

Applying biocultural research protocols in ecology: Insider and outsider experiences from Australia

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Summary Collaborations between Indigenous and non-Indigenous scientific researchers are increasingly mandated by global to local conservation policy and research ethics guidelines. Breakdowns occur due to misunderstandings around expected protocols of engagement and cooperation, which are compounded by lack of broader awareness of differences in cultural values, priorities and knowledge systems. Using first-hand experiences, we outline eight key protocols and guidelines that researchers should consider when undertaking research with Indigenous peoples, or on Indigenous Country, through exploration of biocultural protocols and guidelines within Australian and Indigenous customary laws. We use the onion as a metaphor to highlight the layers of protocols and guidelines that researchers can peel back to guide their research from international to local scales, with ethics around the research question at the core. This paper draws on the perspectives and experiences of an Indigenous researcher (as 'insider'/'outsider') and non-Indigenous researcher ('outsider'), working on a cross-cultural and multidisciplinary investigation of past Aboriginal dispersal of rainforest trees on the Australian east coast. This paper is part of the special issue 'Indigenous and cross-cultural ecology - perspectives from Australia' published in Ecological Management & Restoration.

Key words: cross-cultural ecology, First Nations knowledge, Indigenous biocultural knowledge, Indigenous engagement, Indigenous research ethics, two-way ecology.

Introduction

The surge of ecologists embracing work with Indigenous peoples is important for ethical and sustainable approaches to conservation (Berkes 1993; Pierotti 2000; Usher 2000; Horstman & Wightman 2001; Clarke 2008; Walsh *et al.* 2013; Ens *et al.* 2015). We have previously found that non-Indigenous ecologists often lack awareness or empathy towards the social dynamics and cultural governance structures that must be followed to work with Indigenous communities in a respectful and collaborative way (Smith 1999; Christie 2008; Kwaymullina 2016). Equally, research teams may not be cognisant of the unique cultural complexities that Indigenous researchers face when working with other Indigenous peoples as both an 'insider' (close familial ties) and 'outsider' (institutional connection) (Smith 1999; Kwaymullina 2016; Dew *et al.* 2019). The cultural obligations that an Indigenous researcher must fulfil are more ambiguous than the expected ethical obligations of a non-Indigenous researcher. Indigenous researchers often have their own framework or set of guiding principles, driven by cultural and social expectations, while working within Indigenous groups and communities. However, the objectives and challenges of Indigenous-led research and the role of researchers are not often explicit in Indigenous engagement strategies. A notable exception was developed by Darlene Oxenham, who produced a set of protocols for Curtin University in Western Australia that clearly highlighted the roles and processes for researchers from both Indigenous and non-Indigenous backgrounds, who were undertaking research with Aboriginal and Torres Strait Islander people and communities (Oxenham 1999).

Under international law, Indigenous peoples have a right to be negotiated with when ecologists (Indigenous or non-Indigenous) are researching themselves or their communities, their knowledge or any aspect of their Indigenous ancestral estates (Davies *et al.* 2004; United Nations 2007; AIATSIS 2020). Due to the early European indoctrination of the fallacy of *Terra Nullius*, many researchers do not

recognise that Australia is morally Aboriginal land as ancestral land rights and sovereignty were never ceded. It is not apparent to many non-Indigenous Australians that according to Aboriginal law, they need to consult or negotiate with Traditional Owners (TOs) to access or interfere with their ancestral estates. At a minimum, some researchers believe that they only need to engage with TOs while actually on declared Aboriginal land under Australian legislation.

Despite the fact that many Indigenous groups aspire to work with ecologists, some non-Indigenous researchers have stated that it is too hard to work with Indigenous people, or they have tried it once and had a bad experience, so they will not do it again (Roughley & Williams 2007). This paper aims to raise awareness of the expectations that Indigenous Australians have of researchers and how these expectations and preferred ways can be navigated to facilitate effective and mutually beneficial research, alongside adherence to mandated protocols and institutional guidelines. Kwaymullina (2016) outlined three essential considerations that non-Indigenous researchers must consider before initiating Indigenous research: (i) should it be conducted at all and what is the relevance to the community or individuals being researched?; (ii) researcher positionality, where researchers position themselves within the research from a biased or non-biased framework; and (iii) ethical principles of free and prior informed consent and intellectual property rights. To work effectively with Indigenous peoples, ecologists also need to understand the spiritual, familial and cosmological meanings behind 'Country' from an Indigenous perspective (Kwaymullina 2005b; Kingsley *et al.* 2013; Maclean *et al.* 2013), as is further described below.

Tuhiwai Smith (1999), in her book, *Decolonizing Methodologies: Research and Indigenous Peoples*, provided a perspective of 'insider' and 'outsider' researcher roles. An 'insider' is described as someone who is perceived as coming from within the studied community, and an 'outsider' as someone who originates from outside the community and whose

interests are largely external to that of the Indigenous community. These positions require different practices and behaviours to be performed based on existing relationships and connections the researcher has with communities. They offer a more nuanced approach to research that appreciates that Indigenous people can also be researchers of their own communities. Researchers must take into consideration the social dynamics and cultural governance structures of Indigenous communities to be able to work in a respectful and collaborative way (Christie 2008).

What are cultural protocols?

For Indigenous peoples, protocols may be considered as guiding principles that set out a way for non-Indigenous people to conduct business or research with other Indigenous peoples and on Country (Piquemal 2000). As Swiderska *et al.* (2012) stated, biocultural community protocols are 'Charters of rules and responsibilities in which communities set out their customary rights, values and worldviews relating to biocultural resources, natural resources and land, as recognised in customary, national and international laws'. Perhaps spurred on by the United Nations Convention on Biological Diversity Nagoya Protocols, Indigenous people are developing and designing biocultural protocols to set the parameters for those who aspire to do 'business' with Indigenous peoples and on Indigenous Country (Bavikatte & Robinson 2011; Hill *et al.* 2011; Kohli *et al.* 2012; Ens *et al.* 2015; Pert *et al.* 2015). This is further exemplified in Australia by the growing Indigenous Protected Area program, 'Healthy Country' plans and Traditional Use of Marine Resources Agreements (TUMRAs) that all assert the need to gain cultural authority in research and natural resource management. While general protocols for cross-cultural collaborations exist in Australia (Byrne *et al.* 2005; Janke 2009; Janke *et al.* 2009; AIATSIS 2020; Moggridge 2020), clear step-by-step processes designed to guide Australian ecologists and their navigation of both institutional and Indigenous protocols are lacking. Although some corporations and Indigenous community groups are developing steps forward for

collaborative research, as exemplified by CSIRO and NAILSMA's *Our Knowledge Our Way in Caring for Country: Indigenous-led approaches to strengthening and sharing our knowledge for land and sea management* (Woodward *et al.* 2020).

When conducting research with Indigenous people the researcher initially requires an understanding of the local community protocols. If there are formal corporations or organisations established then the locally defined Indigenous Terms of Reference and associated frameworks should be used. It is essential for researchers to explore and unpack the layers of protocols and guidelines relevant to their research field and the location/s of study to ensure best practice ethical research is conducted and to reduce the potential for unintended impacts on the community, organisation or researchers themselves (AIATSIS 2020).

First Nations Peoples' understanding of Country

For Australian Indigenous peoples, Country is the basis behind everything: 'Country is family, culture, identity, Country is self' (Kwaymullina 2005a). As Aboriginal elder Duncan McInnis stated: 'Culture is everywhere. Culture is situated in the Land and on the Country, in our rivers and sea, and within our people, it is everywhere'. Country builds your culture, your belief systems, your lore's and songs; it maintains life through hunting and gathering (Rose *et al.* 2002; Kwaymullina 2005a; Dietsch *et al.* 2011).

The emotions attached to the term Country (Stanner 1965; Davies *et al.* 2013), from Indigenous peoples' perspectives, can be hard to comprehend from a non-Indigenous perspective. From a non-Indigenous standpoint, the tangible aspects of Country (generally referred to as land) can be bought or sold as a commodity (Langton 2020). While non-Indigenous families have responsibility to maintain and look after the land that they have 'bought' or 'rented', Indigenous peoples have ties to land that are thousands of years old with clan-based rights inscribed through kinship systems and spiritual connections (Graham 1999; Kwaymullina &

Kwaymullina 2010). European settlers have only been in Australia for 232 years and do not have the depth of ancestral and cultural connection to Country as Indigenous peoples do. Indigenous peoples have lived in Australia for over 50,000 years (Broome 1994; Tobler *et al.* 2017), or from time immemorial as Indigenous peoples believe (Perry 2010). They have survived and adapted to the shifting of land masses, rising and falling of seas, climate change, fire, arrival of exotic plants and animals, and many other landscape influences. During this time, the Aboriginal custodians worked and lived well off natural and cultural resources (Kingsley *et al.* 2013). Now, Indigenous peoples emphasise that Country is sick and it is telling us how sick it is (Morgan *et al.* 2010).

Indigenous peoples are striving to maintain their rights to ancestral clan estates (their Country) through Land Rights acts, the national *Native Title Act 1993* and Indigenous customary law (McCorquodale & John 1987; Altman *et al.* 2006; Davis 2008). As stated by Kwaymullina and Kwaymullina (2010), '[Aboriginal] Law flows from the living hearts of Aboriginal countries, and in this sense, is location specific. The purpose of Aboriginal legal systems is to sustain the pattern of creation'. In contemporary Aboriginal societies, Aboriginal Law and spirituality have been challenged by non-Indigenous people and due to the pervasive impacts of colonisation and assimilation, there are a range of feelings about what Country means for different contemporary Indigenous peoples (Morgan *et al.* 2010).

Beyond cultural awareness, towards mutual benefits of ecological research

Much has been written about the need for greater: Indigenous cultural awareness (Bean 2006; Parmenter & Trigger 2018), Indigenous intellectual property and knowledge rights (Janke 2009; Janke *et al.* 2009), cultural connectivity (Rose 2001; Rose & Robin 2004) and Indigenous research methodologies (Smith 1999; Kwaymullina 2016). The disciplines of health, education and law are now routinely embracing cultural protocols

(Dunstan 2019). These disciplines, however, are physically 'detached' from the bio-physical aspects of Country. The cultural awareness requirements in the scientific disciplines of ecology, biology or natural resource management demand greater awareness of the linked biological and cultural protocols that are required for respectful access and interaction with Country, as well as greater acceptance of Indigenous cosmologies, ontologies and epistemologies (ways of knowing and doing).

Menzies (2001) described the need for respectful Indigenous research protocols that emphasise the rights, responsibilities and obligations of research partners. Perhaps even more important is co-design, which incorporates 'the right' research questions, goals and planned outcomes that align with Indigenous research methodologies. Reciprocity is also important; ensuring that benefits flow back to Indigenous peoples who provide valuable knowledge and time to research projects (Smith 1999; Clarke 2008; Kwaymullina 2016). Best practice guidelines for work with Indigenous peoples advocate for transparency and agreed benefits that should be received by all parties (Carter 2010; Kamau *et al.* 2010; AIATSIS 2012, 2020; Trigger *et al.* 2014; Woodward *et al.* 2020).

There is much important ecological research taking place, and scientists are increasingly working to integrate different scientific pursuits that include Indigenous knowledge and peoples (see for example those in this Special Issue and those reviewed by Ens *et al.* (2015)). To move forward, the fields of ecology and biology will benefit from the clarification of effective cross-cultural research approaches, including advancement of Indigenous-led research (See Goolmeer *et al.* 2022, this issue). This paper unpacks the layers of cultural and institutional protocols for Indigenous biocultural research and demonstrates application of these protocols from an 'insider' and 'outsider' perspective.

Methods

In order to unpack the biocultural guidelines, laws and protocols required to

conduct respectful ecological research with Indigenous groups, this paper draws on the experiences of a multidisciplinary and multi-institutional project, 'Retracing the dispersal of rainforest food trees by pre-colonial Aboriginal Australians' (referred to as the 'Aboriginal rainforest tree dispersal' project from here), which was funded by the Australian Research Council Discovery Project scheme (2018–2021). Funded were two PhD students: Patrick Cooke, an Indigenous (Gungalida) man focused on collating historical and ethnographic biocultural data from an 'insider'/'outsider' perspective; and Monica Fahey, a non-Indigenous female researcher investigating the plant genetic data. The PhD students are the lead authors of this paper. The research team worked with east coast Australian Aboriginal groups from northern New South Wales to Cape York Peninsula, which forms the study region of this paper. This project crosses 19 Australian Indigenous language groups (Fig. 1).

The 'Aboriginal rainforest tree dispersal' project aimed to: (i) investigate evidence for pre-colonial human dispersal of rainforest trees using multidisciplinary methods; and (ii) develop an ethical and culturally sensitive research protocol for working with Traditional Owners (TOs).

Familiarising ourselves with guidelines, law and protocols

Prior to initiating the project, Cooke and Fahey explored the Research Questions (Layer 8, Fig. 2) and researched international, national and state guidelines, law and protocols – including those specific to their research institution (Layers 1–4; Fig. 2) (Macquarie University, Human Research Ethics), as directed by the *National Statement on Ethical Conduct in Human Research* (2007) and *AIATSIS Guidelines for Ethical Research in Australian Indigenous Studies* (AIATSIS 2020).

We developed a conceptual model based on the 'onion' as a metaphor (see Fang 2005; Kristensen 2018) to help unpack and apply information from multi-level biocultural protocols, laws and guidelines in our research. We explored biocultural protocols from a range of

sources, including legislation, guidelines, informal protocols and local customary engagement practices. In the Australian research context, we identified eight different layers of protocols and guidelines that can guide best practice and ethical research with Indigenous peoples (Fig. 2; Table 1). The key biocultural layers included International, National, State, Research Institutions, Local organisations, Research Participants, the Researcher and the Research Question (Fig. 2, Table 1). These layers can be flexibly applied and the researcher may navigate multiple layers and the corresponding principles, stakeholders and ethical considerations at any given stage of the research, as described below.

Researcher perspectives: as method

This paper discusses and develops a biocultural protocol framework from three perspectives drawn from Smith (2012):

- 1 An Indigenous 'insider' perspective of Cooke: an Indigenous person who has pre-existing relationships and understandings of Indigenous Peoples, Country and lore.
- 2 An Indigenous 'outsider' perspective of Cooke: an Indigenous researcher

without a previous long-term connection to Indigenous peoples, Country and lore.

- 3 An non-Indigenous 'outsider' perspective of Fahey: a non-Indigenous person without previous long-term or short-term connections to Indigenous peoples, Country and lore.

Below, we describe how researchers from each of these perspectives established research collaborations with two different Aboriginal groups (Mamu and Githabul), with reference to the protocols framework (Fig. 2; Table 1). Note that here we only describe how the researchers established the collaboration, not the entire research process.

Researcher perspectives: as result

The following flowchart outlines the layers of protocols and guidelines that were activated at each stage of the Indigenous insider and outsider's initial research.

Perspective 1: Indigenous 'insider' research with Mamu

Following identification of the research questions and a literature review of existing research to understand the layers of

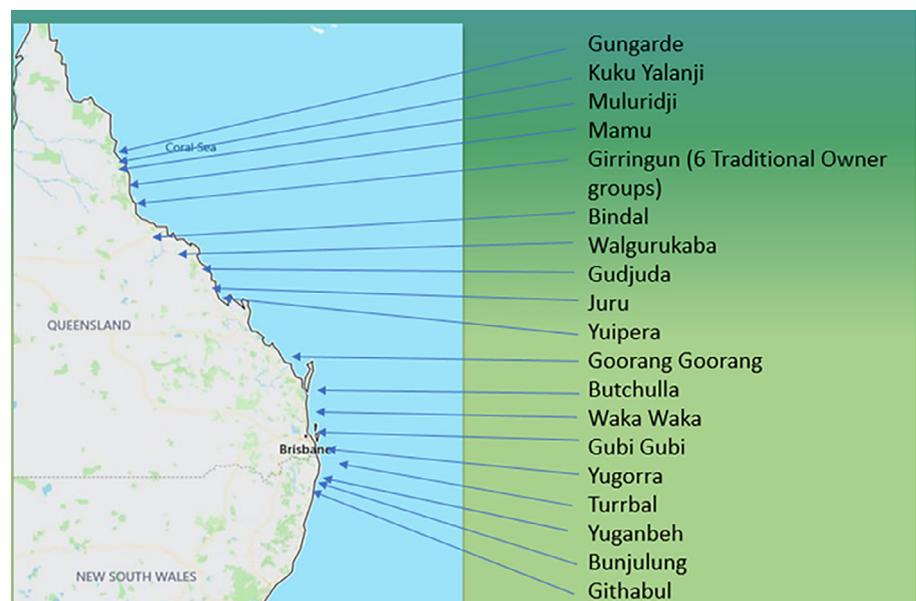


Figure 1. Australian Indigenous groups relevant to the 'Aboriginal rainforest tree dispersal' project (Map produced by P. Cooke).

Table 1. Layers and examples of biocultural guidelines, law and protocols requiring consideration when working with Indigenous people and Country in Australian ecology

Layer	Examples
1 International	<i>Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity</i> to the Convention on Biodiversity (CBD)(United Nations Treaty Collections, Chapter XXVII Environment, 8.b.) The <i>Nagoya Protocol</i> was adopted in 2010 and entered into force in 2014, and aims to create greater legal certainty and transparency for both providers and users of genetic resources. It applies to genetic resources and that are covered by the CBD, including associated traditional knowledge and to the benefits arising from their utilisation (CBD, https://www.cbd.int/abs/). Australia became a signatory to the protocol in 2012; however, it is still in the process of ratification as of the time of writing.
2 National	<i>The Environmental Protection and Biodiversity Conservation Act</i> (1999); the Australian government's Caring for our Country strategy and Indigenous Advancement Scheme; and the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) Code/Guidelines
3 State	Laws and protocols set by state and territory governments, such as wildlife and cultural heritage permits.
4 Institutions	University Human Research Ethics
5 Community organisations/groups	The community may have a set of protocols which enables you to work with them as well as on their country.
6 Participants	They may be driven by participants personal protocols, the community protocols and/or organisational policy and procedure documentations.
7 Researcher	Apply the researcher's individual ethical, personal values and moral standards
8 Research Question	Is the question suitable?

processes, being mindful not to pressure anyone into signing straight away. Once participants were given time to consider whether to sign the prior informed consent forms, which was done, the group was happy to start sharing some of their knowledge by giving examples of the significance of the trees and the importance of preserving these sites for future generations.

After the initial meeting and recording of preliminary information, Cooke established further meetings with the CEO and Elders in order to provide them with a field report of the previous meeting, including photos (Giving back, Fig. 3a). Further to this, Cooke offered his research skills to the group to facilitate a reciprocity process. From these discussions, Cooke was asked to assist in the development of a draft research agreement for the corporation. This should have long-term benefits by enabling negotiations with institutions or government departments regarding research on their Country. This giving back process invoked national to institutional, organisational and researcher protocols (Layers 2, 4, 5 and 7 Fig. 2, Table 1).

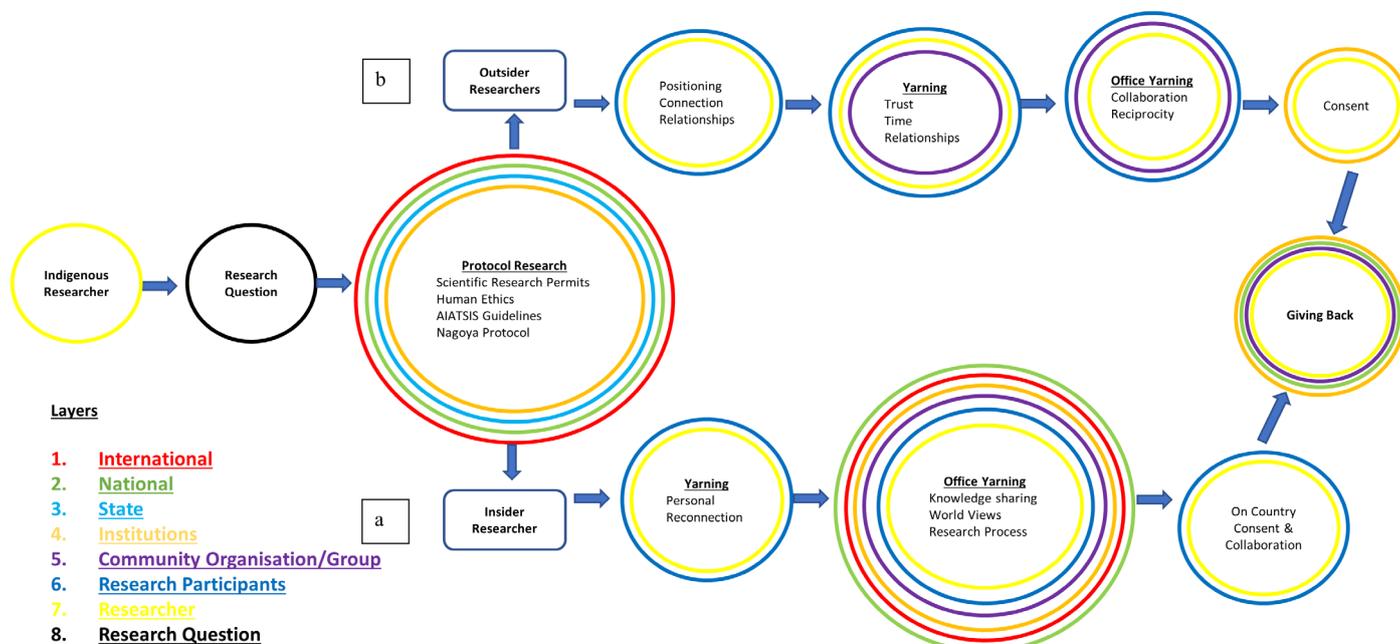


Figure 3. Multiple layers of cultural protocol during the establishment phase of the 'Retracing the dispersal of rainforest food trees by pre-colonial Aboriginal Australians' project according to the Indigenous 'insider (a)' and 'outsider (b)'.

Perspective 2: Indigenous 'outsider' research with the Githabul

As a Gungalida man and an Indigenous researcher who had not worked with the Githabul or on their Country, Cooke was first required to conduct background research on the group and determine whether he could be connected to the community (Positioning, Fig. 3b). This process invoked personal and research participant protocols (Layers 6, 7 Fig. 2, Table 1).

Following the desktop analysis of the group on the Internet, Cooke made phone calls and sent emails to the organisation with initially mixed success in establishing contact. Through his connections, he heard that there was a public event (Bunya Festival) where a Githabul TO was doing a welcome to Country. Cooke attended the festival and waited until after the TO had finished his welcome to Country speech. He then approached him personally to introduce himself and have a yarn over a cup of tea (Yarning, Fig. 3b). This yarn was about positioning himself and connecting to the Elder's worldview (Bessara & Ng'andu 2010). Once the Elder had placed him in his worldview, the Elder acted as a cultural broker and set about introducing Cooke to other members of his group who were prominent figures in the community and who had deep and intimate knowledge of their Country. It turned out that these community members were Githabul Rangers and were happy to exchange numbers and emails for Cooke to visit their Country.

Allowing time to yarn and build relationships and trust through continual phone calls and a face-to-face catchup resulted in Cooke being invited to go on Githabul Country and experience firsthand the importance of what their Country meant to them (Geia *et al.* 2013). Upon arrival on Githabul Country, Cooke arranged to meet face-to-face with the rangers, who then introduced him to their CEO who was another Githabul Elder (Office Yarning, Fig. 3b). After yarning with him around the project and having a personal introduction, he gave permission for the rangers to show Cooke around

their Country and to introduce him to other Elders within the community.

To build trust and integrity within the community, it took Cooke three visits to be able to undertake interviews with key knowledge holders. Once the trust was gained, Cooke talked with participants to see who was willing to participate in the research, as some people had the knowledge but did not want to openly share it. This process of voluntary participation in research is integral to the national and institutional prior informed consent process of ethical human research (Layers 2, 3 Fig. 2, Table 1).

Once Cooke had established who would be a willing participant, he then talked through the process of how the interviews would be conducted and mentioned that he would need their signed consent forms to participate in the research. He further explained the importance of the consent forms, not only from the institutional perspective around the intellectual knowledge protection and ethical guidelines, but also for giving participants the opportunity to voice their intent to protect certain knowledge and to determine who was allowed to access this information in the future through the research project.

After being on Country, yarning, spending time sitting and listening with individuals and groups, and gaining consent to conduct the research, Cooke offered his services to the CEO (Giving back, Fig. 3b), invoking the institutional and research protocols of reciprocity (protocols 3, 7; Fig. 2, Table 1). This demonstrated that Cooke wanted to share his skills with the community, as they had shared so much with him. From these conversations with the CEO, Cooke was asked by the CEO to develop a draft community market garden program and a draft Junior Ranger program as a way of giving back to the community.

Perspective 3: Non-Indigenous researcher with Mamu and Githabul

In this case study (Fig. 4), researcher Fahey outlines how she applied biocultural protocols to her research as a non-Indigenous person working with Mamu

and Githabul people, as well as with Indigenous researcher Cooke. After the process of a literature review, exploration of the research question and consultation with the project research team, Fahey worked with project Indigenous cultural brokers and decided on a procedure of: first, meeting with research participants; second, sending a formal project invitation letter to the board of each study group; and third, if the board accepted the invitation, she would send a written agreement for consent to obtain and analyse genetic data for trees that grew on their Country. This process aligned with the Institutional and community organisation's researcher protocols (Layers 4, 5, 7; Fig. 4, Table 1). In order to be as inclusive as possible, Fahey sought out relevant PBCs and TOs not aligned to the PBCs to conduct fieldwork.

Fahey's PhD research focused on genotyping culturally significant rainforest trees. For genetic research involving Indigenous people, Knowledge and Country, there is an obligation for researchers to comply with international and Australian protocols (Layers 1 and 3, Fig. 2, Table 1). Fahey drafted a written agreement with Indigenous cultural broker (project team member/co-author), Gerry Turpin, with the intention to obtain permission from PBCs to collect genetic material from their Native Title determination areas. This agreement is in line with the international *Nagoya Protocol* (Layer 1; Fig. 2, Table 1) and served to: first, provide evidence that permission was obtained from TOs to collect plant genetic material; second, to hold the researcher to account; and third, help the PBC with their own internal accountability in terms of approving activities on Country. The agreement stipulated the conditions under which the genetic material would be used and the terms to be negotiated by the PBC before signing. For transparency, unaligned TOs were made aware of the agreement with the PBC, though written permission was not sought from such individuals.

Following this process by Fahey and the initial contact with Githabul, as described above by Cooke, feedback was sought from the Githabul Rangers on how best to draft a locally meaningful

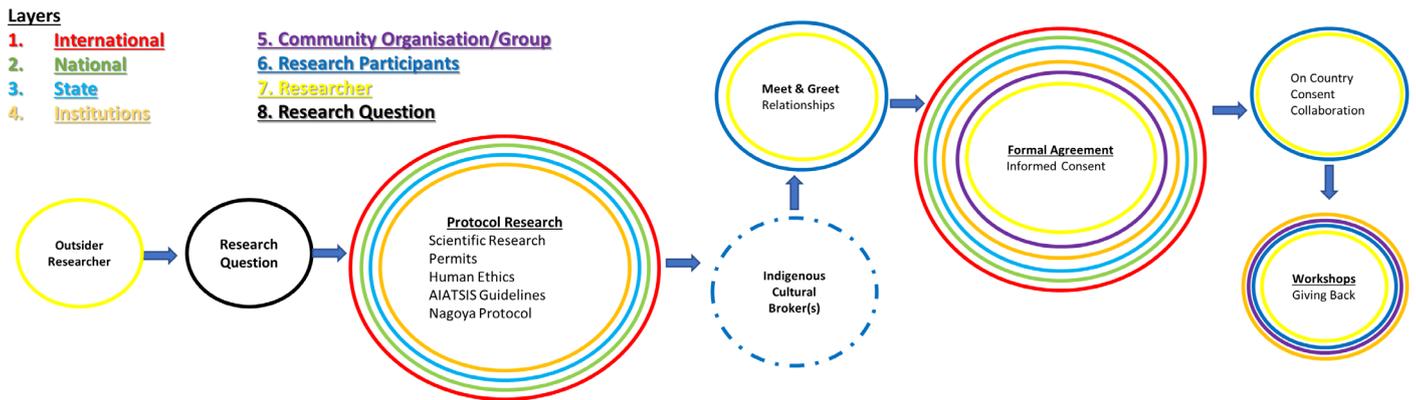


Figure 4. Application of biocultural protocols during the initial phase of the rainforest dispersal project by a non-Indigenous ‘outsider’ researcher.

project information sheet. The project information sheet is an important communication tool, as it can be passed between interested parties and allows research participants to revisit the project concept. As research participants sometimes express fears and misconceptions that genetic data can be exploited for commercial uses, the information sheet needed to explain that the data are not sufficient to allow for any genetic engineering or other biotechnical applications.

Fahey followed the standard procedures to apply for permits to collect plant genetic material from protected reserves across the study sites as they are managed by the Queensland and New South Wales governments (Layer 3, Fig. 4). Fahey also sought human ethics approval through Macquarie University in order to conduct research activities associated with the project (Layer 4; Fig. 4).

Prior to fieldwork, Fahey and the research project team discussed the cultural protocol and ethical sensitivities of the project. It was important for Fahey to understand the Indigenous researcher’s perspectives and preferred approaches to the project as Aboriginal knowledge custodians and cultural brokers. For instance, Cooke’s family could be affected if an unresolved conflict were to arise during fieldwork in the area that they live. Fahey found value in spending a couple of days outside of the office to contemplate and discuss these issues, and without the pressures of trying to achieve objectives such as collecting samples.

It was important for Fahey to collaboratively develop an ethical protocol for consent agreements as she and Cooke initially had differing expectations on what and when written permission should be obtained. They also had separate ideas on what the most ‘sensitive’ aspect of the research was: taking genetic samples of culturally significant trees versus recording the associated biocultural knowledge. These discussions were highly valuable for Fahey and informed development of a respectful research protocol that aligned with the values of both researchers (Layer 7, Fig. 4).

The first field trip to each collection location was scheduled as a ‘meet and greet’ (Layers 5–6, Fig. 4) with the local ranger group (Githabul) or PBC (Mamu), and this was brokered by Cooke. The aim of these trips was to establish relationships before signing a formal consent agreement. A flexible agenda for these trips allowed time for the Githabul Rangers to build trust before taking researchers out on Country. On the last day of the trip, Fahey was invited to a big ranger cook-up. This helped to break down some of the barriers with people who had expressed a general mistrust of researchers. This experience allowed time for the participants to air grievances about past research projects, and this gave Fahey the opportunity to demonstrate her willingness to listen to these critiques, which in turn helped build trust (Baskin 2005).

The ‘meet and greet’ also provided opportunities to further discuss the aims of the project and nature of the genetic

data. Fahey found that this eased the concerns of some participants who saw risks associated with genotyping culturally significant trees. It also allowed the participants to raise hypotheses that they hoped the genetic data could investigate, and thus fostered a more collaborative and reciprocal relationship (Layers 5–7, Fig. 4). To further cultivate collaboration and reciprocity, participants were invited to further contribute to the research through participation in conference presentations and cultural/scientific skill-sharing workshops. The degree of interest in socialising and engaging in the project varied between groups, as not all groups were willing to discuss intellectual property and only wanted a certain degree of familiarity with the non-Indigenous ‘outsider’ researcher.

Discussion: New Biocultural Protocol Framework

This paper identified eight layers of biocultural guidelines, law and protocols relevant to ecological research in Australia. International, national, and to some extent, state bodies, have developed directives that benchmark ‘best practice’ research in cross-cultural and Indigenous research. These policy directives, in tandem with more localised and institutional priorities and processes as well as personal and specific research question ethics, as demonstrated in the case studies here, can be used to guide biocultural research projects.

Nations have a responsibility to respond to international directives, although progress in Australia has been slow, as evidenced by the delayed ratifications of the Nagoya Protocol and UN Declaration on the Rights of Indigenous People. As outlined here in 'the onion' metaphorical layering of protocols (Fig. 2) and application of this schema from Indigenous insider and outsider perspectives (Figs 3, 4), national and international protocols offer a starting point for non-Indigenous and Indigenous researchers working together in cross-cultural spaces. Personal values from the researcher and research participants also come into effect and can influence how ethical the process of Indigenous engagement might be. The addition of personal ethics into the biocultural protocols framework presented here is unique; however, from our perspective, it is at the core of effective engagement.

The multiple perspectives we presented in the case studies demonstrate the existence of core values and previous relationships (or lack thereof) that can benefit effective research in Indigenous spaces. The way in which protocols are applied will differ, depending on whether the researcher is Indigenous or non-Indigenous, and an insider or outsider. Non-Indigenous researchers who are 'outsiders' need to build their capacity for understanding Indigenous knowledge epistemologies and Indigenous cultural lore while demonstrating flexibility in their approaches to allow for Indigenous ways of knowing and doing. This can be facilitated by cultural brokers who are individuals with working knowledge of the local community dynamics and are willing to guide others while undertaking research on Indigenous peoples' lands (Michielil 2003; Maru & Davies 2011). In the non-Indigenous 'outsider' case study presented here, a cultural broker played a pivotal role in facilitating the cultural understanding and sensitivities for the non-Indigenous researcher, enabling progression to the next stage of research and meeting 'face to face' with members of the local communities.

Central to establishing the research from both perspectives was the importance of allowing ample time, gaining

prior informed consent and establishing reciprocity (Ens *et al.* 2012; Preuss & Dixon 2012; AIATSIS 2020). We share the view with other cross-cultural researchers that these core values need to be taken into consideration in the development of a 'personal protocol' of researchers if they are to develop sustainable working relationships with Indigenous research partners (Pretty & Smith 2004; Maru & Davies 2011; Holmes & Jampijinpa 2013). Both researchers explicitly deployed reciprocity at several points in the initial phases of their research projects and extended this by offering assistance with tasks outside the scope of the project.

The case studies also highlight that the application of the different layers of biocultural protocols does not need to proceed in a linear order, and researchers moved backward and forward between them. It was like peeling back the layers of an 'onion', and yes it will make you cry, but what it does do is meaningfully embed the researcher within the research in a culturally appropriate way, according to both Western and Indigenous Law/Lore. In the inner layers, the framework needs to be flexible so researchers and participants both have opportunities to stop and reflect and draw in information from different layers as required. Essential to effective deployment of this process is communication between all parties. Communication is critical as this forms part of relationship building, and making time to work with participants helps build rapport and trust in moving forward with the research.

Moving towards culturally respectful ecological research

As this paper demonstrated, one approach is unlikely to fit all stakeholder needs and must therefore be tailored to the specific research questions, researcher and context. Different stakeholders have different perspectives and aspirations that may result in vastly different expectations of knowledge sharing, collaboration and consent. We found in our research that 'yarning' in order to establish trust on a personal level needed to precede the

development of formal agreements with the two Indigenous groups.

Currently, it is generally up to the goodwill of researchers to follow through and ensure there are benefits to Indigenous research participants (see Goolmeer *et al.* this issue). There are no enforced consequences for not following legal protocol, for example by-passing consent to enter or remove biological material from Indigenous managed lands. However, there are increasing calls from Indigenous leaders for enforceable protocols for work on Indigenous land, with Indigenous people and with Indigenous knowledge (Goolmeer *et al.* this issue).

Currently, Indigenous representation in academia is low, so it may not always be possible to have 'Indigenous-led' research, as is recommended by AIATSIS (2020). It is therefore important for non-Indigenous researchers to think about whether the research question is appropriate after consulting with Indigenous research participants or Elders/leaders in the community even before research starts and then assess whether it will be beneficial to participants or the community (Kwaymullina 2016). Ideally, the research should reflect Indigenous values and aid Indigenous researchers and participants in asserting the right to self-representation, self-definition, self-identification and self-determination. Development of mutually beneficial research when working with Indigenous people, knowledge and Country is imperative.

Importantly, we also argue that researchers need to assess their own individual protocols and ethics. This is best done in collaboration with the Indigenous peoples that researchers desire to work with so all parties can gain an understanding of the dynamics of the layers of protocols they work in, akin to the 'shared learning' or 'learning by doing' philosophies of community development (Borrini *et al.* 2004).

As more Indigenous research moves towards being Indigenous-led, a lesson learnt from this research was that although the Indigenous 'outsider' perspective benefited from having strong awareness of Customary law, cultural protocols and indirect connections and was

somewhat absolved of the personal relationship accountability of the 'insider', there was still the need to take extra precautions to prevent indirect personal and professional risks associated with doing research with 'other' Indigenous groups. The experiences outlined in this paper indicate that Indigenous researchers are highly valuable, if not essential, for cross-cultural ecology, although they carry additional social obligations when working with their own and other communities. Research teams need to support or allow space for Indigenous researchers to navigate such challenges and remain flexible to allow for alternative ways of doing and knowing throughout ecological research projects that aspire to empower Indigenous people, knowledge and Country.

Conclusion

Biocultural protocols are an important means for Indigenous communities to uphold governance structures while adhering to international and national legal requirements, institutional ethical guidelines and local customary practices. Given the diversity of Indigenous cultures and the different government and institutional legal systems, navigating these layers of protocols in ecological research can be overwhelmingly complex, site-specific and highly dependent upon whether the researcher operates from an Indigenous, non-Indigenous, 'insider' or 'outsider' perspective. Ecologists who wish to engage in cross-cultural research will benefit from exploring the layers of biocultural protocols relevant to the research question, research location and the Traditional Owner group(s) while reflecting on their own ethical processes and those incumbent to their organisation.

References

- AIATSIS (2012) *Guidelines for Ethical Research in Australian Indigenous Studies*. AIATSIS, Canberra.
- AIATSIS (2020) *Code of Ethics for Aboriginal and Torres Strait Islander Research*. AIATSIS, Canberra.
- Altman J., Linkhorn C. and Clarke J. (2006) *Land Rights and Development Reform in Remote Australia*. Centre for Aboriginal Economic Policy Research, Canberra, ACT.
- Baskin C. (2005) Storytelling circles: Reflections of Aboriginal protocols in research. *Canadian Social Work Review* **22**, 171–187.
- Bavikatte K. and Robinson D. F. (2011) Towards a people's history of the law: Biocultural jurisprudence and the Nagoya Protocol on access and benefit sharing. *Law, Environment and Development Journal* **7**, 35.
- Bean R. (2006) *The Effectiveness of Cross-Cultural Training in the Australian Context*. Department of Immigration and Multicultural Affairs, Canberra.
- Berkes F. (1993) Traditional ecological knowledge in perspective. Chapter 1 In: *Traditional Ecological Knowledge: Concepts and Cases*, (ed J. Inglis) International Development Research Centre, Ottawa, Canada.
- Bessara D. and Ng'andu B. (2010) Yarning about yarning as a legitimate method in Indigenous research. *International Journal of Critical Indigenous Studies* **3**, 37–50.
- Borrini G., Jaireth H., Farvar M. T., Pimbert M. and Kothari A. (2007) Sharing power: learning-by-doing in co-management of natural resources throughout the world. *Earthscan*.
- Broome R. (1994) *Aboriginal Australians*, 2nd edn. Allen and Unwin, Sydney.
- Carter J. (2010) Protocols, particularities, and problematising Indigenous 'engagement' in community-based environmental management in settled Australia. *Geographical Journal* **176**, 199–213.
- Christie M. (2008) *Traditional Aboriginal knowledge practices and North Australian biosecurity*, pp. 64–74. Kritis-Learning Communities, Special Co-publication.
- Clarke P. A. (2008) *Aboriginal plant collectors: Botanists and Australian Aboriginal people in the nineteenth century*, 1st edn. Rosenberg Publishing, Dural, NSW.
- Davies J., Hill R., Walsh F. J., Sandford M., Smyth D. and Holmes M. C. (2013) Innovation in management plans for community conserved areas: Experiences from Australian indigenous protected areas. *Ecology and Society* **18**(2).
- Davies J., Thomsen D. A., Muir K. and Lester Y. (2004) *They should Come and Talk: Aboriginal Perspectives on Commercial Kangaroo Harvest in South Australia*. AIATSIS Project G2002_6724. The University of Adelaide.
- Davis M. (2008) Indigenous struggles in standard-setting: The United Nations Declaration on the rights of indigenous peoples. *Melbourne Journal of International Law* **9**, 439.
- Dew A., McEntyre E. and Vaughan P. (2019) Taking the research journey together: The insider and outsider experiences of Aboriginal and non-Aboriginal researchers. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research* **20**. <https://doi.org/10.17169/fqs-20.1.3156>
- Dietsch E., Martin T., Shackleton P., Davies C., McLeod M. and Alston M. (2011) Australian Aboriginal kinship: A means to enhance maternal well-being. *Women and Birth* **24**, 58–64.
- Dunstan K. (2019) The Law Society's Lore law project. *Brief* **46**, 42.
- Ens E. J., Finlayson M., Preuss K., Jackson S. and Holcombe S. (2012) Australian approaches for managing 'country' using Indigenous and non-Indigenous knowledge. *Ecological Management & Restoration* **13**, 100–107.
- Ens E. J., Pert P., Clarke P. A. *et al.* (2015) Indigenous biocultural knowledge in ecosystem science and management: Review and insight from Australia. *Biological Conservation* **181**, 133–149.
- Fang T. (2005) From "onion" to "ocean": Paradox and change in national cultures. *International Studies of Management & Organization* **35**, 71–90.
- Geia L. K., Hayes B. and Usher K. (2013) Yarning/Aboriginal storytelling: Towards an understanding of an Indigenous perspective and its implications for research practice. *Contemporary Nurse* **46**, 13–17.
- Goolmeer T., Skroblin A. and Wintle B. (2022) Getting our Act together to improve Indigenous leadership and recognition in biodiversity management. *Ecological Management & Restoration* **23**(S1), 33–42.
- Graham M. (1999) Some thoughts about the philosophical underpinnings of Aboriginal worldviews. *Worldviews: Global Religions, Culture, and Ecology* **3**, 105–118.
- Hill R., Cullen-Unsworth L. C., Talbot L. D. and McIntyre-Tamwoy S. (2011) Empowering Indigenous peoples' biocultural diversity through World Heritage cultural landscapes: a case study from the Australian humid tropical forests. *International Journal of Heritage Studies* **17**(6), 571–591.
- Holmes M. C. C. and Jampijinpa W. (2013) Law for Country: The structure of Warlpiri ecological knowledge and its application to natural resource management and ecosystem stewardship. *Ecology and Society* **18**(3).
- Horstman M. and Wightman G. (2001) Karparti ecology: Recognition of Aboriginal ecological knowledge and its application to management in north-western Australia. *Ecological Management & Restoration* **2**, 99–109.
- Janke T. (2009) *Report on the Current Status of Indigenous Intellectual Property*. Terri Janke and Company Pty Ltd, National Centre for Indigenous Studies Australian National University and Jumbunna Indigenous House of Learning University of Technology Sydney, Canberra.
- Janke T., Holcombe S. and Davis M. (2009) *Indigenous Ecological Knowledge and Natural Resources in the Northern Territory: Report on the Current Status of Indigenous Intellectual Property*. Natural Resources Management Board (NT), Darwin.
- Kamau E. C., Fedder B. and Winter G. (2010) The Nagoya Protocol on Access to Genetic Resources and Benefit Sharing: What is new and what are the implications for provider and user countries and the scientific community. *Law Environment and Development Journal* **6**, 246.
- Kingsley J., Townsend M., Henderson-Wilson C. and Bolam B. (2013) Developing an exploratory framework linking Australian Aboriginal peoples' connection to country and concepts of wellbeing. *International Journal of Environmental Research and Public Health* **10**, 678–698.

- Kohli K., Shrumm H., Jonas H., Hiemstra W. and OLIVA M. J. (2012) Community protocols and free, prior informed consent—overview and lessons learnt. *Biodiversity and Culture: Exploring Community Protocols, Rights and Consent* **25**.
- Kristensen L. K. (2018) "Peeling an onion": Layering as a methodology to promote embodied perspectives in video analysis. *Video Journal of Education and Pedagogy* **3**, 1–21.
- Kwaymullina A. (2005a) Seeing the light: Aboriginal law, learning and sustainable living in country. *Indigenous Law Bulletin* **6**, 12.
- Kwaymullina A. (2005b) Seeing the light: Aboriginal law, learning and sustainable living in country. *Indigenous Law Bulletin* **6**, 12–15.
- Kwaymullina A. (2016) Research, ethics and Indigenous peoples: An Australian Indigenous perspective on three threshold considerations for respectful engagement. *AlterNative: An International Journal of Indigenous Peoples* **12**, 437–449.
- Kwaymullina A. and Kwaymullina B. (2010) Learning to read the signs: Law in an Indigenous reality. *Journal of Australian Studies* **34**, 195–208.
- Langton M. (2020) Welcome to country: Knowledge. *Agora* **55**, 3.
- Maclean K., Ross H., Cuthill M. and Rist P. (2013) Healthy country, healthy people: An Australian aboriginal organisation's adaptive governance to enhance its social–ecological system. *Geoforum* **45**, 94–105.
- Maru Y. and Davies J. (2011) Supporting cross-cultural brokers is essential for employment among Aboriginal people in remote Australia. *The Rangeland Journal* **33**, 327–338.
- McCorquodale J. and John M. (1987) *Aborigines and the Law: A Digest*. Aboriginal Studies Press, Canberra.
- Menzies C. R. (2001) Reflections on research with, for, and among Indigenous peoples. *Canadian Journal of Native Education* **25**, 19–36.
- Michielil M. (2003) The role of culture brokers in intercultural science education: A research proposal. In: *Paper presented at the 34th annual conference of the Australasian Science Education Research Association held in Melbourne, 10–12 July 2003*. p. 12.
- Moggridge B. (2020) Indigenous engagement protocols for threatened species researchers. NESP Threatened Species Hub. [Accessed 20 Sept 2021.] Available from URL: <https://www.nespthreatenedspecies.edu.au>
- Morgan S., Mia T. and Kwaymullina B. (2010) Heartsick for country: Stories of love, spirit and creation. Available from URL: ReadHowYouWant.com.
- Nakata M., Byrne A., Nakata V. and Gardiner G. (2005) Indigenous knowledge, the library and information service sector, and protocols. *Australian Academic & Research Libraries* **36**, 7–21.
- Oxenham D. (1999) *Aboriginal Terms of Reference: The Concept at the Centre for Aboriginal Studies/Darlene Oxenham*. Curtin Indigenous Research Centre, Perth.
- Parmenter J. and Trigger D. (2018) Aboriginal cultural awareness training for mine employees: Good intentions, complicated outcomes. *The Extractive Industries and Society* **5**, 363–370.
- Perry R. J. (2010) *From Time Immemorial: Indigenous Peoples and State Systems*. University of Texas Press, Austin, TX.
- Pert P. L., Hill R., Maclean K. *et al.* (2015) Mapping cultural ecosystem services with rain-forest aboriginal peoples: integrating biocultural diversity, governance and social variation. *Ecosystem Services* **13**, 41–56.
- Pierotti R. and Wildcat D. (2000) Traditional ecological knowledge: the third alternative (commentary). *Ecological Applications* **10**(5), 1333–1340.
- Piquemal N. (2000) Four principles to guide research with Aboriginals. *Policy Options* **21** (10).
- Pretty J. and Smith D. (2004) Social capital in biodiversity conservation and management. *Conservation Biology* **18**, 631–638.
- Preuss K. and Dixon M. (2012) 'Looking after country two-ways': Insights into Indigenous community-based conservation from the Southern Tanami. *Ecological Management & Restoration* **13**, 2–15.
- Rose D. (2001) Connecting with ecological futures. The National Humanities and Social Sciences Summit (26–27 July 2001, Canberra).
- Rose D. B., D'Amico S., Daiyi N. *et al.* (2002) *Country of the Heart: An Indigenous Australian Homeland*. Aboriginal Studies Press, Canberra.
- Rose D. B. and Robin L. (2004) The ecological humanities in action: An invitation. *Australian Humanities Review* **31**(2).
- Roughley A. and Williams S. (2007) *The Engagement of Indigenous Australians in Natural Resource Management: Key Findings and Outcomes from Land & Water Australia and the Broader Literature*. Land & Water Australia, Canberra, ACT.
- Smith L. T. (1999) *Decolonizing Methodologies: Research and Indigenous Peoples*. Zed Books, London.
- Smith L. T. (2012) *Decolonizing Methodologies: Research and Indigenous Peoples*, 2nd edn. Zed Books, London.
- Stanner W. E. (1965) Aboriginal territorial organization: Estate, range, domain and regime. *Oceania* **36**, 1–26.
- Swiderska K., Shrumm H., Hiemstra W. *et al.* (2012) *Biodiversity and Culture: Exploring Community Protocols, Rights and Consent*. IIED, London.
- Tobler R., Rohrlach A., Soubrier J. *et al.* (2017) Aboriginal mitogenomes reveal 50,000 years of regionalism in Australia. *Nature* **544**, 180–184.
- Trigger D., Keenan J., de Rijke K. and Rifkin W. (2014) Aboriginal engagement and agreement-making with a rapidly developing resource industry: Coal seam gas development in Australia. *The Extractive Industries and Society* **1**, 176–188.
- United Nations (2007) United Nations declaration on the rights of Indigenous peoples. UN Wash, 12, 1–18.
- Usher P. J. (2000) Traditional ecological knowledge in environmental assessment and management. *Arctic* 183–193.
- Walsh F. J., Dobson P. V. and Douglas J. C. (2013) Anperrirentye: A framework for enhanced application of indigenous ecological knowledge in natural resource management. *Ecology and Society* **18**(3).
- Woodward E., Hill R., Harkness P. and Archer R. (2020) *Our Knowledge Our Way in Caring for Country: Indigenous-led Approaches to Strengthening and Sharing Our Knowledge for Land and sea Management. Best Practice Guidelines from Australian Experiences*. NAILSMA and CSIRO, Cairns, Australia.