people and communities.⁸⁶ It was also important to be actively involved within the community I was completing research with, and this was achieved through volunteering, giving presentations and meeting with local schools. The Honours research was not only about getting knowledge, collecting data and submitting a dissertation, it was about building my own cultural connections and capabilities in community.

Another cultural protocol was to gain approval from Charles Sturt University's Human Ethics Committee. The application was approved on 9th May 2022, and this allowed for informal yarns with Birpai / Birripi Elders and Traditional Owners on the conservation of koalas and Eucalyptus species on Birpai / Birripi Country. Two yarns were conducted with each lasting about 30 minutes. The knowledge and yarns of Birripi Traditional Owner and Elder Uncle Richard Dacker and Birpai Traditional Owner and Elder Aunty Rhonda Radley were incorporated in several sections of my dissertation and this paper. The knowledge gained from their yarns was used as quotes and reference material where appropriate to incorporate Indigenous perspective and culture. The yarn process and planning followed the National Statement on Ethical Conduct in Human Research (NSECHR) and AIATSIS Code of Ethics for Aboriginal and Torres Strait Islander Research (AIATSISCE). This ensured ethical practice by addressing the four main values of NSECHR of research merit and integrity, justice, beneficence and respect,⁸⁷ as well as the four main ethics principles of Indigenous self-determination, Indigenous leadership, impact and value, and sustainability and accountability in AIATSISCE.⁸⁸

84 Cf. New South Wales Government: Aboriginal Land Rights Act 1983 No 42.

85 Cf. Michael Christie: *Transdisciplinary Research and Aboriginal Knowledge*; Maggie Walter, Michele Suina: *Indigenous Data, Indigenous Methodologies and Indigenous Data Sovereignty*.

86 Cf. Australian Institute of Aboriginal and Torres Strait Islander Studies: *AIATSIS Code of Ethics for Aboriginal and Torres Strait Islander Research*.

87 Cf. National Health and Medical Research Council, Australian Research Council and Universities Australia: *National Statement on Ethical Conduct in Human Research 2007* (Updated 2018).

88 Cf. Australian Institute of Aboriginal and Torres Strait Islander Studies: *AIATSIS Code of Ethics for Aboriginal and Torres Strait Islander Research*.

The main aim of the yarns was to integrate Indigenous culture in the Introduction and Discussion chapters of my Honours dissertation. Indigenous culture and knowledge are passed on through oral / verbal methods,⁸⁹ a practice not very prevalent in Western science. To incorporate such specific knowledge from the Birpai / Birripi people meant that yarns needed to be undertaken. The yarns with Birpai / Birripi peoples were important because they highlighted the importance of the project and justification as to why it needed to be done. They serve as a form of triangulation to the findings in journal articles and government reports about the decline in koala population numbers. The knowledge gained and shared from the yarns was used as reference material in the same way as published material is referenced in scientific / academic writing in journal articles, books and reports.⁹⁰ To ensure respectful use of Birpai / Birripi Elders' and Traditional Owners' knowledge, a draft of my dissertation containing their statements and quotes was sent to them to ensure that information was being used the way they wanted it, and if not, it was either edited or removed, and the same was done for this publication.⁹¹

Personal Reflections

Each fortnight throughout my Honours year, I completed a personal reflection in the form of a journal entry. The reflection process was important and gave me opportunity to document my growth as a student, researcher, and an Indigenous woman in science. A major aim of my Honours project was to include Indigenous science, even though the research project had a very strong Western science foundation and content.

Having a theme for my journal entries continuously reminded me of the purpose of these reflections, while also allowing me to focus on tasks I needed to complete over the next two-week period to continue my learning journey. During each fortnight, I would note down topics in dot point form regularly. This would ensure that I did not forget key areas to reflect on and could focus until the time came to write up the reflections. This ensured I would not forget anything important and allowed for a structured process. It also allowed me to determine what the reoccurring themes throughout my journey were.

These reflections took place in the first stages of my research and academic career and hold the place of a 24 / 25-year-old who had just finished her undergraduate degree. The writing style and comprehension of knowledge is reflective of this time throughout the following sections, and the style of writing was done intentionally in a casual conversational style to allow for diversity in understanding. It is important to showcase true reflections of where we have come from so

89 Cf. Pauline Foster, Terri Janke: Keeping Cultural Knowledge with Indigenous Research Protocols.

90 Cf. Colin Neville: Referencing.

91 Cf. Australian Institute of Aboriginal and Torres Strait Islander Studies: AIATSIS Code of Ethics for Aboriginal and Torres Strait Islander Research.

that we can use this to help develop and reflect on where we are going particularly in our own learning and knowledge journeys.

Growth as an Indigenous Person

One of the most noticeable changes I documented was my own growth as an Indigenous person. As I began to learn and incorporate Indigenous methodologies in my research, I noticed that my outlook on the world both personally and in academia began to shift significantly as I was introduced to new knowledge and knowledge systems. I was starting to understand more about myself and how my approach to science / scientific method was based mainly on a Euro-centric-Western-tradition approach. I began frequently researching and chatting with Indigenous people about approaches to decolonising science and learning ways to move away from the predominantly Western scientific methods. Decolonising science, to me, was not about discrediting the work and place of Western Science, rather it was about allowing my own cultural representation within the work I was completing and the act of doing this and going against the euro-centric / colonial norm. As I began to research and put a heavy focus on incorporating Indigenous methodologies, it highlighted how I had grown to understand other ways of science. It also became apparent how little I knew about my culture in the scheme of academic practice and science. I felt excited and empowered to learn and connect to my culture in a way that reflected me and my love for environmental research / learning.

Additionally, conducting the yarns and incorporating Indigenous ecological knowledge of the Country on which the research project was undertaken was special. I got to give the Traditional Owners and Elders a voice for Country and share why the research was important to them. While not all the knowledge gained from the yarns was directly relevant to my research dissertation, it was relevant and vital to my growth and journey as an Indigenous person. It also resulted in creating stronger relationships with the Birpai / Birripi community, and the Country that I had grown up on for most of my life.

Gaining a Deeper Understanding of Ecology

During the earlier years of my degree, I had started to gain an understanding of the concept of ecology and how it impacts not only the environment but human society. Nonetheless, the majority of it was framed from a Western view with minor influence of Indigenous culture. As I started to investigate the literature around what influenced koalas and their diet selection, I began to realise the complexity and how little I really knew about ecology. My earlier studies had only introduced me to a broad understanding of the concept and not to how complex interrelating relationships can be and the impact they have on each other. Through my studies I had noticed that there were two different understandings /

concepts / interpretations of ecology. People either understand ecology as either including or excluding humans in ecosystems. I now recognise that historically the discipline of ecology in Euro-centric societies excluded humans from ecosystems and their interrelating environmental relationships, which was influenced heavily by religion,⁹² while Indigenous cultures predominately view themselves as part of the environment and ecosystems.⁹³ I developed an understanding of how ecology plays a part in the morals, ethics and application of research and understanding or relation to the land. One of the key areas in my learning journey was the understanding of how complex Indigenous culture is and its direct link into a holistic ecology. It has been inspiring to reinforce the idea that Indigenous culture, lore and practices have been embedded in the environment for such an extended period of time that they themselves and their actions have become parts of the interrelating relationships within ecosystems.⁹⁴ This idea and knowledge development was further reinforced by the yarns I had with Elders and Traditional Owners.

Participating in yarns with two Birpai / Birripi Traditional Owners and Elders provided a deeper understanding of ecology and Indigenous culture. I was able to experience firsthand the different interpretations of ecology conservation and reinforced my ideas that ecology is more than just the environment, it incorporates people and can also incorporate culture and spirituality. At this current stage of my journey, I have developed a deeper understanding because I am now beginning to look at the bigger picture of ecology, that there are many more factors to ecology and that ecology in a sense is a part of everything. I have learnt the significance that koalas play in relation to Country and Indigenous peoples' lives, as well as learning the role of foliage chemistry in relation to diet selection, biological functions of koalas, and how societies need to be informed of this to ensure ongoing conservation and restoration.

Indigenous Ecological Knowledge

Indigenous peoples have used culture to sustainably manage the environment or Country for tens of thousands of years, but previously I was not aware of the practices they used. When I was young, I was told stories and yarns by my family about how they would know when they could gather food or when to hunt and fish certain species. Once I started my tertiary studies, I began to gain a greater understanding of the importance of this knowledge and its use. To study one niche of ecology around koala diet selection, and in the context of the Birpai / Birripi people, required a lot of work to meld the two. I was starting to learn about the concept in theory, but to then apply and seek the practical aspect of gaining Indigenous ecological knowledge as well was a large but rewarding task.

92 Cf. Michel Loreau: *Nature that Makes Us Human*.

93 Cf. Nicole Redvers, Paula Aubrey, Yuria Celidwen, Kyle Hill: *Indigenous Peoples*; Natalie Stoeckl, Diane Jarvis, Silva Larson, Anna Larson, Daniel Grainger: *Australian Indigenous Insights into Ecosystem Services*.

94 Cf. *ibid.*

Learning the theory of IEK reinforced my understanding about each Country having their own unique culture and knowledge, and how this knowledge was unique to clans, family groups, and even to each person.⁹⁵ What I learned from the theory and practical application of yarns was that IEK was more than just the 'topic' I was studying; that it can include a magnitude of different interrelating information or relating knowledge and can be taught / shared in a magnitude of different ways such as song, dance, stories, and yarns.⁹⁶ I learnt that IEK is not always as direct as Western science but is as important when it comes to understanding the ecology of the Australian environment. By combining both IEK and Western science, I was able to develop a more holistic understanding, rather than just a singular one. Most importantly it was reflective of my own identity and cultural responsibility I have to the koala and my two camps.

Incorporating Culture and Indigenous Science into a Western Science System

Prior to undertaking Honours, I was unaware that science could be conducted in ways that were not the predominantly Euro-centric Western (science) methodology, and this was reflective of my education and standpoint.⁹⁷ Environmental science, especially in the ecology discipline, is viewed as being embedded in Western scientific knowledge systems, but from extensive reading I developed an understanding that there were niches of this discipline were qualitative or alternative methodologies to the Euro-centric norms, including Indigenous methodologies, could be incorporated.⁹⁸ It is important to note and reflect that Western science has an important place in academia and helps with gaining scientific insight through the use of its rigorous methodologies, technological innovation and application to gaining niche understandings,⁹⁹ and this paper provides an alternative look at how Indigenous culture in an Australian context offers new ways of knowing, being and doing. The ultimate use of a mixture of both quantitative and qualitative research methodologies reflected both my Western upbringing and scientific appreciation, as well as my desire to incorporate Indigenous science, culture and practices. Reflecting on my standpoint as a person with Indigenous and non-Indigenous heritage I have expanded my understanding of dominant Western scientific paradigms to reposition Indigenous science as central to ecology. However, prior to that I observed more explicit separation between humans and environment due to dominant scientific ways of being and doing.¹⁰⁰

95 Cf. Teresa Cochrane: *Conservation through the Eyes of Indigenous Australian Culture*; Alfred Michael Dockery: *Culture and Wellbeing*.

96 Cf. Liz Cameron: *Australian Indigenous Sensory Knowledge Systems in Creative Practices*.

97 Cf. Jay Phillips: *Indigenous Australian Studies, Indigenist Standpoint Pedagogy, and Student Resistance*.

98 Cf. Linda Tuhiwai Smith: *Decolonizing Methodologies*; id.: *Decolonizing Research*; Alexandra R. Knight, Catherine Allan: *Intentional Ecology*.

99 Cf. Jed Brown, Andrew Merchant, Lachlan Ingram: *Utilising Random Forests in the Modelling of *Eragrostis Curvula* Presence and Absence in an Australian Grassland System*.

100 Cf. Jay Phillips: *Indigenous Knowledge Perspectives*.

There has been a push from Indigenous peoples around the world to incorporate their culture and ways of knowing into research and science despite the Western / Euro-centric norm.¹⁰¹ One of the first pieces of writing that was suggested to me about Indigenous methodologies and the ideology of decolonising research was 'Decolonizing Methodologies: Research and Indigenous Peoples' by Linda Tuhiwai Smith.¹⁰² From further review of the literature,¹⁰³ I became aware of many others pursuing this research field and that culture and Indigenous science does have its place in academia. Another important source of information that helped in my growth as an Indigenous person navigating academia was within the special issue (January edition, 2022) of the *Journal of Ecological Restoration and Management* that focused around bringing Indigenous science, knowledge, and ways of doing into a Western system of research.¹⁰⁴

The incorporation of my Indigenous heritage in my dissertation had many positives and negatives. As I started to understand the significance and importance of the research I was undertaking, and how I wanted it to reflect me, I realised that a vital part of that was my identity as an Indigenous woman and my cultural responsibilities to conserve Country and my totem the koala. I faced several challenges in the initial stages of my Honours largely due to a lack of understanding by others of my culture and how this could be merged into an Honours project. This ambitiousness to incorporate my culture into a Western science system was met with some opposition based on ideas such as: it was not how it is usually done, it would be too difficult, it was not within the framework of a 'traditional' ecology research project, or it would make the project larger than an Honours year would allow. The issues of having to explain and reiterate the importance of my culture and the role that Indigenous science and culture had, took a severe toll on my mental health and wellbeing. Feeling culturally unsafe through witnessing first-hand the hierarchical nature of Western science and how it delegitimises alternatives to the Euro-centric norm really hurt me, because this was not just critiquing a scientific practice, it was devaluing my culture and who I am. Having someone laugh in my face when I shared with them that I was feeling culturally unsafe during the project for the way that they viewed and commented on my culture and our ways of knowing, being and

101 Cf. William M. Adams, Martin Mulligan: *Decolonizing Nature*; Margaret Hughes, Stuart Barlo: *Yarning with Country*; Val Plumwood: *Decolonizing Relationships with Nature*; Lester-Irabinna Rigney: *A First Perspective of Indigenous Australian Participation in Science*; Langaliki Robin, Kuntjupai Robin, Ettore Camerlenghi, Luke Ireland, Ellen Ryan-Colton: *How Dreaming and Indigenous Ancestral Stories are Central to Nature Conservation*; Frances Wyld, Bronwyn Fredericks: *Earth Song as Storywork*.

102 Cf. Linda Tuhiwai Smith: *Decolonizing Methodologies*.

103 Cf. Natalie C. Ban, Alejandro Frid, Mike Reid, Barry Edgar, Danielle Shaw, Peter Siwallace: *Incorporate Indigenous Perspectives for Impactful Research and Effective Management*; Michael Christie: *Transdisciplinary Research and Aboriginal Knowledge*; Malcolm Lindsay, Louise Beames, Yawuru Country Managers, Nyul Nyul Rangers, Bardi Jawi Rangers: *Integrating Scientific and Aboriginal Knowledge, Practice and Priorities to Conserve an Endangered Rainforest Ecosystem In the Kimberley Region, Northern Australia*; Naohiro Nakamura: *Indigenous Methodologies*; Vanessa W. Simonds, Suzanne Christopher: *Adapting Western Research Methods To Indigenous Ways Of Knowing*; Maggie Walter, Michele Suina: *Indigenous Data, Indigenous Methodologies and Indigenous Data Sovereignty*.

104 Cf. Emilie J. Ens (ed.): *Indigenous and Cross-Cultural Ecology Perspectives from Australia*.

doing was the 'straw that broke the camel's back'. On reflection there were a lot of red flags identified throughout the process of my Honours before this, but I ignored them as I did not place myself with the strength to stand-up and speak my truth against the microaggressions before it was too late for me mentally. I was thankfully incredibly lucky to have a strong support network of people that really helped me get back on track and respected my cultural expression. The issues were eventually resolved and resulted in the merging of different methodologies within my dissertation in a safe and supportive way.

A positive outcome of this somewhat challenging journey was that I found that both forms of science (Indigenous and Western) could be used in a way that was reflective of me, and I could be proud of. It was also incredible to not only gain more information on the koala to help in its conservation, but I was also doing it in alignment with my cultural responsibilities.

Conclusion

The design of this research project enabled the use of both Indigenous and Western science methodologies to create a more holistic and different approach to the way that ecological studies are normally designed. This was important as it allowed a reflection of my Indigenous heritage and my cultural responsibilities to koalas and my Ancestors. During this process I faced some significant challenges, but I was successful in completing my Honours because of my fellow authors and my support networks both physically and theoretically in literature. Going against the culturally dominant norms in any situation can come with its challenges, but if my Indigenous Ancestors could thrive on one of the world's 'harshest' continents since time immemorial (or 65 000 years), and more recently through Invasion and genocide, then I can draw on this strength and apply it throughout my continuing academic and research journey.

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