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About the journal

The *Australian Journal of Emergency Management* is Australia's premier journal in emergency management. Its format and content are developed with reference to peak emergency management organisations and the emergency management sectors—nationally and internationally. The journal focuses on both the academic and practitioner reader. Its aim is to strengthen capabilities in the sector by documenting, growing and disseminating an emergency management body of knowledge. The journal strongly supports the role of the Australian Institute for Disaster Resilience as a national centre of excellence for knowledge and skills development in the emergency management sector. Papers are published in all areas of emergency management. The journal encourages empirical reports but may include specialised theoretical, methodological, case study and review papers and opinion pieces. The views in the journal are not necessarily the views of the Australian Government, Australian Institute for Disaster Resilience or its partners.

Aboriginal and Torres Strait Islander peoples are advised that this publication may contain images of deceased people.

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The image of the southern sky was an important choice for this special edition. Indigenous peoples from Australia and Aotearoa New Zealand are separated by water but united by the southern sky. First Nations peoples tell stories of creation that live on through the stars. The constellations were used by ancestors to guide and navigate unfamiliar places. As we step into a future made uncertain by climate change, a renewed sense of guidance and navigation offers pause. We honour those ancestors and connect with them, and each other, through continuing to gaze upon the southern sky.

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The AJEM Editorial Committee recognises the efforts of researchers and practitioners who serve as peer reviewers of articles submitted to the journal. Peer reviewers play an essential role in ensuring the quality of research published. Their contribution is critical to the success of the journal and, more importantly, to the field of emergency management and disaster resilience.

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About this edition

This edition of the *Australian Journal of Emergency Management* collects existing Indigenous-led research and utilisation of disaster risk reduction and resilience research and practice across Aotearoa New Zealand and Australia. Content includes the practices and knowledges from across these 2 nations. In doing so, the aim of this special edition of the journal is to document and encourage incorporation of Indigenous peoples' knowledges into practice.

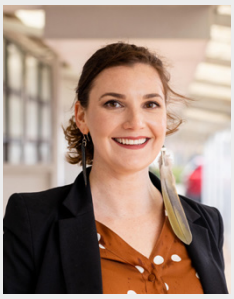
This edition was made possible in partnership with guest editors Lucy Kaiser (Massey University and GNS Science) and Dr Bhiamie Willaimson (Monash University). Throughout the development of this edition, the guest editors, representing Aotearoa New Zealand and Australia respectively, were guided by a shared purpose to:

- foster an Indigenous-led and decolonial discourse in disaster resilience and emergency management
- explore and enhance understanding of Indigenous perspectives and experiences in relation to disasters and other hazard events
- highlight Indigenous leadership and excellence in disaster resilience and emergency response
- explore structural similarities and points of difference in the experiences of Māori and Aboriginal and Torres Strait Islander peoples.

This edition was an opportunity to work with different sources of knowledge and give voice to Indigenous researchers and practitioners in the field of disaster risk reduction and resilience. In doing so, this edition contributes to a broader knowledge base and encourages new ways of thinking and working. This edition was also an invitation to emerging Indigenous researchers to develop and share knowledge that shapes the disaster risk reduction and resilience discourse in Aotearoa New Zealand, Australia and beyond.

The editorial team acknowledges the contribution of the authors and peer-reviewers who contributed their time and expertise to this edition.

About the guest editors



Lucy Kaiser

Massey University,
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Lucy Kaiser (Kāi Tahu, Kāti Māmoe, Waitaha) is a disaster social scientist specialising in Indigenous and community-centered emergency management. She is a researcher at GNS Science and Massey University in Aotearoa New Zealand, where she is also completing a PhD in emergency management. Her research explores disaster preparedness and resilience, particularly within Māori, Indigenous and rural communities, with a particular focus on Indigenous perspectives on climate change.

Lucy collaborates with iwi, hapū and local communities to develop culturally responsive strategies for managing natural hazards. Lucy has contributed to national and international discussions on disaster risk reduction, school preparedness and climate adaptation, advocating for inclusive, evidence-based policies. She is also an active mentor and educator, supporting the next generation of social scientists in the field of emergency management.

Dr Bhiamie Williamson

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Dr Bhiamie Williamson is a Euahlayi man from north-west New South Wales with familial ties to north-west Queensland. He has led research into the impacts of disasters on Indigenous communities including examining the effects of the 2019–20 bushfires and 2022 northern rivers floods. He is a graduate of the Australian National University and the University of Victoria, British Columbia, Canada. Bhiamie leads the National Indigenous Disaster Resilience Project within the Fire to Flourish program at Monash University.

The *Australian Journal of Emergency Management* is published by the Australian Institute for Disaster Resilience, which is based on the lands of the Wurundjeri people of the Kulin Nation. AIDR acknowledges Aboriginal and Torres Strait Islanders as the first inhabitants and Traditional Custodians of Country, and Māori as the Tāngata Whenua and Treaty of Waitangi partners in Aotearoa New Zealand.

AIDR pays respects to ancestors and Elders: past and present.

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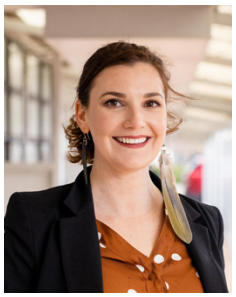
Foreword



Lucy Kaiser

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For tens of thousands of years Indigenous peoples have cared for our lands and waters, forming intimate and reciprocal bonds between people and place. Before European expeditions crossed the Atlantic, Polynesian people conquered the Pacific Ocean. Before Egyptians built the pyramids, Indigenous peoples from western New South Wales created a complex system of aquaculture. Bhiamie Ngunnhu [Brewarrina fish traps] continue to be regarded as the world's oldest human construction.

In recent times, our peoples have experienced immense loss, suffering and trauma. Colonisation changed our worlds like nothing before. While processes of colonisation have resulted in a deep sense of cultural loss, it has also brought forward an undeniable, and powerfully compelling, sense of resilience. This sense of resilience continues to support our peoples as we respond to the devastating result of a referendum for constitutional recognition in Australia in 2023 and recent attempts to erode Māori rights through reviewing and revising Te Tiriti o Waitangi (the Treaty of Waitangi).

It is with this sense of antiquity and a spirit of resilience that we are proud to present this special edition of the *Australian Journal of Emergency Management.*

Given the broad and profound ills inflicted upon Indigenous peoples in Australia and Aotearoa over the last few centuries, we have chosen to not limit contributions to Western conceptions of 'disasters'. Rather, our call for contributions was an opportunity for Indigenous researchers, practitioners, public servants and community leaders to define resilience in their own sense. The result of this broad call for contributions is a diverse content that considers issues of cultural burning, cultural responses to COVID-19, climate change effects and environmental contamination.

All contributions to this edition are either authored or led in authorship by First Nations people. This was a deliberate and important choice to demonstrate that Indigenous peoples' voices are not marginal or supplementary in disaster resilience; they are central.

This edition demonstrates the indelible contributions Indigenous people are already making in emergency management and disaster resilience. It also highlights what is possible by embracing and upholding Indigenous leadership.

Despite the deep cultures of resilience our peoples possess, we remain in a state of recovery from the harms of colonisation; harms that continue to be inflicted upon our peoples. And so it is that we face the reality of a changing climate with temperatures reaching and breaching the 2°C target while still seeking to (re)define our sense of identity in a changed, and changing, world.

It is at this juncture that we pause and reflect on the place, purpose and contributions of Indigenous peoples in emergency management and disaster resilience. We thank all contributors for their willingness and trust. We hope to have honoured your leadership with a brave, yet careful, journal edition.

We thank the Australian Institute for Disaster Resilience for investing in this themed issue and for shining a light on Indigenous leadership and excellence. We thank in particular, Dr Margaret Moreton, who possessed the seed of vision for this edition.

May this journal offer a beacon of light in what might feel like dark times.

Mauri ora / Yalu

Abstract

Marae are traditional meeting grounds and a vital component of cultural infrastructure for Māori, the Indigenous peoples of Aotearoa New Zealand. The precarious exposure of marae to natural hazards and climate change poses a significant threat to the cultural identity and wellbeing of Māori communities. In recent hazard events, marae have repeatedly played a central role in providing safety and shelter for the community at short notice. This research explores the resilience of marae to natural hazards and examines the role of marae in emergency preparedness and community response. Adhering to the tenets of kaupapa Māori theory, the research employs a mixed-methods approach with GIS-based hazard maps and semi-structured interviews to assess marae hazard exposure and inform marae-based decision-making. Key outcomes include the development of marae-specific hazard maps contributing to emergency preparedness plans for 26 marae in the study region in collaboration with Te Arawa Lakes Trust, a local tribal post-settlement governance entity. A significant finding is the crucial role of Māori engineers whose understanding of Māori values and protocols bridges the gap between technical solutions and cultural needs. This research presents a novel approach for engineers and practitioners to work collaboratively with Māori. This work highlights the importance of flexibility and patience, recognising the voluntary nature of marae roles.

From past failures to effective engagement: bridging the gap between engineering and cultural infrastructure

Peer reviewed

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Introduction

Aotearoa New Zealand (hereafter, Aotearoa) has many geophysical, hydrological, meteorological and climatological natural hazards. The hazards that have had significant effects in recent events include seismic (Fraser et al. 2014; Hinga 2015; Okaya et al. 2007; Partridge et al. 2011; Soons and Selby 1992; Wibowo et al. 2021; Zhang et al. 2018) and co-seismic (Rosser et al. 2017), fluvial flooding (Kingston et al. 2016; Mason et al. 2021; Reid et al. 2021), coastal flooding (Lane et al. 2017) and high-impact weather events (Anderson et al. 2008; Basher 2013; Melia et al. 2022). Climate change projections in Australasia demonstrate long-term trends toward warming, rising oceans, increased frequency of extreme heat events, fewer events of extreme cold and changes in rainfall patterns (Reisinger et al. 2014). In anticipation of increasing natural hazard frequency and intensity, it is of interest to investigate the effects on Māori communities.

Māori are the Indigenous population of Aotearoa. Many Indigenous communities are already experiencing and adapting to changing climate (Ford et al. 2020; Maldonado et al. 2014), including Māori. Bailey-Winiata et al. (2024) showed that because Indigenous peoples have histories with marginalisation, lower socio-economic opportunities, lack of resources, poorer health outcomes and the ongoing intergenerational effects of colonisation, data suggest that Māori may be vulnerable to natural hazards and climatic variability. Notwithstanding, Māori have long practised the art of resilience for centuries as many cultural practices require rapid response, collaboration and leadership. Further, Māori have coordinated time, people and resources through cultural imperatives due to the artificial hazard of colonisation (Fa`aui and Hoete 2022; Kenney and Phibbs 2014).

This paper explores a novel approach to conducting research with Māori communities in engineering and disaster management contexts. The objectives are threefold:

- To describe the culturally resonant research approach that ensures positive engagement and mutually beneficial outcomes.
- To present the key factors of success when dealing with marae and Māori communities.
- To address the apparent divide between engineers and the community, as well as technical capability for informed decision-making.

The case study relates to the iwi [tribe] of Te Arawa located in the central North Island of Aotearoa. Kaupapa Māori research that is designed by, for and with Māori may be more relevant for disaster research and analysis than mainstream approaches (Phibbs et al. 2015). To this end, the University of Auckland conducted research in partnership with Te Arawa Lakes Trust to document Māori responses, co-develop marae emergency preparedness plans and capture the voices of Māori communities within the study region. This research contributes to the growing body of literature on marae resilience and disaster risk reduction by Indigenous peoples more broadly.

This paper begins by setting the research within its historical and cultural context through an exploration of post-1840 history and the connection between Māori and land. The importance of Māori values and the role of marae in natural hazard contexts is elucidated. The materials and methods section outlines the methodological approach, including kaupapa Māori principles and geospatial analysis, which together underpin the research. The discussion and conclusion sections synthesise the findings and summarise key outcomes, respectively.

Past and present context

This section examines the historical context of Aotearoa, with a focus on the period following the signing of Te Tiriti o Waitangi and the repercussions for Māori. The connection between Māori and land is explored to introduce the concept of marae or pā and their function in contemporary natural hazard contexts.

Post-1840 history

In 1840, some Māori tribal leaders signed Te Tiriti o Waitangi (the Māori language version of the Treaty of Waitangi) with the British Crown (Ruru and Kohu-Morris 2020). The treaty is the founding document of Aotearoa, a covenant between the Māori people and the British Crown, agreed upon to recognise Māori ownership of their lands, properties and to grant the same rights as lawless British subjects (Fa`aui 2017). Because 2 versions of the treaty were created, one in English and one in Te Reo Māori (the Māori language), the contents differed considerably, leading to confusion, ambiguity and contrasting interpretations (Burns et al. 2024). The Crown assumed the treaty granted the British sovereignty over Aotearoa, while Māori believed Te Tiriti allowed the British the right to govern in exchange for protection and the rights of British subjects under the Crown, while still maintaining the authority to manage their tribal affairs (Cant 1995). This discrepancy fuelled a series of injustices against Māori and has since been viewed as a strategic manoeuvre to introduce colonisation and assimilation in Aotearoa (Came 2013).

Aotearoa has a complicated history with engineering projects and working with engineers has often had negative consequences for Māori communities, resulting in irreversible effects across the economic, social, cultural and environmental domains of wellbeing (Fa`aui 2017; Morgan 2008). Numerous examples of this tension can be found since the turn of last century. For example, the Auckland sewage disposal scheme in 1914 depleted the main food source of local tribe, Ngāti Whātua (Morgan 2008); the Ohaaki power station, constructed in 1980s, gave rise to significant land subsidence (Allis and Zhan 2000; Bromley et al. 2015) and displaced local tribe members of Ngāti Tahu (Stokes 2004) and, in the same decade, an effluent discharge into the Kaituna River as a mechanical solution from the mind of an engineer was highly objectionable on medical, social, spiritual and cultural grounds and elicited profound discontent among the local tribe of Ngāti Pikiao (Temm 1990; Waitangi Tribunal 1984).

Engineering New Zealand (2022) (the professional body that represents engineers in Aotearoa) acknowledges that the establishment of institutions grounded in imperial models are examples of chequered histories and failures toward Māori over the years. Central to these cases are the adverse effects that result from a lack of consideration, consultation and understanding of the specific cultural contexts of Māori communities. Despite the validity and practicality of the technical engineering solution, the failure to comprehend the worldview, knowledge and belief systems of Māori resulted in missed opportunities to incorporate and build on the existing body of traditional knowledge present (Poli et al. 2022). By extension, this lack of understanding and consultation gave rise to the oversight of the specific needs of Māori as an end-user community (Engineering New Zealand 2022). To be effective, any solution developed should be fit-for-purpose and aligned with the specific context in which they are applied. It would be fair to say that these instances are undeniably a direct result of the treaty's signing, and the ensuing series of legislative structures instituted to further suppress, marginalise and culturally fragment Māori. The introduction of several key pieces of legislation—chiefly the *New Zealand Settlements Act* (1863), the Native Lands Acts

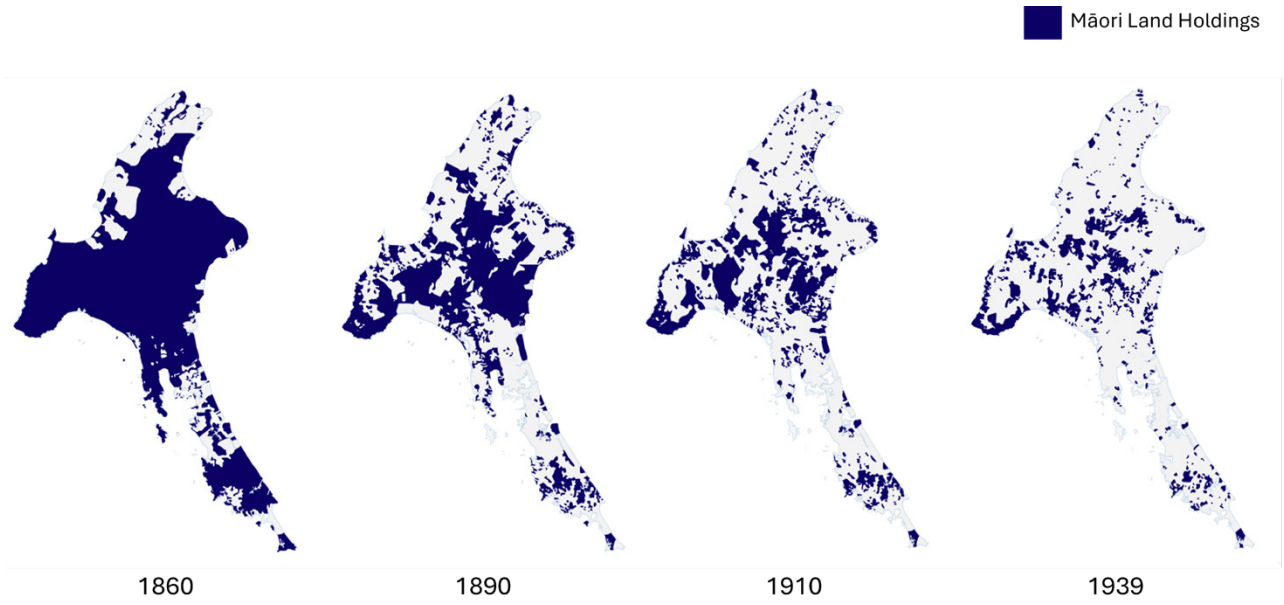

Figure 1: Māori land holdings declined due to confiscations in the North Island of Aotearoa New Zealand in 1860, 1890, 1910 and 1939.
Source: Adapted from Appendix 4, Orange (2004).

(1862 and 1865) and the *Public Works Act 1864* (and later amendments)—resulted in significant land loss for Māori (Thom and Grimes 2022), as illustrated in Figure 1.

Māori connection to land

Like many nations, the relationship between Māori and the land differs significantly from that of their non-Indigenous counterparts (Durie 1999; Gilliam-Knight et al. 1992; Morgan 2008). It has more to do with the notion implied by the English term ‘belonging’ and less about ownership in the sense of possession (Barlow 1994; Davis 1993). Hence, it is not a matter of land ‘belonging’ to the individual, but rather the individual ‘belonging’ to the land. In Māoridom, the nexus between people and land transcends beyond the physical realm where perceptions of land extend into and derive from spiritual associations (Keenan 2012; Lockhart et al. 2019). The English term 'home' most closely aligns with the Māori concept of belonging as when Māori refer to home it typically denotes a place to which they belong rather than somewhere that is owned. In the Māori language, this concept is expressed with the term ‘tūrangawaewae’, a place to stand (Shaw 2021). A pā, or commonly referred to as a marae today, (illustrated in Figure 2) is a living village that serves as the tūrangawaewae for affiliated whānau [family], hapū [sub-tribe] and iwi (Gilliam-Knight et al. 1992; Tapsell 2002). Extended whānau amalgamate to form larger kinship groups: hapū and iwi (Houkamau 2019; Moeke-Pickering 1996). While whānau represent the primary economic

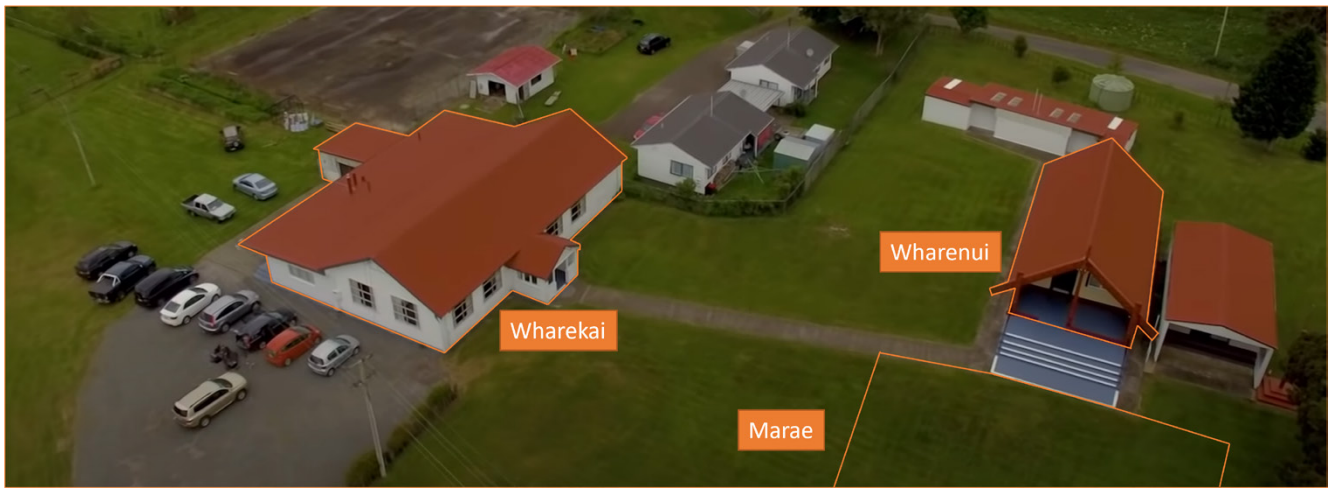

Figure 2: Typical marae layout comprising the wharenui [meeting house] and wharekai [dining hall].

unit and hapū the primary political unit within traditional Māori society (Pihama and Gardiner 2005), iwi serve as the broader socio-political structure that connects several hapū across large geographic areas.

Marae are traditional meeting grounds for Māori (Austin 1975), a bastion of self-determination (Joseph 2002) and a vital component of cultural infrastructure within Māori society (Durie 1999; Te Puni Kōkiri 1999). By definition, a marae is the enclosed space in front of a house, courtyard or village common (Tapsell 2002; Williams 1957). However, the contemporary understanding of a marae often broadly includes the complex of buildings around the marae into this modernised interpretation (Metge 1967). Marae are generally situated on ancestral lands and typically characterised by a wharenui [ancestrally named meeting house] and wharekai [dining hall], as shown in Figure 2. The marae is considered inalienable because it is intrinsically connected to the living soil of Papatūānuku [Earth Mother] (Tapsell 2002). However, the more correct term that should be normalised is 'pā', signifying a fortified village, place or stockade (Williams 1957). This term accurately captures the function and significance of these culturally demarcated sites to Māori and their pivotal role in providing support to communities during times of need. For centuries, physical tribal infrastructure such as marae have spontaneously become support centres for Māori in the face of adversity (Kenney and Phibbs 2014). Typically, urban marae are connected to municipal infrastructure services, whereas rural marae often relies on decentralised infrastructure. These distinctions are crucial in the context of marae resilience, emergency management and preparedness, as they significantly influence each community's capacity to respond to and recover from natural hazards. In the face of colonisation and land loss, Māori continue to uphold their cultural imperatives, language and connection to land, while ensuring that marae remain a vital component of community infrastructure.

Importance of Māori values in natural hazard response

Core values in Māoridom include a concern for past, present and future generations, functioning as an interweaved lattice of guiding principles and value processes (Ritchie 1992). Kenney and Phibbs (2014) described whakapapa [genealogy], whānau [family], whanaungatanga [relationship-building and interdependence], kotahitanga [collective wellbeing and unity], manaakitanga [altruism and hospitality] and kaitiakitanga [stewardship, responsibility and commitment to land and natural resources] as principles that shaped the response of Ngāi Tahu responders' support behaviours in the 2016 Kaikōura earthquakes (Broughton 1993; Harmsworth 2005; Harmsworth and Awatere 2013; Marsden 1992).

At the heart of Māori identity is whakapapa, the genealogical table (Williams 1957) that links individuals to ancestors (Roberts 2013), land (Te Rito 2007) and future generations along a boundless continuum. From whakapapa, the concept of whānau brings this connection into the present, extending beyond the confines of the nuclear family to include extended family and blood relations (Dai and Bentley-Gray 2023; Metge 1990). Whakapapa is synonymous with the concept of whānau as a multi-layered, flexible and dynamic system (Carlson et al. 2023; Hancock and Newton 2022). Whanaungatanga, the broader concept of kinship, intersects with the concept of collectivism (O'Carroll 2013). The intimacy and depth of relationships within whānau underpin the notion of whanaungatanga, often described as the 'glue' that socially connects people (McNatty and Roa 2021). Therefore, while whānau defines who is included, whanaungatanga makes reference to the process and practice of how these relationships are cultivated and maintained.

Putnam (2000) explains bonding social capital as 'the ties that bind groups together on the basis of shared structural positions within a particular social hierarchy; examples include class, age or ethnicity'. Kāwharu (1992) points out that Māori view kotahitanga as their source of bonding social capital within their respective communities. Kotahitanga forms the base of collaborative Māori responses to unfavourable circumstances and is a natural characteristic within Māoridom (Kenney and Phibbs 2015). Manaakitanga is the display of respect or kindness (Williams 1957) by which the collective action is guided (O'Steen 2021). As a form of habitus, particularly in disaster management contexts, Māori altruism is demonstrated through generosity, hospitality and entertainment (Carter and Kenney 2018). Finally, all these values embody kaitiakitanga, which supports the notion of sustainability, guardianship and protection of the environment and people in perpetuity (Hopkins et al. 2015). Long-term orientation is also reflected in the notion of kaitiakitanga (Haar et al. 2019) as the strong ties Māori retain to past generations is a constant reminder to conserve for the collective future (Hook 2007; King 2004). Ritchie (1992) argues that these terms are not mutually exclusive and may coexist, such that the use of any one draws upon a host of meanings linked to the others. Thus, for example, invoking 'whanaungatanga' inherently makes indirect reference to related concepts such as kotahitanga or manaakitanga. Therefore, it becomes evident that every core value plays a distinct role in shaping the Māori worldview. Durie (2005) clarifies that these values, conventions, rules and behaviours are all important indicators of Māori endurance (resilience), uniting people to support and share in times of abundance and adversity. These values are actively enacted through collective efforts that prioritise relational connections, shared responsibilities and community-focused actions in times of crisis.

The role of marae in hazard contexts

The role of the marae and how it might function becomes most apparent during life crises such as tangihanga [funerals] (Tapsell 2002). The tangihanga process lasts several days and can be an extravagant and emotional occasion (Metge 1967). The process typically involves a dedicated workforce of whānau who come together to welcome, feed and accommodate visitors as they bid farewell to the departed. Marae may cater for hundreds to thousands of visitors over the 3-day ceremony. Māori have long practised the art of cooking (Wihongi 2013), organisation (Barnett 2001), coordination and speechmaking (Mahuta 1974). These are desirable skill sets in a natural hazard event. In ancient times, visitors may unexpectedly cause hostility or disrespect the hau kāinga [home people] in speechmaking, often resulting in combat (Vayda 1970). Therefore, it appears that Māori have historically relied on the unknown as a measure of preparedness. Despite the complex nature of tangihanga and the diverse skill sets required, Māori have established quick-thinking, teamwork and leadership abilities that are regarded as key driving factors for community resilience.

Aotearoa's most recent natural hazard events have recurrently seen Māori and pā at the forefront, providing safety and shelter for the community at short notice. Ngāi Tahu's response to the 2011 Christchurch and 2016 Kaikōura earthquakes and subsequent recovery processes embody a standard of excellence (Kenney and Phibbs 2014). The improvised volunteer army by Ngāti Awa in the 2017 Edgecumbe floods exemplified an excellent recovery and relief response (Gillespie 2017; Kenney 2022). Under great stress and significant natural hazards, marae are often the focal point for the community to congregate in times of need (Hudson and Hughes 2007). During times of crisis, Māori enact cultural values such as kotahitanga, whanaungatanga, manaakitanga, kaitiakitanga and most of all, aroha nui ki te tangata [love to all people] (Kenney and Phibbs 2014). The practical realities of pre-colonial Māori economic life and culture gave rise to core values (Harmsworth 2005; Harmsworth and Awatere 2013) upheld by a complex system of tikanga [Māori traditional rules, lore and customs] (Broughton 1993; Marsden 1992). While the external world is governed by law, within the marae, Māori lore prevails (Black et al. 2017).

Despite the complexity of hosting the multitudes with limited resources, marae and Māori communities have continued to demonstrate effective emergency management, response, recovery and relief (Hoskins 2019; Kenney and Phibbs 2015). While some marae may be seen to be flourishing, the institution of marae is considered by many to be under-resourced and in a vulnerable state (Kāwharu and Pfeiffer 2014) with infrastructure and buildings requiring significant repairs or upgrades (Lee-Morgan et al. 2021). As flooding is the most prevalent natural hazard in Aotearoa and earthquakes pose the greatest potential for damaging and disruption (Department of the Prime Minister and Cabinet 2007), gaining a deeper understanding of national marae exposure to natural hazards becomes a critical challenge. People affected by the 2011 Christchurch earthquake agreed that tribal infrastructure such as marae helped the community to adapt after the event. Thornley et al. (2015) argue that the role of marae, as key tribal infrastructure, embodies altruism as a culturally constructed principle. Whakapapa provides a sound emergency management infrastructure for Māori and the wider community, integrating the ties that bind iwi through identity and kinship ties. Whakapapa also mold marae as tribal infrastructure in the sense that specific whānau are already tasked with managerial responsibilities and duties associated with marae operation (Kenney and Phibbs 2014).

Materials and methods

Cahill (1996) argued that neither qualitative nor quantitative techniques have universal application, though qualitative methods can bring quantitative information to life. Wertz (2014) similarly noted that the historical study of qualitative methods offers a treasure trove for understanding and integrating such methods with quantitative inquiry. McKibbon and Gadd (2004) suggested that qualitative studies often incorporate both qualitative and quantitative methods. A mixed-methods approach has the potential to yield unexpected findings and new insights through detailed exploratory data analysis (Jefferson et al. 2014). Further, Fossey and Harvey (2001) pointed out that combining data collection with existing quantitative methods amplifies the voice of the consumer and provides rich contextual data with which to make sense of quantitative data.

The methodological flow chart presented in Figure 3 outlines the 4 stages of the research process. Throughout all stages Māori values such as whakaaetanga [consent], ohaoha [reciprocity] and most importantly, whakaute [respect] were enacted and upheld in line with tikanga, in addition to the cultural values outlined earlier in this paper. Given the nature of the research and process are not linearly sequential, it became clear that following a kaupapa Māori research methodology would be best suited to achieve the aims and objectives of this research.

The fabric of kaupapa Māori research is woven together by the principles of tino rangatiratanga [self-determination], social justice, Māori worldview, Te Reo Māori and whānau (Bishop 1998; Walker et al. 2006). Thus, a kaupapa Māori approach operationalises autonomy and recognises the unique cultural context, aspirations and experiences of Māori to ensure their voices and knowledge systems are

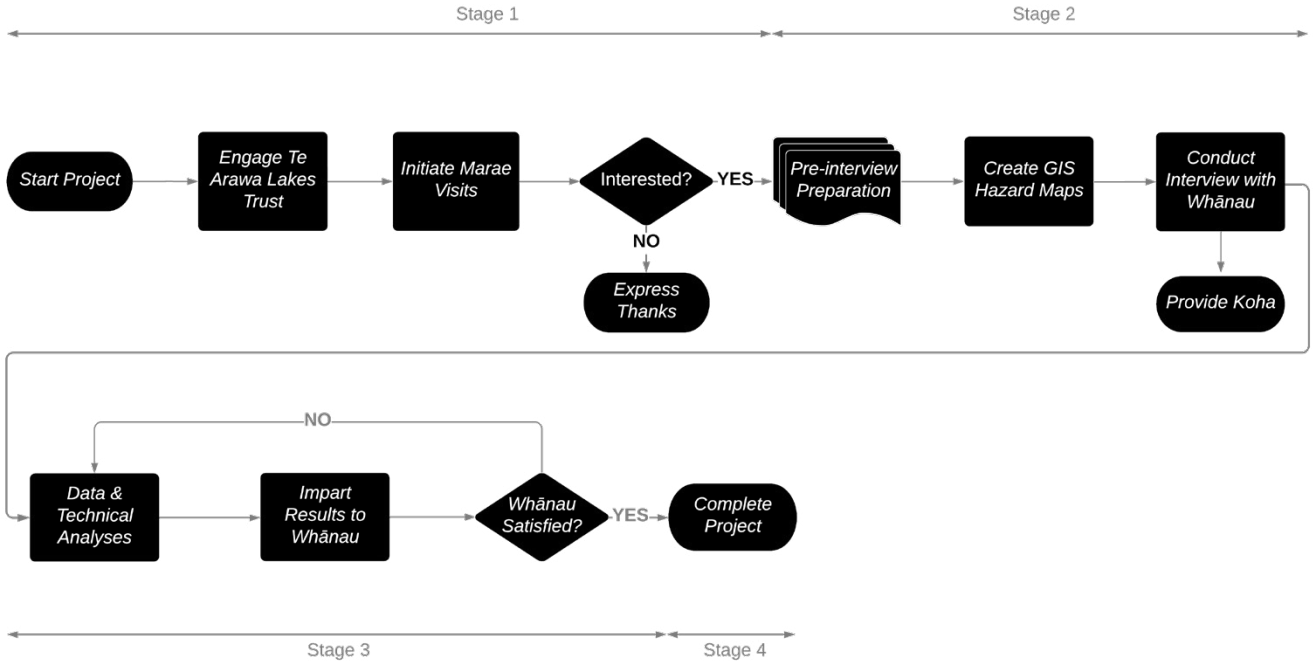

Figure 3: Methodological flow chart used in this research.

central to the research. As kaupapa Māori approaches strive to create positive outcomes (Durie 2013; McIntosh and Mulholland 2011; Smith 1997 1999; Workman 2016), this research assists in reimagining collective and contemporary research practice at the confluence of engineering and Māori in disaster management contexts.

Project initiation and interest

The need to assess marae and infrastructure resilience to natural hazards was identified at the outset, where initial aims, objectives, research design and the scope of the project were outlined. Whakapapa primarily gave impetus to this research as several members of the research team held strong genealogical ties to the Te Arawa region. Secondly, the complex hazardscape of the central North Island enabled the assessment of various hazards and environmental phenomena unique to the region, such as geothermal activity. Early engagement was sought and established with Te Arawa Lakes Trust (TALT), a post-settlement governance entity responsible for the oversight and management of Te Arawa's settlement assets, including the region's 14 lakes located in the central North Island of Aotearoa (shown in Figure 4). TALT was involved in developing marae emergency preparedness plans for 26 marae in the Rotorua region, which presented an ideal opportunity to have a complementary relationship and create mutually beneficial outcomes. Once the partnership had been established, face-to-face meetings or hui were organised at each marae to gauge interest in and address any concerns with the research.

The initial hui allowed for mihimihi [introduction] and the opportunity to present the project's purpose, goals and benefits to the marae and wider hapū. Within this stage, it is important to recognise that arranging hui with marae can be challenging, as whānau volunteer their time and energy out of dedication to their marae. Consequently, these hui often took place on weekends when whānau were not engaged in regular work commitments. Additionally, the rate at which these hui were secured can be attributed to the personal and genealogical connections between TALT staff and marae members. Whanaungatanga is the most critical element in this step as it sets the precedence for future research interactions and remains throughout all marae engagements from inception to completion.

For marae who expressed interest, the research team set a date for the interview and marae emergency preparedness planning session. If a marae declined, we would express thanks for their time and consideration. The research team received a positive response from all marae willing to participate in the research.

Interview preparations and GIS hazard mapping

Prior to the interview, the project brief, interview questions and necessary forms were prepared and sent ahead of time. This step ensured that whānau were well-informed and adequately prepared. Marae-specific GIS hazard maps were produced in advance to visually represent the potential natural hazards as well as to inform and prompt discussion with whānau throughout the discussion. A marae hazard example map is provided

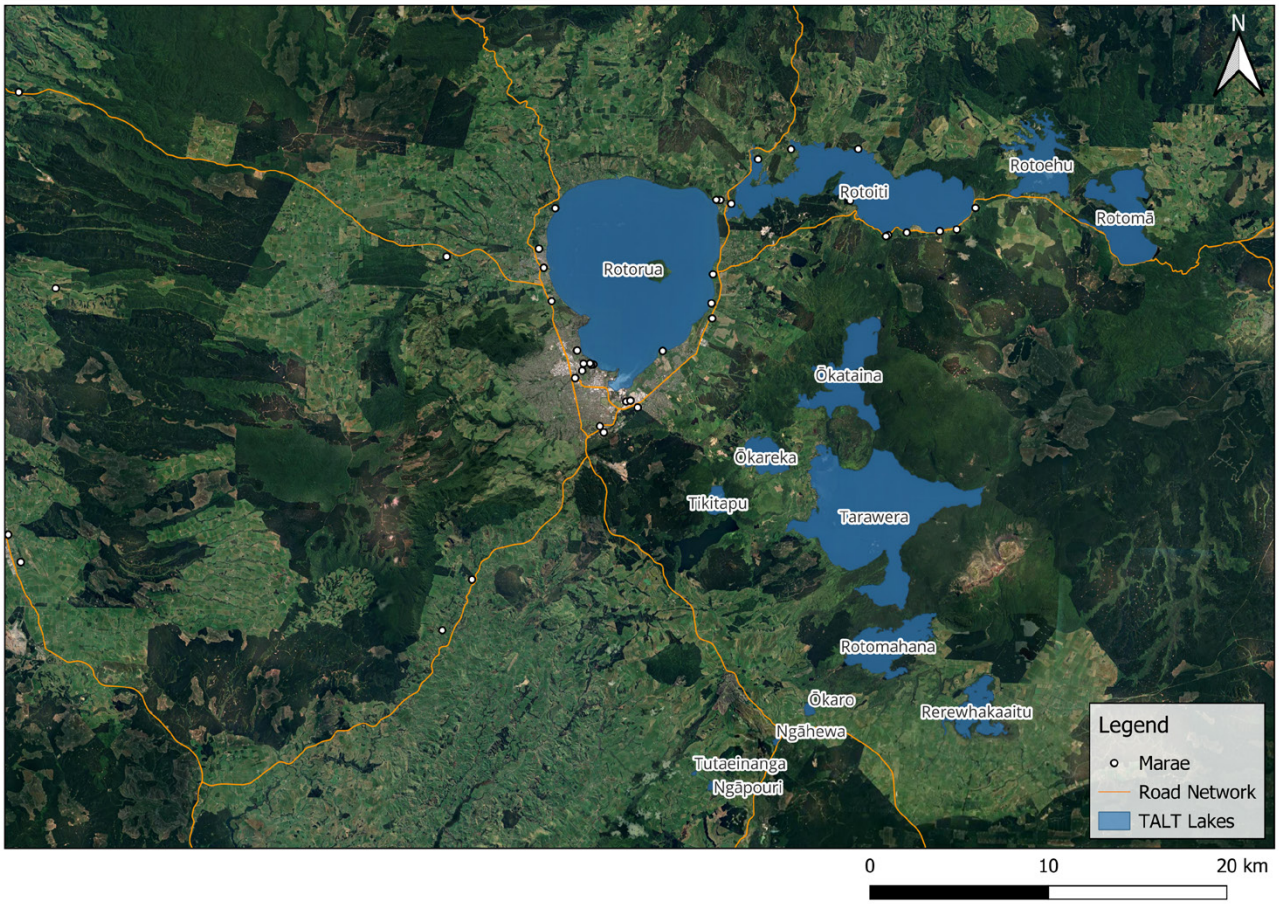

Figure 4: Geographic distribution of lakes managed by Te Arawa Lakes Trust and marae in the Rotorua region.

in Figure 5. It shows 3 marae in close proximity along with site boundaries, building outlines, infrastructure networks and a specific hazard. While the infrastructure data shown in Figure 5 was provided by the local council, the national-scale flood hazard model is an amalgamation of outputs from various local councils in Aotearoa and represents a broad spectrum of underlying assumptions. The indicative flood model is described in Paulik et al. (2029, 2023) and generally represents events with a 100-year return period or a 1% annual exceedance probability. For marae located in urban city centres where local council infrastructure data was accessible, a higher level of detail could be provided. In contrast, marae situated in rural areas had lower levels of infrastructure detail and resolution available for analysis.

The concept of place is central to geography and is seminal to the thinking of Indigenous peoples, including Māori (Murton 2012). Given the process by which Māori knowledge systems were transformed from predominantly visual and oral forms into a written structure (Lilley 2019), it would be reasonable to suppose that Māori may resonate deeply with visual and oral literacy modalities. The longstanding history of traditional Māori artforms such as whakairo [carving] and raranga [weaving] would support that Māori have a natural affinity for visual artforms (Thornton 1989). Traditionally, hazard assessment and mapping were time- and labour-intensive tasks with manual handling and processing of data (Dhakal et al. 1999). GIS have increasingly become integral to the field of geospatial studies and give researchers robust tools for spatial analysis and cartographic representations (Unwin 1996). QGIS (Quantum Geographic Information System) is a free, open source software that allowed the research team to create, edit, visualise, analyse and publish geospatial information. Hence, this research employed a mixed-methods approach.

A geospatial hazard assessment was conducted to quantitatively analyse the exposure of marae to natural hazards, while dialogical and narrative interviewing methods were applied to capture qualitative insights. Ten semi-structured focus groups contained pre-set, open-ended questions with further questions emerging from the discussion (Denny and Weckesser 2022). The flexible nature of the interviews facilitated and improved the richness of discussion, which often led to tangents that provided more in-depth responses while also capturing necessary data. In this way, tikanga of the hau kāinga was adhered to while feeling empowered to tell the story

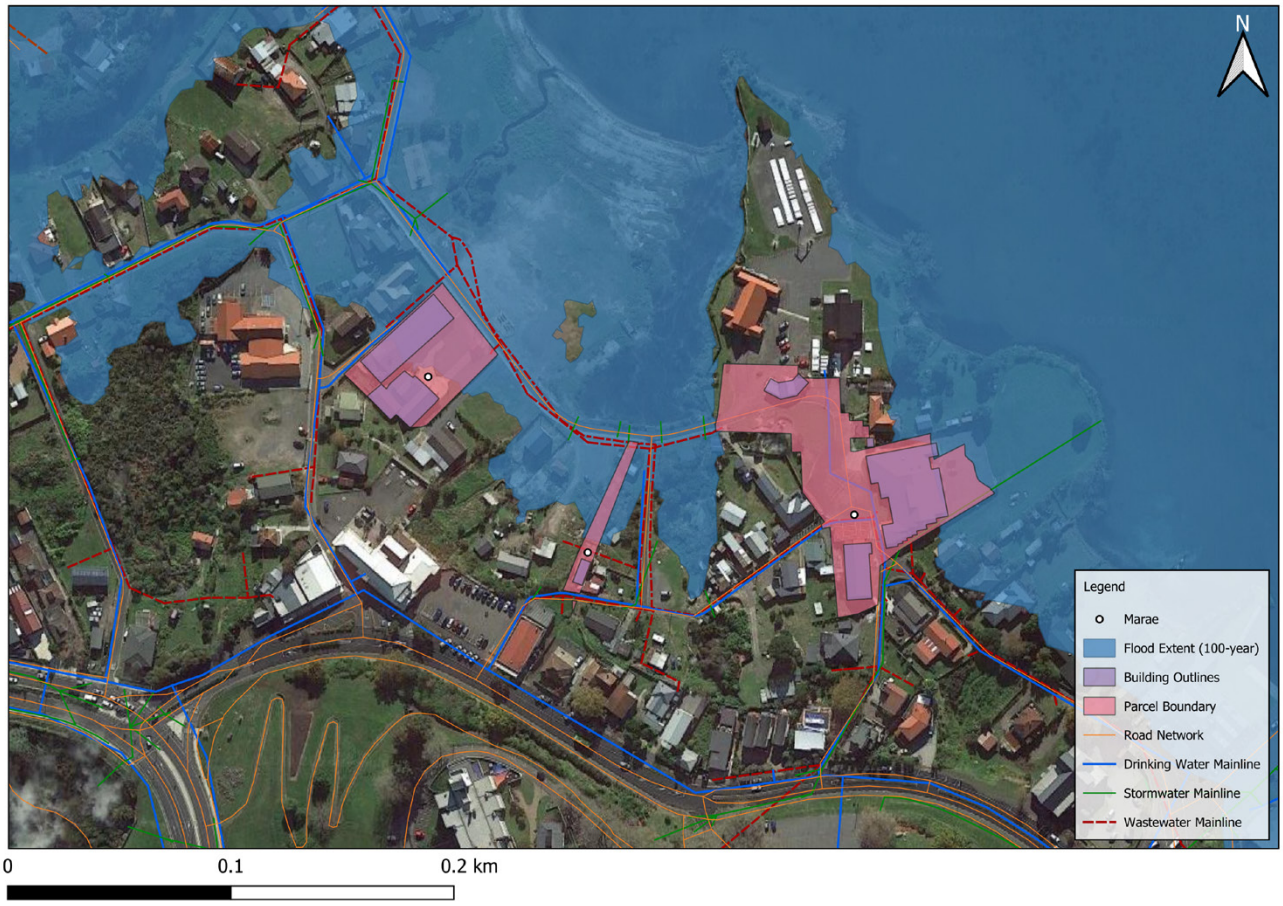

Figure 5: Marae flood map showing 3 marae in close proximity along with site boundaries, building outlines, infrastructure networks and a specific hazard.

through their eyes. The use of GIS-based data and mapping techniques proved highly effective in disseminating data that resonates with hapū.

The interview phase typically took place inside the wharenui or wharekai and involved sitting down with the whānau to discuss their experiences and perspectives on natural hazards, emergency management, preparedness, adaptation, marae resilience and the state of marae infrastructure. The marae could have as many or as few representatives they wished in attendance. This resulted in interviews that included a mix of single or multiple whānau participants. Having already been welcomed onto the marae, the transition to conduct the interview became a fluid process as the relationships and trust had already been established. The flexible structure of the interview often enhanced the depth of the discussion and allowed conversations to veer off on tangents that improved richness while still capturing the necessary data. All interviews were audio recorded (and subsequently transcribed) with notetaking occurring throughout.

Marae participation in the study was of utmost importance given the raw, untouched knowledge and experience on the underlying processes required for a marae to operate under business-as-usual and emergency scenarios. Participants provided in-depth, thorough and specific information on marae operations that could not be retrieved elsewhere. At the conclusion of the hui and in accordance with tikanga, food was shared and the marae was provided koha, a gift to maintain social relationships and has connotations of reciprocity (Durie 1999).

Data analysis and feedback

The interviews were transcribed and thematically analysed to identify commonalities among marae communities such as urban, rural and coastal settings. For transparency, marae were provided shared access to data they provided and deliverables that used their data (questionnaire responses, recordings, transcripts and marae hazard and infrastructure maps). Data sovereignty is important when dealing with Indigenous communities, including Māori (Kukutai and Taylor 2016). In contrast to traditional, individualistic research that primarily benefits the researcher and their personal agenda, kaupapa Māori research adopts a collectivistic approach focused on advancing collectively determined agendas of both the researcher and the researched (Bishop 1998). The recorded data, including computer files, are jointly owned by the researchers and respective marae and are accessible by

researchers, supervisors and respective marae participants only. If the whānau were satisfied with the findings, the overall project moved towards completion. However, if further refinement was required, the process would loop back to the data and technical analysis stage for adjustments after which the findings would be presented again. The transparency of this process helped to strengthen relationships and trust between the research team and whānau. This stage ensured that the whānau fully understood the findings and had the opportunity to provide feedback.

Beyond its emphasis on cultural and data transparency, this process provided marae communities with critical information for informed engineering decision-making. The marae-specific hazard and infrastructure maps shared practical insights into potential hazard and infrastructure exposure. These resources helped whānau understand key technical aspects and equipped marae with the requisite knowledge to interact effectively with engineers. The feedback loop created space for whānau to ask questions, provide input, seek clarity and voice concerns about engineering decisions, resulting in a greater level of inclusion and active participation.

Ethics statement

Ethics approval was granted by The University of Auckland Human Participants Ethics Committee on 21 April 2023 for a period of 3 years, approval number UAHPEC25317.

Discussion

The collaborative nature of this research led to several significant outcomes, particularly within the context of Māori-led engagement in an engineering framework. A key achievement was the successful engagement with all 26 marae within the Te Arawa region, drawing attention to the effectiveness of the approach. In addition to building meaningful relationships, the approach also empowered whānau through the provision of tools and resources to support data-driven decision-making. The tailored hazard maps offered valuable insights into the specific hazards each marae is exposed to and may need to consider for future events, including fluvial flooding and coastal inundation, seismic and co-seismic events, tsunami, erosion and accretion (gradual accumulation of additional layers or matter). The maps define the spatial context and show the extent to which buildings, land parcels and infrastructure are exposed to various hazards and scenarios, albeit indicatively. These insights provided a clear idea of potential effects, enabling marae to pinpoint their most vulnerable or resilient on-site assets. This supported better-informed decisions in terms of resource allocation and strategic planning. One participant stated, 'I think the maps confirm that it was a wise choice; it wasn't by chance that they (ancestors) placed it (marae) here'.

The interview process stimulated reflection and prompted whānau to identify infrastructure deficiencies and gaps in processes related to future natural hazard events. Throughout the questionnaire process, the notion of redundancy or back-up options emerged on multiple occasions as a priority for marae infrastructure, particularly in the context of natural hazard events. For example, installing on-site water tanks for water storage in the event of council water main failures or exploring the use of solar or diesel generators for energy supply during power outages. Another participant stated, 'As a result of that survey, you know… they've put in 3 extra water tanks… It gives you an idea of the resources and where they might be expended'.

Insights gained from publicly available datasets helped to develop and refine marae emergency preparedness plans. This research heightened awareness within Te Arawa marae communities that contributed to improved communal understanding of resilience, preparedness and proactive planning in the face of natural hazards and climate change. Another participant stated:

> *Resilience to me means that we're prepared and that we have a plan of how we would respond to any emergency or any request… that we're probably aware of what might impact us and have a planned approach rather than a reactive one.*

A critical element is the concept of 'marae space, marae pace', which stresses the importance of patience and flexibility when working with marae and Māori communities. Unlike the rigid, deadline-driven approaches in conventional engineering practice, this approach adopts an adaptive and organic timeline. Because most marae roles are voluntary and whānau members often have demanding schedules, accommodating whānau availability and working at a pace that respects existing commitments is essential. Despite its simplicity, maintaining regular contact and providing ongoing updates to whānau throughout each phase of the project was critical to inclusion and active participation. Another unique aspect of the approach was the dual role of the researcher who acted as the investigator and also held a genealogical connection to the research, occupying an insider position within the communities of interest. The presence of Māori engineers, particularly those with well-established community relationships and a deep understanding of Māori values, creates a common space. Fluency in and frequent use of Te Reo Māori was observed as a positive factor in making whānau feel at ease during interviews and general interactions while providing a sense of trust and security throughout the research process. This bridges the gap between engineering practices and cultural needs, leading to informed decision-making and culturally appropriate solutions. In instances where direct involvement is not possible, providing the tools, education and awareness is a useful to increase capacity within the community.

Conclusion

This paper introduces a novel approach for engineers to collaborate with marae and Māori communities through a model that promotes flexibility, patience and understanding the voluntary nature of marae roles. The findings highlight several factors that are conducive to successful engagement of an engineering analysis within Māori and marae contexts. The following actions are critical to achieve meaningful and successful outcomes:

- building genuine, long-term relationships is instrumental throughout the project lifecycle and beyond
- identifying and acknowledging pre-existing genealogical ties or common links to strengthen connections and build trust
- taking kai [food] and koha to hui is a practical way to fulfil tikanga obligations, show respect and make the process a positive experience
- following project initiation and keeping whānau, hapū and marae regularly updated with progress fosters active participation, establishes mutual trust and ensures transparency in the research process
- going for multiple 'cups of tea' in the form of hui, visits or engagements demonstrates patience, commitment to the process and builds rapport as opposed to an extractive single-contact research model or one-off engagement
- using visuals such as photographs or maps could increase engagement as Māori are a visual and oral people
- using Te Reo Māori in presentations and interactions reduced barriers and provided a sense of comfort for whānau.

This research represents a process for whānau, hapū and iwi to bring to life aspirations that have long been held within communities. What sets this approach apart is the integration of engineer and community as one, where both roles coalesce with a common objective. The convergence of engineer and community unlocks opportunities for meaningful engagement, effective solutions and richer outcomes benefiting all parties. This approach holds broader implications beyond the immediate iwi. The learnings could be applied to other iwi, Indigenous communities and engineers facing similar challenges. The intent is to share these findings for others to benefit and lay the groundwork for those pursuing similar initiatives. Looking ahead, the findings from this work will contribute to the national dialogue on marae resilience and hazard exposure.

References

Allis RG and Zhan X (2000) 'Predicting subsidence at Wairakei and Ohaaki geothermal fields, New Zealand', *Geothermics,* 29(4–5):479–497 https://doi.org/10.1016/S0375-6505(00)00017-1

Anderson SAJ, Doherty JJ and Pearce HG (2008) Wildfires in New Zealand from 1991 to 2007. *New Zealand Journal of Forestry,* 53(3):19–22.

Austin MR (1975) 'A Description of the Māori Marae', in *The Mutual Interaction of People and Their Built Environment: A Cross-Cultural Perspective,* edited by Amos Rapoport, Berlin, New York: De Gruyter Mouton, pp.319–323. https://doi.org/10.1515/9783110819052.229

Bailey-Winiata A, Gallop SL, White I, Wotherspoon L, Fa'aui T, Dickson M and Ellis J (2024) 'Looking backwards to move forwards: insights for climate change adaptation from historical Māori relocation due to natural hazards in Aotearoa New Zealand,' *Regional Environmental Change,* 24(80). https://doi.org/10.1007/s10113-024-02240-5

Barlow C (1994) *Tikanga Whakaaro: Key Concepts in Māori Culture.* Oxford University Press, Auckland, N.Z.

Barnett S (2001) 'Manaakitanga: Māori hospitality — a case study of Māori accommodation providers', *Tourism Management,* 22(1):83–92. https://doi.org/10.1016/S0261-5177(00)00026-1

Basher LR (2013) 'Erosion processes and their control in New Zealand', in Ecosystem services in *New Zealand – conditions and trends,* pp.363–374. Manaaki Whenua Press.

Bishop R (1998) 'Freeing ourselves from neo-colonial domination in research: A Māori approach to creating knowledge', *International Journal of Qualitative Studies in Education,* 11(2):199–219. https://doi.org/10.1080/095183998236674

Black SA, Kidd J, Thom K, Mills A, McIntosh T and Quince K (2017) 'Researching Ngā Kōti Rangatahi–Youth Courts on Marae: Koia te Hāngaitanga?: That's the Right Way?', *Ethnographic Edge,* 1(1):33–45. https://doi.org/10.15663/tee.v1i1.18

Bromley C, Currie S, Jolly S and Mannington W (2015) Subsidence: an Update on New Zealand Geothermal Deformation Observations and Mechanisms. Presented at the Proceedings World Geothermal Congress, Melbourne, Australia, 19–12 April 2015.

Broughton J 1(993) 'Being Māori', *The New Zealand Medical Journal,* 106(968):506–508.

Burns C, Hetaraka M and Jones A (2024) 'Te Tiriti o Waitangi: The Treaty of Waitangi, Principles and Other Representations', *New Zealand Journal of Educational Studies,* 59:15–29. https://doi.org/10.1007/s40841-024-00312-y

Cahill DJ (1996) 'When to use qualitative methods: a new approach', *Marketing Intelligence and Planning,* 14(6):16–20. https://doi.org/10.1108/02634509610131117

Came H (2013) 'Doing research in Aotearoa: a Pākehā exemplar of applying Te Ara Tika ethical framework. Kōtuitui: New Zealand', *Journal of Social Sciences Online,* 8(1–2):64–73. https://doi.org/10.1080/1177083X.2013.841265

Cant G (1995) 'Reclaiming Land, Reclaiming Guardianship: The Role of the Treaty of Waitangi Aotearoa, New Zealand', *Aboriginal History,* 19(1/2):79–108.

Carlson B, Kennedy T and Day M (2023) *Global networks of Indigeneity: Peoples, sovereignty and futures.* Manchester University Press, Manchester.

Carter LH and Kenney CM (2018) 'A tale of two communities: B-race-ing disaster responses in the media following the Canterbury and Kaikōura earthquakes', *International Journal of Disaster Risk Reduction,* 28:731–738. https://doi.org/10.1016/j.ijdrr.2018.01.037

Dai H and Bentley-Gray D (2023) 'Cultural perspectives on the concept of whānau and health decisions', *ATLAANZ Journal,* 6(1). https://doi.org/10.26473/ATLAANZ.2023/005

Davis SH (Ed.) (1993) Indigenous views of land and the environment (English). World Bank discussion papers; no. WDP 188 Washington, D.C. http://documents.worldbank.org/curated/en/720271468741314548

Denny E and Weckesser A (2022) 'How to do qualitative research?', *BJOG: An International Journal of Obstetrics and Gynaecology,* 129(7):1166–1167. https://doi.org/10.1111/1471-0528.17150

Dhakal AS, Amada T and Aniya M (1999) 'Landslide Hazard Mapping and the Application of GIS in the Kulekhani Watershed, Nepal', *Mountain Research and Development,* 19(1):3–16. https://doi.org/10.2307/3674109

Durie M (2013) *Ngā Kahui Pou Launching Māori Futures.* Huia NZ Ltd, New York.

Durie M (2005) *Ngā tai matatū: tides of Māori endurance.* Oxford University Press, Melbourne, Victoria.

Durie M (1999) 'Marae and Implications for a modern Māori psychology', *Journal of the Polynesian Society,* 108(4):351–366.

Engineering New Zealand (2022) Take a journey through our foundational story. Engineering New Zealand website www.engineeringnz.org/programmes/kimihia-rangahaua/foundational-story/english, accessed 28 January 2025.

Fa`aui T (2017) 'An Integrated Assessment of New Zealand's Worst Environmental Maritime Disaster: The 2011 Grounding of the MV Rena on Otāiti (Astrolabe Reef), Bay of Plenty' (Thesis). ResearchSpace website https://researchspace.auckland.ac.nz/items/5efe3198-cac5-44f4-8b88-0d94602391bb, accessed 17 January 2025.

Fa`aui T and Hoete A (2022) Mātauranga Māori: Kaupapa hapū research. Presented at the QuakeCoRE, Napier, New Zealand, p.19.

Ford JD, King N, Galappaththi EK, Pearce T, McDowell G and Harper SL (2020) 'The Resilience of Indigenous Peoples to Environmental Change', *One Earth,* 2(6):532–543. https://doi.org/10.1016/j.oneear.2020.05.014

Fossey E and Harvey C (2001) 'A conceptual review of functioning: implications for the development of consumer outcome measures', *Australian and New Zealand Journal of Psychiatry,* 35(1):91–98. https://doi.org/10.1046/j.1440-1614.2001.00846.x

Fraser SA, Power WL, Wang X, Wallace LM, Mueller C and Johnston DM (2014) 'Tsunami inundation in Napier, New Zealand, due to local earthquake sources', *Natural Hazards,* 70:415–445. https://doi.org/10.1007/s11069-013-0820-x

Gillespie K (23 April 2017) Edgecumbe clean up moves into 'recovery' phase. Bay of Plenty Times.

Gilliam-Knight D, Robb L, Presbyterian Church of Aotearoa New Zealand and Hope-Cross A (1992) Te Maungarongo: the ancestral house of the Māori Synod. Presbyterian Church of Aotearoa New Zealand, Wellington, N.Z.

Haar J, Roche M and Brougham D (2019) 'Indigenous Insights into Ethical Leadership: A Study of Māori Leaders', *Journal of Business Ethics,* 160:621–640. https://doi.org/10.1007/s10551-018-3869-3

Hancock F and Newton P (2022) 'Becoming whānau: Māori and Pākehā working together on the Indigenous-led campaign', *#ProtectIhumātao', Ethnicities,* 22(5):642–662. https://doi.org/10.1177/14687968211062655

Harmsworth G (2005) Report on the incorporation of traditional values/tikanga into contemporary Māori business organisation and process. Landcare Research Report.

Harmsworth G and Awatere S (2013) *Indigenous Māori knowledge and perspectives of ecosystems.* Manaaki Whenua Press.

Hinga BDR (2015) *Ring of fire: an encyclopedia of the Pacific Rim's earthquakes, tsunamis and volcanoes.* ABC-CLIO, Santa Barbara, California.

Hook GER (2007) 'A future for Māori education part 2: the reintegration of culture and education', *MAI Review, 1.*

Hopkins D, Campbell-Hunt C, Carter L, Higham JES and Rosin C (2015) 'Climate change and Aotearoa New Zealand', *WIREs Climate Change,* 6(6):559–583. https://doi.org/10.1002/wcc.355

Hoskins R, Lee-Morgan J, Knox W, Dennis H, Henry L, Nathan L, Smiler R, Ratana M (2019) Tūranga ki te marae e tau ana. Reimagining marae-based kāinga in Tāmaki Makaurau. A resource to support urban marae-based housing developments, September 2019. Ngā Wai a te Tūī Press, Auckland. https://purangakura.co.nz/wp-content/uploads/2023/03/PDF2_Turanga-ki-te-marae-final-book.pdf

Houkamau CA (2019) *Routledge Handbook of Indigenous Wellbeing.* Taylor & Francis Group, Oxford, United Kingdom.

Hudson J and Hughes E (2007) The role of marae and Māori communities in post-disaster recovery: a case study, GNS Science report. GNS Science, Lower Hutt, N.Z.

Jefferson T, Austen S, Sharp R, Ong R, Lewin G and Adams V (2014) 'Mixed-methods research: What's in it for economists?', *The Economic and Labour Relations Review,* 25(2):290–305. https://doi.org/10.1177/1035304614530819

Joseph RA (2002) ''The government of themselves': case law, policy and section 71 of the New Zealand Constitution Act 1852', Te Mātāhauariki Institute monograph series. Te Mātāhauariki Institute, University of Waikato, Hamilton, N.Z.

Kāwharu IH (1992) 'Kotahitanga: Visions of Unity', *The Journal of the Polynesian Society,* 101(3):221–240.

Kāwharu M and Pfeiffer K (2014) *Maranga Mai! Te Reo and Marae in Crisis?,* 1st ed. University Press, Auckland.

Keenan D (2012) *Huia histories of Māori: ngā Tāhuhu Kōrero.* Huia, Wellington, N.Z.

Kenney C (2022) 'Na Ara Ahurea: Envisioning Collaborative Governance in Disaster Risk Reduction in Aotearoa', in James, H., Shaw, R., Sharma, V., Lukasiewicz, A. (Eds.), *Disaster Risk Reduction in Asia Pacific: Governance, Education and Capacity.* Springer Nature, Singapore, pp.37–54. https://doi.org/10.1007/978-981-16-4811-3_3

Kenney C and Phibbs S (2015) 'A Māori love story: Community-led disaster management in response to the Ōtautahi (Christchurch) earthquakes as a framework for action', *International Journal of Disaster Risk Reduction,* 14(1):46–55. https://doi.org/10.1016/j.ijdrr.2014.12.010

Kenney C and Phibbs S (2014) 'Shakes, Rattles and Roll Outs: The Untold Story of Māori Engagement with Community Recovery, Social Resilience and Urban Sustainability in Christchurch, New Zealand', *Procedia Economics and Finance,* 18:754–762. https://doi.org/10.1016/S2212-5671(14)00999-X

King M (2004) *The Penguin History of New Zealand,* [Rev. ed.] Penguin Books, Auckland, N.Z.

Kingston DG, Lavers DA and Hannah DM (2016) 'Floods in the Southern Alps of New Zealand: the importance of atmospheric rivers', *Hydrological Processes,* 30,(26):5063–5070. https://doi.org/10.1002/hyp.10982

Kukutai T and Taylor J (2016) 'Data sovereignty for indigenous peoples: current practice and future needs', in Kukutai, T., Taylor, J. (Eds.) *Indigenous Data Sovereignty, Toward an Agenda.* ANU Press, pp.1–22.

Lane EM, Borrero J, Whittaker CN, Bind J, Chagué-Goff C, Goff J, Goring D, Hoyle J, Mueller C, Power WL, Reid CM, Williams JH and Williams SP (2017) 'Effects of Inundation by the 14th November, 2016 Kaikōura Tsunami on Banks Peninsula, Canterbury, New Zealand', *Pure Applied Geophysics,* 174:1855–1874. https://doi.org/10.1007/s00024-017-1534-x

Lee-Morgan J, Penetito K, Mane J and Eruera N (2021) 'Marae Ora Kāinga Ora: Indigenous Health and Wellbeing Solutions via Time-Honored Indigenous Spaces', *Genealogy,* 5(4):99. https://doi.org/10.3390/genealogy5040099

Lilley S (2019) 'Developing Māori collections', *Collection and Curation,* 38(1):15–18. https://doi.org/10.1108/CC-09-2017-0041

Lockhart C, Houkamau CA, Sibley CG and Osborne D (2019) 'To Be at One with the Land: Māori Spirituality Predicts Greater Environmental Regard', *Religions,* 10(7):427. https://doi.org/10.3390/rel10070427

Mahuta RT (1974) Whaikoorero a study of formal Māori speech (Thesis). https://hdl.handle.net/10289/11485

Maldonado JK, Colombi B and Pandya R (2014) *Climate Change and Indigenous Peoples in the United States: Impacts, Experiences and Actions.* Springer International Publishing AG, Cham. https://doi.org/10.1007/978-3-319-05266-3

Marsden M (1992) *Kaitiakitanga: a definitive introduction to the holistic world view of the Māori.* Ministry for the Environment, Wellington, N.Z.

Mason K, Lindberg K, Haenfling C, Schori A, Marsters H, Read D and Borman B (2021) 'Social Vulnerability Indicators for Flooding in Aotearoa New Zealand', *International Journal of Environmental Research and Public Health,* 18(8):3952. https://doi.org/10.3390/ijerph18083952

McIntosh T and Mulholland M (2011) *Māori and social issues.* Huia, Wellington, New Zealand.

McKibbon KA and Gadd CS (2004) 'A quantitative analysis of qualitative studies in clinical journals for the 2000 publishing year', *BMC Medical Informatics and Decision Making,* 4(11). https://doi.org/10.1186/1472-6947-4-11

McNatty W and Roa T (2021) 'Whanaungatanga: An Illustration of the Importance of Cultural Context', *He Puna Kōrero: Journal of Māori and Pacific Development,* 3(1):88–96. https://search.informit.org/doi/10.3316/INFORMIT.884027781311679

Melia N, Dean S, Pearce HG, Harrington L, Frame DJ and Strand T (2022) 'Aotearoa New Zealand's 21st-Century

Wildfire Climate', *Earth's Future,* 10:e2022EF002853. https://doi.org/10.1029/2022EF002853

Metge J (1967) *The Maoris of New Zealand, Societies of the World.* Routledge & K. Paul, London.

Metge J (1990) 'Te Rito O Te Harakeke: Conceptions of the Whaanau', *Journal of the Polynesian Society,* 99:55–92.

Moeke-Pickering TM (1996) *Māori Identity Within Whānau.* University of Waikato.

Morgan TKKB (2008) *The value of a Hapū perspective to municipal water management practice : mauri and its potential contribution to sustainability decision making in Aotearoa New Zealand* (Thesis). University of Auckland. http://hdl.handle.net/2292/52062

Murton B (2012) 'Being in the place world: toward a Māori "geographical self"', *Journal of Cultural Geography,* 29:87–104. https://doi.org/10.1080/08873631.2012.655032

O'Carroll AD (2013) 'Virtual Whanaungatanga: Māori utilizing social networking sites to attain and maintain relationships', *AlterNative: An International Journal of Indigenous People,* 9(3):230–245. https://doi.org/10.1177/117718011300900304

Department of the Prime Minister and Cabinet (2007) National Hazardscape Report. NEMA website www.civildefence.govt.nz/resources/national-hazardscape-report, accessed 17 January 2025.

Okaya D, Stern T and Davey F (2007) A Continental Plate Boundary: Tectonics at South Island, New Zealand. American Geophysical Union, Washington, USA.

Orange C (2004) *An illustrated history of the Treaty of Waitangi,* [New ed.]. ed. Bridget Williams Books, Wellington, N.Z.

O'Steen B (2021) 'The Self Who Teaches and Learns: Sharing the Space After a Disaster', in Hall, M.P., Brault, A.K. (eds) *Academia from the Inside.* Palgrave Macmillan, Cham, pp.149–168.

Partridge R, Bouslough DB, Proano L, Soliai-lemusu S, Avegalio F and Anesi A (2011) 'Medical Disaster Relief after the 2009 American Samoan Tsunami: Lessons Learned', *Prehospital and Disaster Medicine,* 26(s1):1–21. https://doi.org/10.1017/S1049023X11003530

Paulik R, Craig H and Collins D (2019) 'New Zealand Fluvial and Pluvial Flood Exposure', Report number: 2019118WN Affiliation: National Institute of Water and Atmospheric Research.

Paulik R, Zorn C, Wotherspoon L and Sturman J (2023) 'Modelling national residential building exposure to flooding hazards', *International Journal of Disaster Risk Reduction,* 94:103826. https://doi.org/10.1016/j.ijdrr.2023.103826

Phibbs S, Kenney C and Solomon M (2015) 'Ngā Mōwaho: an analysis of Māori responses to the Christchurch earthquakes', *Kōtuitui: New Zealand Journal of Social Sciences Online,* 10(2):72–82. https://doi.org/10.1080/1177083X.2015.1066401

Pihama DL and Gardiner D (2005) Building Baseline Data on Māori, Whānau Development and Māori Realising Their Potential Literature Review: Developing Leadership 63.

Poli T, Lay M, Owen M and Boston M (2022) 'Building the cultural capacity of engineers in Aotearoa, New Zealand: A Students Perspective', in 33rd A*ustralasian Association for Engineering Education Conference (AAEE 2022): Future of Engineering Education.* https://search.informit.org/doi/10.3316/informit.895401765783457

Putnam RD (2000) *Bowling alone: the collapse and revival of American community.* Simon & Schuster, New York.

Reid KJ, Rosier SM, Harrington LJ, King AD and Lane TP (2021) 'Extreme rainfall in New Zealand and its association with Atmospheric Rivers', *Environmental Research Letters,* 16(4):044012. https://doi.org/10.1088/1748-9326/abeae0

Reisinger A, Kitchin, R, Chiew F, Hughes L, Newton P, Schuster S, Tait A, Whetton P, Barnett J, Becken S, Blackett P, Boulter S, Campbell A, Collins D, Davies J, Dear K, Dovers S, Finlay K, Glavovic B and Reser J (2014) Climate Change 2014: Impacts, Adaptation and Vulnerability. Working Group II Contribution to the Fifth Assessment Report of the IPCC: Australasia Intergovernmental Panel on Climate Change. https://ianas.org/wp-content/uploads/2020/08/ClimateChange_IPCC_A.pdf

Ritchie JE (1992) *Becoming bicultural.* Huia Publishers, Wellington, N.Z.

Roberts M (2013) 'Ways of Seeing: Whakapapa', *SITES A Journal of Social Anthropology and Cultural Studies,* 10,(1):93–120. https://doi.org/10.11157/sites-vol10iss1id236

Rosser B, Dellow S, Haubrock S and Glassey P (2017) 'New Zealand's National Landslide Database', *Landslides,* 14:1949–1959. https://doi.org/10.1007/s10346-017-0843-6

Ruru J and Kohu-Morris J (2020) 'Maranga Ake Ai' The Heroics of Constitutionalising Te Tiriti O Waitangi/The Treaty of Waitangi in Aotearoa New Zealand', *Federal Law Review,* 48(4):556–569. https://doi.org/10.1177/0067205X20955105

Shaw R (2021) *Tūrangawaewae: Identity and Belonging in Aotearoa New Zealand.* Massey University Press.

Smith GH (1997) *The development of kaupapa Māori: theory and praxis.* University of Auckland.

Smith LT (1999) *Decolonizing methodologies: research and indigenous peoples.* Zed Books, New York.

Soons JM and Selby MJ (1992) *Landforms of New Zealand,* 2nd ed. Longman Paul, Auckland, N.Z.

Stokes E (2004) 'Ohaaki: a power station on Māori land', Te Mātāhauariki Institute monograph series. University of Waikato, Hamilton, N.Z. https://hdl.handle.net/10289/6092

Tapsell P (2002) 'Marae and Tribal Identity in Urban Aotearoa/New Zealand', *Pacific Studies,* 25(1).

Te Puni Kōkiri (1999) *Discussion paper on the review of the Māori Community Development Act 1962,* Ministry of Māori Development, Wellington, N.Z.

Te Rito JS (2007) 'Whakapapa and whenua: an insider's view', *MAI Review,* 2007(3). https://journal.mai.ac.nz/system/files/maireview/79-193-1-PB.pdf

Temm P (1990) *The Waitangi Tribunal: the conscience of the nation.* Random Century, Auckland, N.Z.

Thom RRM and Grimes A (2022) 'Land loss and the intergenerational transmission of wellbeing: The experience of iwi in Aotearoa New Zealand', *Social Science & Medicine,* 296:114804. https://doi.org/10.1016/j.socscimed.2022.114804

Thornley L, Ball J, Signal L, Lawson-Te Aho K and Rawson E (2015) 'Building community resilience: learning from the Canterbury earthquakes', *Kōtuitui: New Zealand Journal of Social Sciences Online,* 10(1):3–35. https://doi.org/10.1080/1177083X.2014.934846

Thornton A (1989) 'Some Reflections on Traditional Māori Carving', *The Journal of the Polynesian Society,* 98(2)47–166. https://www.jstor.org/stable/20706270

Unwin DJ (1996) 'GIS, spatial analysis and spatial statistics', *Progress in Human Geography,* 20(4):540–551. https://doi.org/10.1177/030913259602000408

Vayda AP (1970) *Māori warfare.* Polynesian Society Māori monographs; no. 2. Reed for the Polynesian Society, Wellington, N.Z.

Waitangi Tribunal (1984) *Report of the Waitangi Tribunal on the Kaituna River claim (Wai 4).* 2nd ed. The Tribunal, Wellington, N.Z.

Walker S, Eketone A and Gibbs A (2006) 'An exploration of kaupapa Māori research, its principles, processes and applications', *International Journal of Social Research Methodology,* 9(4):331–344. https://doi.org/10.1080/13645570600916049

Wertz FJ (2014) 'Qualitative inquiry in the history of psychology', *Qualitative Psychology,* 1(1):4–16. https://doi.org/10.1037/qup0000007

Wibowo W, Purwa T, Bahri ENA, Ulama BSS, Wilantari RN (2021) 'Impacts of Earthquakes on Consumer Price Index and Inflation: A Case Study in West Nusa Tenggara Province, Indonesia', *Journal of Physics: Conference Series 1863.* https://doi.org/10.1088/1742-6596/1863/1/012062

Wihongi H (2013) Tangihanga: Through the eyes of young Māori women. [Thesis] University of Waikato, Hamilton, N.Z.

Williams HW (1957) A Dictionary of the Māori Language.

Workman K (2016) 'From a search for Rangatiratanga to a struggle for survival - criminal justice, the state and Māori, 1985 to 2015', *Journal of New Zealand Studies,* 22:89–104. https://search.informit.org/doi/10.3316/informit.206526297651486

Zhang Y-X, Goebel T, Peng Z, Williams C, Yoder M and Rundle J (2018) 'Earthquakes and Multi-hazards around the Pacific Rim, Vol. 1: Introduction', in: Zhang, Y., Goebel, T., Peng, Z., Williams, C.A., Yoder, M., Rundle, J.B. (Eds.) *Earthquakes and Multi-Hazards Around the Pacific Rim, Vol. I,* Pageoph Topical Volumes. Birkhäuser, Cham, pp. 1–4. https://doi.org/10.1007/978-3-319-71565-0_1

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[Te Arawa, Tūwharetoa, Te Āti Haunui-a-Pāpārangi, Ngāti Kahungunu, Ngāti Pāhauwera, Ngāti Raukawa, Ngāi Tahu]

Dr Tūmanako Fa`aui has extensive experience in Māori focused research which includes research around the MV Rena grounding and the impacts on hapū and iwi, marae resilience and hazard management with hapū and iwi, climate resilience, geothermal resources and water infrastructure issues for marae.

[Te Arawa, Ngāti Uenukukōpako, Ngāti Whakahemo]

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Abstract

Environmental hazards and climate change disproportionately affect Indigenous peoples and raises important concerns for social equity, environmental justice and disaster risk reduction. The under-representation of Indigenous peoples in natural hazard policymaking also impacts on the acceptability and relevance of disaster risk reduction initiatives to First Nations peoples. Indigenous concepts, values and understandings of environmental justice are pertinent to climate change mitigation, transformative practice and sustainable futures. This research was a collaboration between Māori academics and Māori community members and explores local understandings of Indigenous peoples of disaster risk reduction and highlights the need to maintain harmony and balance among humans and in relation to the natural world. Using a papakāinga [traditional village] framework and rongoā [healing systems], the study demonstrates how traditional Māori practices can address environmental challenges such as Per- and Poly Fluoroalkyl Substances (PFAS) contamination, land degradation, biodiversity loss and increasing flood events. Findings of this study highlight the importance of Indigenous cultural strengths and holistic frameworks to achieve climate resilience and sustainable futures.

Whaowhia te Kete Mātauranga: Papakāinga as a Hapū Resilience Framework

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Introduction

Environmental hazards and climate change disproportionately affect Indigenous people, exacerbating existing vulnerabilities and raising significant concerns regarding social equity, environmental justice and disaster risk reduction. According to the Intergovernmental Panel on Climate Change (IPCC 2023), Indigenous communities face heightened disaster risks due to their dependence on natural resources, geographic exposure to climate-related events, and limited access to adaptive resources. Working with the Ngāti Raukawa Northern Marae Collective, Ngāwairiki – Ngāti Apa and Ngāti Hauiti ki Rātā from the lower North Island of Aotearoa New Zealand, this research centres the voices of kaumātua [elders] and whānau [families] while exploring how strengthened connections to whenua [land] can enhance mauri [energetic life force] and foster collective wellbeing. Framed by a papakāinga [traditional village] view, the research prioritises intergenerational collaboration to mitigate pressing environmental challenges which are the legacy of colonisation such as confiscation of territory, land degradation, biodiversity loss and flooding while addressing ongoing intergenerational trauma exacerbated by contemporary environmental and social issues.

Interrelating traditional knowledge with contemporary disaster risk reduction strategies enables this study to highlight the importance of maintaining harmony and balance between people and the natural world while sharing how Indigenous perspectives can shape equitable and effective responses to environmental crises. According to Professor Huhana Smith (Smith n.d). Māori knowledge systems such as kaupapa Māori and mātauranga Māori [Māori traditional ancestral knowledge] play critical roles in fostering sustainable environmental practices. Smith suggests that these systems emphasise interconnected relationships

between people, land and ecosystems and reflect a deep ecological understanding. Projects formed by these frameworks prioritise the integration of Indigenous knowledge with modern scientific approaches and foster beneficial outcomes for iwi [tribes] and hapū [subtribes] while addressing contemporary environmental challenges. Smith highlights that research outcomes are designed to create shared benefits for all communities (Smith n.d.).

This paper tells the story of one of the Rangitīkei River hapū [family groups] within the Ngāti Raukawa Northern Marae Collective, that is dealing with PFAS contamination of their ancestral lands from the Royal New Zealand Air Force Base at Ohakēā. The hapū address these historical and contemporary challenges by using papakāinga [traditional village framework] and rongoā [Māori healing systems] to foster collective wellbeing, reduce disaster risk and pursue environmental justice.

Note on terminology: This article uses first person pronouns as the primary author is narrating from her experience as a hapū member within the research team.

Site history and PFAS contamination

Indigenous communities worldwide often face disproportionate environmental risks including effects of pollution (Fernández-Llamazares et al. 2020) and climate change (Redvers et al. 2023). For Indigenous peoples in white, settler-colonial societies additional affects include land alienation or loss, marginalisation, discrimination, food insecurity, poor mental health and reduced resilience (Cormack et al. 2019; Moeke-Pickering et al. 2015; Moeweka Barns and McCreanor 2019). Living along the banks of the Rangitīkei River our hapū [descendants of a common ancestor] have endured intergenerational trauma (Pihama et al. 2014) since the confiscation of ancestral lands through pene raupatu [confiscation by way of the pen] in the 1800s (Richardson et al. 2024). This disconnection from the whenua has profoundly affected the community and the environment, leading to a decline in mauri [life force]. Recently, contamination of traditional homelands and waterways by PFAS chemicals has compounded environmental injustice, threatening health as well as cultural and spiritual wellbeing (Savage and Richardson 2021). These ongoing consequences reflect the challenges documented in the Waitangi Tribunal[1] claims as Ngāti Parewahawaha, particularly for whānau at Mangamāhoe.

In Aotearoa New Zealand, PFAS, often referred to as 'forever chemicals' (Environmental Protection Authority 2023), have been widely used in firefighting foams, particularly at military bases. At the Royal New Zealand Air Force Base Ohakēā, PFAS-containing foams were discharged onto the runway between 1985 and 2005 as a regular part of fire suppression training and emergency operations. This led to environmental contamination.

Investigations by the New Zealand Defence Force identified significant PFAS presence in the surrounding soil and water, including the Mākōwhai Stream. The spread of PFAS from the Air Force Base at Ohakēā (see Figure 1) has created a long-term environmental disaster for Indigenous lands to the south. The proximity of the Mangamāhoe eastern boundary to the Air Force Base at Ohakēā has placed our whenua [land] directly in the path of PFAS contamination flow, a chemical that does not break down in water and persists in the environment for generations to come. PFAS is gradually contaminating ground water at a rate of 50-100 metres per year. The plume is expected to expand to approximately 4,300 hectares over the next 50 years, with contamination lasting up to 150 years (Pattle Delamore Ltd 2019). Given the high water table in this area, any flooding worsens the effects, as PFAS is carried into the soil and deposited permanently. Over time, the compound will inevitably spread to the river mouth and surrounding beaches as it is carried in water. Indigenous communities reliant on these lands and waters face inter-generational challenges as the chemical compromises drinking water bores and contaminates the land used for agriculture and customary use. The risk of buying out the remaining ancestral land by the New Zealand Defence Force, as an imposed solution to the contamination, threatens our identity and traditional practices that are tied to the land and waterways.

PFAS contamination has had severe consequences for our community. We can no longer grow kai [food] on our land or drink from groundwater sources, which effects our health, traditional practices and resilience. The Mākōwhai Stream has been contaminated, making it impossible to gather kai. All biota living in the streams and edible vegetation traditionally harvested are now contaminated, rendering traditional food sources unsafe and environmental and health effects are expected to persist (Ministry for the Environment n.d.). The long-lasting PFAS compounds pose serious threats to the environment, traditional landowners and the health of the surrounding communities. Local farmers are aware that PFAS-contaminated concrete from an old runway surface was dumped along the banks of the Rangitīkei River and on Māori reserve land. This act polluted the already neglected riparian river margins, intensifying risk of extending contamination to the land, water and remaining ecosystems.

Soil testing confirms contamination of the waterways and land (Pennington 2024) and raises concerns for our health, environment and ability to sustain traditional practices. Chemical spread and rising levels of pollutant (Pennington 2024) threaten our connection to the land

1. Established by *Treaty of Waitangi* Act 1975, the Waitangi Tribunal provides a legal process by which Māori Treaty claims could be investigated. Tribunal inquiries contribute to the resolution of Treaty claims and to the reconciliation of outstanding issues between Māori and the Crown (Waitangi Tribunal n.d.).

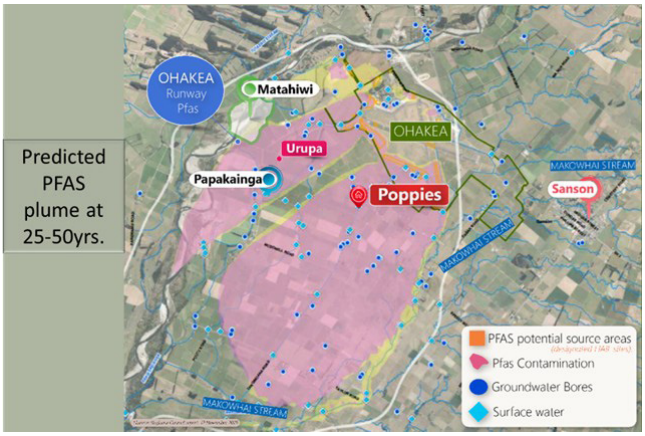

Figure 1: Overlay of whenua including Papakāinga housing, Poppies homestead, the urupā [cemetery] in the plume. The blue circle outside of the plume shows the location of the old runway spoil/ Māori reserve land, riparian margin restoration and whānau farm.

Source: Adapted from RNZAF Base Ohakea Investigation: Comprehensive Site Investigation Report (Pattle Delomore Ltd., 2019).

that affects our physical environment and our cultural identity. Despite precautionary measures from health officials (such as distributing bottled water between 2018 and 2022 until a NZD$12 million piped-water scheme was opened (Pennington 2014)), the long-term health effects have been played down and remain largely unknown. Farm owners as well as local and regional councils are tasked with monitoring the slow-spread contamination. However, full cleanup and recovery could take generations, thus is the magnitude of the environmental injustice faced by our community. PFAS contamination of the land and waterways has impeded customary practices associated with kaitiakitanga [guardianship] and so we are looking towards traditional innovation to address this.

Research design

Kaupapa Māori framework

This study used kaupapa Māori methodologies, prioritising Māori knowledge, tikanga Māori [customary practices] and cultural values (Smith 2012). Kaupapa Māori challenges inequities and seeks transformation through Indigenous-led approaches to research. Using a kaupapa Māori framework, this research adopted a papakāinga [traditional village] lens and is grounded in qualitative methodologies. According to Pihama (2001), kaupapa Māori research prioritises addressing injustices, uncovering inequities and driving transformative change. With whānau at the centre of this inquiry, Winiata (2002) emphasised the importance of researching people at home, by people from home, where 'home' typically refers to the marae or papakāinga. This approach ensures that the voices of whānau are faithfully represented and remain true to their origins. Since whānau are often cautious of external researchers, they may withhold important information or provide inaccurate details to protect sensitive kōrero [oral information] unique to their community. Thus, careful handling is critical to maintain the credibility of the kōrero to ensure that Indigenous knowledge is accurately reflected by researchers who are either trusted whānau members of and/or known to the community.

Methods

This research was a collaboration between Māori academics and hapū along the Rangitīkei River in Aotearoa New Zealand. It engaged mātauranga Māori [Māori traditional ancestral knowledge] and local intelligence to develop culturally grounded disaster risk reduction initiatives for hapū along the banks of the Rangitīkei River from the headwaters to the sea in the central North Island of Aotearoa New Zealand. Findings presented draw on several research projects that have been carried out over the last decade, including a report developed by the Ngāti Parewahawaha hapū for our Waitangi Tribunal claim, which is currently in the process of being heard by the Crown.

The research involved:

- **qualitative interviews:** semi-structured discussions with knowledge holders
- **wānanga [gatherings]:** collaborative workshops to share knowledge and develop disaster preparedness plans
- **focus groups:** facilitated discussions about community-led approaches to resilience and recovery
- **document review:** review of mātauranga from the early 1800s within traditional sources such as whānau manuscripts and recorded and written kōrero [talk].

Participants and recruitment

The trustees of the marae committee sought support to gather evidence on behalf of whānau affected by river flooding and chemical contamination originating from the adjacent Ohakēā Air Force Base. They also emphasised the need to develop disaster preparedness plans to address the ongoing effects of flooding and to improve community resilience. This process helped the development of disaster preparedness plans based on traditional knowledge, collaboration and shared experiences. Participants included whānau, marae trustees, kaumātua [elders] and rangatahi [youth] from hapū along the Rangitīkei River. Recruitment prioritised local connections with participants invited by marae [gathering place for descendants of an ancestor] committees and iwi leaders to ensure culturally appropriate engagement.

Interviews and hui

The research team attended the monthly marae meeting to listen to whānau concerns about disaster unpreparedness, particularly regarding flood and contamination risks. This hui, with 20 whānau in attendance, introduced

plans to hold a series of wānanga aimed at sharing traditional knowledge, building resilience and creating response strategies. Twelve whānau of the papakāinga development were interviewed and 50 hui participants (confident in their shared kinship) shared narratives about environmental challenges and traditional knowledge. These discussions aimed to support the development of hapū-based resilience plans and foster community capabilities.

While formal research was used to document mātauranga Māori related to disaster risk reduction and hapū resilience, sharing of knowledge through wānanga prompted hapū members to implement programmes to address concerns identified. Actions included establishing a papakāinga, replanting native bush, growing traditional kai off site, reconnecting to the land, learning how to identify and use native plants, teaching traditional cooking methods and sharing rongoā [traditional Māori healing systems such as plant medicine] with disaster-affected communities (Richardson 2024). Richardson et al. (2024) focused on sharing traditional medicine with communities affected by Cyclone Gabrielle.

Research limitations

This study faced some limitations including restricted information, time and resource constraints. While the use of a whānau researcher fostered trust and encouraged whānau to share sensitive kōrero, it is acknowledged that certain mātauranga Māori are protected and cannot be shared. The research was delayed due to COVID-19 pandemic restrictions and difficulties experienced booking marae post-pandemic due to demand for the facility. Limited funding and capacity restricted the ability to fully immerse within the papakāinga [traditional village], which would have provided a clearer understanding of the interwoven dynamics of whānau life, cultural practices and the lived experiences of environmental challenges. For some participants, competing demands on their time may have prevented them from attending or fully participating in collective wānanga activities. Despite these limitations, the research offers important insights while highlighting the need for sustained investment and flexible approaches to Indigenous-led research.

Papakāinga as an analytical template

Papakāinga has been used as a Māori housing tool kit (Rotorua Lakes District Council 2020) as a research topic (Menzies 2023; also see Cram et al. 2020) and as a case study in the development of quantitative kaupapa Māori methodology (Henry and Crothers 2019). However, we are unaware of scholarship that has used papakāinga as a template for organising and interpreting research material. The papakāinga template was developed by the first author and her whānau as the main analytical tool for this research. The template integrates mastery in emotional, cultural, spiritual, physical, environmental knowledge aligning with Māori worldviews and promoting collective wellbeing. Papakāinga [traditional village] highlights kinship, collective living and traditional knowledge systems to restore harmony between people and the environment. As a model for resilience, papakāinga enables whānau to strengthen ties to whenua, recover mauri and foster sustainable futures through Indigenous environment stewardship. The template incorporates the following Kaupapa [principles]:

- Mātauranga: traditional knowledge systems
- Te Taiao: the natural world, whenua and relationships between people and the environment
- Wairuatanga: spirituality, mauri, as well as the cosmological and cosmogonical features that are the basis for Indigenous identity
- Rongoā: traditional healing systems to support holistic wellbeing, balance and harmony
- Whakapapa: genealogy, identity, leadership, customary rights, institutional knowledge
- Kaitiakitanga: sustainability, protection, restoration and stewardship of the natural environment and its relationship to wellbeing
- Whānau: kinship ties, intergenerational support, kāinga, collective living and wellbeing
- Rangatiratanga: self-determination and control over one's destiny.

Acknowledging centuries of conversations and manuscripts, these themes emerged organically as key elements reflecting traditional knowledge systems and holistic wellbeing. The principles became the agreed overarching template – comprising Mātauranga, Te Taiao, Wairuatanga, Rongoā, Whakapapa, Kaitiakitanga, Whānau and Rangatiratanga – through which all interviews and research materials were analysed. Using a papakāinga lens (a model of collective living on ancestral lands) as a case study, we aimed to identify new possibilities for healing and recovery within the community. At the conclusion of the research, whānau reflected on their participation, sharing insights gained and emphasising the need for this research and the significance of the outcomes identified by kaumātua [elders].

Human ethics approval for the research was obtained from Massey University, approval number OM3 24/01.

Findings

This research shows the transformative potential of interweaving Indigenous knowledge systems into disaster risk reduction and environmental justice initiatives. Indigenous knowledges and practices, such as local environmental indicators for disaster preparedness,

can complement modern climate adaptation strategies. The papakāinga framework illustrates how traditional living systems can inform climate-resilient housing, land management and community planning. This section considers papakāinga and rongoā Māori as hapū resilience and disaster preparedness tools.

Papakāinga and collective wellbeing

The papakāinga framework emerged as a cornerstone to foster collective wellbeing and environmental stewardship within the research. Te Puni Kōkiri (2024) highlighted that papakāinga developments incorporate shared spaces and communal facilities such as gardens and orchards, which promote sustainable living and enhance cultural and spiritual connections. The papakāinga incorporates features that enable Māori communities to adapt, strengthen kinship ties and enhance whānau resilience through collective living. Papakāinga revitalises cultural practices such as karakia [rituals], rongoā [healing systems] and maara kai [village gardens], which support holistic health and environmental sustainability. The papakāinga framework serves as a model for sustainable development that balances human needs with environmental care.

Papakāinga embodies collective living, inter-generational support, a whakapapa [ancestral] connection to whenua [land, waterways, mountains] and a spiritual acknowledgment of overall wellbeing. By revisiting this traditional way of life, we can explore its relevance for whānau wellbeing, modern resilience planning, community health and environmental restoration.

Initial findings suggest that papakāinga strengthens kinship ties and fosters a reconnection with traditional knowledge systems crucial to address emerging environmental challenges. These ancient Māori knowledge systems offer transformative pathways to restore balance and harmony between people and the environment aligning with broader Indigenous understandings of environmental justice. Despite the potential for healing through papakāinga, our whānau continue to confront activities that degrade lands and waterways. Ongoing exposure to environmental hazard disproportionately affects local Indigenous communities (Fernández-Llamazaresm et al. 2020). This highlights the urgent need for inclusive and culturally relevant sustainable initiatives that recognise and integrate Indigenous concepts of environmental stewardship and justice.

Since the early 1800s, Ngāti Parewahawaha has resided in papakāinga along the Rangitīkei River where our marae was constructed in 1967. The traditional environment of papakāinga considers kaupapa tuku iho [values handed down by tupuna Māori] that underpin our ways of living, interpreting the world and analysing the teachings passed down through generations. Papakāinga illustrate the value of living as a whānau, highlighting hapū and local intelligence, shared hapū mātauranga [local knowledge], tikanga [customs] and kawa [protocols] and, importantly, the capacity for our whānau and mokopuna [generations to come] to build on the vision of sustainability through kaitiakitanga [guardianship].

A new whānau papakāinga at Mangamāhoe opened in January 2025 on the whenua of Ngāti Parewahawaha in accordance with the traditional notion of whānau working and living together in harmony. Rebuilding the papakāinga, restoring the surrounding native flora and addressing PFAS contamination are ways that our hapū are managing the ongoing risk of land confiscation. The stories of whānau have identified how our mātauranga [knowledge] to support papakāinga development mimics traditional notions of living, promotes safe housing for whānau and connects to whānau resilience.

Integration of Rongo ā Papakāinga framework

Research emphasises the holistic health benefits of using Indigenous frameworks, particularly within Māori communities (Reweti 2023; Wilson et al. 2021). Rongoā Māori, a traditional healing system, encompasses spiritual, emotional and physical wellbeing and effectively counters the adverse effects of environmental degradation. Ahuriri-Driscoll et al. (2022) highlighted that rongoā Māori connection with the land is integral to identity and wellbeing and emphasised the reciprocal healing relationship between people and environment. Further, restoring natural ecosystems, such as wetlands and native bush, contributes to environmental health and emotional healing for whānau.

Rongo ā wairua [spiritual wellbeing]

Traditional rituals such as karakia [mediation and prayer] and whakawaatea [clearing] connected participants with atua and celestial beings and reinforced a sense of purpose and balance in responding to environmental challenges (Richardson et al. 2024). At the heart of papakāinga life, karakia is practiced morning and night by specific knowledge holders to acknowledge atua, seek guidance and protect the wellbeing of the whānau. Karakia unites whānau and provides spiritual grounding and connection to foster a collective sense of purpose. When opening the papakāinga in January 2025, a traditional ritual was conducted to protect and reset the mauri [energy] of the site as explained by a hapū member, ‘Whakatō mauri [setting energy to a place] was done at the papakāinga to ensure those that live their flourish’ (PS 2024).

Māori spirituality is linked to the environment with loss of mauri ora [balance] linked to unhealthy whenua [land] and languishing native ecosystems (Harmsworth and

Awatere 2013). Knowledge of traditional rituals to restore noa [ordinariness] such as karakia [mediation and prayer] and whakawaatea are essential in disaster contexts. For example, following the devastating 6.1 magnitude Christchurch earthquake on 22 February 2011 that killed 185 people and injured thousands, both local and international first responders and Urban Search and Rescue Teams accessed local Ngāi Tahu kaumātua for whakawaatea and to debrief (Phibbs et al. 2015). In this way, rongo a wairua supports mental and physical wellbeing in times of stress as well as in post-disaster contexts.

Rongo ā tinana (physical wellbeing)

The physical health of whānau is closely tied to access to clean water and safe food sources. PFAS contamination has compromised these essentials, highlighting the urgent need for systemic change and restoration of Indigenous food systems based on local environmental knowledge. For example, a hapū member described the importance of traditional mātauranga Māori for planting and disaster planning:

> *As a whānau we hold hui (workshops) to pass on and practice our mātauranga Māori (traditional ways). By reading the tīkōuka tree in November we can determine whether the season ahead will be wet or dry. This knowledge allows us to prepare for what is coming between December and March, ensuring resilience and readiness for environmental changes.*
> (PR 2023)

The communal nature of papakāinga enables coordinated planning and mutual support during events such as flooding and drought. Whānau can collectively stock emergency supplies, create evacuation plans and implement sustainable infrastructure such as raised gardens or permeable pathways to reduce flood risks. Maara kai [village garden] initiatives reintroduce sustainable gardening practices rooted in ancestral knowledge as explained by a hapū member:

> *My great-great grandfathers' role was to protect the south side of the Rangitīkei Rriver and he was also a provider of kai (food) through a huge maara kai (village garden) which we were told ran a few kilometres along the riverbank and on the current site of Ohakēā Airforce Base. Many traditions were passed down to my father as he too was an avid village gardener, farmer…*
> (RR 2024)

Restoring customary gardening traditions and growing traditional foods promotes rangatiratanga [self-determination] while ensuring that the inter-generational transfer of knowledge and local food insecurity are addressed.

Rongo ā hinengaro (emotional wellbeing)

Disconnection from the whenua has profoundly affected our community and the environment, which has led to a decline in mental and emotional wellbeing. The communal support system inherent in papakāinga plays a vital role in positive mental health. It provides access to rongoā [traditional healing] passed down through the generations and creates spaces to kōrero [share], reflect and learn, which supports whānau to navigate challenges together. Research indicates that positive mental and emotional wellbeing buffers negative post-disaster psycho-social effects. Receiving and offering help promotes recovery and resilience for individuals and communities through supportive social networks and collective problem solving (Resilience Challenge n.d.).

Rongoā Māori, as a holistic and cultural healing practice, incorporates deep, personal connections with the natural environment. For centuries, whānau Māori have cultivated rongoā, passing its unique knowledge down through generations. The practice is derived from mātaturanga, which many Māori regard as central to their identity (Te Whatu Ora n.d). By embracing rongoā and strengthening communal bonds such as papakāinga, whānau can enhance their mental and emotional wellbeing, particularly in times of adversity, such as contemporary housing insecurity, as explained by a hapū member:

> *Our papakāinga is also a refuge for those hapū members requiring a retreat or homeless who work on the farm in return for lodgings. Recollections of kaumātua and kuia who would have their own cabins on the papakāinga showed the multi-generations residing there. Living together provided the support that all whānau could benefit from.*
> (MT 2024)

Rongo ā whānau (family and relationship wellbeing)

Whānau narratives emphasise the deep connection between whakapapa [genealogy] and the expression of rongoā [traditional healing practices] in papakāinga. This interconnectedness strengthens kinship ties through collective knowing and being. Living in a papakāinga provides a foundation where whanaungatanga [relationships] and intergenerational living create opportunities for caring to ensure all whānau members are supported holistically and to collectively practice rongoā. This maintains traditional healing spaces and the ability to pass on matauranga [knowledge] for future generations. A hapū member said:

Our papakāinga is a place where whakapapa (connection) and rongoā (traditional healing) come together. We are connecting to atua (celestial beings), tupuna (ancestors), who did the same, and ensuring our mokopuna (grandchildren) grow up knowing their role in protecting the land and caring for each other for the wellbeing of current and future generations.
(KS 2023)

The papakāinga hosts many wānanga [educational gatherings] where kaumātua [elders] share the whakapapa of protocols and plants used in healing. Whānau learn to see themselves as part of an interconnected system of wellbeing, care and restoration to strengthen both spiritual and physical wellbeing.

Rongo ā wānanga (ancestral knowledge - space to be)

Wānanga [collaborative learning spaces] are essential to foster intergenerational knowledge exchange and create shared strategies for resilience within papakāinga. Regular monthly gatherings at the marae guided the design of wānanga, creating opportunities for iterative learning and collaboration. Wānanga [gatherings] were held at the papakāinga and along the Rangitīkei River to consider environmental challenges such as flooding and land and water contamination. These gatherings helped to explore whakapapa, share ancestral memories, develop disaster preparedness plans and solutions to address flood risks that are grounded in mātauranga Māori and contemporary science. By connecting whānau to tradition and each other, wānanga enhances cultural identity collective wellbeing and resilience as explained by a hapū member:

Tamariki [children] and mokopuna [grandchildren] are central to the transmission of knowledge on the whenua where they live. Including them in wānanga is essential to ensuring the oral transmission of matauranga, as this knowledge is both for them and about them. Their presence at places and spaces of historical significance strengthens their connection to their heritage, ensuring they receive and carry forward the stories and traditions of their whānau.
(PR 2019)

Rongo ā whenua (environmental wellbeing)

Rongo ā whenua embodies the reciprocal relationship between people and the land, emphasising care, respect and restoration. Grounded in kaitiakitanga, it acknowledges that the land sustains the physical, spiritual and cultural wellbeing of whānau. Spinks (2018) documented a 6-year hapū-led project at Lake Waiorongomai and demonstrated that ecological restoration grounded in Māori cultural values leads to transformative change and enhanced the mauri [life force] of both the environment and the community. Practices like maara kai [village gardens] and the protection of waterways are integral to this relationship to help future generations thrive in harmony with the whenua. A hapū member reflected on the effects of land alienation as well as ongoing environmental degradation over her lifetime:

Our papakāinga [homelands] is south of the Ohakēā Airforce Base. There is only one stand of rongoā rākau [native trees] left on our reserve that we now have to protect. All around us is intensive dairy farming. Prior to the settler's arrival in 1840, our papakāinga was lush with ngahere (native bush), wetlands, birds, animals, insects, and freshwater kai [foods] feeding our emotional and spiritual wellbeing. In my lifetime, I recall the wetlands, but we don't have any now, so all the animals, birds and Rongoā [traditional herbs] have gone. The presence of the airforce base further restricts the growth of trees as concerns over bird strikes on aircraft remain a priority.
(RR 2023)

Within this papakāinga, whānau have faced significant environmental challenges, including land alienation, contamination of the river from industrial activity and flooding caused by the destruction of native bush and wetlands that traditionally slowed the river. To address these issues, whānau adopted ongoing wānanga to develop ways to mitigate risk both now and into the future. Initiatives are in place to reduce flooding through restoring the ngahere [forest] and wetland ecosystems that are opportunities for healing and reconnection to all that once was. Whānau also actively engage in riverbank restoration, planting harakeke and tīkōuka to stabilise the soil and to filter pollution while reviving habitats for native wildlife. These actions are in line with traditional Māori understandings about the relationship between humans and the environment as explained by one hapū member:

My father shared when we care for the papatuānuku [land], she cares for us. Protecting the whenua (land) and water isn't just an obligation; it's a privilege and a legacy we pass on to our mokopuna.
(RR 2024)

Disaster preparedness for whānau and hapū involves traditional environmental knowledge and modern disaster risk reduction strategies to mitigate and respond to flooding and contamination. Wānanga shared narratives of early flood warning indicators, like being informed by whānau up-river, which allows 12 hours for the lower reaches to move stock and prepare. Modern tools such as flood mapping are combined with these insights to create a disaster plan that integrates with tradition. Rongoā Māori is often narrowly viewed as involving plants and trees. However, the atua Rongo embodies ease and peace across

all facets of our environment. PFAS contamination which renders lands and waterways unsafe and raises important issues related to Indigenous environmental justice.

Environmental justice and restoration

Environmental hazard and climate change effects are patterned along lines of social inequality, with Indigenous peoples more likely to be affected, which raises important environmental and social justice concerns (Phibbs and Kenney 2022; Phibbs et al. 2024). The under-representation of Indigenous people in disaster risk reduction and environmental justice policymaking also impacts on the acceptability and relevance of sustainability initiatives to First Nations peoples. Indigenous concepts, values and understandings of environmental justice are pertinent to disaster risk reduction, climate change mitigation, transformative practice and sustainable futures (Phibbs and Kenney 2022). In white settler colonial societies, such as Aotearoa New Zealand and Australia, colonisation is a form of ecological violence that degrades Indigenous cultural integrity, health, food security, social resilience and environmental stewardship (Whyte 2018). The PFAS contamination of local whenua has rendered water use, the collection of kai [food] and traditionally harvested edible vegetation unsafe. In this case, the establishment of settler collective continuance through land confiscation, conversion for military purposes and subsequent environmental degradation has occurred at the expense of Indigenous cultural continuance (Whyte 2018).

Local indigenous understandings of environmental justice emphasise the need to maintain harmony and balance among humans and in relation to the natural world (Mihaere et al. 2024; Whyte 2018). A global review by Reyes-Garcia et al. (2019) highlighted that Indigenous peoples and local communities contribute significantly to restoring diverse ecosystems through leveraging traditional knowledge to enhance biodiversity and support ecosystem services. Papakāinga initiatives relocate Māori on ancestral lands, enabling local restoration efforts to effectively address both historical and contemporary environmental challenges. Hapū-led initiatives identified in this research include reintroduction of native vegetation as well as riparian and wetland restoration to mitigate the effects of PFAS contamination and flooding. The Māori concept of kaitiakitanga [guardianship] highlights the reciprocal relationship between people and the environment and focuses on long-term sustainability.

The weaving of Indigenous knowledge and Western emergency management approaches strengthens disaster preparedness and fosters community resilience. For example, Kenny et al. (2023) identified that integrating these epistemic approaches results in efficient and sustainable disaster risk reduction outcomes. Māori academics have highlighted the importance of customary environmental indicators and community-led initiatives in this context. Indigenous communities worldwide often face disproportionate environmental risks. The findings of this research reaffirm that Indigenous-led approaches, grounded in traditional knowledge and practices, are essential to build equitable and sustainable futures. By prioritising cultural strengths and holistic frameworks, communities can effectively address environmental crises while honouring their cultural heritage.

Conclusion

This study highlighted the transformative potential of Indigenous knowledge systems as embodied in the papakāinga framework to address contemporary environmental challenges. By reviving and adapting traditional Māori practices, this study illustrated how communities can reconnect with their whenua, restore mauri and enhance collective wellbeing. The findings advocate for the inclusion of Indigenous voices and methodologies in policymaking to create culturally relevant and sustainable disaster preparedness plans. As the whānau at Mangamāhoe prepared to inaugurate their new papakāinga in 2025, this research reaffirmed the value of Indigenous-led initiatives to confront environmental injustice, rebuild connections to the land and safeguard the wellbeing of current and future generations. Highlighting the role of papakāinga and rongoā in facilitating community resilience may have relevance for other Indigenous and marginalised groups advocating for equitable solutions to contamination and climate affects.

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References

Ahuriri-Driscoll A, Baker V, Hepi M, Hudson M, Mika C and Tiakiwai S (2022) 'Ko Au te Whenua, Ko te Whenua Ko Au: I Am the Land, and the Land Is Me: The Connection

between Rongoā Māori (Traditional Māori Healing) and the Land', *International Journal of Environmental Research and Public Health,* 19(14):8547. https://doi.org/10.3390/ijerph19148547

Cram F, Hutchings J and Smith J (2022 Editors) *Kainga tahi kainga rua: Maori housing realities and aspirations.* Wellington: Bridget Williams Books.

Cormack D, Harris R and Stanley J (2019) 'Māori experiences of multiple forms of discrimination: findings from Te Kupenga 2013', *Kōtuitui: New Zealand Journal of Social Sciences Online,* 15(1):106–122. https://doi.org/10.1080/1177083X.2019.1657472

Durie M (2016) Keynote presentation at the Indigenous Research Conference: *Ngā Pae o te Maramatanga,* November, Auckland University.

Environmental Protection Authority (2023) PFAS are forever – a complicated chemical family. EPA website www.epa.govt.nz/community-involvement/science-at-work/pfas/, accessed 8 December 2024.

Fernández-Llamazares A, Garteizgogeascoa Niladri Basu M, Sonnewend Brondizio E, Cabeza M, Martínez-Alier J, McElwee P and Reyes-García V (2020) 'A State-of-the-Art Review of Indigenous Peoples and Environmental Pollution', *Integrated Environmental Assessment and Management,* 16(3):324–341. https://doi.org/10.1002/ieam.4239

Harmsworth GR and Awatere S (2013) 'Indigenous Māori knowledge and perspectives of ecosystems', in Dymond JR ed. *Ecosystem services in New Zealand – conditions and trends.* Manaaki Whenua Press, Lincoln, New Zealand.

Henry E and Crothers C (2019) *Exploring Papakainga: A Kaupapa Maori quantitative methodology.* National Science Challenges Building Better Homes, Towns and Cities. Ko ngā wā kāinga hei whakamāhorahora. www.buildingbetter.nz/wp-content/uploads/2023/08/Henry__Crothers_2019_Exploring_Papakainga_KTKR.pdf

IPCC (Intergovernmental Panel on Climate Change) (2023) *AR6 Synthesis Report: Climate Change 2023.* IPCC website www.ipcc.ch/report/sixth-assessment-report-cycle/, accessed 30 November 2024.

Kenney C, Phibbs S, Meo-Sewabu L, Awatere S, McCarthy M, Kaiser L, Harmsworth G, Harcourt N, Taylor L, Douglas N and Kereopa L (2023) 'Indigenous Approaches to Disaster Risk Reduction, Community Sustainability, and Climate Change Resilience', in *Disaster Risk Reduction for Resilience: Climate Change and Disaster Risk Adaptation,* pp.37–59. Cham: Springer International Publishing.

Menzies D (2023) *Whāia ngā Putea: Māori housing support and barriers.* Ngāi Tahu Centre. www.canterbury.ac.nz/content/dam/uoc-main-site/documents/pdfs/reports/ntrc-contemporary-research-division/Whaia-nga-Putea-Huaki-DM-F-27-2-23.pdf

Mihaere S, Holman-Wharehoka M-t-o, Mataroa J, Kiddle GL, Pedersen Zari M, Blaschke P and Bloomfield S (2024) 'Centring localised indigenous concepts of wellbeing in urban nature-based solutions for climate change adaptation: case-studies from Aotearoa New Zealand and the Cook Islands', *Frontiers in Environmental Science.* 12:1278235. https://doi.org/10.3389/fenvs.2024.1278235

Moeke-Pickering T, Heitia M, Heitia S, Karapu R and Cote-Meek S (2015) 'Understanding Māori Food Security and Food Sovereignty Issues in Whakatane', *MAI Journal,* 4(1):30–42. www.journal.mai.ac.nz/system/files/MAIJrnl_V4Iss1_Pickering.pdf

Moewaka Barnes H and McCreanor T (2019) 'Colonisation, hauora and whenua in Aotearoa', *Journal of the Royal Society of New Zealand,* 49(sup1):19–33. https://doi.org/10.1080/03036758.2019.1668439

Redvers N, Aubrey P, Celidwen Y and Hill K (2023) 'Indigenous Peoples: Traditional knowledges, climate change, and health', *PLOS Global Public Health.* Oct 13(10):e0002474. https://doi.org/10.1371/journal.pgph.0002474

Richardson R, Pere AP, Savage K, Phibbs S and Kenney C (2024) 'Te Mauri AIO: a traditional Māori healing approach to Cyclone Gabrielle', National Sustainability Society Conference. University of Washington, Seattle, 9–12 September 2024.

Ross H, Haque CE and Berke, F (2024) 'Transmission of knowledge and social learning for disaster risk reduction and building resilience: A Delphi study', *Sustainable Development,* 32(2):1525–1537. https://doi.org/10.1002/sd.2685, accessed 21 February 2025.

Rotorua Lakes District Council (2020) *He papakāinga, he hāpori taurikura te poupou rautaki: Homes and thriving communities strategic framework.* Prepared by Rotorua Lakes District Council on behalf of the Establishment Leadership Group, Rotorua.

Pattle Delamore Partners Ltd (2019) *RNZAF Base Ohakēā PFAS Investigation: Comprehensive Site Investigation Report.* Wellington. Ministry for the Environment. https://environment.govt.nz/assets/publications/land/Ohakea-CSIR_PartA-2019.pdf

Pennington P (17 July 2024) Toxic firefighting foam: High levels persist at Ohakēā. *RNZ* website www.rnz.co.nz/news/national/522336/toxic-firefighting-foam-high-levels-persist-at-ohakea, accessed 3 February 2025.

Phibbs S, Richardson R, Pere AP, Savage K and Kenney C (2024) 'Environmental justice and indigeneity: A Māori view', National Sustainability Society Conference. University of Washington, Seattle, September 9–12, 2024.

Phibbs S and Kenney C (2022) 'Indigenous Responses to Natural Hazard Events', in Edited by Tara K. McGee,

Edmund C. Penning-Roswell (2022) *Handbook of Environmental Hazards and Society.* London and New York: Routledge, pp.273–286. https://doi.org/10.4324/9780367854584-24

Phibbs S, Kenney C and Solomon M (2015) 'Ngā Mōwaho: an analysis of Māori responses to the Christchurch earthquakes', *Kotuitui: New Zealand Journal of Social Sciences* Online, 10(2):72–82. http://dx.doi.org/10.1080/1177083X.2015.1066401

Pihama L, Reynolds P, Smith C, Reid J, Smith LT and Te Nana R (2014) 'Positioning Historical Trauma Theory within Aotearoa New Zealand', *AlterNative: An International Journal of Indigenous Peoples,* 10(3):248–262. https://doi.org/10.1177/117718011401000304

Pihama L (2001) *Tīhei mauri ora: Honouring our voices: Mana wahine as a kaupapa Māori theoretical framework.* Doctoral thesis. University of Auckland.

Resilience Challenge (n.d.) *Psychosocial response and recovery.* Policy Brief. https://resiliencechallenge.nz/wp-content/uploads/Psycho-Social-Response-and-Recovery-Policy-Brief.pdf

Reweti A (2023) 'Understanding how whānau-centred initiatives can improve Māori health in Aotearoa New Zealand', *Health Promotion International,* 38(4):daad070. https://doi.org/10.1093/heapro/daad070

Reyes-García V, Fernández-Llamazares Á, McElwee P, Molnár Z, Öllerer K, Wilson SJ and Brondizio ES (2019) 'The contributions of Indigenous Peoples and local communities to ecological restoration', *Restoration Ecology,* 27:3–8. https://doi.org/10.1111/rec.12894

Savage K and Richardson R (2021) *Tūāpapa Paper Five PFAS Chemicals and the Crown Response to Contamination from Ōhakea Air Force Base.* https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_173456333/Wai%202200,%20M017.pdf

RNZ (Radio New Zealand) (17 December 2020) Firefighting foam: EPA sets deadline to phase out damaging types. RNZ website www.rnz.co.nz/news/national/433055/firefighting-foam-epa-sets-deadline-to-phase-out-damaging-types, accessed 29 November 2024.

Smith H (n.d.) Using Māori knowledge systems to protect the environment. In *Rangahau – Research at Massey University.* Palmerston North. Massey University website https://sites.massey.ac.nz/rangahau2020/our-research-stories/using-maori-knowledge-systems-to-protect-the-environment/, accessed 3 December 2024.

Smith LT (2012) *Decolonizing methodologies: Research and Indigenous peoples* (2nd ed.). Zed Books.

Spinks AHC (2018) *Restoring the Mauri of coastal dune lake ecosystems: The case study of Lake Waiorongomai.* Doctoral thesis. Massey University.

Te Puni Kōkiri (2024) Te whakatū papakāinga. Ministry of Mauri Development website www.tpk.govt.nz/mi/nga-putea-me-nga-ratonga/maori-housing-support/supporting-new-homes-an d-papakainga/papakainga-planning, accessed 17 January 2025.

Te Whatu Ora (n.d.) Rongoā Māori. Wellington: Health New Zealand. www.tewhatuora.govt.nz/health-services-and-programmes/maori-health/rongoa-maori

Waitangi Tribunal (n.d.) About the Waitangi Tribunal. Waitangi Tribunal website https://waitangitribunal.govt.nz/en/about/about-the-waitangi-tribunal/about-the-waitangi-tribunal, accessed 17 January 2025.

Wilson D, Moloney E, Parr JM, Aspinall C and Slark J (2021) 'Creating an Indigenous Māori-centred model of relational health: A literature review of Māori models of health', *Journal of Clinical Nursing,* 30(23–24):3539–3555. https://doi.org/10.1111/jocn.15859

Winiata Whatarangi (2002) 'Repositories of Ropu Tuku Iho: a contribution to the survival of Māori as a people'. Wellington: LIANZA Conference, 2002.

Winiata W (2005) The Reconciliation of Kāwanatanga and Tino Rangatiratanga. http://firstfound.org/wrrt2005/rua_rautau_lecture_2005,%20Whatarangi%20Winiata_The%20Reconciliation%20of%20Kawanatanga%20and%20Tino%20Rangatiratanga.htm

Whyte K (2018) 'Settler Colonialism, Environmental Justice', *Environment and Society* 9(1):125–144. www.jstor.org/stable/26879582

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Abstract

Iwi, hapū and Māori communities have consistently demonstrated an ability to effectively engage in readiness, response and recovery for catastrophic hazard events in Aotearoa New Zealand. These actions are operationalised, both independently and in collaboration with local Civil Defence and Emergency Management (CDEM) groups. There are increasing calls from the Aotearoa New Zealand Government and from iwi and hapū to formalise relationships and support available. Little work has been done to understand what the perspectives and experiences of Māori and non-Māori emergency managers have been in navigating past events and planning for future ones. This qualitative research included a series of interviews with emergency managers from across the country on barriers and opportunities for Māori participation in response and recovery. It compares participant experiences with findings from recent reports, research and formal inquiries. This study provides recommendations for areas of focus for the emergency management sector in Aotearoa New Zealand to effectively optimise Māori response and recovery.

Emergency managers' perspectives on Māori response and recovery approaches: managing catastrophic hazard events in Aotearoa New Zealand

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Introduction

Māori have played an important role in emergency management for a number of natural hazard events including the 2010–11 Canterbury and 2016 Kaikōura earthquakes, the Edgecumbe flood in 2017, the 2019 Tasman Nelson bushfires and the 2023 Cyclone Gabrielle severe weather event. Across Aotearoa, there are examples of iwi [tribe] and hapū [sub-tribes] effectively responding to disasters (Bush International Consulting 2024; Kenney et al. 2015; Carter and Kenney 2018) and preparing their communities for future disaster events. Ngāi Tahu and Ngāti Porou are 2 iwi that are installing emergency management containers at marae that are stocked with supplies such as generators, blankets and food as well as installing Starlink satellite communication systems for marae (Jacobs 2023; Te Rūnanga o Ngāi Tahu 2023). Te Rūnanga o Ngāi Tahu have partnered with the Natural Hazards Commission-Toka Tū Ake to produce a series of videos aimed at Ngāi Tahu whānau [family] to encourage them to prepare for an Alpine Fault rupture using pūrākau [traditional stories].

The Aotearoa New Zealand Government has outlined its commitment to optimise the effort of iwi Māori to benefit all people in an emergency. There are clear national directives for the need to work effectively with iwi, hapū and Māori partners in emergency management but scant guidance on how this is to be achieved equitably at local and regional levels (Technical Advisory Group Department of Prime Minister and Cabinet 2017). From a research

perspective, work that explores the perspectives of emergency managers on working with Tangata Whenua is limited as are Māori approaches to emergency management in acute disaster settings.

This qualitative research project was developed at the request of iwi, hapū and other Māori entities to address knowledge gaps in Māori emergency management theory, knowledge and practices. The research aimed to develop new knowledge to increase understanding about the roles of Māori attributes (knowledges, values and practices) in managing catastrophic emergencies.

Emergency management is legislated in Aotearoa New Zealand, overseen by a national emergency management infrastructure and enacted at the regional level under the auspices of local councils (see, *Civil Defence and Emergency Management Act 2002)*. Synergies and areas of dissonance between regional emergency management groups and local Tangata Whenua were documented during this research. The views of regional emergency managers (both Māori and non-Māori) are discussed.

Background

Emergency management in Aotearoa New Zealand is governed by the *Civil Defence and Emergency Management Act 2002* (CDEM Act).[1] The Act provides for the appointment, functions and powers of individuals engaged in civil defence and emergency management as well as civil defence emergency management planning and duties at national and regional levels. The national infrastructure was previously situated within the Department of Prime Minister and Cabinet. In December 2019, a new emergency management structure was authorised with the establishment of the National Emergency Management Agency (NEMA)[2] to be led by an independent chief executive. NEMA's various roles include providing advice to government on civil defence and emergency management matters; identifying hazards and risks; developing and evaluating the effectiveness of civil defence and emergency management; ensuring coordination at local, regional and national levels; promoting civil defence and emergency management and providing public education on how to prepare for, and act, in an emergency. NEMA also supports emergency management capability development, planning and operations through creating guidelines and standards as well as monitoring the performance of the 16 regional Civil Defence Emergency Management (CDEM) groups. Within these regional groups are joint committees that include elected councillors from each council within regional boundaries.

CDEM groups partner to create consortiums that include representatives from local authorities, emergency services, lifeline utilities and government departments. Groups deliver emergency management through their executives, planners and operational staff working with partner agencies to identify and understand (local) hazards and risks, prepare CDEM group plans and manage hazards and risks in accordance with the 4 cycles of an emergency (reduction, readiness, response and recovery) (Saunders et al. 2007).

Māori, iwi and hapū are not recognised within emergency management legislation. Neither the CDEM Act nor the *Local Government Act 2022*[3] makes mention of Māori or iwi. Recent Māori emergency management initiatives have been challenged by a range of tensions including resistance to collaborative governance, delayed communication with the Ministry of Civil Defence and Emergency Management (now NEMA), delayed integration of Māori responses with the formal civil defence and emergency management infrastructure and non-recognition or support for Māori frontline responders' cultural practices (Jayasinghe et al. 2020; Carter and Kenney 2018; Kenney et al. 2015; Phibbs et al. 2015). Previous research has documented the appropriation of Māori stakeholder resources such as marae [community buildings], food supplies and satellite phones by CDEM groups (Kenney et al. 2015). They have also documented challenges with operationalising marae that are registered as civil defence hubs and issues with non-acknowledgment and resistance to engaging with Māori emergency management volunteers (Carter and Kenney 2018). These diverse issues prompted a ministerial review of emergency management in Aotearoa New Zealand in 2017 (Department of Prime Minister and Cabinet 2017). The acting Minister of Emergency Management stated:

> *Māori are disproportionally impacted by natural disasters and emergencies. However, we also recognise that iwi bring a great deal of capability in relation to emergency management and their contributions have been essential – before, during and after emergencies.*
> (Faafoi 2021)

Willingness on the part of Māori to mobilise significant human capital and material resources in response to natural hazards has garnered interest from central government and local authorities (Johnson et al. 2014). As an exemplar, the effectiveness of Māori approaches to disaster management was acknowledged in the Technical Advisory Group's (TAG) *Ministerial Review Better Responses to Natural Hazard Disasters and Other Emergencies in New Zealand* (Department of Prime Minister and Cabinet 2017). The review recommended that the Aotearoa New Zealand Government and CDEM groups formally recognise the capability that iwi bring

1. *Civil Defence and Emergency Management Act 2002* at www.civildefence.govt.nz/cdem-sector/legislation.
2. NEMA at www.civildefence.govt.nz.
3. *Local Government Act 2022* at www.legislation.govt.nz/act/public/2002/0084/latest/DLM170873.html.

to emergency management and legislate to enable iwi to participate in planning for and responding to a disaster or other emergency. It also advocated for bringing clarity to the role of iwi and hapū by allowing for appropriate iwi representatives to be part of the Coordinating Executive Groups (CEGs) and on the joint committees. Concurrently, a Ministerial Advisory Committee on Emergency Management was established to advise Cabinet on legislative innovation and to help strengthen the enablement of iwi, hapū and Māori in emergency management. In 2021, NEMA established the national 'Kaitohutohu' ['Advisor'] function to support the management of issues pertaining to iwi, hapū and whānau during a response.[4]

Improving emergency management responses to natural hazards and disasters

The purpose of the TAG review was to generate information and recommendations to inform New Zealand's emergency response capabilities and ensure that the broader disaster management framework is well placed to meet future challenges. The review identified areas for strengthening New Zealand's emergency management infrastructure. Recommendations included enhancing legislation to incorporate professional standards and an expanded system of audit and assurance, establishing NEMA and allocating primary authority for local states of emergency to local governance and group controllers (Technical Advisory Group Department of Prime Minister and Cabinet 2017, p. 2). Specifically, despite ample evidence as to capabilities, the review established that the resources, skillsets and social capital maintained and mobilised by Māori stakeholders to assist in emergency responses were not recognised in current legislation (Technical Advisory Group Department of Prime Minister and Cabinet 2017, p.18). Review findings highlighted that national and regional emergency management stakeholders' engagement and relationships with Māori were not consistently well managed. In addition, consultation with Māori related to emergency management planning often occurred late in the strategy development phase, which resulted in the needs Māori of communities not being adequately recognised in local Civil Defence and Emergency Management Group plans (Technical Advisory Group Department of Prime Minister and Cabinet 2017, p.3). Using marae as welfare centres in the event of a disaster for example, is a costly process and the review found government processes to reimburse costs incurred as well as mobilising support resources were considered by Māori to be 'complex, bureaucratic and lacking in clarity' (Technical Advisory Group Department of Prime Minister and Cabinet 2017, p.18).

Following Hurricane Gabrielle in 2023, a 2024 *Government Inquiry into the Response to the North Island Severe Weather Events* (NISWE) was produced. Among its key recommendations was the need to empower iwi Māori who have the 'capacity, capability, and desire to contribute to emergency management' (p.23). As of June 2024, a new bill to replace the CDEM Act was in draft form to deliver the 'robust, fit-for-purpose emergency management framework that New Zealand needs' (Emergency Management and Recovery Minister Mark Mitchell, in Crimp 2024). Additionally, in October 2024, the Aotearoa New Zealand Government released a response to the NISWE to 'strengthen disaster resilience and emergency management' and endorsed 14 recommendations. This includes Recommendation 3 to 'optimise the effort of iwi Māori to benefit all people in an emergency' (New Zealand Government 2024).

The need for a better integrated emergency management system in Aotearoa New Zealand is being advocated for by researchers, policymakers and emergency managers. However, little research has been conducted on the perspectives of emergency managers on how the current system enables Māori participation as well as what the opportunities are for building a cohesive and inclusive emergency management system for the future.

Research design and methods

This qualitative project was designed and implemented by Māori researchers in accordance with Māori research and ethical principles (Bishop 1996; Smith 1999) and is equally informed by the principles of partnership, protection and participation developed from the articles of the Treaty of Waitangi. Geographic case studies were selected based on regional risk profiles for natural hazard events (Horspool et al. 2015; Stirling et al. 2012), previous research links with Te Rūnanga o Ngāi Tahu (Kenney and Solomon 2012) and consultation with Māori in Auckland, Wellington, Bay of Plenty and Hawke's Bay as well as advice from local CDEM authorities.

Participant engagement was purposive and navigated by intermediaries through disaster risk reduction networks. Fifteen emergency managers (n=10 non-Māori, 5 Māori) were recruited as research participants from regional CDEM groups located in Auckland, Bay of Plenty, Hawke's Bay, Wellington and Canterbury. Participant roles spanned group controllers, emergency managers, welfare managers and coordinators, emergency management advisors and Kāiarahi Māori [local Māori emergency management advisors].

The views, stories and experiences of participants were gathered during dialogical (Frank 2005) semi-structured

4. Following an internal review of operations following the 2023 North Island severe weather event, this function was re-named 'Tākaihere'. The name translates to 'tākai' being to wrap-around and 'here', which means to tie together. This recognises the purpose of the team to connect and support throughout emergency management.

interviews (Corbin and Morse 2003), participant observation (Liamputtong 2007; Bishop 1996) and hui a wānanga [interpretive workshops] (Barnes 2000; Frank 2000). Interview discussions were guided by an overarching question: 'What are your views and concerns in regards to Māori emergency management?' Prior to the interviews, 10 discussion topics were circulated to participants for consideration as potential conversation prompts during interviews. Conversational prompts consisted of Māori emergency management capabilities and capacities, Māori emergency management assets and resources, partnering with iwi, barriers to or enablers of Māori emergency management, legislated recognition of Māori emergency management, workforce professionalisation, mātauranga Māori [values, knowledge and actions] in policies and practice, collaborative emergency management and governance as well as Māori emergency management accountabilities.

Thematic analysis (Clarke and Braun 2017) was applied to analyse Māori emergency managers' talk and observations of participants. Four themes emerged during data analysis:

- Whakatureture me Kawanantanga [legislation and governance].
- Whakawhanaungatanga [communication, engagement and relationships].
- Mātauranga Māori [Māori emergency management values, knowledges and practices].
- Āheitanga [capability and capacity].

Discussion

Participants reflected on a variety of topics and themes regarding the inclusion of Te Ao Māori [Māori worldviews] and Māori disaster management into mainstream emergency management. Discussion was guided to identify opportunities, barriers, synergies and discordance in emergency management structures, policies and practices.

Participants have been given pseudonyms (chosen at random from a book on Aotearoa New Zealand birds) for quote attributions. Māori emergency managers have been assigned Te Reo Māori names of endemic Aotearoa New Zealand birds (Tūī, Kākā, Whio, Ruru) and non-Māori participants were assigned English-language names of non-endemic birds (Kingfisher, Oystercatcher, Teal, Silvereye, Song Thrush, Goldfinch, Blackbird, Skylark, Starling, Chaffinch).

Whakatureture me Kawanatanga - legislation and governance

One of the core themes that emerged in the interviews was whakatureture me kawangatanga [legislation and governance]. Several of the participants noted the current lack of provisions for Māori participation in emergency management legislation, noting that the CDEM Act is the only legislation in Aotearoa New Zealand that does not refer to Te Tiriti o Waitangi. Goldfinch, a non-Māori participant, concluded that a lack of explicit inclusion in the CDEM Act should not be a barrier for CDEM groups to partner with iwi and hapū:

> *Even the Treaty of Waitangi talks about partnership, so why can't we do that? We shouldn't have to have it in legislation to do it. The legislation will help and enable it, but it should happen anyway. It would be nice to see it happening.* (Goldfinch)

Skylark indicated that relationships between CDEM groups and local iwi are inconsistent. She noted that including Māori, iwi and hapū specifically in the legislation may not have a significant effect as regional CDEM groups are currently 'not even accountable to [NEMA] anyway'. If the CDEM Act was amended to include provision for Māori, iwi and hapū involvement in emergency management, the participant concluded that regional CDEM groups would need to have aligned measures to ensure action.

All participants deemed partnerships between regional CDEM groups and iwi and hapū as important and that more work was needed on both sides to strengthen arrangements. One Māori participant, Kākā, noted that 'we don't want a tokenistic set-up because you mess it up with Māori once and it's game over'. It was argued by another Māori participant that if emergency managers are able to understand and use a Te Ao Māori worldview to look at emergency management 'it's going to work for both of us and it's going to be a win-win situation' (Tūī). A major challenge with the current partnership approach is that relationships are very dependent on individuals and 'if individuals fall over on both sides, how do we keep that partnership; that relationship working?'(Goldfinch). Calls for greater representation of Māori in the development of emergency management policy and planning have been made by academics (Hudson and Hughes 2007; Kenney and Phibbs 2015). This may help to effectively embed partnerships at an institutional rather than individual level.

Another issue that emerged was a lack of clarity on what Māori governance would look like for regional emergency management. One non-Māori participant stated they were unsure of what the 'partnership space' with iwi would look like, 'are they a stakeholder or are they a partner?' (Silvereye). Emergency managers were clearer on the role of Māori at an operational and community level rather than in leadership. The efficacy of marae to aid in response and recovery efforts is well-documented by academics, the media and in government reports (Bailey-Winiata et al. 2022; Bush International Consulting 2024; Carter and Kenney 2018). One participant stated that, based on their experience, 'governance is not where [iwi] want to be sitting to be able to effect change' (Rosella) and that a lack

of clarity on what collaborative governance arrangements with iwi looks like creates a challenge for implementation.

Some CDEM groups have achieved iwi representation on their CEGs with varying degrees of success. One participant saw this arrangement as a real 'thumbs up' (Chaffinch) and an opportunity for mana whenua guidance at a governance level to filter down through their structure. Another participant spoke of the challenges of iwi representation on both the CEG and the joint committee regarding influence on decision-making:

> *A decision was made that iwi would go on the CEG as a member with full voting rights… but there wouldn't be voting rights on the joint committee. Now when we have the JC and the CEG meetings, [iwi] are sitting at the table… I suppose in a sense they have decision-making rights they just don't have final decision-making rights…* (Goldfinch)

It was clear from the participant contributions that collaborative governance arrangements and roles and responsibilities for iwi and hapū representation on CEGs and in joint committees needs to be better articulated and organised. However, the diversity of iwi, hapū and regional emergency management groups means that no single model would be likely to be useful. As of October 2024, NEMA has begun working with the National Iwi Chairs Forum along with other Māori organisations to explore the contribution of iwi and Māori to emergency management. The intention is to co-design the development of an investment and implementation roadmap and to formalise the role of iwi and Māori in emergency management settings. The success of this initiative will be highly dependent on the quality of relationships developed.

Whakawhanaungatanga – engagement and relationships

Participants identified issues with whakawhanungatanga [engagement and relationships] from both emergency management and iwi and hapū perspectives. Some regional CDEM staff were reported as lacking patience when engaging with iwi 'because it takes too long'. For other participants, following the correct tikanga [cultural practices] processes was deemed crucial. 'There's a reason for it, that's the way things happen and it always has been. It's not just one person making a decision, it's the whānau' (Kākā). By enabling time for effective engagement, better relationships can be built on a stronger foundation.

Some participants reported general negativity from staff who had engaged with iwi and hapū previously. 'I think people have had some quite negative experiences working with Māori leadership…I see people going "well we don't want that, we don't want civil defence disrupted. We want someone who can work with us"' (Skylark). However, Māori emergency managers had received strong feedback from whānau who had taken issue with how engagement had been conducted by CDEM groups in the past, 'Don't come and tell us what we can and can't do on our land, that's a big turn off' (Ruru) and that CDEM staff need to be 'as flexible as we ask the Māori community to be' (Silvereye) when engaging.

One non-Māori participant discussed their experiences learning more about Māori kaupapa [principles] 'like manaakitanga [hospitality], whanaungatanga [relationships] and the opportunities to integrate them into emergency management more widely. 'That should be weaved into the fabric of our organisation rather than just an expectation for when you engage with Māori' (Chaffinch). Overall, participants described challenges developing strong and trusting relationships with Māori and that presented a significant barrier to effective inclusion of Māori in emergency management. 'It's continuing working at a relationship, you can't take it for granted, you have to consistently work on it, you can't let it lapse'. (Oystercatcher)

Māori emergency managers discussed the tensions they experienced working with their communities as council employees:

> *A concern for me, working at the coalface is… you're not one face, you're a label and the moment someone goes out there and does something with iwi, it doesn't matter who you are, you stuffed up, 'you're council, you stuffed up'… there is a fear, for me, that we can do a lot of really good work only for it to be fumbled by someone else who is maybe not quite up to speed in terms of how we interact.* (Kākā)

The establishment of a Kaitohutohu/Tākaihere function and Māori Advisory Committee by NEMA in 2021 demonstrated some progress towards greater equity at the national level. Additionally, at the local level in 2021, the Nelson Tasman CDEM formally invited iwi to nominate representatives to attend meetings (Sivignon 2021). This process is being replicated to varying degrees by other CDEM groups. As one non-Māori participant commented:

> *One thing we've struggled with is in our CIMS structure, it has a role that says 'iwi representation'. In our [regional] structure we call it 'iwi and Māori advisory'… 19 iwi in our very small EOC… I think that's the real challenge. How do we take that role from an iwi Māori advisor role to an actual true iwi representation role in the ECC [Emergency Coordination Centre]. That's a bit of a journey that will take us a little while.* (Teal)

There has been some criticism by Māori practitioners on the way in which the Kaitohutohu/Tākaihere function is operationalised. Alternative models are being proposed that integrate the connections with Māori communities and marae in particular (Katene 2025). More cognisance of

the 'dual role' that is required for Māori working in CDEM groups is needed as well as a greater understanding of the time and protocols needed to build genuine relationships with iwi, hapū and Māori communities.

Mātauranga Māori and emergency management knowledge and practices

The role of Mātauranga Māori [Māori-specific knowledge and practices] in emergency management has been explored in research (Dunlop et al. 2023; Kenney et al. 2015; Rout et al. 2024). Authors argue that Māori knowledge, worldviews, values and practices inform a culturally grounded and effective approach to disasters based on a long history of holistically responding to crises. As one Māori participant reflected: 'all of that [emergency preparedness] stuff was always transmitted through waiata, through korero through karakia, through poi through just wānanga, those are the things that allow us to maintain resilience as a whānau' (Ruru).

The ability to effectively engage with mātauranga Māori in mainstream emergency management is hampered by a lack of understanding from agencies (Kenney et al. 2015). These findings were supported by interviews with emergency managers. Generally, participants saw the value of Mātauranga Māori in emergency management acknowledging that 'it provides a much richer understanding of what that science means and how we respond' (Rosella). Additionally, 'good research that's bringing in a Māori or iwi perspective can only be good for the sector' (Goldfinch). Some participants were unclear on the best way to incorporate Mātauranga Māori into emergency management practices. Oral histories and pūrākau [inter-generational oral narratives] were mentioned. For example, stories of taniwha [water guardians] and their correlation to evidence of past tsunami (as explored in King et al. 2020) were mentioned but there was confusion on how to put it into a 'European context' (Silvereye).

Some participants were uncomfortable with access and use of Mātauranga Māori in emergency management due to their own skills and knowledge, concluding that more trust needs to be built:

> *I'm unsure what the right protocols are about requesting to use that knowledge and the processes around that. The last thing we want to do is take something. So there has to be a process.*
> (Silvereye)

Progress on understanding the role of Mātauranga Māori in emergency management has been made. Through different strands of work, emergency managers are beginning to 'sow the seeds' (Oystercatcher). However, one non-Māori participant was firm that anything regarding mātauranga Māori needs to be 'mana whenua-led' as opposed to led by council (Teal).

Mātauranga Māori is a living body of knowledge that is inter-generational and provides a rich framework for how communities can recover from disaster events as explained by the following Māori participant:

Long-term preparedness with Mātauranga Māori is actually the beginning of long-term recovery. If everyone has a plan that's intergenerational and everyone knows what to do and how to survive, well that's already recovery happening.
(Whio)

One of the ways local CDEM groups were growing capacity was through hosting Māori Masters students to work on resilience projects. A Māori emergency manager reflected that many young Māori who are educated in science, planning and other disciplines related to emergency management are returning to their ancestral lands and could potentially help with the skill shortage in that area. Growing Māori capacity and capability within mainstream emergency management and simultaneously, growing emergency management capability in Māori communities, needs to be a focus to ensure the sector can grow in an equitable and inclusive manner. The Natural Hazards Commission provided ongoing funding for Te Toi Whakaruruhau o Aotearoa, a Mātauranga Māori Disaster Risk Reduction Centre based in Massey University and focused on Māori disaster risk reduction interests and aspirations. This programme provides connection and support particularly for emerging pūkenga [Māori researchers] working in emergency management (New Zealand Government 2024). It is important that iwi, hapū and senior Māori mentors are involved in providing support and guidance for emerging researchers and professionals.

Āheitanga - capacity and capability

Independent inquiries into CDEM responses to recent disasters have found limitations in the capacity and capability of mainstream emergency management agencies to work effectively with iwi, hapū and Māori organisations (Bush International Consulting 2024; Government Inquiry into the Response to the North Island Severe Weather Events 2024). Of particular concern to emergency managers was a lack of cultural competency to be able to effectively work with iwi, hapū and Māori communities and the need to resource further development for staff. As one non-Māori participant remarked: 'we're trying to build a bit of internal competency. We're really lucky in our team to have a lovely guy who's been helping in our weekly meetings with pronunciation' (Songthrush). Participants noted that some CDEM centres had put in place bilingual signage, had conducted Te Reo Māori and Te Tiriti o Waitangi [Treaty of Waitangi] workshops and tikanga training.

Participants noted that there have been efforts to increase staff capability but that there is a funding gap to resource initiatives. Emergency managers spoke highly of Māori staff

supporting initiatives to train staff. They also expressed concern for the additional burden on Māori staff to fill that gap for CDEM groups as cultural training is something that gets 'delegated' to them. Emergency managers also discussed their own challenges developing skills in this space:

> *But if you're starting from scratch where a lot of people in emergency management are, then it's pretty scary and daunting and it's just little things, pronunciation… And that's not hard to get, you just need to think about it.*
> (Rosella)

Participant Goldfinch claimed that if he had been asked a few years ago about his desire to step onto a marae it would probably have been 'reasonably low, a bit of fear and uncertainty'. Working with Māori communities has changed his perspective. 'It's quite different now. There's work required to develop that understanding, it's not just emergency management, it's life in general, working with iwi and understanding iwi' (Goldfinch).

There was optimism from participants that there has been, albeit slow, progress in staff capacity and capability for working with iwi, hapū and Māori communities and a general enthusiasm for improving skills in Te Reo Māori and in tikanga. Without specific resourcing for training, responsibility for this is likely to fall on the shoulders of Māori staff. As one Māori emergency manager discussed, training needs to go beyond the surface level to better understand Māori worldviews so that emergency managers:

> *…understand the reasons why we do a karakia, this is what the spiritual realm looks like, this is the importance of that, mana atua [spiritual power of deities], mana whenua [spiritual power of the land], mana tangata [spiritual power of the people]…that's deep understanding.*
> (Tūī)

Emergency managers also discussed the capacity and capability of Māori participating in emergency management. Participants discussed their appreciation of what Māori have to offer but acknowledged that further work is needed to collaborate effectively.

> *I think… we have not particularly valued the capabilities and capacities that Māori bring in a day-to-day environment and consequently, in the response and recovery environment. With the number of events… I think it's starting to expose to our sector that there is that capacity and capability and maybe there's more to Māori than 'a marae is a great place to set up a welfare centre'.*
> (Blackbird)

> The cultural, spiritual and psychosocial support given to emergency management staff by Māori in high-stress response environments was recognised.

> *There's a level of support [from Māori] that can be provided throughout that system that we can't do. And what I've seen in a response is how that manaakitanga provided to our staff and our responders. That was really important and significant.*
> (Rosella)

They also acknowledged tensions due to the 'command and control' element of emergency response in appropriating iwi, hapū and marae resources:

> *You can't just go into someone's home and say we're going to take water from them, you need to actually to ask that before you go in and just take water… Just those little considerations for iwi so that it's not just 'take take take' because we have the powers under a [state of emergency] declaration… You have to actually ask and seek their advice.*
> (Rosella)

Māori emergency managers spoke of the 'it's just what we do' attitude of Māori when responding to disasters as something that is inherent and natural:

> *…to whānau, they don't know what [emergency management] is. To them, it's just coming together, looking after each other and making sure they can get through it, as they have done… the last thing we want to do is walk in and say, this is what you need to do even though you've been doing it since as we say, time immemorial.*
> (Kākā)

While the proactive attitude of Māori communities responding to disaster events was seen as positive, it can also result in tensions when there are expectations on iwi and hapū to support disaster response without adequate resourcing:

> *…we need to recognise what iwi can do themselves… They're not highly funded entities… so when it comes to playing the game they do require quite a bit of support.*
> (Kākā)

Participants acknowledged that while there is broad recognition of the contributions iwi and hapū can make in emergency management, the ability to effectively partner is still very limited and dependent on individual relationships as opposed to a systemic culture. This claim was supported in an independent inquiry into the response to Cyclone Gabrielle in 2023 by Hawke's Bay CDEM. The inquiry found that 'engagement of iwi Māori and Māori communities was more a matter of ad hoc relationships than the product of systematic and formalised effort' and that 'Māori agencies and marae felt that their proven abilities to deliver welfare services at scale were either ignored or hampered by bureaucratic decision-making from the centre' (Bush International Consulting 2024:6).

Not all iwi, hapū and marae may be in a position to participate in formal emergency management systems but those with the capacity, capability and desire to be involved should be empowered to participate in the system. The Government Inquiry into the Response to

the North Island Severe Weather Events 2024 suggested that to give effect to participation, 'the role of iwi Māori in emergency management should be formalised and embedded within the one emergency management system' and 'reflected throughout the community, local, regional and national structures' (p.16). While legislation can provide the statutory imperative for emergency management agencies to implement the framework for partnering with iwi and hapū, embedding these relationships requires upskilling of emergency management staff to give effect.

Conclusion

The interviews with emergency managers provided insights into both the challenges and opportunities for partnering effectively with iwi, hapū and Māori communities in emergency management. Effective Māori emergency management practices have been well-documented in research and in government reports. Most recently, the Government Inquiry to the North Island Severe Weather Events claimed that 'iwi-led civil defence readiness, response and recovery are already in effect and provide a living example of what can be done in an emergency'.

While emergency managers expressed a desire to improve relationships with iwi and hapū to better respond to emergencies, there is still significant progress that needs to be made. There remains a gulf between the manner in which mainstream emergency management operates using a formal CIMS structure and how iwi, hapū and marae use their own emergency management practices. To date, the role of iwi, hapū and other Māori organisations is not formally mandated in legislation and relationships continue to operate on an ad hoc basis. There is limited understanding of Mātauranga Māori and Māori emergency management practices and more work needs to be done to improve capability and capacity in mainstream and Māori emergency management.

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References

Bailey-Winiata A, Gallop SL, Hikoura D and White I (2022) The role of coastal marae in natural hazard response and climate change adaptation.

Barnes H (2000) Kaupapa Māori: Explaining the ordinary. Auckland: Whariki Research Group, Massey University. PMID: 11709875.

Bishop R (1996) Whakawhanaungatanga Collaborative Research Stories. Palmerston North: Dunmore Press Ltd.

Clarke V and Braun V (2017) Thematic analysis. *The Journal of Positive Psychology,* 12(3):297–298. https://doi.org/10.1080/17439760.2016.1262613

Bush International Consulting (2024) Hawke's Bay Civil Defence and Emergency Management Group Response to Cyclone Gabrielle review. Hawke's Bay Emergency Management website www.hbemergency.govt.nz/cyclone-gabrielle-review/, accessed 12 October 2024.

Carter LH and Kenney CM (2018) 'A tale of 2 communities: B-race-ing disaster responses in the media following the Canterbury and Kaikōura earthquakes', *International Journal of Disaster Risk Reduction,* 28:731–738. https://doi.org/10.1016/j.ijdrr.2018.01.037

Corbin J and Morse J (2003) The Unstructured Interactive Interview: Issues of Reciprocity and Risks when Dealing with Sensitive Topics. *Qualitative Inquiry,* 9(3):335–354. https://doi.org/10.1177/1077800403009003001

Crimp F (2024) ''Significant shortcomings' in NZ's emergency management system – inquiry'. Stuff website www.rnz.co.nz/news/national/514982/significant-shortcomings-in-nz-s-emergency-management-system-inquiry, accessed 23April 2024.

Department of Prime Minister and Cabinet (2017) Ministerial Review Better Responses to Natural Hazard Disasters and Other Emergencies in New Zealand. NEMA website https://www.dpmc.govt.nz/departmental-agency/nema/ministerial-review-better-responses-natural-disasters-and-other, accessed 11 October 2024.

Dunlop E, Boston M and Owen M (2023) Reimagining Community Resilience through a Te Ao Māori Worldview. https://hdl.handle.net/10289/17147

Faafoi K (2021) Ensuring Māori perspectives are integrated in our emergency management system. Beehive website www.beehive.govt.nz/release/ensuring-m%C4%81ori-perspectives-are-integrated-our-emergency-management-system, accessed 3 September 2024.

Frank A (2000) 'The standpoint of storyteller', *Qualitative Health Research*, 10(3):354-365. http://dx.doi.org/10.1177/104973200129118499

Frank A (2005) 'What is dialogical research and why should we do it?' *Qualitative Health Research,* 15(7):964-974. https://doi.org/10.1177/1049732305279078

Horspool N, Cousins WJ and Power WL (2015) Review of Tsunami Risk facing New Zealand: A 2015 Update, GNS Science Consultancy Report 2015/38.

Hudson J and Hughes E (2007) *The role of marae and Maori communities in post-disaster recovery: a case study* 2007/15.

Israel B, Schulz A, Parker E and Becker A (1998) 'Review of community-based research: Assessing partnership approaches to improve public health', *Annual Review of Public Health,* 19:173–202. https://doi.org/10.1146/annurev.publhealth.19.1.173

Jacobs M (2023) 'Hopes emergency pods will be ready for the next East Coast weather event'. Stuff website www.stuff.co.nz/pou-tiaki/300783058/hopes-emergency-pods-will-be-ready-for-the-next-east-coast-weather-event, accessed 12 January 2025.

Jayasinghe K, Kenney CM, Prasanna R and Velasquez J (2020) 'Enacting "accountability in collaborative governance": Lessons in emergency management and earthquake recovery from the 2010–2011 Canterbury Earthquakes', *Journal of Public Budgeting, Accounting and Financial Management,* 32(3):439–459. http://dx.doi.org/10.1108/JPBAFM-09-2019-0143

Katene H (2024) 'Developing marae roles and responsibilities for Te Whanganui-a-Tara, Aotearoa', *Australian Journal of Emergency Management*, 40(2):109–110.

Kenney C, Phibbs S, Paton D, Reid J and Johnston DM (2015) 'Community-led Disaster Risk Management: A Māori response to Ōtautahi (Christchurch) earthquakes', *Australasian Journal of Disaster and Trauma Studies,* 19(1)9-20. https://trauma.massey.ac.nz/issues/2015-IRDR/AJDTS_19_IRDR_Kenney.pdf

Kenney CM and Phibbs S (2015) 'A Māori love story: Community-led disaster management in response to the Ōtautahi (Christchurch) earthquakes as a framework for action', *International Journal of Disaster Risk Reduction,* 14:46–55. https://doi.org/10.1016/j.ijdrr.2014.12.010

Kenney C and Solomon MW (2014) *Māori Community-led Disaster Risk Management: An effective response to the 2010-2011 Christchurch Earthquakes,* UNISDR Scientific and Technical Advisory Group Case Studies—2014.

King DN, Manawatu M and Shaw WS (2020) 'Comparing and combining ethnographic records with active Māori histories to provide insights on tsunami hazard', *Quaternary Research,* 95:43–55.

Liamputtong P (2007) *Researching the Vulnerable.* London, Thousand Oaks, CA, New Delhi: Sage Publications Ltd. https://doi.org/10.4135/9781849209861

New Zealand Government (2024) *Strengthening disaster resilience and emergency Management Government response to the Report of the Government Inquiry into the Response to the North Island Severe Weather Events.* www.civildefence.govt.nz/assets/Uploads/documents/publications/reports/Strengthening-disaster-resilience-and-emergency-management.pdf

Phibbs S, Kenney C and Solomon M (2015) 'Ngā Mōwaho: an analysis of Māori responses to the Christchurch earthquakes', *Kōtuitui: New Zealand Journal of Social Sciences Online,* 10(2):72–82. https://doi.org/10.1080/1177083X.2015.1066401

Rout M, Awatere S, Reid J, Campbell E, Huang A and Warmenhoven T (2024) 'A 'te ao Māori' disaster risk reduction framework', *Disasters,* e12622. https://doi.org/10.1111/disa.12622

Saunders W, Forsyth J, Johnston D and Becker J (2007) 'Strengthening linkages between land-use planning and emergency management in New Zealand', *Australian Journal of Emergency Management,* 22(1):36–43.

Sivignon C (2021) 'Nelson Tasman Emergency Management seeks strong partnership with iwi'. Stuff website www.stuff.co.nz/national/125872715/nelson-tasman-emergency-management-seeks-strong-partnership-with-iwi, accessed 23 July 2021.

Stirling M, McVerry G, Gerstenberger M, Litchfield N, Van Dissen R, Berryman K, … Jacobs K (2012) 'National Seismic Hazard Model for New Zealand: 2010 Update', *Bulletin for the Seismological Society of America,* 102(4):1514–1542. http://dx.doi.org/10.1785/0120110170

Te Rūnanga o Ngāi Tahu (2023) 'Marae to install emergency pods'. https://ngaitahu.iwi.nz/connect-2/connect/media/marae-to-install-emergency-pods/, accessed 3 September 2024.

Te Rūnanga o Ngāi Tahu (2024) 'Storytelling helps emergency preparedness'. https://ngaitahu.iwi.nz/connect-2/connect/media/storytelling-helps-emergency-preparedness/, accessed 3 September 2024.

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Māori-led tourism and climate change impacts and adaptation: Perspectives from Westland Tai Poutini National Park, New Zealand

Abstract

There is growing evidence of the effects climate change will have on Aotearoa New Zealand, and many of these effects are already apparent in the country, with some regions more significantly affected than others. One particularly vulnerable region is Te Tai Poutini on the West Coast of the South Island. This paper outlines how selected Māori-led tourism businesses (MLTBs) and other tourism stakeholders are experiencing and adapting to the effects of climate change in the region. The research is based on qualitative semi-structured key informant interviews with Māori and non-Māori (n=13) involved in these businesses and in the wider tourism sector. Findings reveal that most informants acknowledge the climate change effects the region is experiencing, with consequences for their business and manuhiri [visitors]. The greatest risks identified include disruption to road networks and infrastructure and the continued retreat of the region's iconic glaciers. MLTBs are considering future adaptation options in light of key Māori values, including Kaitiakitanga [guardianship or stewardship], Manaakitanga [hospitality] and Whangaungatanga [relationships]. By providing an Indigenous cultural lens to the issue of climate change adaptation, this research can inform strategic discussions among tourism operators, managers and regional stakeholders about how adaptation can be planned to take account of Te Ao Māori perspectives.

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Introduction

Aotearoa New Zealand has significant natural assets, which provide the basis for a vibrant and economically influential tourism industry. Many of the country's most visited tourist destinations and activities are located in bio-physically dynamic areas, such as mountainous or coastal regions where sudden-onset natural hazard events (including earthquakes, tsunami, flooding and landslips) can impact on the environment and on infrastructure including roads, bridges and communication networks (Rosselló et al. 2020). This puts tourists at considerable risk. Regions differ in the extent and type of likely events. For example, the South Island's West Coast [Te Tai Poutini] is extremely prone to flooding (restricting access) and glacial retreat is having a negative effect on tourist experiences (Purdie et al. 2020; Wang and Zhou 2019). In particular, Fox Glacier [Te Moeka o Tuawe] and Franz Josef Glacier [Kā Roimata o Hine Hukatere] have retreated more than 700 metres since 2008 with many climate models indicating they will disappear by the end of this century (Wang and Zhou 2019). While glacier tourism, which is a mainstay of tourism offerings on the West Coast for generations, may be buoyed by 'last chance to see' appeal (Stewart et al. 2016) this can only be considered a short-term situation. Significant concerns are emerging about the future of the multimillion-dollar tourism industry in 'Glacier Country' (Westland District Council 2023). In 2022, Lisa Tumahai, Ngāi Tahu's leader [Te Kaiwhakahaere], described a visit to Franz Josef Glacier [Kā Roimata o Hine Hukatere]:

> *It came as something of a physical shock. A blow to the senses. To visit Kā Roimata o Hine Hukatere for the first time in eight years, was devastating. This mighty glacier, that sits among the ancestors, a taonga of our people, a presence once so physically commanding, is shrinking into oblivion. Kā Roimata o Hine Hukatere has been subdued, humiliated by the actions of humans, actions remote yet undeniable. To see this retreating giant is to understand impermanence, to understand the real and terrible results of industrialisation, of climate change.* (Tumahai 2022, p.2)

The glaciers are located in Westland Tai Poutini National Park, a UNESCO World Heritage site. Access to the area is limited to one road: SH6 via Hokitika in the north and from the south via Haast (Figure 1). The climate change effects facing this region are exacerbated by its isolated nature and small population (Purdie et al. 2020).

While the population of this region is small, it is a place of considerable significance to tāngata whenua. Early Māori settlements were located on the edges of Tai Poutini Westland's lagoons and lakes. The area has cultural significance to Ngāti (Kāti) Māhaki hapu of the wider Ngāi Tahu and Ngāti Mamoe iwi [tribe] of the Te Wai Pounamu South Island. This is due to its resources and intergenerational connections to tūpuna [ancestors] and te taiao [the environment] (Department of Conservation 2023a, 2023b; Te Rūnanga o Makaawhio 2023). Two hapu [groups, sub-tribes] of Ngāi Tahu iwi are based in this case study area. These are the Te Rūnanga o Makaawhio and Te Rūnaka o Kāti Waewae. Each rūnanga has a tribal boundary defined by law in Te Rūnanga o Ngāi Tahu (Declaration of Membership) Order 2001 (New Zealand Government 2001).

Māori are significantly involved in tourism in Te Tai Poutini Westland, most notably through Ngāi Tahu Tourism (NTT). Ngāi Tahu has over 80,000 tribal members and NTT is managed by Ngāi Tahu Holdings. In 2022, 54 of the 422 kaimahi [employees] of NTT were Ngāi Tahu members, making NTT the largest employer of Ngāi Tahu whānau [extended family] (Ngāi Tahu Tourism 2023). Māori values underpin the operations of NTT, as their website affirms, 'Tourism allows us to host manuhiri [visitors], reconnect with ngā awa [rivers], ngā maunga [mountains] and te moana [the sea], and provide lasting memories for our customers'.

NTT is one of the country's largest Māori-owned tourism businesses and operates a number of well-known tourist attractions and activities. On the West Coast, they operate Franz Josef Glacier Guides and Franz Josef Glacier Hot Pools (Ngāi Tahu Tourism 2023). NTT is committed to long-term investment in the tourism sector and acknowledges its crucial role in protecting the environment for future generations. While not all Māori-led tourism businesses on the West Coast are affiliated with the Ngāi Tahu tribe/iwi, they still play a role in promoting climate change adaptation practices through their inherent genealogy/whakapapa links to the environment.

Ngāi Tahu are cognisant of the risk that climate change poses to their takiwā [territory or region] and to their businesses, including those operated by NTT. In 2018, the iwi launched their climate change strategy (Te Rūnanga o Ngāi Tahu 2018), under which all Ngāi Tahu entities must operate. This strategy has 6 guiding values that help address the risks and opportunities arising from climate change (Arnt 2024; Tumahai 2024). These values are:

- Whanaungatanga (fostering and maintaining relationships in the iwi, community and organisation)
- Manaakitanga (paying respect to each other, to iwi members and to all others. expertise)
- Tohungatanga (expertise through pursuit of knowledge and ideas to strengthen the iwi and community)
- Kaitiakitanga (active stewardship to protect the people, environment, knowledge, culture, language and resources important to Ngāi Tahu for future generations)
- Tikanga (ensuring appropriate action in line with the values of Ngāi Tahu)
- Rangatiratanga (leading with integrity and ethical behaviour in all actions and decisions taken) (Te Rūnanga o Ngāi Tahu 1997).

This paper reports on a study that explored how Māori-led tourism businesses (MLTBs) are experiencing and adapting to the effects of climate change in Te Tai Poutini Westland and the wider West Coast area in Te Wai Pounamu the South Island of Aotearoa New Zealand. At the core of the research is the proposition that providing an indigenous cultural lens to the issue of climate change adaptation will inform strategic discussions of tourism operators, managers and regional stakeholders about how climate change adaptation can be planned in a way to take account of Te Ao Māori perspectives. With climate change projected to intensify hazard events in the region as they compound and cascade (Department of Conservation 2020; Steiger et al. 2022), there is a need for clear adaptation strategies for the tourism industry.

The paper begins with a brief literature review that provides the context for this study and summarises recent research assessing the effects of climate change on tourism. This includes mitigation and adaptation strategies being implemented in tourism businesses and destinations around the world. The role that indigenous values and indigenous-led businesses can have in this process is also presented. An overview of the study methods, including the methodological approach taken and data gathering and analysis processes is provided and findings are outlined. The paper concludes with a discussion of the implications of these findings and outlines directions for future research.

Climate change and indigenous-led tourism

The effects of climate change on picturesque natural landscapes have the potential to be disastrous for the tourism sector. As Gössling and Scott (2024, p.1) stated, 'Climate change is no longer in the future, it is an evolving business and policy reality for tourism'. To date, the response of most tourism business managers in Aotearoa New Zealand has been reactive; coping spontaneously with natural hazard events rather than pro-actively planning for them and being confident in their resilience and ability to cope with any eventuality (Espiner and Becken 2014; Orchiston 2013). This has resulted in the constant need for repair and maintenance of infrastructure damaged by extreme weather events in tourism destinations (Becken 2013; Munshi et al. 2024; Lawrence et al. 2023).

Debates about the need for a tourism 'reset' have been a common theme in both the scholarly literature and the popular press (Carr 2020; loannides and Gyimóthy 2020; Sigala 2020). With the prospect of more severe and continuing extreme weather events, there is a demand for climate change adaptation measures in the tourism sector (e.g. Dube et al. 2022; Scott and Gössling 2022; Wolf et al. 2021:). However, as Becken et al. (2020, p.1603) demonstrated in their analysis of 101 policy documents representing 61 countries over 17 years, 'only 37 documents covered the tourism-climate nexus substantially, suggesting climate change has not yet become a priority for tourism policy makers'. This analysis found a 'lack of explicit tourism and climate change adaptation policies' (p.1603). In Aotearoa New Zealand, the country's first national adaptation plan was released in 2022. This plan acknowledges that climate change will impact on the tourism industry in various ways and also highlights the possibility of new tourism offerings (New Zealand Government 2022). The tourism industry is also looking to change, with Tourism Industry Aotearoa (2024, p.4) (TIA) 'Tourism 2050 – a Blueprint for Impact' strategy document released addressing climate change mitigation and adaptation options (see also The Aotearoa Circle 2023).

The scholarly literature increasingly suggests the need to learn from Indigenous perspectives as the tourism industry resets for a changing climate (e.g. Hutchison et al. 2021; Mbah et al. 2021; Vogel et al. 2022). Indigenous worldviews are frequently woven into climate change adaptation planning, acknowledging that Indigenous peoples' connections to the environment is entwined into their culture, way of life and values (e.g. Scheyvens et al. 2021; United Nations 2023). Many Māori view the world as most Indigenous cultures view the world—through a long-established cultural knowledge system that encompasses comprehension of everything visible and invisible existing in the world, from past to present (Hikuroa 2017). Māori-led tourism businesses offer an avenue to reconnect with cultural traditions, protect natural resources through a mātauranga Māori worldview and provide employment for whānau (Matunga et al. 2020). Literature indicates that MLTBs embed Māori values in their practices, which aims to protect and improve tourism offerings while remaining connected to whakapapa and respecting and protecting te taiao (Kenney et al. 2023; McIntosh 2004; Ringham et al. 2016; Salmond 2012). Having Māori values underpinning MLTB planning should guide climate change adaptation responses and other sustainable business practices (Harmsworth 2009) and, arguably, a greater recognition and inclusion of Māori cultural values within the tourism industry will benefit indigenous-led tourism and the tourism industry (Arnt 2024).

Methods

With the approval of Lincoln University Human Ethics Committee HEC2023-35, this research consisted of semi-structured interviews with 13 key informants. These included 7 informants recruited from 3 MLTBs and 6 informants recruited from the wider tourism sector of the region and Aotearoa New Zealand including iwi, local government and charitable trust representatives. Five of the 7 informants from MLTBs were Māori as were half the tourism stakeholders interviewed.

The majority of interviews were conducted face-to-face at an agreed location with online or phone interviews conducted when face-to-face interviews were not possible. Each interview varied in duration, taking from approximately 35 minutes to one hour. The interview guide spanned a range of themes including:

- background information on the participant's connection to the West Coast region, what they valued about the region, what they thought tourism offered the region, if and how Māori values informed day-to-day practices
- any climate change effects in the region that informants had witnessed and awareness of predicted future climate change affects
- effects of climate change on tourism businesses and the destination as a whole, including current and anticipated effects
- response of the tourism sector to climate change, including individual business and collaborative efforts.

Interviews were recorded with the key informant's consent and all participants agreed to interviews being recorded. Each recording was transcribed using Microsoft speech-to-text feature in Word. Each completed Word document was immediately proofread to stay close to the data and any misinterpreted speech-to-text was edited to reflect a precise transcription (Lofland 2006). This manual check ensured that every word spoken by the key informant was correct in the transcription.

All participant names and business names were replaced with a code for the purposes of confidentiality. Tourism-sector key informants were given an A beside their number and Māori-led tourism key informants were assigned a B, to ensure each type of informant could be distinguished during analysis. Data analysis was ongoing and iterative throughout the interview process, beginning during the first interview. Once each transcription was completed, a reflection of the data and key themes emerging were noted in field notes to inform later analysis and interviews with flexibility allowing for further investigation of emerging themes (Lofland 2006). Once all interviews were completed, initial index coding allowed the researcher to synthesise underlying ideas. Data coded similarly from across the interviews was grouped in a table to facilitate the reduction and conceptual refinement stages that followed the index coding (Deterding and Waters 2021). Following this, emerging themes were identified to help refine the final analysis. Some of the key findings are presented.

Findings

Key findings from this research are presented in 3 sections. First, informants' viewpoints regarding the Māori values supporting MLTB operations are discussed. This is followed by exploring informant perspectives on current and anticipated climate change effects facing the region and the adaptive responses of the MLTBs in Te Tai Poutini, including the way that these values inform climate change adaptation practices. The section concludes with a discussion of how the values of the MLTBs are driving climate change adaptation planning and actions.

Māori values underpinning MLTBs

The literature shows that Māori-led businesses commonly embrace multiple values for sustainable business practices (Harmsworth 2009, p.97). However, whakapapa [geneaology] is central to a Māori worldview and signifies interconnectedness in te ao [the world] (Salmond 2012; Kenney et al. 2023). In particular, all creation links to Māori through their tūpuna (Roberts 2013). The viewpoints of informants in this study supported the literature, revealing that this inherent connection to the environment through whakapapa guides daily and future business directions. Most informants talked about their personal connection to the whenua [land], which drives their business operation. This perspective was acknowledged by a MLTB owner:

> *We're not a money-making business; we're a family business…We definitely don't focus on trying to make money, which is probably why we don't have any money. Our conservation values are more important than our money values.*
> (#4B)

Kaimahi [employees] of these businesses tend to share the MLTB philosophies, as a MLTB manager said:

> *…we're lucky. The people that work within this business are so connected and passionate about the whenua. They have this strong connection [so] that everyone wants to play their part.*
> (#7B)

This perspective is supported by the observation of a non-Māori glacier guide working for a MLTB business:

> *[I] can see particular values coming out in the way that [new staff] get introduced to what this job is, and what the company is about, and that's not about making [money].*
> (#8B2)

The value of kaitiakitanga [stewardship] was mentioned regularly when discussing caring for the environment. A MLTB general manager explained how their business plans:

> *…need to not just answer the 'Oh, why can't we deliver our mahi [work] because of weather impacts?', but actually, what is our footprint on what we are doing, and what are we doing to reduce it?*
> (#10B)

A glacier guide agreed that 'having a business operating with a principle of kaitiakitanga as a foundation is very different, for example, than other businesses in town that have different priorities on paper'. Glacier guides talked about how their jobs include the act of showing manaakitanga [respectful hospitality] to guests, which also meant 'educat[ing] them about appropriate use of the land' (#8B1). A strategy advisor confirmed that 'the value of manaakitanga is embedded through Māori owned businesses; it's just part of what they do' (#9A). Manaakitanga helps build a sense of pride in te taiao and te whenua, which sets the scene for kaitiakitanga (Munshi et al. 2024; Moore 2022).

Whanaungatanga, or relationship building, is a value underpinning all the strategies of Ngāi Tahu, and this is apparent in its tourism operations and in the operations of other MLTBs. As a general manager explained:

> *We've got a strong relationship with Tourism New Zealand. We work with MBIE [Ministry of Business, Innovation & Employment]…. Local relationships, whanaungatanga, on the ground with DOC, emergency response and with sustainability groups is key because they know what is happening on the ground.*
> (#10B)

Practising whanaungatanga can also present a challenge. As a tourism business advisor noted, 'it takes time to get those relationships and again, you know, everywhere you go, there's good apples and there's bad apples' (#10B).

Taking an intergenerational lens in planning meant these businesses put whānau [family], kaimahi [employees], manuhiri [visitors] and te taiao [the environment] rather than money at the forefront of everything they do. A Ngāi Tahu o Te Rūnanga kaimahi describes Te Ao Māori as:

> *Being a good ancestor, for our mokopuna, for their mokopuna… obviously those principles of stewardship/ kaitiakitanga and hospitality/manaakitanga are all woven through our climate change strategy.*
> (#9A)

In the words of the iwi: 'What is good for Ngāi Tahu is good for Aotearoa' (Te Rūnanga o Ngāi Tahu 2018, p.3). However, some informants saw tensions between the Māori values underpinning a tourism business and how they were actioned in day-to-day operations. A MLTB general manager wondered if the kaimahi on the ground always understood the values that drive their everyday actions, particularly related to sustainability actions. They added that they hoped these messages were flowing down, but did not think the business was 'quite there yet' (#9A).

Experiences of climate change in the current climate

Informants agreed that the effects of climate change were already being experienced in Aotearoa New Zealand, including on the West Coast, with one local tourism informant concluding:

> *I would almost say that there isn't a tourism business which isn't affected by climate change in the region already…. There will certainly be some that have been affected more than others.*
> *(#7B)*

This manager agreed that tourism businesses were affected by changing weather patterns, which were influencing 'the ability to operate' (#7B). Other informants discussed specific events, such as the 2019 storm that destroyed the Waiho Bridge in Franz Josef that created devastating consequences for local businesses (see Somerfield 2020). A MLTB manager who witnessed the bridge collapse recalled:

> *It was a surreal feeling. We stood down there and watched it happen. It was unbelievable. There was a lot of confusion at the time, a lot of questions and you do feel like you're the end of the road essentially, there is that real isolation. I had whānau just on the other side that I'm really close with. That was challenging, because you're so close, but you can't make that connection.*
> (#7B)

Most informants acknowledged that road closures and damage from extreme weather events had been occurring for some time but these events were intensifying and happening more frequently. As one informant said, 'we are getting more extreme weather events. We are going to get more roads getting washed out, and I think it is clearly linked with climate change' (#2A). They were able to identify particularly vulnerable parts of the road network due either to landslip risk or coastal inundation. Efforts were already underway to mitigate the latter with a sea wall built alongside the main highway in Bruce Bay.

Official predictions of climate change effects in the case study area are for increased frequencies of heavy rainfall, which in turn jeopardises vital infrastructure such as access to Te Tai Poutini via the road (Ministry for the Environment 2024; Te Tai o Poutini Plan 2024). There is already a level of apprehension among tourists visiting Te Tai Poutini region about the vulnerability of the infrastructure network during and after weather events (Cui et al. 2023). Informants made numerous references to visitor apprehension with statements such as 'people are avoiding coming here because of the big storms, and because of how long it takes for them to open the roads' (#4B), 'people are wary of being stuck on the coast' (#9A) and 'it totally affects [visitor] plans' (#12B). Not knowing when or if the roads will be reopened after each storm event makes it difficult to plan a trip to Te Tai Poutini.

The effects of climate change are affecting visitor experiences in other ways, particularly around accessing the region's glaciers on foot or by road. The Fox Glacier Valley access road has been washed out and rebuilt so frequently in recent years that the Department of Conservation made a decision in 2019 that the road would no longer be maintained (Department of Conservation 2020). A local department representative confirmed the issue saying:

> *…the last time that we put the Fox carpark back, a big flood wiped everything out, and it all got put back. That cost just a bit over a million dollars to do.*
> (#6A)

The department representative adding that to reinstate the road again in 2019 'was going to cost way more than that and that's why we pulled out of the Fox [Glacier]' (#6A). The representative felt there was a degree of denial among some locals about this future reality in the region:

> *If you wander out (to the river), you'll see them frantically building stop banks. There seems to be a high level of things staying as they are or were. There's not really a whole lot of acceptance I guess that things are changing necessarily, but I think people are kind of hoping that things don't change too much.*
> (#6A)

A local Westland District Council representative suggested that eventually 'neither of the glacier roads will be reinstated' due to the colossal cost, adding that the 'rivers are wanting to break out of channels where man-made channels have been made' (#1A). This was confirmed by

The Waiho Bridge collapsed in 2019 severing the only road access south of Franz Josef Glacier in the South Island.

Image: Waiho Bridge, (Photo by Abby Hamilton, 11 October 2023)

the department representative who said, 'if the road [to Franz Josef] goes again, we might not be putting it back, or it might be the last time we put it back, because it's really expensive'
(#1A).

Climate change effects on the glaciers was frequently discussed in interviews. Most informants had personally witnessed the 'massive retreat in the glaciers' (#4B). A MLTB manager and lifelong resident of Te Tai Poutini stated that it was 'the end of an era when you finally couldn't walk on the glacier in 2012' (#7B). A local Department of Conservation representative described their 20-year experience in the region and pointed out:

> *…anyone who has lived here, no matter how long, overall, the glaciers [Franz Josef and Fox] have been going backwards, so no one can say they didn't know. The glaciers aren't coming back anytime soon.*
> (#6A)

Informants acknowledged that the recession of the glaciers has created 'issues catering for people wanting to get close to the glaciers now' (#6A). In response to this, helicopters were used to access the glaciers (Strong et al. 2023) but even that was increasingly difficult, as a local department representative explained, 'it is an issue over summer for helis [helicopters] to find somewhere to land. They have to go higher and higher to find safe places' (#6A). The majority of informants had an opinion on the maladaptive practice of using helicopters to get visitors onto the glacier. With further retreat of the glaciers predicted (Anderson et al. 2021), continuing helicopter flights onto the glaciers is a controversial subject.

Most informants discussed the risk 'that people just stop coming because they can't see the glaciers anymore' (#2A). Ten years ago, Wilson et al. (2014, p.67) revealed that nearly half (45.6%) of all respondents in their study said they would 'definitely not' visit the region if there was a possibility that they would not see Franz Josef Glacier. A local Māori government representative suggested that there:

> *Needs to be foresight; not 'What do we do with what we've got now? or 'What do we do after? What does the West Coast or what does Franz Josef look like in 5 years' time?' … because otherwise you start packing up the bags now and retreat, retreat somewhere else and it will just become a ghost road.*
> (#1A)

Results highlight that many key informants referred to repercussions of extreme weather events including landslips and major damage to infrastructure as the major consequence of climate change experienced in the region.

The next section explores adaptation actions underway and, in particular, the role of Māori values in planning and decision-making.

Adaptation actions through a Te Ao Māori lens

Key informants indicated that being in a continual reactive state, responding to climate change in the region, particularly regarding road access and vulnerable road infrastructure, was now very much 'business as usual'. Informants recognised that delays to reopening main road networks had devastating local consequences and, unsurprisingly, hardening the transport network infrastructure was regarded as a top priority. But they also recognised as a challenge:

> *Building resilience is difficult in the region due to the key transport networks being quite limited, even though the infrastructure has such a role in bringing people to the place. If they're wiped out, it's devastating for tourism operators.*
> (#9A)

Other efforts towards adapting to climate changes were identified by the key informants. These included the need to identify the most obvious and immediate adaptation measures, diversify the tourism product, encourage a longer-length of stay and develop grassroots regenerative tourism opportunities (including pest control).

In line with the Tourism Industry Aotearoa (2024) Blueprint for the Future, informants saw an important first step in addressing these challenges was to reduce carbon emissions (see Fountain 2024). One MLTB general manager described this as a matter of 'identify[ing] the low-hanging fruit', which included:

> *…electrification of all vehicle fleets, solar infrastructure, set targets for tree plantings and waste and water reviews conducted in their businesses to gauge how to remove and reduce use.*
> (#10B)

According to this informant, such actions would 'basically give your business a license to… [currently, in good conscience]… operate in the changing environment'. Such action aligns with the climate change strategy of Ngāi Tahu (Te Rūnanga o Ngāi Tahu 2018) and would be visible to the visitor:

> *[When] someone walks in … [they] can see at the very least that there are 5 initiatives right then and there, and we're actually doing what we're saying. At every touch point of the visitor's/manuhiri's experience, there needs to be something.*
> (#10B)

This informant also stressed that it needed to be a wider iwi effort, which builds whanauanatanga between businesses and connects beyond the region to the iwi to support each other's learning.

The issue of electrification of vehicles to move kaimahi and manuhiri around the region was a contentious topic for informants. They agreed on the need to find ways to reduce the carbon emissions resulting from tourism, but the region's isolation made this difficult. As an informant with a fully electric vehicle explained:

> *I cannot get to the West Coast from Queenstown/ Tāhuna. Not only are there permanent road closures, but the ability to electrify and drive electric vehicles does not exist. It's really bad and what ends up happening is if you do care about the environment and you're in an electric rental, you won't go to the West Coast.*
> (#10B)

Electrification plans are developing in a context of increasing reliance on helicopters for visitors to see the glaciers. As a local researcher debated:

> *…at what point do you say, 'Well, you know, we're emitting a huge amount of greenhouse emissions to get these people up to the glaciers' or 'We're having a physical impact on the park'.*
> (#2A)

One MLTB operating heli-hiking tours onto the glacier is planning to reduce the number of helicopter flights from 300 to 50 landings a day. They said 'we have an actual reduction plan with 3 key tiers to assess where we will be and where we are going' (#10B). Whether this is enough is open to question. It could be argued that short-term economic gain outweighs long-term climate change adaptation planning and that this strategy is an example of maladaptation (Schipper 2020).

The need to diversify tourism offerings in the region was discussed by most informants who felt that the area would continue to attract visitors due to the scenic beauty of the region. This supports other research (e.g. Strong et al. 2023). As one informant commented, 'there's not many places more beautiful than the West Coast' (#5A) and an MLTB owner suggested that there is an 'opportunity of being able to focus more on nature' (#4B). There was a sense that 'there is more diversity in what tourism businesses offer than 20 years ago' (#2A) and there had also been 'a conscious shift away from only promoting things that are glacier-oriented' (#2A). However, a local researcher acknowledged:

> *…it's a hard conversation to have, when … the whole area has been built around the glaciers…. All of a sudden, you're being told, well actually, possibly your business isn't going to viable for too much longer.*
> (#2A)

Name changes for the region was an important issue for some informants as the current label of 'Glacier Country' did not support the broader appeal of the region. Some informants felt that a change in name presented an opportunity to use the te reo Māori names of the region to recognise 'the place of Māori, the place of Ngāi Tahu' (#9A) in the region. Some informants also felt that the time was right to develop cultural attractions and activities to share Indigenous practices and to tell indigenous stories. A strategy adviser acknowledged that Māori culture is:

> *Increasingly recognised by domestic tourists and by international tourists. I think there's going to be a high level of interest in Māori-led tourism, because of the authenticity… Local MLTBs [have the] opportunity to share our stories, our culture, our way of living, our history, and what's important to us, and I think people want to hear those stories.*
> (#9A)

A Māori hospitality worker in Franz Josef township commented that they 'would like to see more Māori businesses' (#11B) in the area. There is evidence of diversification of tourism options, including indigenous tourism. The Pounamu Pathways experience in Māwhera Greymouth and the Te Kopikopiko o Te Waka installation at the Tohu Whenua cultural heritage site at Fox Glacier are examples of this. These cultural installations are expected to attract visitors and encourage longer stays in the region (Department of Conservation 2022; Glacier Country Tourism Group 2024; Pounamu Pathway Untamed Natural Wilderness 2023).

Most informants discussed opportunities to work together and build whanaungatanga [relationships] to encourage visitors to stay longer. The literature argues that longer-length-of-stay is a key criterion to address responsible travel issues in the tourism industry and supports the United Nations Sustainable Development Goals (e.g. Gössling et al. 2018). A Westland District Council representative suggested 'bringing together collective action' to pursue the opportunity to '[create] enough attraction for people to stay one or 2 nights', while working together on 'how to move forward to a world

without glaciers' (#1A). A Department of Conservation representative agreed:

> *If you can get tourists to see this area as more than just the glaciers, you can get people to stay longer, even if it's only 2 nights instead of one night. It's one night longer. There is definitely economic opportunity there, if people can grasp that and see that as an opportunity rather than as a problem.*
> (#6A)

This also aligns with authentic indigenous tourism experiences, as a MLTB general manager explained:

> *We know that we need a bigger window for visitors/ manuhiri to see the region because it's a great place to visit, and that inevitably means more in the economy. But it also means a more richness of knowledge about the area, and really getting behind the scenes to get to know the people, and the place that you're visiting, versus the quick in and out.*
> (#10B)

While recognising the cultural, environmental and economic value NTT brought to Te Tai Poutini, key informants also saw scope for grassroots regenerative tourism opportunities that are 'eco-tour conservation oriented, including hunting tours in terms of sharing pest management strategies and survival strategies in the bush' (#1A). This informant acknowledged that the region currently had too much focus 'on the big-ticket stuff' before suggesting:

> *NTT is not actually coming down to grassroots level and saying, 'Hey, let's start down here…how can we prop up our people?' because people might come to the little ventures and discover the big-ticket items.*
> (#1A)

Associated with the drive for regenerative tourism opportunities is a desire to find ways for tourists to restore the environment with tree planting and predator-control activities. Most MLTBs are already undertaking such actions as part of the Predator Free South Westland project that is in its fourth year of a 5-year plan (Predator Free South Westland 2024). Such projects require collaborative efforts to make change happen (Peters et al. 2015) and evidence suggests these collaborative relationships are in place. For example, a MLTB manager discussed how they are working with the agricultural sector to plant native trees on unused farmland, saying, 'by bringing the tourism industry and the agricultural industry together, collectively we can make some big changes' (#7B) to adapt to climate change. Their MLTB is also looking for a community site on which to plant trees and 'tell the story [of climate change adaptation, which] people can go and visit, and that's something very visual' (#7B). Kaimahi employees of this business are involved with the planting projects as team-building exercises or when their usual tasks are put on hold due to weather-related events. Other MLTBs were initiating tree-planting ventures. One MLTB owner outlined how:

> *…we're moving more into getting our clients to plant trees, getting involved in the trapping [of pests]. They're able to put money into places to offset their carbon and stuff like that.*
> (#4B)

The global pandemic intensified recognition of the importance of balance between human activity and te taiao (Carr 2020). A local Māori tourism kaimahi observed that during the lockdown 'Papatūānuku [earth mother] was breathing again. Mountains became visible, and animals were seen' (#12B). Another young local Māori remarked, 'Did you see how good the planet was when everyone was in the COVID-19 lockdown?… We need to take action now, because we're the problem' (#13B). The need for balance and the experience of border closures during COVID-19 meant some informants were opposed to tourism numbers rising too much, as a MLTB owner explained:

> *We don't need mass tourism. It was quite nice to have the tourism numbers knocked back again. It made a big difference for people's attitudes. People are a lot nicer to tourists now, so there's definitely a balance between enough tourists to survive and to keep people in communities like this going…especially when you've got community people that are very focused on saving it, and keeping the environment cared for.*
> (#4B)

Informants agreed that to date, Māori values have not been appropriately considered in regional or central government environmental planning. As an example, a Pākehā (European) scientist highlighted the tension between the concept of 'conservation estate' and Indigenous values, noting that:

> *…the idea of National Parks could be an anathema to Māori …because it's putting things in a box over there, and with these sort of cultural values enshrined in the National Parks Act which aren't Māori values.*
> (#2A)

Despite previous lack of recognition of Māori values within the government sector, some informants felt that this was changing in the environmental sphere. A local MLTB owner acknowledged that Māori values are 'definitely having influence in big decisions in parliament, which is good, and a lot of it is around protecting nature, and protecting the environment' (#4B). However, a strategy advisor pointed out barriers to implementation of a Māori worldview within government-led strategies, saying, 'It's one of those things where the 3-year parliamentary cycle is a real impediment to affecting intergenerational change'

and argued for 'our own [iwi] driven climate strategies or climate policy responses' (#9A).

This research identified awareness of a Māori worldview, at least among some Māori informants. As a MLTB employee said:

> *I think it's because the way that you view [the environment] from a Māori point of view is, it's not really like the planet we need to look after, this is Papatūānuku [earth mother]. We've personified the way that we see all things, so when you put that mind-set into it it's like, man, would you throw rubbish onto Papatūānuku?... Respecting the planet like it is a human...It's quite an emotional connection I'd say...a spiritual connection...I feel like it's not only just a Māori worldview, it's indigenous, because man, there are so many cultures that have the exact same perspective, not just Māori.* (#13B)

Some non-Māori informants were unsure how to discuss Māori values but further elaboration showed that their values around environmental guardianship were closely aligned. A non-Māori informant articulated this perspective:

> *I know that my personal values align in many ways [with Māori values], but I'm also not tāngata whenua, let alone mana whenua. We talk about manaakitanga, kaitiakitanga and I think we all practice it, without necessarily having all of the language to articulate it.* (#8B2)

Most key informants used the words 'kaitiakitanga' and 'manaakitanga' to describe Māori values. As one non-Māori said:

> *I'm Tāngata Tiriti [Person of the Treaty (of Waitangi)] myself ... so I'm sort of coming in as an interloper... I'm not quite able to speak to the Te Ao Māori worldview, but I think that the guiding whakataukī [proverb] of te rūnunga is 'Mō tātou, ā, mō kā uri ā muri ake nei – for us and our children after us', and then obviously those principles of kaitiakitanga and manaakitanga.* (#9A)

Māori and non-Māori informants agreed that recognition and visibility of Māori values had significantly increased in the past 2 decades. One non-Māori recalled that there was no cultural experience when visiting the glaciers 20 years ago. There are a range of explanations of this shift, including the growth of NTT and a greater awareness and interest among Māori in their whakapapa [genealogy], which has also increased the interest of non-Māori, for example, 'They want to know about Māori history, they're interested. You've got a lot of them that want to talk te reo' (#11B). But there was another viewpoint expressed by a non-Māori informant on a conservation board:

> *There's a real fear out there of Pākehā losing control of conservation, and we just have to let go of that fear. We have to accept that actually, Māori ran this place pretty well for hundreds of years before we turned up, and we've just pretended that knowledge doesn't exist, and we've stuffed it up. There is a real fear there, right and from that fear comes, comes a backlash.* (#2A)

A young Māori working with their iwi's tourism businesses alluded to the change among Māori of their generation who are embracing their Māori worldview in the face of climate change:

> *I think the generation before me and the generation before that was obviously quite colonised, so my grandparents had, how do you say it, quite a colonised way of thinking about things and the environment and how to look after the planet pretty much. Whereas now, all of those [traditional Indigenous] teachings are starting to come back into the new generations, and with that is how to look after the planet. And yeah, and how we do that with a Māori point of view, an Indigenous point of view.* (#13B)

It is clear from the findings that informants acknowledge the consequences of climate change for Te Tai Poutini and the consequences for tourism businesses manifesting around disruption to road networks and infrastructure and to the retreat of the region's glaciers. Despite Māori values being insufficiently integrated into environmental planning at both the regional and central government levels in the past, the informants indicated that considering future adaptation options in light of key Māori values, including Kaitiakitanga [guardianship or stewardship], Manaakitanga [hospitality] and Whangaungatanga [relationships] is central to addressing these complex issues.

Conclusion

The findings of this research align with scholarly literature showing that a whakapapa-based intergenerational path to climate change adaptation and resilience exists within a Māori worldview (Kenney et al. 2023; Mason et al. 2021). The importance of striking a balance in climate change adaptation efforts for MLTBs in the region cannot be overstated. It is crucial to prioritise actions that promote sustainable tourism practices and enhance the environment rather than cause harm (Carr 2020). Achieving a balance between tourism development and environmental protection is essential for the long-term sustainability of MLTBs and socio-economic stability in the region (Lawson et al. 2021). By adopting practices that prioritise sustainability, regeneration, cultural integrity and environmental stewardship/kaitiakitanga, MLTBs can contribute to the preservation and enhancement of the region's natural and cultural heritage and support their

local communities while offering meaningful and authentic experiences to visitors/manuhiri. In the context of climate change adaptation, Māori values can guide MLTBs to implement practices that minimise environmental damage, promote community engagement and collaboration and foster long-term resilience to changing environmental conditions. By aligning business operations with these values, MLTBs can contribute to the preservation of cultural heritage and the protection of natural ecosystems.

As this research showed, embedding a Māori worldview within tourism operations in Te Tai Poutini is not without challenges. Similarly, challenges exist in integrating Indigenous perspectives into mainstream policy frameworks, including climate change policy (Johnson et al. 2022). To overcome these challenges, there is a need to advocate for inclusive approaches that recognise the diversity of Māori perspectives and worldviews, rather than applying a one-size-fits-all approach. As Cradock-Henry et al. (2021, p.1–5) suggest, 'industry-specific, locally based options and pathways to support adaptation are needed'. This means prioritising the voices and leadership of specific iwi as mana whenua. By empowering iwi and fostering genuine partnerships [whānaungatanga] between Indigenous communities and government agencies, it becomes possible to create culturally responsive and effective climate change strategies that reflect the values and aspirations of all stakeholders involved. By acknowledging Māori leadership in tourism development and climate change action, the government not only validates the contributions of Indigenous peoples but also signals a commitment to meaningful partnership and collaboration. This recognition can pave the way for inclusive and effective climate change policies and initiatives that draw on the strengths and insights of Māori communities.

References

Anderson B, Mackintosh A, Dadić R, Oerlemans J, Zammit C, Doughty A, Sood A and Mullan B (2021) 'Modelled response of debris-covered and lake-calving glaciers to climate change, Kā Tiritiri o te Moana/Southern Alps, New Zealand', *Global and Planetary Change,* 205:103593.

Arnt TAJ (2024) 'Asserting rangatiratanga and kaitiakitanga in response to colonialism, capitalism, and climate change: the case of Ngāi Tahu', Thesis/Dissertation, University of British Columbia website https://open.library.ubc.ca/soa/cIRcle/collections/ubctheses/24/items/1.0442048, accessed 4 February 2024.

Becken S, Whittlesea E, Loehr J and Scott D (2020) 'Tourism and climate change: Evaluating the extent of policy integration', *Journal of Sustainable Tourism,* 28(10):160–1624. https://doi.org/10.1080/09669582.2020.1745217

Becken S (2013) 'Developing a Framework for Assessing Resilience of Tourism Sub-Systems to Climatic Factors', *Annals of Tourism Research,* 43:506–528. https://doi.org/10.1016/j.annals.2013.06.002

Carr A (2020) 'COVID-19, indigenous peoples and tourism: a view from New Zealand', *Tourism Geographies,* 22(3):491–502. https://doi.org/10.1080/14616688.2020.1768433

Cradock-Henry NA, Diprose G and Frame B (2021) 'Towards local-parallel scenarios for climate change impacts, adaptation and vulnerability', *Climate Risk Management,* 34:100372.

Cui A, Fountain J and Espiner S (2023) 'Communicating natural hazard risks to Chinese visitors: a case study from New Zealand', *Frontiers in Sustainable Tourism,* 2, 1192124. http://dx.doi.org/10.1016/j.crm.2021.100372

Department of Conservation Te Papa Atawhai (2023a) Historic Westland Tai Poutini. Department of Conservation Te Papa Atawhai website www.doc.govt.nz/parks-and-recreation/places-to-go/west-coast/places/westland-tai-poutini-national-park/historic-westland-tai-poutini/, accessed 9 May 2023.

Department of Conservation Te Papa Atawhai (2023b) Westland Tai Poutini National Park - Getting There. Department of Conservation Te Papa Atawhai website www.doc.govt.nz/parks-and-recreation/places-to-go/west-coast/places/westland-tai-poutini-national-park/?tab-id=50578, accessed 8 May 2023.

Department of Conservation (9 December 2022) West Coast unveils spectacular new cultural heritage attraction. Department of Conservation Te Papa Atawhai website www.doc.govt.nz/news/media-releases/2022-media-releases/west-coast-unveils-spectacular-new-cultural-heritage-attraction/, accessed 9 January 2023.

Department of Conservation Te Papa Atawhai (2020) Department of Conservation climate change adaptation action plan Te Papa Atawhai he whakamahere hātepe urutau mō te huringa huarangi - 2020/2021 - 2024/2025. Department of Conservation Te Papa Atawhai website www.doc.govt.nz/our-work/climate-change-and-conservation/adapting-to-climate-change/, accessed 28 June 2024.

Deterding NM and Waters MC (2021) 'Flexible Coding of In-depth Interviews: A Twenty-first-century Approach', *Sociological Methods and Research,* 50(2):708–739. https://doi.org/10.1177/0049124118799377

Dube K, Nhamo G and Chikodzi D (2022) 'Climate change-induced droughts and tourism: Impacts and responses of Western Cape province, South Africa', *Journal of Outdoor Recreation and Tourism,* 39:100319. https://doi.org/10.1016/j.jort.2020.100319

Espiner S and Becken S (2014) 'Tourist towns on the edge: Conceptualising vulnerability and resilience in a protected area tourism system', *Journal of Sustainable Tourism,* 22(4):646–665. https://doi.org/10.1080/09669582.2013.855222

Fountain J (2024) 'Preparing for climate change risks in the destination management plans of Regional Tourism Organisations in Aotearoa New Zealand'. Paper presented at CAUTHE 2024: Diversity voices: Creating change in tourism, hospitality and events, 7–9 February, Hobart, Tasmania.

Glacier Country Tourism Group (2024) Walking and hiking Fox Glacier viewpoint / Te Kopikopiko o te Waka. Glacier Country website www.glaciercountry.co.nz/gct_walks/peak-view-lookout-fox-glacier/, accessed 12 February 2024.

Gössling S and Scott D (2024) 'Climate change and tourism geographies', *Tourism Geographies,* 1–11. https://doi.org/10.1080/14616688.2024.2332359

Gössling S, Scott D and Hall CM (2018) 'Global trends in length of stay: implications for destination management and climate change', *Journal of Sustainable Tourism,* 26(12):2087–2101. https://doi.org/10.1080/09669582.2018.1529771

Harmsworth G (2009) 'Sustainability and Māori business', in Frame R., Gordon R., Mortimer C eds *Hatched: the capacity for sustainable development,* Chapter 10:95–108.

Heard G (2019) *Waiho Bridge will take longer to reinstate than first thought – NZTA.* Stuff website www.stuff.co.nz/national/111673913/waiho-bridge-will-take-longer-to-reinstate-than-first-thought--nzta, accessed 26 April 2024.

Hikuroa D (2017) 'Mātauranga Māori—the ūkaipō of knowledge in New Zealand', *Journal of the Royal Society of New Zealand,* 47(1):5–10. https://doi.org/10.1080/03036758.2016.1252407

Hutchison B, Movono A and Scheyvens R (2021) 'Resetting tourism post-COVID-19: why Indigenous Peoples must be central to the conversation', *Tourism Recreation Research,* 46(2):261–275. https://doi.org/10.1080/02508281.2021.1905343

Ioannides D and Gyimóthy S (2020) 'The COVID-19 crisis as an opportunity for escaping the unsustainable global tourism path', *Tourism Geographies,* 22(3):624–632. https://doi.org/10.1080/14616688.2020.1763445

Johnson DE, Parsons M and Fisher K (2022) 'Indigenous climate change adaptation: New directions for emerging scholarship', *Environment and Planning E: Nature and Space,* 5(3):1541–1578. https://doi.org/10.1177/25148486211022450

Kenney C, Phibbs S, Meo-Sewabu L, Awatere S, McCarthy M, Kaiser L, Harmsworth G. Harcourt N, Taylor L. and Douglas N (2023) 'Indigenous approaches to disaster risk reduction, community sustainability and climate change resilience', in Eslamian, S., & Eslamian, F. (Eds.). *Disaster risk reduction for resilience: Climate change and disaster risk adaptation* (pp.37–59). Springer.

Lawrence J, Wreford A, Blackett P, Hall D, Woodward A, Awatere S, Fountain J, Costello MJ, Ausseil A-GE, Watt MS, Dean SM, Cradock-Henry NA, Zammit C and Milfont TL (2023) 'Climate change adaptation through an integrative lens in Aotearoa New Zealand', *Journal of the Royal Society of New Zealand,* 54(4). https://doi.org/10.1080/03036758.2023.2236033

Lawson G, Dean D. He Y and Huang X (2021) 'Motivations and satisfaction of New Zealand domestic tourists to inform landscape design in a nature-based setting', *Sustainability,* 13(22):12415. https://doi.org/10.3390/su132212415

Lofland J (2006) *Analyzing social settings: a guide to qualitative observation and analysis* (4th ed. ed.). Wadsworth/Thomson Learning.

Mason K, Lindberg K, Haenfling C, Schori A, Marsters H, Read D and Borman B (2021) 'Social vulnerability indicators for flooding in Aotearoa New Zealand', *International Journal of Environmental Research and Public Health,* 18(8):3952.

Matunga H, Matunga HP and Urlich S (2020) From exploitative to regenerative tourism: Tino Rangatiratanga and tourism in Aotearoa New Zealand.

Mbah M, Ajaps S and Molthan-Hill P (2021) 'A systematic review of the deployment of indigenous knowledge systems towards climate change adaptation in developing world contexts: implications for climate change education', *Sustainability,* 13(9):4811.

McIntosh AJ (2004) 'Tourists' appreciation of Maori culture in New Zealand', *Tourism Management,* 25(1):1–15. https://doi.org/10.1016/S0261-5177(03)00058-X

Ministry for the Environment (2024) Tourism scenarios. Ministry for the Environment website https://environment.govt.nz/what-you-can-do/climate-scenarios-toolkit/climate-scenarios-list/tourism-climate-change-scenarios/, accessed 14 May 2024.

Moore R (2022) *Whakaoranga taiao, whakaoranga tangata: The restorative, healing, and decolonising potential of environmental restoration.* Doctoral dissertation, The University of Waikato. https://hdl.handle.net/10289/15325

Munshi D, Kurian P, Morrison S, Kathlene L and Cretney R (2024) *Centring Culture in Public Engagement on Climate Change Adaptation: Re-shaping the Future of the NZ Tourism Sector.* NIWA-hosted NSCs: Deep South and Sustainable Seas National Science Challenges. https://doi.org/10.60919/niwa.26011159

New Zealand Government (2001) New Zealand Legislation Te Runanga o Ngai Tahu (Declaration of Membership) Order 2001. Parliamentary Counsel Office website www.legislation.govt.nz/regulation/public/2001/0200/latest/whole.html, accessed 14 December 2023.

New Zealand Government (2022) *Urutau, ka taurikura: Kia tū pakari a Aotearoa i ngā huringa āhuarangi Adapt and thrive: Building a climate-resilient New Zealand – New Zealand's First National Adaptation Plan.* Ministry of the Environment website https://environment.govt.nz/publications/aotearoa-new-zealands-first-national-adaptation-plan/, accessed 28 June 2024.

Ngāi Tahu Tourism (2023) Ngāi Tahu Tourism. Ngāi Tahu Tourism website www.ngaitahutourism.co.nz/, accessed 18 April 2023.

Orchiston C (2013) 'Tourism business preparedness, resilience and disaster planning in a region of high seismic risk: The case of the Southern Alps, New Zealand', *Current Issues in Tourism,* 16(5), 477–494. https://doi.org/10.1080/13683500.2012.741115

Peters MA, Hamilton D and Eames C (2015) 'Action on the ground: A review of community environmental groups' restoration objectives, activities and partnerships in New Zealand', *New Zealand Journal of Ecology,* 39(2):179–189.

Pounamu Pathway Untamed Natural Wilderness (2023) Welcome to Pounamu Pathway. Pounamu Pathway website www.pounamupathway.com/?gad_source=1, accessed 29 November 2023.

Predator Free South Westland (2024) Predator Free South Westland. Predator Free South Westland website https://predatorfreesouthwestland.nz/, accessed 9 February 2024.

Purdie H, Hutton JH. Stewart E and Espiner S (2020) 'Implications of a changing alpine environment for geotourism: A case study from Aoraki/Mount Cook, New Zealand', *Journal of Outdoor Recreation and Tourism,* 29:100235. https://doi.org/10.1016/j.jort.2019.100235

Ringham S, Simmonds N and Johnston L (2016) 'Māori tourism geographies: Values, morals and diverse economies', *MAI Journal,* 5(2):99–112. https://doi.org/10.20507/MAIJournal.2016.5.2.1

Roberts M (2013) 'Ways of seeing: Whakapapa', *Sites: A Journal of Social Anthropology and Cultural Studies,* 10(1):93–120. https://doi.org/10.11157/sites-vol10iss1id236

Rosselló J, Becken S and Santana-Gallego M (2020) 'The effects of natural disasters on international tourism: A global analysis', *Tourism Management,* 79:104080. https://doi.org/10.1016/j.tourman.2020.104080

Salmond A (2012) 'Back to the future: first encounters in Te Tai Rawhiti', *Journal of the Royal Society of New Zealand,* 42(2):69–77. https://doi.org/10.1080/03036758.2012.675576

Scheyvens R, Carr A. Movono A, Hughes E, Higgins-Desbiolles F and Mika JP (2021) 'Indigenous tourism and the sustainable development goals', *Annals of Tourism Research,* 90:103260. https://doi.org/10.1016/j.annals.2021.103260

Schipper ELF (2020) 'Maladaptation: when adaptation to climate change goes very wrong', *One Earth,* 3(4):409–414.

Scott D and Gössling S (2022) 'A review of research into tourism and climate change-Launching the annals of tourism research curated collection on tourism and climate change', *Annals of Tourism Research,* 95:103409.

Sigala M (2020) 'Tourism and COVID-19: Impacts and implications for advancing and resetting industry and research', *Journal of Business Research,* 117:312–321. http://dx.doi.org/10.1016/j.jbusres.2020.06.015

Somerfield EG (2020) *Planning for visitor access: A case study of West Coast glacier country: A dissertation submitted in partial fulfilment of the requirements for the Degree of Master of Planning at Lincoln University.* Master of Planning, Lincoln University.

Stewart EJ, Wilson J, Espiner S, Purdie H. Lemieux C and Dawson J (2016) 'Implications of climate change for glacier tourism', *Tourism Geographies,* 18(4):377–398.

Steiger N, Darelius E, Kimura S, Patmore RD and Wåhlin AK (2022) 'The dynamics of a barotropic current impinging on an ice front', *Journal of Physical Oceanography,* 52(12):2957–2973.

Strong S, Stewart E, Espiner S and Hanly K (2023) 'The Tourism Adaptation Classification (TAC) framework: An application to New Zealand's Glacier country', *Frontiers in Human Dynamics,* 5. http://dx.doi.org/10.3389/fhumd.2023.1130918

Te Rūnanga o Makaawhio (2023) Nau mai, haere mai! Welcome to the official website of Te Rūnanga o Makaawhio. Te Rūnanga o Makaawhio website www.makaawhio.co.nz/, accessed 22 May 2023.

Te Rūnanga o Ngāi Tahu (1997) Ngāi Tahu Values. Te Rūnanga o Ngāi Tahu website https://ngaitahu.iwi.nz/assets/Documents/NgaiTahu-20251.pdf, accessed 22 July 2024.

Te Rūnanga o Ngāi Tahu (2018) *He Rautaki mō te Huringa o te Āhuarangi Climate Change Strategy.* https://ngaitahu.iwi.nz/wp-content/uploads/2018/11/Ngai-Tahu-Climate-Change-Strategy.pdf

The Aotearoa Circle (2023) Tourism Sector Climate Change Scenarios. The Aotearoa Circle website www.theaotearoacircle.nz/reports-resources/tourism-sector-climate-change-scenarios, accessed 28 June 2024.

Tourism Industry Aotearoa (2024) Tourism 2025 and Beyond. Tourism Industry Aotearoa website https://www.tia.org.nz/assets/Infograph/TIA-Tourism-2050-Blueprint-for-Impact-Report_v10_low-res.pdf, accessed 14 May 2024.

Te Tai o Poutini Plan (2024) Proposed Te Tai o Poutini Plan. Te Tai o Poutini Plan website https://ttpp.nz/, accessed 28 February 2024.

Tumahai L (2022, July) *Ka Roimata o Hine Hukatere.* Te Rūnanga o Ngāi Tahu website https://ngaitahu.iwi.nz/our_stories/ka-roimata-o-hine-hukatere-tk90/, accessed 28 June 2024.

Tumahai L (2024) 'Climate Policy in Jacinda Ardern's New Zealand: A Ngāi Tahu Perspective', Chapter 7, *New Zealand's Foreign Policy under the Jacinda Ardern Government*, pp.139–157. https://doi.org/10.1142/9789811285165_0007

United Nations (2023) Department of Economic and Social Affairs Sustainable Development. The 17 Goals. United Nations website https://sdgs.un.org/goals, accessed 4 March 2024.

Vogel B, Yumagulova L, McBean G and Charles Norris KA (2022) 'Indigenous-led nature-based solutions for the climate crisis: Insights from Canada', *Sustainability,* 14(11):6725.

Wang S-J and Zhou L-Y (2019) 'Integrated impacts of climate change on glacier tourism', *Advances in Climate Change Research,* 10(2):71–79. https://doi.org/10.1016/j.accre.2019.06.006

Westland District Council (2023) Places to visit: Franz Josef Glacier. Westland District Council website www.westlanddc.govt.nz/recreation/places-to-visit/franz-josef-glacier/, accessed 22 May 2023.

Wol F, Filho WL, Singh P, Scherle N, Reiser D, Telesford J, Miljković IB, Havea PH, Li C, Surroop D and Kovaleva M (2021) 'Influences of Climate Change on Tourism Development in Small Pacific Island States', *Sustainability,* 13(8):4223. www.mdpi.com/2071-1050/13/8/4223

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Abstract

This study explored Aboriginal and Torres Strait Islander peoples' experiences receiving Aboriginal cultural support from a public health unit in Hunter New England Local Health District in New South Wales. Using an Indigenist research approach, an online survey was conducted as well as yarning with Aboriginal and Torres Strait Islander people who had received cultural support while in isolation during the COVID-19 pandemic. Non-Aboriginal parents and carers of Aboriginal children were also eligible. Of 3,819 eligible individuals, 70 surveys were received with 55 valid responses after excluding 15. Using purposive sampling, 60 individuals were invited to participate in a yarn. Fifty-five participants completed the online survey and reported that the Aboriginal cultural support model they received was helpful and supportive. Yarns revealed valuable insights and lessons learnt for future pandemics. Three themes emerged: 1) cultural and community obligation, 2) culturally centred COVID-19 support and 3) accessing trusted COVID-19 information. This study highlighted the importance of Aboriginal-led pandemic responses. Embedding Aboriginal cultural support into public health responses enables tailored communication, strengthens relationships with Aboriginal communities and reinforces Aboriginal leadership.

Aboriginal cultural support during COVID-19: a mixed-methods study in a local health district, New South Wales

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Introduction

The World Health Organization declared COVID-19 a worldwide pandemic on 11 March 2020. Australia implemented national lockdown restrictions in March 2020. New South Wales (NSW) introduced a range of public health and social measures to help control the spread of COVID-19, including restrictions on indoor and outdoor movement, wearing masks, non-essential business closures, home isolation and quarantine, travel restrictions and mandatory hotel quarantine for overseas arrivals (Capon et al. 2021).

For many Aboriginal people, the use of punitive and controlling language in public health emergencies, such as 'surveillance' and 'non-compliant', can evoke painful memories of assimilation and segregation, reinforcing feelings of systemic oppression, control and historical trauma (Donohue and McDowall 2021). Research following the 2009 H1N1 pandemic revealed distrust and scepticism among Aboriginal people and communities because previous pandemic plans were developed without respectful engagement with communities (Massey et al. 2009). This research found that Aboriginal people wanted to work collaboratively with government and be included in the development of pandemic plans and responses that considered specific strategies tailored to Aboriginal peoples based on culturally grounded holistic models of care.

Aboriginal people and leaders were quick to respond to the COVID-19 pandemic at a national and local level. Many Aboriginal Community Controlled Health Organisations (ACCHOs) and remote communities enforced their own measures and lockdowns to avoid the same effects of previous pandemics (Crooks et

al. 2020). Prior to the COVID-19 pandemic, Hunter New England Local Health District (HNELHD), Population Health had developed and embedded a cultural governance structure into its organisational decision-making to reflect the principles of co-design and two-way learning and sharing. This made it easier to replicate this structure in its COVID-19 Incident Command System (ICS) (Crooks et al. 2021; Crooks et al. 2023). This was done to include Aboriginal people in the prevention, preparedness, response and recovery phases of the COVID-19 public health pandemic response.

As the local COVID-19 response evolved, it was identified by Aboriginal staff members that there was a need to offer culturally responsive support for Aboriginal cases and contacts. In March 2020, the Public Health Aboriginal Team (PHAT), a team of Aboriginal staff from within HNELHD, was established to provide cultural governance in the local Public Health Unit ICS during the COVID-19 response. PHAT ensured that Aboriginal cases and contacts affected by isolation measures were offered holistic culturally appropriate and supportive care (Crooks et al. 2023). The team initially consisted of Aboriginal staff from the Public Health Unit, including a program manager, a registered nurse and an Aboriginal health worker and, as things progressed, the team grew to include clinical and non-clinical Aboriginal staff who were internal and external to HNELHD. PHAT understood that Aboriginal cases and contacts may feel more culturally safe and comfortable speaking to other Aboriginal people with similar lived experiences who could relate to the unique challenges arising from experiences with health services and government agencies. Support provided by the team included telephone calls, provision of food boxes, hygiene packs, health education and support, referrals to healthcare services, access to COVID-19 testing and vaccination as well as advocacy and referrals to other services and support agencies.

This study explored Aboriginal peoples' experiences with receiving cultural support during the pandemic. The aim of the study was to develop better practices for how Aboriginal people can be supported in public health emergencies. This work was developed, led and conducted by HNELHD Public Health Aboriginal staff members.

Methods

The research team and standpoint

The research team consisted of members of the PHAT who were involved in the development and implementation of the Aboriginal cultural support model during the COVID-19 response in HNELHD. The team included public health practitioners and researchers with expertise in Aboriginal health, cultural governance, qualitative research, epidemiology and health protection. As Aboriginal researchers, we brought lived experience and professional expertise to the study, embedding Aboriginal perspectives to strengthen the integrity of the research.

Study design and setting

This study was conducted from March 2020 to January 2022. HNELHD is one of the largest health districts in NSW. It is approximately 160 km north of Sydney and extends north to the Queensland border and includes a mix of urban, regional, rural and remote communities (see Figure 1). HNELHD provides public health services to approximately 900,000 people, including 87,000 Aboriginal and Torres Strait Islander people who represent 25.9% of the total Aboriginal population in NSW (Centre for Epidemiology and Evidence 2024) (Figure 1).

Researchers conducted a mixed-methods study and applied an Indigenist research approach to explore Aboriginal peoples' experiences in receiving cultural support during the pandemic. This approach aimed to understand what worked well, what did not work well and how Aboriginal people can be supported in future public health emergencies. Indigenist research centres Aboriginal communities and upholds the integrity as sovereign peoples (Kennedy et al. 2022). It means the entire research process is determined by Aboriginal peoples and is conducted in a culturally appropriate and responsive way that aligns with the cultural preferences, practices, struggles and aspirations of Aboriginal people. Yarning, as an Indigenous methodology, was used to gather data. Yarning enabled the collection of stories and insights by eliciting Indigenous worldviews and experiences (Kennedy et al. 2022).

Participants and recruitment

This study included individuals who received cultural support during the COVID-19 pandemic in the HNELHD during the study period. Participants were recruited for

Figure 1: Map of NSW showing the health districts with Hunter New England Local Health District in yellow.

Source: NSW Health website www.health.nsw.gov.au/lhd/Pages/default.aspx.

both an online survey and yarns. Invitations were sent via text message during April 2024. Individuals were given 60 days to accept and complete the survey. Interviews were conducted between May 2024 and November 2024.

Inclusion criteria

Primary participants were Aboriginal and Torres Strait Islander people aged 18 years and over who had received Aboriginal cultural support. Secondary participants were parents and carers of Aboriginal and Torres Strait Islander children aged under 18 years old who received Aboriginal cultural support. This included non-Aboriginal parents and carers.

Exclusion criteria

Individuals were excluded from the study if they were hospitalised at the time of being a COVID-19 case or contact due to having access to support by Aboriginal Hospital Liaison Officers. People who had passed away since receiving cultural support were also excluded.

Online survey recruitment

Of 3,826 cases and contacts who received cultural support during the study period, 3,819 individuals were eligible and invited to participate in the online survey. Recruitment was conducted via a personalised text message using a mass messaging communications platform that included a link to the online consent form and survey. All parents and carers of children who were aged under 18 years at the time of receiving cultural support were able to complete the survey on their behalf. This included non-Aboriginal parents and carers of Aboriginal and Torres Strait Islander children.

Yarning recruitment

Purposive sampling was used to select participants from the 3,819 eligible individuals to ensure diversity in age, gender and location across HNELHD. Sixty individuals were contacted via text message, invited to participate in yarns and provided with an information sheet and consent form. Survey participants who wanted to take part in a yarn were sent an invitation via MS Teams and an information sheet and consent form.

Data collection and analysis

Data were collected using quantitative and qualitative methods.

Online survey

We collected participant demographics, experiences with cultural support and feedback on the model for future pandemics. The survey consisted of 25 questions, most of which were measured by a 5-point Likert scale (1=strongly agree to 5=strongly disagree). Participants were given the opportunity to provide additional feedback or share their experiences in detail through free-text fields throughout the survey. Survey participants had the option to take part in a yarn.

Participants could complete the survey based on their own experiences or on behalf of a household or family member whom they cared for. Survey data was collected in RedCap and analysed using Microsoft Excel.

Yarns

Yarning was conducted to understand people's experiences of receiving cultural support during the pandemic. We developed a yarning guide to ensure consistency across sessions while allowing participants to share their stories and experiences freely. The guide included prompts about their experiences, including what made it easier or harder during their isolation and strengths and challenges of the cultural support model.

All yarns were conducted by phone or Microsoft Teams and lasted between 30 and 60 minutes. Aboriginal researchers who were experienced in qualitative methods, conducted the interviews, with one asking questions and others scribing. With participant permission, yarns were recorded. Recordings were not transcribed to maintain authenticity of the yarning process (Bailey 2008; Kennedy et al. 2022). Participants received a store voucher of $20 for their time.

Three Aboriginal members of the research team conducted an inducted thematic analysis of the notes and recordings. The data was coded independently using an online collaborative whiteboard platform (Miro) and then discussed and reviewed to finalise agreed themes. This approach aligns with decolonising methodologies and Participatory Action Research principles, which prioritise Aboriginal worldviews. Qualitative data was analysed in a way that honours and reflects Aboriginal worldviews and respects Indigenous data sovereignty. Embedding Aboriginal perspectives and lived experiences into the thematic analysis ensured that both the process and findings were culturally relevant to Aboriginal communities. This approach enabled themes to emerge while maintaining the principles of Aboriginal knowledge and practice. The online platform tool facilitated real-time discussion and collaboration.

Ethics

This research was approved by the Hunter New England Human Research Ethics Committee of Hunter New England Local Health District, Reference 2022/ETH02532 and the NSW Aboriginal Health and Medical Research Council Ethics Committee, Reference 2052/23. Informed consent was obtained from each participant.

Results

Online survey

Of the 3,826 cases and contacts who received cultural support, 7 individuals were excluded because they had passed away, leaving 3,819 eligible participants who were invited to complete the online survey. A total of 1,311 text messages were undelivered (480 messages were not delivered within the time window, 676 failed and 155 were rejected). Seventy responses were received; however, 15 responses were excluded for incomplete data or were deemed ineligible because they had not received cultural support. Fifty-five surveys were completed. The response rate for each question varied. This is possibly due to participants skipping questions that were not applicable to them or could be from survey fatigue or poor recall.

Most respondents who fully competed the survey identified as Aboriginal (n=54) and most were female (n=38). All respondents resided within the HNELHD with most in major cities (n=25), inner cities (n=20) and outer regional (n=7).

Among the respondents, 28 were COVID-19 cases, 8 were contacts of a COVID-19 case and 19 were initially a COVID-19 contact, but then became a COVID-19 case during their isolation. Most respondents were in isolation for 14 days (n=28) while some isolated for 10 days (n=6) or 7 days (n=18) and others (n=5) isolated for different durations.

The types of cultural support received by the participants varied. The most common type of cultural support was telephone support (n=43) followed by receiving food boxes (n=30) or hygiene items (n=21). Other support included help with accessing COVID-19 vaccinations (n=5), health advice and support (n=2) and supply of a mobile phone (n=1). Regarding frequency of phone calls, 38 respondents rated them 'just right' while 8 respondents felt the calls were 'not enough' and 2 felt they were 'too much'. Seven respondents did not receive any phone calls.

COVID-19 information and advice

Most respondents (n=45) reported receiving enough information from the Cultural Support Team to safely isolate, with 44 out of 45 finding the information easy to understand. Of the 54 participants, 44 indicated the risks of leaving home isolation were clearly explained, while 11 stated they lacked enough information. One survey participant expressed their gratitude stating:

> *I am very grateful for all the information I received…I learnt from your team which provided me the knowledge to then have the conversations openly with my family members.*

Respondents also sought information from other sources during their isolation. The Cultural Support Team was the key source of information (n=28) followed by NSW Health website (n=21), family (n=18), general practitioner (GP) (n=13), social media (n=13), Australian Government Health website (n=10), Aboriginal Medical Service (n=10) and friends (n=10).

Referrals to support services

Fourteen respondents reported being referred to other support services. Most were referred to mental health services (n=5) and COVID-19 home testing (n=5). Other referrals included supported health accommodation (n=1) and medical assessment (n=1).

Preferred sources of information for future pandemics

When asked about future communication during a pandemic, most respondents indicated Aboriginal Medical Services (n=38, 70.4%) as their preferred source followed by NSW Health (n=33, 61.1%) and Public Health (n=23, 42.6%). Other sources included National Aboriginal Community Controlled Health Organisation (NACCHO) (n=21, 38.9%) and the Australian Department of Health (n=15, 27.8%). Two respondents suggested using mail drops and links with key organisations for future pandemic communication dissemination.

Overall views of cultural support

Most respondents (n=46) felt comfortable sharing their personal experiences of COVID-19 with the Aboriginal Cultural Support Team. Forty-one respondents indicated that the support was helpful and supportive and 5 did not comment. Most respondents rated the overall support they received as 'excellent' (n=31), 'good' (n=7) or 'ok' (n=8) (see Figure 2) with 81% stating they were 'likely' or 'very likely' to recommend cultural support to others. One participant appreciated the knowledge and support they received stating, 'the support we received was helpful. the team were knowledgeable and friendly'. While another participant stated:

> *…without a calm, caring voice on the phone I believe my path of health could have gone a bad way. It was only because of their reassurance that I was taken via ambulance to hospital. They contributed to saving my life.*

Many participants stated that cultural support is appropriate (n=54) and acceptable (n=55) during a pandemic. There was strong support for the continuation of cultural support and referrals in future pandemics (n=54) (see Table 1). Many respondents were supportive of receiving healthcare over the phone or video (n=43), while 9 were unsure and 3 strongly disagreed. Some appreciated the practical assistance, with one stating, 'the food and hygiene products were a godsend also as our families were in lockdown also and we were not confident in asking for help from others'. However, another participant shared

Table 1: Aboriginal cultural support survey responses about future pandemic responses.

Statement	Total responses (n)	Variable	n (%)
The Aboriginal cultural support model should be planned, managed and led by Aboriginal and Torres Strait Islander people.	54	Strongly agree	36 (66.7%)
		Agree	14 (25.9%)
		Unsure	2 (3.7%)
		Disagree	1 (1.8%)
		Strongly disagree	1 (1.8%)
Aboriginal cultural support should be provided by Aboriginal and Torres Strait Islander people.	53	Strongly agree	30 (56.6%)
		Agree	14 (26.4%)
		Unsure	8 (15.1%)
		Disagree	1 (1.8%)
		Strongly disagree	0 (0%)
Aboriginal cultural support should be included in future pandemic responses.	54	Strongly agree	43 (79.6%)
		Agree	11 (20.4%)
		Unsure	0 (0%)
		Disagree	0 (0%)
		Strongly disagree	0 (0%)
Aboriginal cultural support is an appropriate way to support Aboriginal and Torres Strait Islander people during a pandemic.	54	Strongly agree	37 (68.5%)
		Agree	16 (29.6%)
		Unsure	1 (1.8%)
		Disagree	0 (0%)
		Strongly disagree	0 (0%)
It is acceptable for all Aboriginal and Torres Strait Islander people to be offered Aboriginal cultural support during a pandemic.	55	Strongly agree	41 (74.5%)
		Agree	14 (25.5%)
		Unsure	0 (0%)
		Disagree	0 (0%)
		Strongly disagree	0 (0%)
It is acceptable for Aboriginal and Torres Strait Islander people to receive Aboriginal cultural support during a pandemic.	54	Strongly agree	42 (77.8%)
		Agree	11 (20.4%)
		Unsure	1 (1.8%)
		Disagree	0 (0%)
		Strongly disagree	0 (0%)
It is acceptable for Aboriginal and Torres Strait Islander people to be offered referrals to support services during a pandemic.	52	Strongly agree	43 (82.7%)
		Agree	8 (15.4%)
		Unsure	1 (1.9%)
		Disagree	0 (0%)
		Strongly disagree	0 (0%)
It is acceptable for Aboriginal and Torres Strait Islander people to receive referrals to support services during a pandemic.	51	Strongly agree	40 (78.4%)
		Agree	10 (19.6%)
		Unsure	1 (1.9%)
		Disagree	0 (0%)
		Strongly disagree	0 (0%)
Now that we have been through the COVID-19 pandemic, it is more acceptable to receive other healthcare over the phone or video.	54	Strongly agree	29 (53.7%)
		Agree	13 (24.1%)
		Unsure	9 (16.7%)
		Disagree	0 (0%)
		Strongly disagree	3 (5.5%)
It is acceptable to receive health information and advice during a pandemic.	53	Strongly agree	40 (75.5%)
		Agree	12 (22.6%)
		Unsure	0 (0%)
		Disagree	0 (0%)
		Strongly disagree	0 (0%)

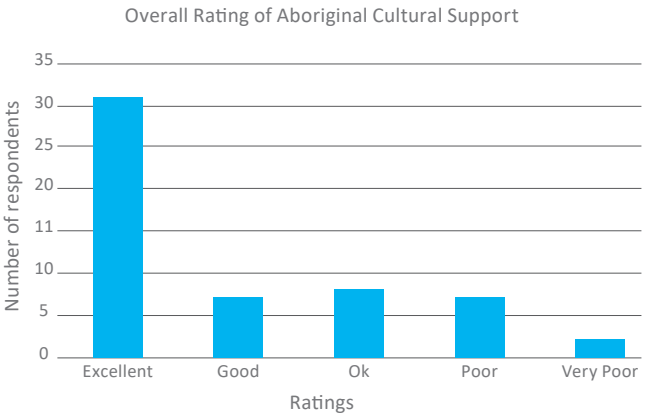

Figure 2: Survey participants rating of Aboriginal cultural support received.

their frustration at not receiving a food box despite requesting one:

> *I believe it was a fault by our local services who on 2 occasions promised to drop one off but never did, which was a pity as we were all really sick and had to rely on friends and other family to drop off supplies, including, hygiene, food and medicinal supplies.*

Yarning interviews

A total of 9 yarns were conducted. Of these, 2 participants were recruited through purposive sampling, while 7 were recruited through the online survey. Eight participants identified as Aboriginal and one was a non-Aboriginal carer of Aboriginal children. Yarns were conducted between May 2024 and November 2024 and ranged from 30 to 60 minutes.

Yarning provided a deeper understanding of participants' lived experiences during the pandemic and framed 3 key themes that emerged, as well as actionable lessons to inform future pandemic responses.

Strengths and challenges of personal COVID-19 experiences

Participants shared both enablers and challenges of their pandemic isolation. Strengths included adaptability, resourcefulness and a strong commitment to keeping their communities safe. In addition to the phone calls, practical support including access to COVID-19 testing, food boxes, information and advice and hygiene items was helpful.

Challenges included the inability to safely isolate, as well as the mental health effects of isolation. Participants described struggles accessing groceries and essentials as well as difficulties isolating safely, especially for large families living in small houses, with one participant sharing 'having to sleep on the lounge with a mask'. Restrictions, not being able to go out, self-isolation and forced isolation had a negative effect on mental health. Additionally, grief and loss took an emotional toll for some participants. One participant shared they were: 'unable to attend to Sorry Business at the same time which made it really hard'.

Participants shared personal stories of their past interactions and negative experiences with health services: 'when you have a bad experience from health, that trauma will stay with you forever…you gotta have that trust and rapport, or you will not connect with me'. Some participants who felt very sick when they had COVID-19 refused to go to the hospital because of past experiences: 'I didn't go to hospital because of past negative experiences of being sent away'. This highlights the need for culturally responsive and supportive care and trusted Aboriginal health workers working in the health service.

Participants reflected on discriminatory legislation with the fear of government taking away children. This was a real and genuine concern, one said: 'if I can't feed my kids, I'll have my kids removed. The Aboriginal Cultural Support Team were able to break down those barriers about [child protection services]'.

Despite the challenges, participants demonstrated strength, resilience and strong determination to do whatever was necessary to protect their family and community from getting sick.

Theme 1: Cultural and community obligation: keeping mob informed and safe

Participants expressed a strong sense of cultural responsibility and obligation to protect and support each other during the pandemic. They highlighted the importance of keeping everyone well-informed about COVID-19 risks and public health measures, especially those who needed the most protection. One participant reflected how well Aboriginal people were supported during the pandemic:

> *I realised we weren't the only ones in our community that were struggling…[we were] sharing and liaising with other groups from all over the state…[and] sharing information that we were able to get from HNE* (Cultural Support).

Participants felt a duty to share information provided by the Cultural Support Team to dispel myths, educate others and promote public health practices to keep families and communities safe. They felt an obligation to care for others by sharing knowledge and understanding of the pandemic through their local groups and networks. For example, one participant, a member of a local Aboriginal Men's Group, shared the information gained from the Cultural Support Team with other men and men's groups that were unaware of support services available to them, saying, 'within our org (sic) we started online men's groups. We were sharing information in these groups'. Participants stressed the importance of education through social and cultural networks and community groups to keep communities

informed about pandemic risks because it's 'good to educate our community'.

Participants recognised the key role of Aboriginal health workers in breaking down complex pandemic information and sharing both population-wide statistics and local Aboriginal-focused data to identify gaps and prioritise local community support services and response. One participant who worked in community said:

> *…[when NSW Health stopped sharing the COVID-19 case numbers] I was checking the FluTracking numbers… mainly for my own benefit….but like when there's big events on, or we are looking at planning things through work, I show my colleagues and sort of say here's a spike, we need more hand gel at these events or just have masks on standby.*

Participants appreciated receiving clear and relatable information and advice that empowered them to have discussions with their families about isolation and public health practices and were 'able to educate family about support services available for them in other areas…[and] COVID-19 tests, drive through testing, masks, hand hygiene and washing everything'.

Theme 2: Culturally centred COVID-19 support: trust, connection and tailored care

Participants emphasised the need for culturally respectful, community-centred support. The Cultural Support Team's holistic approach, grounded by an understanding of local cultural contexts, built trust and strengthened connections. Participants valued the tailored support, which was personal and relevant to their individual needs. Cultural support was offered in a variety of ways including phone calls, text messages and emails, food boxes, hygiene packs, medication and referrals to support services. One participant stated regular check-ins from the team were helpful: 'having someone on the other end of the phone was better and safer'. One mother, whose child was extremely sick, shared the importance of the cultural support phone calls: 'it's good when you can talk to them and ask questions. Every question I asked they answered and if they couldn't help, they gave me a number to call'.

Participants felt the cultural support phone calls were prompt and provided participants with reassurance and a sense of care: 'they contacted me a couple of days later, a couple of follow-up phone calls and let me know they were there if I needed, I felt supported'. The frequency of phone calls varied and most participants felt it was appropriate and acceptable. One said: 'we got a couple of calls. It was nice for them to just check in, cause no one else was checking in'. Another said the calls were 'just right… 4 [calls] was plenty, any more would be too much'. The convenience of the calls was noted as a standout as one participant noted, 'it was paperless – easy to communicate with, didn't have to tell your story to 50 different people. The information was consistent…and you knew what the phone call was about'.

While most participants found the information and advice accessible and helpful, one noted that literacy barriers affected their ability to fully engage with cultural support, 'because of my lack of reading skills, I could have received more support in that aspect'. One participant noted that due to low literacy levels, they experienced difficulties home-schooling their children.

Many participants valued the high-level of support provided by the team, with one participant stating: 'although I told the team I was fine, they still persistently made contact' and another participant appreciated the 'personalised phone call made me feel like I was listened to, validated'.

Participants reflected on the holistic support care the Cultural Support Team provided. One participant noted other communities did not receive 'as much support as Aboriginal people in HNE' and that 'a lot of communities were doing it a lot worse than we were, because of the additional support HNE provided'.

There was a deep sense of appreciation and feeling valued, knowing that there was support available. Some said it was 'unexpected and a surprise' as well as reassuring to know that someone was caring for their wellbeing. It made people feel good and the education provided by the Cultural Support Team helped make things easier, as stated by one participant: 'it was nice to know it was there, it made you feel secure, and made you feel good, and made me feel a bit special afterwards'.

The support helped individuals and families and empowered the wider community. One participant stated the team 'was able to break down the barriers and give all different types of resources to help mob'.

Participants emphasised the Cultural Support Team's inclusive and compassionate approach made them feel valued and respected, regardless of their position or status:

> *Basic human rights respect given from the Cultural Support Team to every single person – compassionate and understanding and explained, 'I understand you don't need it, but we are going to send it to you anyway'…if there was something that I needed, I don't feel bad asking for it.*

Another participant noted how the Cultural Support Team supported all individuals in a non-judgemental way stating: '[the team] didn't ask who it was for, you helped everyone and just gave it to mob'.

Participants indicated the care provided felt real and genuine, culturally grounded and community focused. This highlights the value of kinship and cultural understanding

in fostering trust and providing essential assistance during challenging times. One participant said: 'The cultural aspect is different, that connection in culture, feels…like a friend checking on me…having a yarn. Keep that there'. Another participant shared their experience of receiving regular phone calls:

> *…it was at a personal level, friendly, not prying, it was genuine concern for my wellbeing, and that person didn't know me, but it was what she said it, how she said it, it wasn't just a 2-minute phone call, we chatted for a while.*

The care and support provided by the Cultural Support Team proved to be essential during the pandemic, with one participant stating:

> *…we would have been lost without you, the community would have been lost without you. I don't think we would have survived because we didn't get much help from other people.*

Theme 3: Accessing trusted COVID-19 information

Participants highlighted the importance of access to trusted, reliable and culturally relevant COVID-19 information. Trusted sources such as Aboriginal health workers, Elders and community champions are essential to navigate complex and sometimes conflicting public health messages. Participants told us that the constant changing of information was confusing, overwhelming and confronting, which led to mistrust. Key sources of information included state and national government health websites, ACCHOs, pharmacists, Aboriginal media, social media and the Cultural Support Team. Many participants felt they trusted and valued the information from the Cultural Support Team. They trusted the information because they trusted the people. One participant stated:

> *…having connection with who was on the team. Knowing we were getting the right information we could trust and rely on' and that 'it's a face that you know, and someone that you have that trust and faith in.*

Participants said that young people felt scared about COVID-19 because of the unknowns and that reassurance from the Cultural Support Team lessened some fears. One said: 'if [they] didn't talk to [Cultural Support Team member] as much as they did, they wouldn't have known how serious it was'.

The Cultural Support Team was acknowledged for providing clear, easy to understand, relevant and relatable advice with one participant stating:

> *…the information was easier to understand and was able to listen to because the team is known to the community, its different because you're not likely to listen to those close to you.*

The Cultural Support Team collaborated with the ACCHOs across the area and this was recognised as a strength. Participants noted how 'localised messages that [ACCHO] did in conjunction with Aboriginal cultural support' were designed and tailored to meet local community needs. Participants received information on topics including hygiene practices, staying away from each other to keep safe, COVID-19 testing and vaccinations, mental health tips, medication, signs and symptoms of declining health and when to seek care. One participant said: 'the [Cultural Support Team] was able to provide more helpful information and showed us somebody cared. Good to have some information'.

Participants reflected that 'the [public health] rules at the time didn't make sense to the community around isolation' and recommended that pandemic messages be simplified and that the Cultural Support Team could be the translators and deliverers of complex information:

> *…if they [cultural support] were passing on info…just the facts…[about] what you are allowed to do, not do, more basic so it's easier to understand, it got very confusing in the end, you didn't know what you were doing.*

Lessons from COVID-19: strengthening future public health emergencies for Aboriginal communities

Participants identified successes and strengths of the cultural support model, including personalised and individual care and support, practical support such as food and hygiene boxes, access to information, regular phone calls and trusted team members who could communicate honestly and directly. One participant praised the Cultural Support Team's efforts and the difference they made for Aboriginal communities in HNELHD: 'if mainstream health took a lesson from the Cultural Support Team, you would see big differences'. They also noted the dedication and commitment of the team and importance of prioritising staff wellbeing: 'at the end of the day our communities need our health workers are healthy'. They suggested improving future public health responses through the use of culturally appropriate community-led responses, strong communication and early engagement with Aboriginal organisations.

Key recommendations for future cultural support

Participants provided recommendations for cultural support:

- Additional efforts to support individuals with lower literacy levels by developing tailored resources and strategies that improve accessibility such as social media messages and videos to enhance online engagement.

- Enhanced promotion and communication through broader advertising and visibility of the Cultural Support Team and increased awareness of local support services.
- Improved accessibility by establishing a cultural support hotline or an online chat function for people to access after hours.
- Using technology systems and platforms to gather background information prior to a cultural support phone call. Communicating with individuals using video calls for more personable and supportive care. Sending text messages and links to online information.
- Partner with Aboriginal stakeholders including ACCHOs as well as local Aboriginal health workers to coordinate on-the-ground efforts in community.
- Partner with Aboriginal communities, for example connect and communicate with Aboriginal peoples in future pandemics using stronger communication messages 'in a user-friendly way and plain language' and through a variety of modes including social media platforms, videos and storybooks to attract children and young people. Participants noted the significance of Aboriginal events, gatherings and networks as important for information sharing.
- Improving government and health services systems and responses to support Aboriginal people in future pandemics. One participant stated they observed the hospital was not prepared nor equipped to deal with the influx of Aboriginal cases and the need for health services to be more aware of cultural contexts and needs of the local community, including:
    - cultural respect and awareness training: non-Aboriginal health staff undertake cultural respect training to better understand and meet local community needs
    - accommodation support: participants acknowledged that some families lived in crowded housing and could not afford to pay for accommodation to safely isolate and suggested Aboriginal peoples be supported with accommodation
    - provision of personal protective equipment (PPE): ensuring adequate resourcing and distribution of PPE in Aboriginal communities
    - collaboration with other services: all services, government and non-government, work together to plan and prepare for future pandemics to ensure local responses are ready to go.

Discussion

This study highlighted the importance of Aboriginal-led, culturally informed and tailored support for Aboriginal people when responding to public health emergencies. The depth of engagement with participants during the study meant the findings were grounded in lived experiences and provided valuable insights for future public health emergency policy and practice. Aboriginal people can face significant barriers to health care, which are exacerbated during pandemics. This highlights the need for flexible, accessible and responsive health services so that Aboriginal people are not further disadvantaged (Nolan-Isles et al. 2021) or targeted (Boon-Kuo et al. 2021). Participants reported that the Aboriginal cultural support model was acceptable, appropriate and effective, with high levels of satisfaction. Fundamental factors contributing to the model's success included holistic care and support, trusted relationships with local Aboriginal health workers, development and dissemination of culturally appropriate and relatable communication. Participants valued being able to access clear and reliable information that helped them to keep their families safe during the pandemic. These findings point to the importance of embedding cultural support and Aboriginal representation in local pandemic responses.

Aboriginal people have been continuously overlooked or considered as an afterthought in public health responses and this is a shared experience endured globally by Indigenous peoples (Markwick et al. 2014). This time, HNELHD aimed to show that it is possible to change the narrative by working collectively to centre Aboriginal families and communities in the response. By prioritising Aboriginal voices and needs, HNELHD ensured that the pandemic response was not only inclusive but helpful and not harmful. The findings suggest that the cultural support model was successful for a few reasons. Firstly, it was developed and implemented by Aboriginal people. This aligns with the findings from the National COVID-19 Response Inquiry Report (Department of the Prime Minister and Cabinet 2024) noting that it is crucial to have Aboriginal community-led responses. The report recommended that future public health responses need to be inclusive and better prepared to address the challenges of Aboriginal communities and ensuring those needs are prioritised in emergency management planning. Secondly, the team embedded support options and assistance for Aboriginal cases and contacts. Early engagement with Aboriginal communities and stakeholders helped Aboriginal peoples stay informed of changing information and there was activation of support to areas that needed it (Crooks et al. 2020). Lastly, engaging with Aboriginal stakeholders and organisations throughout the pandemic built trust and strengthened connections. This shows the importance of health systems incorporating cultural values, lived experiences and Aboriginal ways of knowing, being and doing.

Findings

Culturally appropriate and holistic support

Past pandemic plans and responses often overlooked the needs of Aboriginal people and communities, leading to ineffective disease control strategies (Massey et al. 2011). We applied the learnings from previous research, reinforcing the importance of Aboriginal-led and community-focused approaches. This aligns with other research that shows the effectiveness of addressing health inequities during a pandemic (Fredericks et al. 2024). Similarly, the Gurriny Yealamucka Health Service highlighted the importance of community-control and self-determination to enable strong governance and leadership capacity to respond to the pandemic (McCalman et al. 2021).

The Aboriginal cultural support model demonstrated the importance of culturally appropriate and tailored care in building trust between public health and Aboriginal communities. Participants highlighted the profound benefit of a culturally responsive and sensitive approach, which includes holistic support, such as food boxes, hygiene items and phone calls, to address past injustices and sociocultural determinants of health (Stanley et al. 2021).

Communication and trust

Effective communication is crucial for everyone during a pandemic, especially for Aboriginal communities, and must be culturally appropriate to foster understanding, trust and action of public health measures. Participants in this study emphasised the value of receiving clear, relatable and culturally appropriate information from local, known and trusted sources who offer practical guidance are essential for keeping communities safe (Massey et al. 2011). This aligns with other studies showing that trusted messengers of information, such as Aboriginal health workers and community leaders, are crucial in addressing misinformation and communicating public health advice that makes sense for Aboriginal peoples (Finlay and Wenitong 2020; Seale et al. 2020; Walter and Andersen 2013).

Attending cultural and social gatherings, such as funerals and community events, is important for Aboriginal people even when they may be unwell (Massey et al. 2009). Disseminating public health information through significant cultural events and gatherings was suggested to inform community members about pandemics and the associated risks. Tailored and culturally relevant and relatable information can help reduce public health risk to Aboriginal communities (Seale et al. 2020). Participants preferred to receive public health communications primarily through ACCHOs due to their established and trusted relationships with Aboriginal communities (Finlay and Wenitong 2020). This emphasises the importance and role of the Cultural Support Team alongside other reliable and trusted sources of information during a pandemic.

Barriers and challenges

Some participants mentioned how it was a challenge for some families to safely isolate due to large families and inadequate housing, which is consistent with other research where generations live under one roof (Clements et al. 2023). Some participants noted that literacy barriers in understanding public health messages and the inconsistent delivery of resources, such as food boxes, created inequities and gaps in support. One participant shared that homeschooling was hard because of their own low literacy and lack of support. Health literacy and technical support may assist people to understand the reasons for the public health measures and promote and encourage behaviour change (Häfliger et al. 2023; McCaffery et al. 2020; Paakkari and Okan 2020).

Addressing system inequities

Mainstream health services are often an unsafe place to seek healthcare (Australian Institute of Health and Welfare 2023). Some participants reflected on the historical and ongoing effects of colonisation and assimilation and the fear of child removal as a barrier to accessing healthcare. The Cultural Support Team's experience and understanding of the issues Aboriginal peoples experience ensured that the team's planning and response efforts identified and addressed these issues. Being an all-Aboriginal team, efforts were made to ensure Aboriginal cases and contacts felt supported, not reported (Dudgeon et al. 2023). An analysis of the COVID-19 policy response constructs Aboriginal people as vulnerable and mobility as a problem that needed a law-and-order response (Donohue and McDowall 2021). Deficit discourse frames and represents Aboriginal peoples in a narrative that is negative and problem blaming (Chittleborough et al. 2023). To avoid being referred to as 'poor historians', having 'poor recall' or being 'non-compliant', Aboriginal public health leaders ensured that Aboriginal people were included early and not forgotten (McCalman et al. 2021).

Incorporating holistic care into the cultural support model highlights the team's role in acknowledging and addressing fear of disclosing personal information, which is deeply rooted in past policies and practices of forced child removals. Aboriginal people are still fearful of having their children removed due to these experiences (Dudgeon and Walker 2022). By embedding this understanding into the cultural support model to guide conversations with families, we demonstrated the potential of culturally informed care to mitigate intergenerational trauma of assimilation policies. This approach aligns with findings from studies that emphasise the importance of culturally safe and responsive healthcare to build trust with Aboriginal communities (Graham et al. 2022).

Some participants noted the importance of data sharing and understanding local contexts and situations regarding

COVID-19 case numbers. Data sharing had been a longstanding barrier that was easy to remove during the pandemic. However, concerns remain that data sharing was no longer in place (Scheibner et al. 2023). Effective information is crucial to identify and activate local support services and should not be limited to state and national governments but should include Aboriginal communities. This approach ensures that local contexts are understood and addressed, leading to effective public health responses underpinned by shared decision-making and self-determination (Jull et al. 2023). Several frameworks emphasise the need for Aboriginal people to exercise greater control over their data (Data Champions Network Working Group 2024; National Indigenous Australians Agency 2022; Rose et al. 2023) while acknowledging and addressing the historical contexts and considers Indigenous data needs (Walter et al. 2021).

Strengths and limitations

There were many strengths of this study. We centred Aboriginal voices and cultural values by conducting research that was informed by Aboriginal people. This enabled the lived experiences of Aboriginal people to come through, ensuring the findings are meaningful for communities. Both quantitative and qualitative research methodologies, underpinned by Indigenist research and participatory action research approaches, provided deeper understandings of Aboriginal people's experiences of cultural support, allowing valuable insights and suggestions for future pandemic responses. The study captured diverse perspectives and experiences including age, gender and geographical location, to enhance the richness of the findings.

This study had several limitations, including missing or incomplete data for some questions. A key limitation was the considerable time gap between when cultural support was provided (March 2020 to January 2022) and when the study was conducted (April to November 2024). Participants did not indicate when they received cultural support, making it difficult to understand the average time between when individuals were provided support and participation in the survey and yarn. This may have affected recall bias and participant ability to accurately reflect on their experiences. Moreover, there were challenges in follow-up with potential participants for both the survey and yarns, such as disconnected and changed phone numbers, which reduced the ability to reach more people. These factors hindered our ability to understand a wider range of experiences, however, the depth of the insights collated provided valuable learnings and guidance. Some participants may have only shared positive feedback in the yarning session, given that the Aboriginal researchers were also part of the Cultural Support Team. However, we believe participants felt comfortable enough to provide honest feedback. The use of Indigenist research methods, including yarning, ensured participants experiences and perspectives were privileged and contextualised within sociocultural realities. Also, the recruitment approach ensured a diversity of voices.

Recommendations for pandemic policy and practice

Embed cultural governance

Embedding cultural governance and the Aboriginal cultural support model was relatively smooth due to the commitment to privilege Aboriginal representation and ways of doing in the local Public Health Unit (Crooks et al. 2021). However, without the leadership of non-Aboriginal peoples, implementing similar models within a mainstream public health unit may not be as easy or achievable. The success of the cultural support model was attributed to it being led by Aboriginal peoples within a culturally appropriate governance framework (Griffiths et al. 2021). Mainstream public health units could adopt similar approaches by fostering local partnerships with Aboriginal stakeholders, invest in cultural safety and competence training for non-Aboriginal staff and align public health emergency responses with Aboriginal worldviews. Without sustained efforts, Aboriginal peoples' needs and priorities may continue to be overlooked, which can often perpetuate systemic racism and health inequities (Australian Institute of Health and Welfare 2023).

Strengthen Aboriginal leadership and partnerships

Strengthening Aboriginal leadership and partnerships can be achieved by investing in an Aboriginal public health workforce and collaborating with ACCHOs to deliver local responses (Wilson-Matenga et al. 2021)

Tailored and targeted communication

Tailored communication allows for reliable, accessible and culturally relevant information to be developed and disseminated through local and trusted sources, like Aboriginal Community Controlled Health Services and other Aboriginal organisations.

Identify and address systemic barriers

Identifying barriers ensures reliable systems and processes are in place to support individuals, families and households (for example food boxes, household cleaning products).

Embed Aboriginal cultural support models in public health practice

Public health should invest and resource programs like the Aboriginal cultural support model to ensure Aboriginal peoples and communities are supported during public health crises like pandemics.

These recommendations support and align with national and state reforms, priorities and plans (Coalition of Aboriginal and Torres Strait Islander Peak Organisations and Australian Government, 2020; Centre for Aboriginal Health 2024; Department of Health and Aged Care 2021). Sustained investment and efforts are needed to resource public health efforts and build, strengthen and retain an Aboriginal public health workforce to appropriately and adequately plan and respond to public health emergencies in a timely way. Future research could explore the experiences and perspectives of health staff involved in delivering the cultural support model as well as examining best practices for delivering culturally appropriate public health communications with Aboriginal communities.

Conclusion

This study demonstrates the importance of embedding Aboriginal-led, informed and tailored cultural support into public health emergency responses These findings help to inform future public health responses and improve outcomes for Aboriginal peoples. The study highlights the successes of cultural support and provides a model that can be tailored, adapted and replicated in other regions or small or large public health incidents and emergencies.

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The authors acknowledge the unceded lands on which the study took place and pay respects to Elders past and present. We acknowledge the significant place that Aboriginal and Torres Strait Islander peoples hold in Australia as the First Peoples of Australia. We also acknowledge colleagues who supported this study, Ben Elton, Fakhrul Islam and members of the Aboriginal Cultural Support Team and partners in the local response Aboriginal Health Unit and Integrated Chronic Care for Aboriginal Peoples Program. We would not have been able to achieve the successes we did if it were not for the collective and collaborative efforts.

References

Australian Institute of Health and Welfare (2023) Cultural safety in health care for Indigenous Australians: monitoring framework. AIHW website www.aihw.gov.au/reports/indigenous-australians/cultural-safety-health-care-framework/contents/background-material, accessed 27 November 2024.

Bailey J (2008) 'First steps in qualitative data analysis: transcribing', *Family Practice,* 25(2):127–131. https://doi.org/10.1093/fampra/cmn003

Boon-Kuo L, Brodie A, Keene-Mccann J, Sentas V and Weber L (2021) 'Policing biosecurity: Police enforcement of special measures in New South Wales and Victoria during the COVID-19 pandemic', *Current Issues in Criminal Justice,* 33:76–88. https://doi.org/10.1080/10345329.2020.1850144

Capon A, Sheppeard V, Gonzalez N, Draper J, Zhu A, Browne M, Sullivan E, Mihajlovic M, Rockett R and Ferson MJ (2021) 'Bondi and beyond. Lessons from three waves of COVID-19 from 2020', *Public Health Research & Practice,* 31(3):3132112. https://doi.org/10.17061/phrp3132112

Centre for Aboriginal Health (2024) NSW Aboriginal Health Plan 2024-2034. NSW Health website www.health.nsw.gov.au/aboriginal/plan/Pages/default.aspx, accessed 29 November 2024.

Centre for Epidemiology and Evidence (2024) HealthStats NSW. NSW Health website www.health.nsw.gov.au/hsnsw/Pages/default.aspx, accessed 27 November 2024.

Chittleborough E, Delbridge R, Coveney J, Wilson R, MacKean T and Wilson A (2023) 'Challenging deficit discourse in Aboriginal and Torres Strait Islander nutrition and dietetics research: a critical discourse analysis', *SSM-Qualitative Research in Health,* 4:100323. https://doi.org/10.1016/j.ssmqr.2023.100323

Clements C, Hoy C, Bin-Maarus L, Morris S and Christophers R (2023) 'Aboriginal peoples' lived experience of household overcrowding in the Kimberley and implications for research reciprocity in COVID-19 recovery', *Australian and New Zealand Journal of Public Health*, 47(6):100104. https://doi.org/10.1016/j.anzjph.2023.100104

Coalition of Aboriginal and Torres Strait Islander Peak Organisations and Australian Government (2020) National Agreement on Closing the Gap. Closing the Gap website www.closingthegap.gov.au/national-agreement, accessed 29 November 2024.

Crooks K, Casey D and Ward JS (2020) 'First Nations peoples leading the way in COVID-19 pandemic planning, response and management', *Medical Journal of Australia,* 213(4):151–152. https://doi.org/10.5694/mja2.50704

Crooks K, Law C, Taylor K, Brett K, Murray P, Kohlhagen J, Hope K and Durrheim DN (2023) 'Embedding Aboriginal cultural governance, capacity, perspectives and leadership into a local Public Health Unit Incident Command System during COVID-19 in New South Wales, Australia', *BMJ Global Health,* 8(7):e012709. https://doi.org/10.1136/bmjgh-2023-012709

Crooks K, Tully B, Allan L, Gillham K, Durrheim D and Wiggers J (2021) 'Development and implementation of a shared governance model in a mainstream health unit: a case study of embedding Aboriginal voices in organisational decision making', *Australian Health Review,* 46(2):178–184. https://doi.org/10.1071/ah20369

Data Champions Network Working Group (2024) *Framework for Governance of Indigenous Data.* www.niaa.gov.au/sites/default/files/documents/2024-05/framework-governance-indigenous-data.pdf

Department of Health and Aged Care (2021) National Aboriginal and Torres Strait Islander Health Plan 2021-2031. Department of Health website www.health.gov.au/resources/publications/national-aboriginal-and-torres-strait-islander-health-plan-2021-2031?language=en, accessed 29 November 2024.

Department of the Prime Minister and Cabinet (2024) COVID-19 Response Inquiry Report. PM&C website www.pmc.gov.au/resources/covid-19-response-inquiry-report, accessed 27 November 2024.

Donohue M and McDowall A (2021) 'A discourse analysis of the Aboriginal and Torres Strait Islander COVID-19 policy response', *Australian and New Zealand Journal of Public Health,* 45(6):651–657. https://doi.org/10.1111/1753-6405.13148

Dudgeon P, Collova JR, Derry K and Sutherland S (2023) 'Lessons Learned during a Rapidly Evolving COVID-19 Pandemic: Aboriginal and Torres Strait Islander-Led Mental Health and Wellbeing Responses are Key', *International Journal of Environmental Research and Public Health,* 20(3):2173. https://doi.org/10.3390/ijerph20032173

Dudgeon P and Walker R (2022) 'An urgent call to address interpersonal and structural racism and social inequities in Australia', *Lancet,* 400(10368):2014–2016. https://doi.org/10.1016/s0140-6736(22)02491-6

Finlay S and Wenitong M (2020) 'Aboriginal Community Controlled Health Organisations are taking a leading role in COVID-19 health communication', *Australian and New Zealand Journal of Public Health,* 44(4):251. https://doi.org/10.1111/1753-6405.13010

Fredericks B, Bradfield A, Ward J, Spierings S, McAvoy S, Combo T and Toth-Peter A (2024) ''We know what our communities need': What the Indigenous health sector reveals about pandemic preparedness in urban Indigenous communities in Australia', *First Nations Health and Wellbeing-The Lowitja Journal,* 2:100019. https://doi.org/10.1016/j.fnhli.2024.100019

Graham S, Kamitsis I, Kennedy M, Heris C, Bright T, Bennetts SK, Jones KA, Fiolet R, Mohamed J and Atkinson C (2022) 'A Culturally Responsive Trauma-Informed Public Health Emergency Framework for Aboriginal and Torres Strait Islander Communities in Australia, Developed during COVID-19', *International Journal of Environmental Research and Public Health,* 19(23):15626. https://doi.org/10.3390/ijerph192315626

Griffiths K, Ring I, Madden R and Pulver LJ (2021) 'In the pursuit of equity: COVID-19, data and Aboriginal and Torres Strait Islander people in Australia', *Statistical Journal of the IAOS,* 37(1):37–45. https://doi.org/10.3233/SJI-210785

Häfliger C, Diviani N and Rubinelli S (2023) 'Communication inequalities and health disparities among vulnerable groups during the COVID-19 pandemic-a scoping review of qualitative and quantitative evidence', *BMC Public Health,* 23:428. https://doi.org/10.1186/s12889-023-15295-6

Jull J, Fairman K, Oliver S, Hesmer B, Pullattayil AK and Not Deciding Alone Team (2023) 'Interventions for Indigenous Peoples making health decisions: a systematic review', *Archives of Public Health,* 81:174. https://doi.org/10.1186/s13690-023-01177-1

Kennedy M, Maddox R, Booth K, Maidment S, Chamberlain C and Bessarab D (2022) 'Decolonising qualitative research with respectful, reciprocal, and responsible research practice: a narrative review of the application of Yarning method in qualitative Aboriginal and Torres Strait Islander health research', *International Journal for Equity in Health,* 21(1):134. https://doi.org/10.1186/s12939-022-01738-w

Markwick A, Ansari Z, Sullivan M, Parsons L and McNeil J (2014) 'Inequalities in the social determinants of health of Aboriginal and Torres Strait Islander People: a cross-sectional population-based study in the Australian state of Victoria', *International Journal for Equity in Health,* 13:91. https://doi.org/10.1186/s12939-014-0091-5

Massey PD, Miller A, Saggers S, Durrheim DN, Speare R, Taylor K, Pearce G, Odo T, Broome J and Judd J (2011) 'Australian Aboriginal and Torres Strait Islander communities and the development of pandemic influenza containment strategies: community voices and community control', *Health Policy,* 103(2-3):184–190. https://doi.org/10.1016/j.healthpol.2011.07.004

Massey PD, Pearce G, Taylor KA, Orcher L, Saggers S and Durrheim DN (2009) 'Reducing the risk of pandemic influenza in Aboriginal communities', *Rural and Remote Health,* 9(3):1–7. http://dx.doi.org/10.22605/RRH1290

McCaffery KJ, Dodd RH, Cvejic E, Ayre J, Batcup C, Isautier JM, Copp T, Bonner C, Pickles K, Nickel B Dakin T, Cornell S and Wolf MS (2020) 'Disparities in COVID-19 related knowledge, attitudes, beliefs and behaviours by health literacy', *medRxiv.* https://doi.org/10.1101/2020.06.03.20121814

McCalman J, Longbottom M, Fagan S, Fagan R, Andrews S and Miller A (2021) 'Leading with local solutions to keep Yarrabah safe: a grounded theory study of an Aboriginal community-controlled health organisation's response to COVID-19', *BMC Health Services Research,* 21:1–15. https://doi.org/10.1186/s12913-021-06761-1

National Indigenous Australians Agency (2022) *Framework for Governance of Indigenous Data.* Report. NIAA website www.niaa.gov.au/resource-centre/framework-governance-indigenous-data, accessed 27 November 2024.

Nolan-Isles D, Macniven R, Hunter K, Gwynn J, Lincoln M, Moir R, Dimitropoulos Y, Taylor D, Agius T, Finlayson H Martin R, Ward K Tobin S and Gwynne K (2021) 'Enablers and Barriers to Accessing Healthcare Services for Aboriginal People in New South Wales, Australia', *International Journal of Environmental Research and Public Health,* 18(6):3014. https://doi.org/10.3390/ijerph18063014

NSW Ministry of Health (2021) Update on further easing of restrictions. NSW Health website www.health.nsw.gov.au/news/Pages/20211125_02.aspx, accessed 27 November 2024.

Paakkari L and Okan O (2020) 'COVID-19: health literacy is an underestimated problem', *The Lancet Public Health,* 5(5):e249–e250. https://doi.org/10.1016/S2468-2667(20)30086-4

Rose J, Langton M, Smith K and Clinch D (2023) 'Indigenous Data Governance in Australia: Towards a National Framework', *The International Indigenous Policy Journal,* 14:1–30. https://yumi-sabe.aiatsis.gov.au/sites/default/files/outputs/2023-11/Indigenous%20Data%20Governance%20in%20Australia.pdf

Scheibner J, Kroesche N, Wakefield L, Cockburn T, McPhail SM and Richards B (2023) 'Does Legislation Impede Data Sharing in Australia Across Institutions and Jurisdictions? A Scoping Review', *Journal of Medical Systems,* 47(1):116. https://doi.org/10.1007/s10916-023-02009-z

Seale H, Heywood AE, Leask J, Sheel M, Thomas S, Durrheim DN, Bolsewicz K and Kaur R (2020) 'COVID-19 is rapidly changing: Examining public perceptions and behaviors in response to this evolving pandemic', *PloS one,* 15:e0235112. https://doi.org/10.1371/journal.pone.0235112

Stanley F, Langton M, Ward J, Mcaullay D and Eades S (2021) 'Australian First Nations response to the pandemic: A dramatic reversal of the 'gap'', *Journal of Paediatrics and Child Health,* 57(12):1853–1856. https://doi.org/10.1111/jpc.15701

Walter M and Andersen C (2013) *Indigenous statistics: A quantitative research methodology,* Taylor & Francis, Ruthledge, New York.

Walter M, Kukutai T, Carroll SR and Rodriguez-Lonebear D (2021) *Indigenous Data Sovereignty and Policy,* Taylor & Francis, Ruthledge, London.

Wilson-Matenga G, Campbell M, Katterl R, Ellis E and Skeen R (2021) 'Partnership, trust and respect: NSW's response to COVID-19 among Aboriginal people', *Australian and New Zealand Journal of Public Health,* 45(4):315. https://doi.org/10.1111/1753-6405.13138

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Abstract

Youth misuse of fire is a community concern, with potentially devastating consequences. In Australia, youth misuse of fire predominantly occurs in Caucasian populations. However, Indigenous young people are disproportionately represented in statistics for misuse of fire. Evidence shows that early intervention is key to reducing youth misuse of fire, but most research has been conducted on Caucasian populations. This is concerning where evidence suggests that Indigenous communities benefit most from targeted and culturally sensitive interventions. The aim of this study was to bridge this gap by co-designing a youth fire intervention program with Indigenous communities. Between December 2023 and February 2024, Indigenous peer researchers facilitated workshops in 3 Indigenous communities in New South Wales (NSW) Australia. Community members explored what they needed and wanted in terms of youth misuse of fire intervention. Thematic analysis revealed 7 main themes: approach, connection, colonisation, education, empowerment, engagement and personnel. The results showed thematic commonalities within and between Indigenous communities. While these results may not be generalised to communities more broadly, they do indicate that there are shared considerations that must be respected when designing, developing, implementing and evaluating a culturally appropriate youth fire intervention program for Indigenous communities.

Co-designing a youth fire intervention program with Indigenous communities in New South Wales, Australia

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Introduction

Youth misuse of fire is defined as any illegitimate use of fire or incendiary materials by a person under the age of 18 years (Pooley 2018). Youth misuse of fire is a community concern with the potential for devastating consequences. In Australia, youth misuse of fire predominantly occurs in Caucasian-Australian populations; however, Indigenous young people are over-represented in misuse of fire statistics (Muller 2008; Pooley 2018). Pooley (2018) conducted an analysis of Youth Justice Conferencing for fire-related offences in NSW and found that those who identified as Aboriginal and Torres Strait Islander accounted for 25.9% of all young people referred to conferencing for a fire-related offence, despite only accounting for 3.4% of the NSW population. While the majority of young people who participated in conferencing were non-Indigenous, Indigenous young people were disproportionately represented. This over-representation is concerning given young people who identify as Indigenous are less likely to be diverted to conferencing than non-Indigenous people (Allard et al. 2010). Muller's (2008) analysis of bushfire arson offenders similarly identified an over-representation of Indigenous offenders among youth (37%) and adult (20%) fire-related offenders in NSW.

Due to the risks and consequences of youth misuse of fire, early intervention is widely supported. Evidence suggests that early intervention programs are central to changing fire-specific behaviours in young people and their caregivers (McDonald 2010). While reviewing fire-related offences in NSW at the request of the NSW Attorney General, the NSW Sentencing Council (2019) identified education and therapeutic interventions as key intervention mechanisms for youth misuse of fire. Despite evidence that early intervention reduces youth

misuse of fire, most research to date has been conducted on Caucasian populations. A recent systematic review of interventions for preventing fires found a dearth of evidence gathered directly from Indigenous communities (Al-Hajj et al. 2022). Al-Hajj et al. (2022) recommended culturally sensitive interventions targeted at Indigenous communities. This aligns with Pooley's (2020) systematic review of common components of effective youth offender programs. The review found that programs designed for Indigenous people were more effective than mainstream programs, particularly when they incorporated culturally appropriate activities, embedded traditions and norms and were implemented by someone with shared place, language, histories or beliefs. Programs designed for Aboriginal and Torres Strait Islander young people should incorporate culturally appropriate interventions and the active participation of cultural leaders in the design, development, implementation and evaluation of programs (Murphy et al. 2010). Despite this, there are no known culturally specific early intervention programs for young Indigenous people who misuse fire.

Methodology

The National Health and Medical Research Council (NHMRC) guidelines state that ethical research with Aboriginal and Torres Strait Islander peoples and communities should:

- improve the way all researchers work with Aboriginal and Torres Strait Islander peoples and their communities
- develop and/or strengthen research capabilities of Aboriginal and Torres Strait Islander peoples and their communities
- enhance the rights of Aboriginal and Torres Strait Islander peoples as researchers, research partners, collaborators and participants in research.

The guidelines cover 6 core values (spirit and integrity, cultural continuity, equity, reciprocity, respect and responsibility) that should underpin all human research undertaken with Aboriginal and Torres Strait Islander people and communities. These values underpin the co-design approach.

Co-design refers to a collaborative approach whereby people come together to connect their knowledge, skills and resources to understand, interpret and address a challenge or opportunity (Zamenopoulos and Alexiou 2018). Co-design is a collaborative, cooperative, collective or connective approach to conceptualisation, development, implementation and/or evaluation (Zamenopoulos and Alexiou 2018). According to a recent systematic review, co-design approaches can overcome the knowledge-to-practice gap because they are relational, context-driven and based on lived experience (Grindall et al. 2022). Co-design is especially important when working with and for Indigenous communities. Successful co-design with First Nations communities places true value on diverse knowledge systems and is built on strong relationships and authentic partnerships (Tamwoy et al. 2022). Further, for co-design with Indigenous communities to be successful, processes must be respectful, reciprocal and relational (Akama et al. 2019). To ensure respectful, reciprocal and relational co-design, this project adopted concepts of, and applied, Aboriginal Participatory Action Research (APAR) and Community-Based Participatory Research (CBPR).

APAR is positioned as a transformative and critically self-reflexive Indigenous research methodology. APAR aligns with the guiding principles of Indigenous self-determination, empowerment and cultural recognition. It involves Indigenous epistemology (knowledge construction), ontology (way of being), axiology (way of doing) and research methodology. Indigenous co-researchers are critical to APAR, ensuring that Indigenous peoples are central to all components of the research process, from design, data collection, data analysis and interpretation, and conclusions and recommendations (Dudgeon et al. 2020).

CBPR emerged in response to controversial research conducted on marginalised groups. A grassroots movement, guided by the motto 'nothing about us without us', shifted research practice to include meaningful community involvement (Damon et al. 2017). CBPR focuses on local relevance, offers opportunity to build on the community strengths and resources, facilitates co-learning and capacity building and has a greater likelihood of sustainable outcomes (Smith et al. 2020). Communities may be involved in research through review panels, advisory groups or as peer researchers. Peer researchers are community members who are directly employed as research team members (Damon et al. 2017). The use of peer researchers is highly participatory and facilitates inclusive, community-focused research (Damon et al. 2017).

To ensure a respectful, reciprocal and relational co-design process, APAR and CBPR approaches were employed through the inclusion of Indigenous firefighters as peer researchers.

Peer researchers

In June 2023, the research team held preliminary discussions with the committee chairs of Fire and Rescue NSW (FRNSW) Aboriginal and Torres Strait Islander Advisory Committee (ATSIAC). The ATSIAC advises FRNSW and its staff on the lived experiences and issues facing Aboriginal and Torres Strait Islander peoples in NSW. The ATSIAC consists of members of staff, sponsored by management, and is provided with avenues and

opportunities to inform FRNSW policies, procedures and practices. The research team and ATSIAC collectively agreed that Indigenous firefighters should be employed as peer researchers to collect information from their communities. Indigenous firefighters were perceived as uniquely positioned to understand the cultural and environmental significance of fire in their communities and to facilitate data collection in a culturally appropriate and sensitive manner. The project was promoted by word-of-mouth through the ATSIAC and FRNSW community. Seven Indigenous firefighters self-selected to work as peer researchers. Three of these firefighters subsequently facilitated workshops in their communities.

The peer researchers also served an advisory role throughout the study. From June 2023, the peer researchers engaged in collaborative discussions with the other members of the research team to inform all facets of the project including the Human Research Ethics Committee application, study design, data collection and analysis processes, and the interpretation and translation of the results.

While the use of peer researchers was supported by existing literature and the ATSIAC, there were concerns that the employment of Indigenous firefighters as peer researchers would contribute to cultural loading. Cultural loading refers to the additional workload borne by Aboriginal and/or Torres Strait Islander peoples due to extra Indigenous-related expectations and work demands that are not placed on non-Indigenous people (Australian Public Service Commission 2023). To mitigate cultural loading, only those firefighters who self-selected to participate were included in the research team.

Firefighters were informed that they could withdraw from the study at any time. While 7 firefighters initially expressed interest, only 3 collected data from their communities. Four firefighters withdrew due to personal and professional demands and this withdrawal was supported by the research team. The remaining 3 firefighters were supported throughout and remunerated for their time and contribution. To reduce the risk of cultural loading on the 3 peer researchers, the fourth author managed the administrative and logistical tasks associated with this study, drafted the workshop/discussions schedules, provided transcription support, facilitated briefings and de-briefings, and drafted and edited associated reports in line with the peer researchers advice and feedback. The fourth and fifth authors managed ethics approval and all associated forms and processes.

Ethics approval

Ethics approval from the Victoria University Human Research Ethics Committee was obtained (HRE23-138).

Participants

Peer researchers invited community members to participate in the study if they:

- were adults (aged 18 years and over)
- identified as an Aboriginal and/or Torres Strait Islander
- usually resided in the community of interest; and
- had exposure to, or knowledge of, youth misuse of fire.

Recruitment

Between December 2023 and February 2024, Indigenous peer researchers discussed the project and its purpose with members of their communities. The peer researchers contacted known community members who had prior exposure to, or knowledge of, youth misuse of fire. Using snowball sampling, these community members then referred the peer researcher to other community members. Snowball sampling was used because the peer researchers suggested that this was the most appropriate approach. While NHMRC guidelines state that local Elders or respected community members may be best placed to identify potential participants, the peer researchers stated that Elders and community representatives, like Land Councils, are not always representative of their communities and may produce a skewed sample.

While participants were not recruited through Land Councils or Elders, if the peer researchers deemed it appropriate, they were informed of the research and asked for their permission to involve the community in the research. This process did not require written consent unless the representative also participated in the research. Instead, the process of discussing the research with Elders or respected members followed usual community protocols. The importance of following community protocols was critical and the peer researchers had the knowledge and capacity to ensure this occurred.

Peer researchers provided potential participants with an information form about the research project. Participants, either verbally or through another community member, notified the researcher of their interest in participating. Participants were required to provide informed consent using a QR code prior to the workshop or discussion.

Activities

The Indigenous researchers, and the Indigenous people they engaged with, chose a research method that was most suitable to them and their context. In 2 communities, group workshops were deemed the most appropriate approach, while in one community, the peer-researcher held small group discussions to mitigate power imbalances and facilitate accessibility (i.e. discussions were held at times and locations that best suited participants).

Peer researchers were provided with 7 questions to use as prompts for discussion:

- Based on your experience and knowledge, what do you think young people need to help them stop misusing fire?
- What do you think families and communities need?
- What resources do you think may be helpful?
- What has worked in the past in supporting young people who misuse fire?
- What hasn't worked or has made things worse?
- How do you think we could keep young people engaged or interested in a program?
- Do you have any other comments or ideas that can help us reduce misuse of fire in young people?

Despite providing the prompts above, peer researchers were encouraged to facilitate conversation beyond these questions where relevant.

The 2 workshops went for a duration of 2 hours, while the small group discussions went for 1–2 hours. After completion, participants were reimbursed $40.00 per hour via eGift cards disseminated to their nominated email address.

Sample

Three peer researchers facilitated workshops or discussions in their communities. Communities were diverse. They were geographically located in a major city, inner regional area and remote area of NSW. Community populations ranged from 8,000 to 180,000 people. Aboriginal and/or Torres Strait Islander peoples accounted for between 4% and 23% of community populations, all of which were above the NSW average of 3.4%. Despite their geographic and demographic diversity, all 3 communities experienced high rates of youth misuse of fire, as recorded by FRNSW incident data.

Data collection

The data collection method was chosen by the peer researchers and their participants. In one community, summaries and dot points were handwritten by a scribe. In another, mind maps were created on butcher's paper by a scribe, while the scribe also recorded in-depth notes and the peer-researcher recorded their reflection on the workshop. The peer-researcher who held small group discussions recorded participant's in-depth contributions by hand.

Data analysis

The data was collated and thematically analysed, as per Braun and Clarke's (2006) 6-step process: familiarising yourself with your data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. Collaborative yarning[1] was used to unpack different perceptions and interpretations. This involved an iterative process whereby the peer researchers reviewed and refined the themes and sub-themes to ensure accurate interpretation and portrayal. Using Fereday and Muir-Cochrane's (2006) approach to thematic analysis, inductive and deductive coding was used. Codes were developed deductively from the research questions to draw out knowledge on effective intervention for youth misuse of fire. The idea is not to preconceive codes but to discuss them before coding based on the research questions and then seek them out from the data. The rest of the coding process was inductive where codes were generated from the data. Two researchers coded each of the data sources. After coding, the coders met with the peer researchers to discuss the coding and interpretation and reach agreement.

Limitations

Fire is an integral part of Indigenous culture. For tens of thousands of years before colonisation, fire was a core component of Indigenous peoples' relationship to culture, Country and community. However, since colonisation, legislation, policies and practices have negatively influenced Indigenous peoples' traditional relationships with fire. As a result, youth misuse of fire sits within a complex history of intergenerational dispossession, deprivation and disadvantage. Government agencies, including FRNSW, may be perceived as part of the problem. While this project seeks to co-design culturally sensitive components of a youth misuse of fire intervention for Indigenous youth with Indigenous people, there is potential for Indigenous people to feel frustrated that a state government organisation that may be seen as part of the problem, is approaching Indigenous people to understand how to fix the problem. To mitigate this risk, Indigenous peer researchers were employed to work collaboratively with communities to ensure their cultural safety and wellbeing.

Some Indigenous knowledge and practices are unique to, and protected by, communities. There may be some knowledge and information that Indigenous participants do not want to be shared outside of their communities. The intention of this project was to collect knowledge and information that benefits the broader community through reduction of youth misuse of fire. It is therefore important that results are shared. In the participant information form and in discussions with Indigenous participants about the research, this intention was clearly stated. Participants were asked only to share knowledge and information that can be shared and used more broadly. While this approach

1. 'Yarning' is a conversation that involves the sharing of one's own stories and the creation of new knowledge.

may have limited the information received by participants, it was necessary to maintain cultural safety.

Despite the intention to create a program that is culturally sensitive and suitable for Indigenous youth, people under 18 years were not included as participants. Behaviour that is considered unacceptable according to traditional cultural lore may result in feelings of shame or community exclusion. As a result, being identified as someone who has misused fire may have significant cultural ramifications for young Indigenous people. Where the potential cultural ramifications for young people who may have engaged in misuse of fire were too high for them to be participants in this project, they were excluded. This is a limitation of this study.

Three Indigenous communities were included in the study. While these communities were diverse, representing communities in major cities, inner regional areas and remote areas, the findings can not be generalised to all Indigenous communities across NSW and beyond. Despite this, thematic coding revealed commonalities between communities, suggesting that some themes and sub-themes are common across communities and may be translatable.

Results

The workshop data was coded by research question to ensure appropriate contextualisation of each contribution. Overall, there were 7 main themes: approach, connection, colonisation, education, empowerment, engagement and personnel. These themes were evident across multiple research questions. Engagement informed all 7 research questions, followed by empowerment (n=6), personnel (n=5), approach, connection and education (n=4, respectively) and colonisation (n=2).

Within each theme there were several sub-themes, as shown in Table 1. The number of distinct contributions that were coded within each sub-theme are noted in parentheses. The number of distinct contributions does not necessarily constitute a measure of importance where participants may have mutually agreed on one distinct contribution or made separate contributions that all fell within the same sub-theme.

The results highlight thematic commonalities within and between Indigenous communities. While these results may not be generalisable to communities across NSW or more broadly, they do indicate that there are shared considerations that must be respected when designing, developing, implementing and evaluating a culturally appropriate youth fire intervention program.

Approach

Participants suggested that young people should be engaged as early as possible to instill fire safety knowledge and cultural learning at a young age (early engagement). Approaches should facilitate pro-social modelling to demonstrate and embed pro-social behaviour throughout the life course (modelling). Young people also need individualised approaches that meet their varied needs, interests and motivations, including those related to gender and developmental stage (individualised). Programs should employ a skills-based, practical approach (skills-based) with 'hands-on teaching over reading and writing'. Young people also need a safe space (safe space) as reiterated by one participant's comment, 'Let's create a community program that is a safe space for young Indigenous people'. It is also important to recognise that young people and their families and communities have experienced intergenerational trauma that requires trauma-informed care (trauma-informed).

Participants recalled previous successful approaches as those involving targeted, inclusive processes designed to meet the needs of the young person (individualised). Conversely, participants also recalled 3 main approaches that they felt were ineffectual or caused adverse outcomes. One participant described satiation via repetitive, controlled, supervised use of fire as ineffective in satisfying young people's curiosity and interest, and potentially causing iatrogenic outcomes. They stated:

> *… if you think lighting a fire in a drum in the backyard with all the controls in place will satisfy a kids desire to see the power of a fire, it will just make them more hungry to start a bigger fire…*(satiation).

Participants also stated that punitive approaches, such as punishment and negative labelling, are not conducive to encouraging the development of positive relationships with fire (punitive). Some participants also referred to detention as causing a detachment from culture, which could have a negative outcome, particularly given the associated disconnection with culture, community, Country and fire (detention).

To ensure program success, participants highlighted the importance of embedding the program within business-as-usual to normalise its implementation. As one participant said, 'Trying to normalise the process is super important' (normalise program processes).

Colonisation

Participants emphasised that young people have experienced the effects of colonisation and cultural genocide, leading to a disconnection with their culture and traditional relationships with Country and fire. This cultural dispossession has led to the loss of cultural stories, effecting connection with culture and Country. As one participant stated:

Table 1: Indigenous workshop themes and sub-themes by research question.*

Research questions	What do you think young people need to help them stop misusing fire?	What do you think families and communities need?	What resources do you think may be helpful?	What has worked in the past in supporting young people who misuse fire?	What hasn't worked or has made things worse?	How do you think we could keep young people engaged or interested in a program?	Do you have any other comments or ideas?
Themes							
Approach	Early engagement (3) Individualised (4) Skills-based (1) Modelling (1) Safe space (1) Trauma-informed (1)			Individualised (6)	Satiation (1) Punishment (1) Detention (2)		Normalise program processes (1)
Colonisation	Consideration of cultural dispossession (2)				Cultural dispossession (3) Distrust in government (1)		
Connection	Fire (4) Culture (6) Community (4) Country (2)	Culture (1) Continuity (1)		Culture (5)		Culture (2) Continuity (1)	
Education	Consequences (2) Science of fire (1)	Promotion (2) Targeted messaging (2) Events (1)	Primary prevention (1) Cultural competency (2) Culturally appropriate (2) Developmentally appropriate (2)		Lack of targeted information (1) Lack of promotion (1)		
Empowerment	Responsibility (2) Co-design (1)	Community presence (2) Community-led (1)	Co-design (2)	Restorative (2) Responsibility (6) Perspective (4) Community-led (2)		Responsibility (1) Strengths-based (1)	Co-design (1)
Engagement	School programs (1) Activities (1) Firefighters (2)	Authenticity (3) Multiagency (7)	Co-design (2) Cultural activities (1) Social media (2) Cultural approaches (2)	Multiagency (1)	Lack of authenticity (3)	Observation (1) Social media (1) Community (2) Multiagency (5)	Authenticity (1)
Personnel		Local community contact (1) Centralised contact (1)	Engagement Officers (3) Knowledge holders (3) Firefighters (2) Mentors (3) Pool of facilitators (1) Facilitator characteristics (3)	Elders (5) Mentors (2) Support person (2)	Lack of cultural competency (1) Few Indigenous firefighters (1)	Mentors (2) Firefighters (1)	

*The number of distinct contributions that were coded within each sub-theme are noted in parentheses.

From an Aboriginal perspective, our communities and especially our young ones, there is a direct impact of colonisation that has hugely broken our traditional relationship with all things Country and Wiyu (fire)' (cultural dispossession).

As a result, young people have not been taught cultural stories and practices that form the foundation of a healthy relationship with fire. As one participant stated:

The old cultural stories of Wiyu (fire), and there are many of these in many forms across this Country, have been lost or broken because of colonisation and cultural genocide (cultural dispossession).

The effects of colonisation have also engendered distrust in government agencies and personnel that must be repaired prior to, or during delivery of youth fire interventions (distrust in government).

Connection

Participants stated that young people and their families and communities need strong, positive, sustainable connections with fire, Country, community and culture. Young people need opportunities to renew and share cultural stories about, and relationships with, fire. As one participant recommended, 'Traditional cultural knowledge to help build relationship again with Country which includes Wiyu (fire)' (culture). However, it is important to recognise that cultural stories of fire vary across Country and should be shared by local communities. Opportunities to renew and share a connection and traditional relationship with Country were thought to engender respect for the land and the way young people and their communities interact with it (Country). Young people need to connect with and learn from their communities and Elders so that they can develop a sense of community and identity as well as confidence in their culture. One participant emphasised this by stating, 'Connect them within the mob allowing them to meet respected individuals… allowing them to own who they are and be confident in their culture' (community). For this to occur, young people must connect with their culture, embed culture into practice and develop cultural pride. To facilitate this, young people should have access to opportunities to learn about and participate in local cultural burning practices. As one participant, who had a history of misusing fire as a young person, said:

Having opportunities to also burn Country in our old cultural ways has completely changed my story also for the better…. Understanding cultural burning and involving this knowledge in the program will give them more insight, more respect for the land they are on (fire).

Connection may be achieved by embedding the renewal and sharing of traditional knowledge and practice within fire intervention programs for youth. Such an approach may enhance the likelihood that the program is culturally sensitive and specific while building young people's connection with culture (and thus) community, Country and fire (culture). Participants also felt that engagement with youth fire intervention programs could be sustained by providing young people with opportunities to learn about and practice culture, connect with and fulfil their responsibilities and obligations and care for Country. This connection would support continuity of care post program participation. One participant said, 'Getting the kids to engage on a cultural (level)… Not just doing it once and leaving them' (continuity). Familial and kinship engagement in programs was also deemed important to assist young people and their families with continuity of care post program participation (continuity).

Education

Participants felt that there was a lack of targeted, accessible, culturally informed information for communities (lack of information) and poor promotion of targeted information and programs (lack of promotion). A participant stated that '…they (firefighters) don't really have good information for mob'. Consequently, participants recommended that fire safety education should be delivered in schools as a form of primary prevention (primary prevention). However, schools should complete cultural competency training to ensure education is culturally informed (cultural competency). Culturally informed information should be provided to local community organisations and schools for wider dissemination (culturally appropriate), while resources should also be developmentally appropriate (developmentally appropriate).

Specifically, participants stated that young people need education on the dangers of playing with matches and lighters and on the effects of misuse of fire on their community. Participants recommended education about personal harm, property damage and potential legal ramifications of misuse of fire. One participant recommended, 'More education around the negative effects on mob and community' (consequences). Participants also recommended education on the nature and speed of fire, on high-risk conditions that exacerbate fire, the challenges associated with controlling fire and the ramifications of losing control (science of fire). Participants wanted messaging on ignition source accessibility and safe storage as well as the importance of caregiver supervision and awareness, particularly during high-fire-danger periods. One participant recommended:

Messages on keeping ignition sources like matches and lighters out of kitchen drawers and sheds, encourage families and communities to keep these ignition sources in places out of reach of kids and even a secret from teenagers' (targeted messaging).

Participants thought that short videos on the dangers of misusing fire, accessible via QR codes on posters displayed at central locations and at community events may promote fire services while also delivering fire safety education (promotion). Participants also recommended education days or events for local communities (events).

Empowerment

Participants suggested that young people can be empowered by taking responsibility for their stories and by giving them responsibility as the caretaker of Country. Participants recommended that young people be provided with opportunities to tell '…their stories and owning it' and give '…them responsibility as caretaker of the land' (responsibility). Young people can also be empowered by taking ownership over certain program processes (co-design). Participants recommended that young people be involved in the design, development and/or implementation of resources. As one participant stated, 'Letting youth lead the way, being the creators…' may empower young people and enhance ownership over program processes and outcomes (co-design). Participants felt that empowering young people and giving them a sense of responsibility for fire safety would improve their engagement in a program. One participant stated:

> *Make them feel empowered or like leaders in fire awareness by creating a sense of responsibility they are more likely to be invested in what the program offers* (responsibility).

A strengths-based approach is therefore recommended. This can be achieved by tailoring the program to the strengths, interests, and needs of the young person (strengths-based).

Further, participants stated that families and communities need support to encourage and build a stronger cultural presence within community (community presence). Communities may be empowered where program processes establish roles and responsibilities and use community communication lines, which align with the inherent structure and characteristics of each community (community-led). Participants felt that initiatives that empower communities to work collectively to improve young people's understanding of community, culture and Country were beneficial (community-led).

Participants recalled previous successful approaches as those involving restorative approaches. They recommended providing young people with opportunities to repair harm caused by their misuse of fire and empower them to design and deliver an apology to victims that draws on their strengths and interests (restorative). In line with restorative approaches, participants highlighted the importance of providing young people with the opportunity to share their stories and take responsibility for their actions. As one participant noted, 'Story telling is really powerful'. By telling their story, taking ownership and apologising for their behaviour, young people can own and express remorse for their actions (responsibility). Restorative approaches provide an opportunity for people to share their stories and experiences, that encourage young people to understand the effect of their actions from a victim's perspective. This not only empowers the victim but ensures the young person understands the effects of their behaviour on others. As one participant said, 'The key is for our young people to sit, listen and take on a victim's perspective' (perspective).

Engagement

Participants stated that a lack of authenticity in engagement that results from a tick-box culture rather than a genuine desire to instigate change has led to ineffective approaches. One participant said, 'Most of the time what they (firefighters) are doing there is just gammon (fake)…' (lack of authenticity). Another stated, 'Mob need meaningful engagement' (authenticity). To enhance authentic engagement, program facilitators should gain an understanding of the community and their needs to inform a context-specific, tailored approach (community).

Participants recommended the formation of multi-agency networks and partnerships to facilitate multi-modal program delivery and service accessibility and continuity. Participants emphasised the importance of meaningful, genuine engagement between fire services, other organisations and communities. Local, Indigenous community support services and networks could be accessed via a multi-modal program and/or referral pathways. Indigenous representation at inter-agency meetings would build relationships with stakeholders to inform and promote culturally appropriate engagement and access to opportunities and services (multiagency). As one participant stated, 'Collaboration and partnership have presented good outcomes…'.

Participants provided examples of the types of engagement that may improve young people's commitment to a program. Participants felt that young people should be provided with the opportunities to participate in fire safety education programs at school (school programs), school or community-based cultural activities (e.g. weaving, language, cultural activities) and targeted, accessible and culturally informed programs and events (cultural approaches). Participants felt that young people would benefit from engaging with firefighters in the community, particularly at career days, NAIDOC week and other community events (firefighters). They suggested that by providing opportunities for young people to observe firefighting activities, they might gain an awareness of the challenges associated with fire (observation). Young

people may also remain engaged through interactive social media platforms (social media). Targeted, accessible, engaging social media channels and posts may be used to disseminate tailored messaging. One participant recommended, 'Keep up with the social media presence, make content that will reach young people… memes that are relevant and using light-hearted humour' (social media).

Personnel

Participants identified key personnel as critical to youth fire intervention program effectiveness. Firstly, participants wanted a local community contact who can provide context-specific, culturally informed fire safety information and resources. As one participant stated, 'Communities need to know who to contact in their community if they need to know something around fire safety and stuff like that' (local contact). Participants also wanted a centralised contact to direct communities to their local contact and/or provide information and resources. One participant noted, 'Even on the firies web page there is no contact information on who to contact for Aboriginal specific resources' (centralised contact). Participants recommended the employment of Indigenous Community Engagement Officers who can serve as the first point of contact for young people and their families and communities (engagement officers).

Participants recognised traditional knowledge holders and community Elders as critical to the renewal and practice of culture, the sharing of stories (lore) to reconnect community and to encourage community to fulfil responsibilities to Country and fire. Traditional knowledge holders may be the most appropriate person, as elected by the community, to teach young people about culture. As one participant stated, 'Help these knowledge holders pass on essential story (Lore) to reconnect our mob so that all can fulfil traditional cultural obligation and responsibilities' (knowledge holders). Participants also recalled successful interventions as those that connected young people with community Elders to facilitate the renewal and sharing of traditional cultural knowledge and practices. By connecting young people with Elders, continuity of care and responsibility post program participation could be facilitated. Participants recommended that community Elders be invited to participate in components of the program where appropriate (elders).

In addition, participants highlighted the importance of mentors. Where Elders are cultural leaders and teachers, they can be perceived as authoritarian. Mentors, on the other hand, can be matched to young people on certain characteristics such as age and gender to enhance relatability and ensure cultural protocols are followed (mentors). Participants felt that young people would stay engaged in a program if they connected with Indigenous mentors who could form positive relationships with young people and individualise the intervention (mentors). Young people who have graduated from a youth fire intervention program may also work as mentors to share their lived experiences of desistance (mentors). While participants believed that it was important to identify and include the young person's support person in the program (support person), mentors may also serve this purpose.

A lack of Indigenous firefighters was perceived as a barrier to youth fire intervention effectiveness (lack of Indigenous firefighters). Indigenous firefighters were deemed important to serve as role models and to personalise the risks and consequences of fire to Indigenous young people. One participant recommended:

> *More Aboriginal firies working back in their communities, so the young ones can see that if they light some bush or a car or a house on fire, they see the Koorie firies risking their lives to put it out* (firefighters).

Importantly, participants felt that by employing more Indigenous firefighters, fire services could improve representation and the formation of positive, relatable, sustainable relationships (firefighters).

Finally, participants recommended that the program be facilitated by a pool of practitioners who could share caseloads (pool of facilitators). However, participants recalled negative experiences that arose from poor cultural competency in program facilitators due to a lack of cultural education and awareness (lack of cultural competency). Consequently, program facilitators should possess certain characteristics, such as cultural competency, knowledge, professionalism, a calm demeanour and good communication skills to ensure they are relatable and effective (facilitator characteristics).

Discussion

Workshops and small group discussions with Indigenous communities in NSW revealed shared considerations that should be respected when designing, developing, implementing and evaluating a culturally appropriate youth fire intervention program. These findings have implications for academics and practitioners. The findings indicated that the 3 Indigenous communities in the study are seeking an approach that largely aligns with the evidence-base. To reduce the risk of misuse of fire, the literature supports primary prevention approaches, such as fire safety education programs delivered in schools (e.g. Satyen et al. 2004) and secondary prevention approaches including youth fire intervention programs (e.g. Fritzon et al. 2011). Youth fire intervention literature supports early intervention (Fritzon et al. 2011) that applies a targeted, individualised approach and draws on the young person's needs, interests, motivations and strengths (e.g. Lambie et al. 2012). The evidence supports skills-based, practical education (e.g. Haines et al. 2006) that involves pro-

social modelling (e.g. Houvouras and Harvey 2014) and that avoids satiation and other punitive approaches (e.g. Grolnick et al. 1990). The literature calls for programs that are trauma-informed for young people who misuse fire (e.g. Franklin et al. 2002) and Indigenous peoples (e.g. Tujague and Ryan 2021) and programs that are culturally informed and appropriate and delivered by culturally competent facilitators (Al-Hajj et al. 2022). The evidence supports co-designed approaches that empower young people and enhance ownership over program processes and outcomes (e.g. Office of the Advocate for Children and Young People 2020); restorative approaches that provide young people with opportunities to share their stories and take responsibility for their actions (e.g. Braithwaite 2002); strengths-based approaches that tailor the program to the strengths, interests and needs of the young person (e.g. Andrews and Bonta 2007) and multiagency or multimodal approaches that are based on authentic, collaborative partnerships (e.g. Haines et al. 2006). The literature also highlights the importance of trained program facilitators who possess the necessary skills and characteristics, such as cultural competency, to ensure they are relatable and effective (e.g. Lambie et al. 2012).

The findings reflect the evidence-base regarding Indigenous peoples representation in fire services and government agencies. Participants stated that Indigenous firefighters have the capacity to improve representation; form positive, relatable and sustainable relationships with young people and communities and can personalise the risks and consequences of misuse of fire. These findings align with evidence supporting Indigenous peoples representation in fire services, which builds community trust, strengthens social cohesion and increases community pride (e.g. Rasmussen and Maharaj 2020). Further, participants highlighted that Indigenous firefighters could serve at their local fire stations and as local community engagement officers to provide context-specific, culturally informed fire safety information and resources. When Indigenous firefighters serve as program facilitators and/or mentors, they can act as positive, relatable role models; apply inherent cultural competency to program processes; individualise the program to the young person within the context of their community and ensure cultural protocols are followed. Such an approach would align with recommendations by Al-Hajj et al. (2022) for culturally sensitive interventions.

The lived experiences of the participants echo those represented in the literature. Participants reflected on the effects of colonisation and cultural genocide on connections and traditional relationships between Indigenous peoples and their culture, dispossession and detachment from culture and associated loss of cultural stories and identities and poor relationships with government agencies and personnel due to misguided policies and practices that entrench systematic racism. These experiences align with the historical and cultural context of Indigenous people represented in the literature (e.g. Dudgeon et al. 2014; Tujague and Ryan 2021).

There was only one minor deviation from the literature. Participants recommended employing peer mentors who have graduated from a youth fire intervention program to share their lived experiences of desistance with young people. However, evidence suggests that peers may contribute to the maintenance or escalation of problematic behaviour through the normalisation of antisocial actions, association with antisocial role models, reinforcement of antisocial values and stronger alignment with antisocial subcultures (Rhule 2005). Further research is needed to determine if peer mentoring is appropriate in the context of youth fire intervention.

Despite strong alignment with the evidence-base, this study revealed innovative findings. This is the first known study to identify youth fire intervention programs as an avenue through which to support and facilitate strong, positive and sustainable connections between Indigenous young people and:

- culture - by providing opportunities and safe spaces for the renewal and sharing of traditional knowledge and practices
- community - by connecting young people with their communities and supporting the development of a sense of community, identity and confidence in their culture
- Country - by supporting traditional relationships with Country, engendering respect for the land and the way young people and their communities interact with it
- fire - by facilitating the renewal and sharing of cultural stories about, and relationships with, fire through participation in local cultural burning practices.

While there is a growing body of evidence advocating for the renewal of cultural burning knowledge and practices (e.g. Williamson 2021), none of this research investigates the influence of cultural burning on misuse of fire by young Indigenous peoples. This is a significant gap where this study found that healthy relationships with fire are intertwined in connections to culture, community and Country. By providing opportunities for young people to learn about traditional cultural knowledge and practices they may feel more connected with community and their shared identity, be encouraged to fulfil their responsibilities and obligations to Country and fire and develop cultural pride. Participants thought that this connection would support long-term relational, behavioural, and attitudinal changes towards fire, and thus reduce the risk of misuse. Further research is needed to determine if connections between Indigenous young people and culture, community, Country and fire influence misuse of fire, and if so, for whom and in what context.

This study illustrated the value of Indigenous peer researchers as facilitators of respectful, reciprocal and relational co-design processes. During the workshops and small group discussions, the peer researchers created culturally appropriate and safe environments that supported participants in recalling prior positive and negative experiences with government-run programs. Participants also freely expressed their concerns about the effects of colonisation on culture, community and relationships with government agencies and personnel. It is likely that the use of peer researchers mitigated some of the limitations associated with government-led research with Indigenous communities and produced more honest and valuable insights as a result.

Conclusion

Co-design workshops and small group discussions were held with participants from Indigenous communities in NSW to explore what they need and want in terms of youth misuse of fire intervention. Indigenous firefighters, as peer researchers, created culturally appropriate and safe environments for the generation of invaluable information. The results revealed thematic commonalities that must be respected when designing, developing, implementing and evaluating culturally appropriate youth fire intervention programs. While most of the findings align with the literature and reiterate the importance of applying an evidence-based approach, other findings are new and highlight the importance of co-designing programs with Indigenous communities regardless of the presence of a rigorous evidence-base. In the words of one participant, 'Whatever the outcome of these yarns, it needs to be meaningful and in the best interests of our communities'. Practitioners and academics are therefore encouraged to consider these findings when tailoring approaches to young Indigenous people who misuse fire and to do so in close collaboration with Indigenous communities.

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References

Akama Y, Hagen P and Whaanga-Schollum D (2019) 'Problematizing replicable design to practice respectful, reciprocal, and relational co-design with Indigenous people', *Design and Culture,* 11(1):59–84. https://doi.org/10.1080/17547075.2019.1571306

Al-Hajj S, Desapriya E, Pawliuk C, Garis L and Pike I (2022) 'Interventions for Preventing Residential Fires in Vulnerable Neighbourhoods and Indigenous Communities: A Systematic Review of the Literature', *International Journal of Environmental Research and Public Health*, 19(9):5434. https://doi.org/10.3390/ijerph19095434

Andrews J and Bonta DA (2007) *Risk-Need-Responsivity model for offender assessment and rehabilitation.* Report. © Her Majesty the Queen in Right of Canada.

Australian Public Service Commission (2023) Cultural load, it's a real thing. APSC website www.apsc.gov.au/working-aps/diversity-and-inclusion/diversity-inclusion-news/cultural-load-its-real-thing, accessed 10 November 2023.

Braithwaite J (2002) 'Setting Standards for Restorative Justice', *British Journal of Criminology,* 42(3):563–577. https://doi.org/10.1093/bjc/42.3.563

Braun V and Clarke V (2006) 'Using thematic analysis in psychology', *Qualitative Research in Psychology,* 3(2):77–101. http://dx.doi.org/10.1191/1478088706qp063oa

Damon W, Callon C, Wiebe L, Small W, Kerr T and McNeil R (2017) 'Community-based participatory research in heavily researched inner city neighbourhood: Perspectives of people who use drugs on their experiences as peer researchers', *Social Science and Medicine,* 176:85–92. http://dx.doi.org/10.1016/j.socscimed.2017.01.027

Dudgeon P, Bray A, Darlaston D and Walker R (2020) *Aboriginal Participatory action research: An Indigenous research methodology strengthening decolonisation and social and emotional wellbeing.* Lowitja Institute, Melbourne. www.lowitja.org.au/wp-content/uploads/2023/05/LI_Discussion_Paper_P-Dudgeon_FINAL3.pdf

Dudgeon W, Wright M, Paradies Y, Garvey D and Walker I (2014) 'Aboriginal social, cultural and historical contexts', in Purdie, N., Dudgeon, P., & Walker, R., (eds), *Working Together: Aboriginal and Torres Strait Islander Mental Health and Wellbeing Principles and Practice,* Chapter 1, pp.1–24. Barton, ACT: Commonwealth of Australia.

Fereday J and Muir-Cochrane E (2006) 'Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development', *International Journal of Qualitative Methods,* 5(1):80–92. https://doi.org/10.1177/160940690600500107

Franklin GA, Pucci PS, Arbabi S, Brandt MM, Wahl WL and Taheri PA (2002) 'Decreased juvenile arson and firesetting recidivism after implementation of a multidisciplinary prevention program', *The Journal of Trauma Injury, Infection, and Critical Care,* 53(2):260–264. https://doi.org/10.1097/00005373-200208000-00012

Fritzon K, Dolan M, Doley K and McEwan TE (2011) 'Juvenile Fire-Setting: A Review of Treatment Programs', *Psychiatry, Psychology and Law,* 18(3):395–408. https://doi.org/10.1080/13218719.2011.585223

Grolnick WS, Cole RE, Laurenitis L and Schwartzman P (1990) 'Playing With Fire: A Developmental Assessment of Children's Fire Understanding and Experience', *Journal of Clinical Child Psychology,* 19(2):128–135. https://doi.org/10.1207/s15374424jccp1902_4

Haines S, Lambie I and Seymour F (2006) *International approaches to reducing deliberately lit fires: Prevention programmes.* Report. New Zealand Fire Service Commission. www.fireandemergency.nz/assets/Documents/Research-and-reports/Report-63-International-Approaches-to-Reducing-Deliberately-Lit-Fires-Prevention-Programmes.pdf

Houvouras AJ and Harvey MT (2014) 'Establishing fire safety skills using behavioural skills training', *Journal of Applied Behavior Analysis,* 47(2):420–424. https://doi.org/10.1002/jaba.113

Lambie I, Seymour F and Popaduk T (2012) 'Young people and caregivers' perceptions of an intervention program for children who deliberately light fires', *Evaluation and Program Planning,* 35(4):445–452. https://doi.org/10.1016/j.evalprogplan.2012.01.007

McDonald K (2010) *Perspectives on effectiveness: What works in a juvenile fire awareness and intervention program?* PhD Thesis. Victoria University website https://vuir.vu.edu.au/16037, accessed 3 September 2023.

Muller DA (2008) *Offending and reoffending patterns of arsonists and bushfire arsonists in New South Wales.* Australian Institute of Criminology Trends and Issues in Crime and Criminal Justice series, 348. AIC website https://www.aic.gov.au/publications/tandi/tandi348, accessed3 September 2023.

Murphy P, McGuinness A and McDermott T (2010) *Review of effective practice in juvenile justice: Report for the Minister for Juvenile Justice. Report.* Noetic Solutions Pty Ltd, Manuka, Canberra.

National Health and Medical Research Council (2018) National Statement on Ethical Conduct in Human research. NHMRC website www.nhmrc.gov.au/research-policy/ethics/national-statement-ethical-conduct-human-research, accessed 1 April 2023.

NSW Sentencing Council (2019) *Fire offences.* Report. NSW Sentencing Council, Sydney. https://sentencingcouncil.nsw.gov.au/documents/our-work/fire-offences/Report%20Fire%20Offences.pdf, accessed 5 September 2023.

Office of the Advocate for Children and Young People (2020) Children and Young People's Experience of Disaster Report 2020 by ACYP. ACYP website www.acyp.nsw.gov.au/disaster-report-2020, accessed 15 September 2023.

Pooley K (2018) *An Evaluation of Youth Justice Conferencing for youth misuse of fire.* Phd Thesis. https://eprints.qut.edu.au/116520/1/Kamarah_Pooley_Thesis.pdf

Pooley K (2020) *What are the characteristics of effective youth offender programs?* Australian Institute of Criminology Trends and Issues in Crime and Criminal Justice series, 604. AIC website www.aic.gov.au/publications/tandi/tandi604, accessed 3 September 2023.

Rasmussen B and Maharaj N (2020) *The Economic Benefits of the Indigenous Fire and Rescue Employment Strategy (IFARES) Program: Fire and Rescue New South Wales.* Report. Bushfire and Natural Hazards CRC, Melbourne. https://vuir.vu.edu.au/40920/1/2020_Rasmussen&Maharaj_Economic_benefits_of_ifares_16_oct_1.pdf

Rhule DM (2005) 'Take Care to Do No Harm: Harmful Interventions for Youth Problem Behaviour', *Professional Psychology: Research and Practice,* 36(6):618–625. http://dx.doi.org/10.1037/0735-7028.36.6.618

Satyen L, Barnett M and Sosa A (2004) Effectiveness of fire safety education in primary school children. Conference paper. Human Behaviour in Fire: Public Fire Safety Professionals in Partnership, 3rd International Symposium. Belfast, Northern Ireland: Interscience Communications.

Smith JA, Merlino A, Christie B, Adams M, Bonson J, Judd B, Fleay J, Osborne R, Drummond M and Aanundsen D (2020) '"Dudes Are Meant to be Tough as Nails": The Complex Nexus Between Masculinities, Culture and Health Literacy From the Perspective of Young Aboriginal and Torres Strait Islander Males – Implications for Policy and Practice', *American Journal of Men's Health,* 14(3). https://doi.org/10.1177/1557988320936121

Tamwoy N, Rosas S, Davis S, Farthing A, Houghton C, Johnston H, Maloney C, Samulkiewicz N, Seaton J, Tuxworth, G and Bat M (2022) 'Co-design with Aboriginal and Torres Strait Islander communities: A journey', *Australian Journal of Rural Health,* 30(6):816–822. https://doi.org/10.1111/ajr.12918

Tujague NA and Ryan KL (2021) 'Ticking the box of cultural safety is not enough: why trauma-informed practice is critical to Indigenous healing', *Rural and Remote Health,* 21(3):641. https://www.rrh.org.au/journal/article/6411

Williamson B (2021) *Cultural Burning in New South Wales: Challenges and Opportunities for Policy Makers and Aboriginal Peoples.* Working Paper No. 139/2021, Centre for Aboriginal Economic Policy Research, Australian National University. https://doi.org/10.25911/Q1PY-8E04

Zamenopoulos T and Alexiou K (2018) *Co-Design as Collaborative Research.* University of Bristol/AHRC Connected Communities Programme.

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Working together to drive change: weaving caring for Country practices into fire risk management on Djiringanj Country

Abstract

This article documents an action research Community-led project with the Merrimans Local Aboriginal Land Council Aboriginal Rangers on the Far South Coast of New South Wales. The Fire and Country Cultural Values Project explored how best to empower Community-led cultural connection that positively influences bushfire management.

The cultural science team in the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) is, we think, an Australian first. It is a group of government-employed Aboriginal staff who are supported to practice cultural science. Processes of colonisation have disrupted the sharing of cultural knowledge through family and extended kinship networks. While there has been significant growth in the interest and support for Aboriginal caring for Country practices, work to partner with communities to sustainably regrow cultural capacity and capability remains limited. The Fire and Country Cultural Values Project has led to increases in cultural identity through sharing knowledge; restoring pride, confidence and wellbeing and rebuilding kinship relationships between different communities on the south coast. This has enabled community members to participate in, and provide advice to, bushfire risk management planning to protect tangible and intangible cultural assets.

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Position statement

This paper outlines a case study of action research undertaken with the Merrimans Local Aboriginal Land Council (LALC) on the Far South Coast of NSW on Dirringanj Country. The authors acknowledge that the format and writing style used in this paper is that of a traditional academic publication. To influence Western process (as this project aims to do), it is important to communicate in academic journals. However, we need to communicate in both Western and Indigenous ways. To do this, Aboriginal ranger teams are creating paintings as a reflection of their story and journey as part of this project. Beside each painting we display the corresponding scientific papers to demonstrate the different ways of communicating, with both methods respecting the different knowledge systems, but telling the same story.

This paper was written and contributed to by all authors. In some cases, information was provided verbally and transcribed. When cultural knowledge has been provided, it has been referenced or cited using an approach that was developed in collaboration with the NSW Threatened Species Scientific Committee. The approach recognises the significant value of the knowledge held by Aboriginal custodians that has been passed on for generations and should not be considered less than peer-reviewed academic expertise (see Department of Climate Change, Energy, the Environment and Water Threatened Species Working Group 2024, Appendix A).

Introduction

Historical and ongoing processes of colonisation and discrimination prevent Aboriginal people from carrying out their responsibilities to care for Country.[1]

1. Caring for Country at https://soe.dcceew.gov.au/indigenous/management/caring-country

A fundamental aspect of Aboriginal place-based relational care, where Country is kin, is the sharing of tens of thousands of years of cultural knowledge through family and extended kinship networks. This practice has been devastatingly disrupted since European settlement and non-Aboriginal people talk of culture being 'lost'. However, despite pervasive and persistent structural, economic and social barriers, Aboriginal people have continued to practice and share culture. Fundamentally, Aboriginal cultural knowledge is tied to Country, it lives within Country and we believe it can never be lost. Support is needed to regrow cultural capacity and capability.

In recent years, particularly since the 2019 and 2020 bushfires in eastern Australia, there has been a surge in interest and support for cultural land management, particularly 'cultural burning' (e.g. Cavanagh 2022; Costello et al. 2021; Wiliamson 2021, 2022; Victorian Traditional Owner Cultural Fire Knowledge Group 2019). Well-meaning research and grant initiatives from government and not-for-profit organisations have abounded. However, we also need to support sustainable regrowth and repatriation of cultural knowledge. This paper explores how to empower Community-led[2] cultural connection that positively influences bushfire management. The approach includes how to support Indigenous people to attend government meetings, while also supporting non-Indigenous people to listen and hear what Indigenous people are saying and why. This paper also explores what cultural information products work for the purposes of the community planning and for negotiating in government meetings. To achieve this, there was training in the language and terms used in government meetings and opportunities were provided to reconnect with Country and share knowledge with kin across multiple Aboriginal ranger teams from the LALCs.

Government drivers for change in bushfire management

The Applied Bushfire Science Program (ABSP) within NSW DCCEEW addresses key recommendations from the NSW Bushfire Inquiry[3] in 2020 relating to ecosystems, recognition of Aboriginal cultural knowledge and impacts of fire on Aboriginal cultural values (O'Kane and Owens 2020). Specific recommendations addressed include:

- Recommendation 36: Long-term ecosystem and land management monitoring/modelling, improved understanding of ecosystem health and impact of bushfire disturbances.
- Recommendation 19: Quantifying bushfire risk/residual risk and increased research to inform more effective bushfire risk management planning.
- Recommendation 26: Adopting a coordinated approach to the integration of Aboriginal land management practices into bushfire programs.

The cultural science team specialises in partnering Aboriginal knowledge and practices with ecological and bushfire sciences to create meaningful outcomes for people and Country; in many cases, bridging the worldly views of Indigenous knowledge with these sciences (Graham 2008). While definitions vary by practitioner, the cultural scientists do 'science' their cultural way to fulfil their obligations to care for Country, share knowledge and build capacity within community and government, while documenting the changes they observe. Sometimes intentionally and sometimes not, they also influence policy and practice change within the agencies and organisations they work with and within. This outcome is often achieved through demonstrating to non-Aboriginal colleagues a different way of being on, caring for and being cared for in return, by Country. The team works to enable cultural and ecological scientific methods to work side-by-side by building trusted relationships and bridging Aboriginal knowledge and natural and physical sciences.

Bushfire risk planning

The NSW Government has established a regional based approach to planning and coordinating bushfire mitigation activities across all land tenures through regional Bush Fire Management Committees (BFMC).[4] These committees have representation from land management agencies and organisations that have responsibility for bushfire management mitigation and emergency responses. As such, Aboriginal representation on these committees is through the LALCs. However, despite invitations and an open seat at the table, many BFMC meetings do not have any Aboriginal representation. When members of the Community do attend, they often do not feel culturally safe, do not understand the processes and feel that their views are not taken seriously (pers comm Moore, Jan 2022; Anderson 1999). Others recount the challenges faced in protecting cultural heritage from natural disasters (Lissoway and Propper 1988; Marrion 2016).

The purpose of the BFMC is to create risk mitigation plans by understanding each representative's capacity and resources to develop shared plans of action and implementation. An objective of this project was to help Aboriginal representatives feel culturally confident and safe at BFMC meetings and that future bushfire risk management planning would incorporate cultural mapping and cultural seasonal indicators. The goal is for management planning to be updated yearly based on environmental conditions and cultural indicators (i.e. wet years/dry years).

2. Community – capitalised refers to the Aboriginal community as opposed to the wider community of Australia.
3. NSW Bushfire Inquiry, at www.nsw.gov.au/departments-and-agencies/premiers-department/access-to-information/nsw-bushfire-inquiry
4. CNSW Rural Fire Service, Bush Fire Management Committees, at www.rfs.nsw.gov.au/plan-and-prepare/managing-bush-fire-risk/bush-fire-management-committees

Methodology: entwined with place

Our methodology is First Nations-led participatory action research and draws on Indigenous, feminist and emancipatory epistemologies (Chilisa 2020). Together with Community, we developed a collaborative methodology that recognises Country, in this case Djiringanj Country, as the key knowledge holder from whom we learn. In doing this, we follow the lead of Bawaka Country researchers who argue that properly acknowledging Country as the 'author-ity' of research is an ethical imperative (Bawaka Country et al. 2016). A goal of this methodology is that the outcomes of this action research are owned and driven by the Community. This approach is akin to the 'right way' science of McKemey et al. (2022)

Dirringanj Country

Djiringanj Country is part of the Yuin Nation, which consists of 13 tribes (mobs) on the NSW south coast. On Djiringanj Country are significant places that represent creation stories in Yuin culture and we can see the spirit of these creation stories on Country in people and in the cultural practices. Djiringanj Country, like other parts of the Far South Coast, provide places of connection, teaching, learning and cultural practice. These teachings are through Ancestral and spiritual connection to place, kinship to each other and the songlines that guide us on Country.

We have a culture that is alive and, in the present, connects us to ways of being, who we are, our place and roles as Aboriginal people caring for Country. We are the custodians of Country and through the stories and passing on of knowledge we, as Djiringanj people, are able to sustain a living culture into the future. (Avery 2025).

Approach

The project began in 2021 with a Community-led approach to develop foundational understandings of cultural values and options for cultural land management practices that mitigate fire and enable bushfire risk planning that considers cultural rights. Key personnel to the project are Aboriginal knowledge holders and rangers, Elders and the wider local community to determine their understandings of fire effects on cultural values and to empower Aboriginal peoples' inputs to the fire-planning process. As the project continued, it was identified that existing emergency response to bushfires was a key knowledge and capacity growth area for community.

The Senior Cultural Scientist on the project was a Gurrungutti-Munji-Yuin person, respected knowledge holder and Elder, Graham Moore. When looking at the project scope and intended outcomes it was determined that the project needed to focus on a case study where existing relationships existed. Due to the physical location and community ties of members of the cultural science team, south eastern NSW was selected as the broad location. However, this location covers 7 different LALCs who have representation on multiple regional BFMCs.

Discussion with Community members led to a decision to focus on Djiringanj Country (see Figure 1) in the area situated between 2 sacred mountains (Gulaga and Biamanga). The area between these mountains consist of Country that supports major movement pathways for Aboriginal people from across south eastern NSW, including inland NSW, who travel for the purposes of ceremony, trade and other cultural practices. These pathways represent a shared space and provide the kinship connection and responsibilities. Exchange of knowledges can be equally shared with all other mobs in the region meaning that as the project grew, responsibility and knowledges can be shared and discovered as one mob.

The Merriman's LALC was establishing their Aboriginal ranger team and, through engagement with our cultural scientists and this project, we provided operational funds and cultural support for their training and time spent working on this project.

Community-led approach

Consultation with the Board of the Merrimans LALC demonstrated the need for the project to not only support the growth of their new Aboriginal ranger team to become leaders, but to ensure, over time, that the project included the wider community, children and Elders. Maclean et al. (2023) describes the importance of self-determination by Community similar to the way this project is delivered.

Discussions concerning Community data sovereignty were upfront, with agreement that all data and knowledge generated would be stored in a cultural data library, as part of an Indigenous Cultural and Intellectual Property agreement written into the contract between the DCCEEW team and the Merrimans LALC. The data that has been collected from cultural knowledge (i.e. Traditional Ecological Knowledge, cultural values, cultural indicators) is supported with scientific knowledge at the request of community as they wish to learn from that expertise.

Research questions and project structure

Research questions were developed with Community.

Project questions:

- How can we best support Community to connect back to Country through kinship networks?
- How can Aboriginal culture best contribute to bushfire risk management planning?

Sub-questions:

- How do we support Aboriginal Communities to safely and confidently contribute an Aboriginal perspective into Western bushfire decision-making and planning processes?
- What are the challenges for Aboriginal people to practice their culture in this process/space?

Figure 2 illustrates the project components designed at project initiation by the Merrimans LALC Aboriginal ranger team. The areas in green were designed to enable Aboriginal rangers to contribute to bushfire risk planning. The areas in red are the planning processes that require the representation of Aboriginal engagement for whole-of-government planning. This methodology supports a Community-led approach and allows project components to evolve over time to suit the needs of Aboriginal rangers and, importantly, how Country is speaking.

Each week, 4-5 project team members meet to plan weekly activities and engagements that need to occur. This included setting up a work program for the Aboriginal rangers and managing other non-Aboriginal scientists (including university staff) involved in the program. The non-Aboriginal scientists provided support and partnership on various scientific questions. As at January 2025, there are 35 professionals and scientists who have engaged in on-Country activities, assisting and attending regular weekly or monthly catchups as part of the wider project team.

Results: fire and Country cultural values

Drone site mapping

In addition to regrowing and connecting with cultural knowledge, the Aboriginal rangers wanted to increase their knowledge and skills in new technology. Drone mapping was introduced early in the project for 3 reasons:

- it appeals to the Aboriginal rangers (who are young) and they had strong interest in drones
- knowledge holders can no longer access remote cultural sites due to age or health reasons and drone imagery can be provided to Community and Elders so they can immerse themselves in Country, from a sky perspective, to help them reflect on the health of Country and what needs to be done
- there are parcels of land owned by the LALC that need to be treated for bushfire risk management and drones can be used to provide observational records of seasonal indicators, with repeat surveys showing how Country is responding over time to cultural treatments.

Cultural site assessments

This is a key skill for the Aboriginal ranger teams so they can connect with ancestors, understand the Spirit of Country and how Country needs to be managed culturally. The primary law governing Aboriginal heritage in NSW,

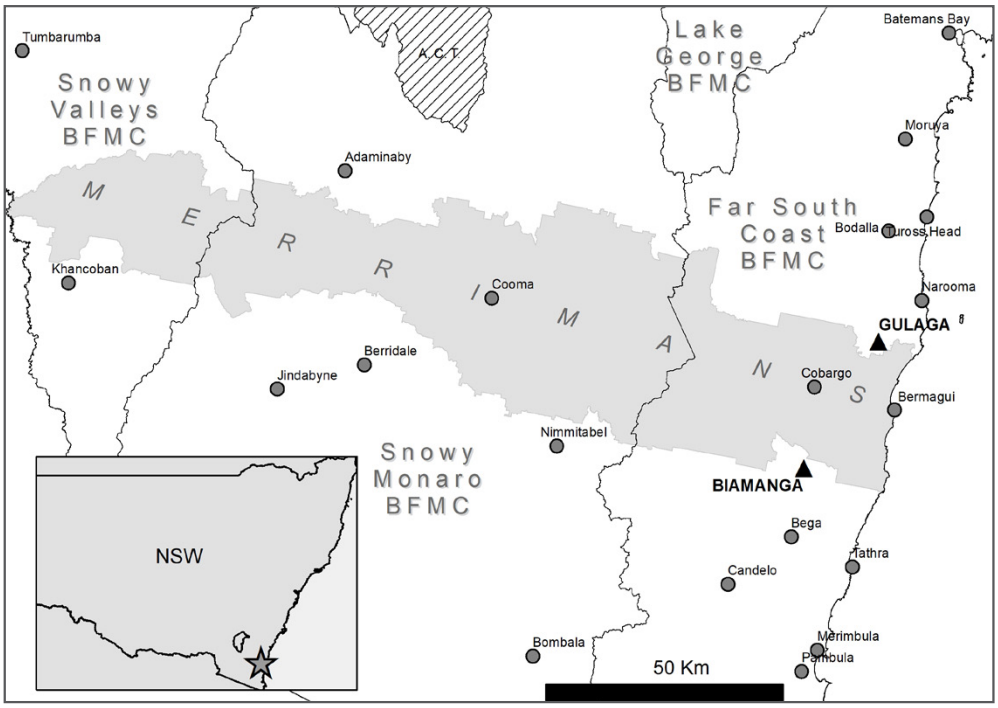

Figure 1: Location of Merrimans LALC boundary (grey) overlaid with multiple regional BFMC and locations of the mountains Gulaga and Biamanga.

Figure 2: The Fire and Country Cultural Values Project structure with green circles showing the components designed by Community. The red circles represent the government planning forums to influence. The yellow/brown circle records the journey for learning, sharing and improvements.

the *National Parks and Wildlife Act 1974* (NSW)[5], does not acknowledge nor uphold the rights of Aboriginal peoples to govern and safeguard cultural and historical heritage. Consequently, the system often fails to identify and protect significant Aboriginal culture and heritage sites.

Managing and protecting culture and heritage from Aboriginal people's perspectives involves acknowledging all components of culture and heritage, tangible and intangible, and their interconnections. Aboriginal ranger teams must be able to safeguard and regulate their culture and heritage as a fundamental aspect of self-determination. The cultural and heritage values of a particular location, often referred to as 'sites', are determined by the physical evidence of how that site has been used, or is being used, and by knowledge about that place and its relationship to people and other parts of Country.

Due to the nature of this project, the Aboriginal ranger teams walk on Country with knowledge holders and Elders from the project team and also members from Community depending on the subject matter at hand. Due to the kinship relationships with other Aboriginal ranger teams, there also regular opportunities where they are able to share knowledge between themselves.

Aboriginal land use and fire modelling

Bushfire planning has moved to a risk-based approach using modelling processes. These include showing recorded sites or predictions of cultural assets. However, this is strongly focused on archaeological type information and may not reflect the wider living culture of the values held within Country. The project team created opportunity in the NSW Government technical modelling processes to allow for this type of knowledge to be shared. The team is developing methods to recognise this information within the models so cultural assets and values are assessed transparently along with other assets (i.e. people, property, environment). This means that mitigation methods for cultural values become authorised in government planning process, which should make it easier for Aboriginal ranger teams to obtain funding and insurances to undertake planned works.

Ecological and bushfire science approaches to environmental site training

This component of the project included required training for the Aboriginal ranger teams in Western

5. NSW Government. National Parks and Wildlife Act 1974 No 80 https://legislation.nsw.gov.au/view/html/inforce/current/act-1974-080

science methodologies for field sampling of soils, water, plants and animals as well as technologies (computer modelling, photography). Further, training in NSW Rural Fire Service (RFS) regulations and requirements included understanding language, laws and applying for permits, workplace health and safety, attending strategic government planning, fire planning and report writing. From a cultural perspective, training is also about understanding the context of site assessments in terms of other cultural features in the landscape, as well as cultural safety. The aim is to re-discover the existing cultural landscape that was, and still is, present and is now becoming seen and then returning Aboriginal land management mitigation approaches to care for Country (Lake et al. 2017; Pasco et al. 2024; Steffensen 2020).

As the Aboriginal rangers and the ABSP team members developed relationships, the sharing of knowledge grows. This is leading to deep and inspiring dialogue that creates motivation, pride and purpose. Having this shared understanding means the Aboriginal and non-Aboriginal team members can evolve their site assessment to include cultural needs. A common dialogue is that the site training from a Western approach often looks at the subject of interest, monitoring it in great detail, whereas the cultural approach looks at the system through kinship relationships.

Cultural values maps

Planning for fire mitigation involves people coming to the BFMC meetings using maps as a common form of language to convey the assets they want to protect. Understanding the use of maps as language and building their own cultural maps gave confidence to the Aboriginal ranger teams to engage in a shared conversation with the committee. We created 3 types of maps:

- Maps that can be shared externally at BFMC meetings that give general information about cultural values.
- Internal maps that provide more detailed information to assist Community to prepare for planning meetings and what information they should share.
- Maps that relate to the seasonal calendar so ultimately the calendar can be represented spatially. This can help communicate where in Country this knowledge would apply. For example, if knowledge was being shared for an area in red (as shown on Figure 3) the knowledge holder could express across tenure that this information can also apply to other parcels of land and, as custodians of Country, they can share conversations about how to work together.

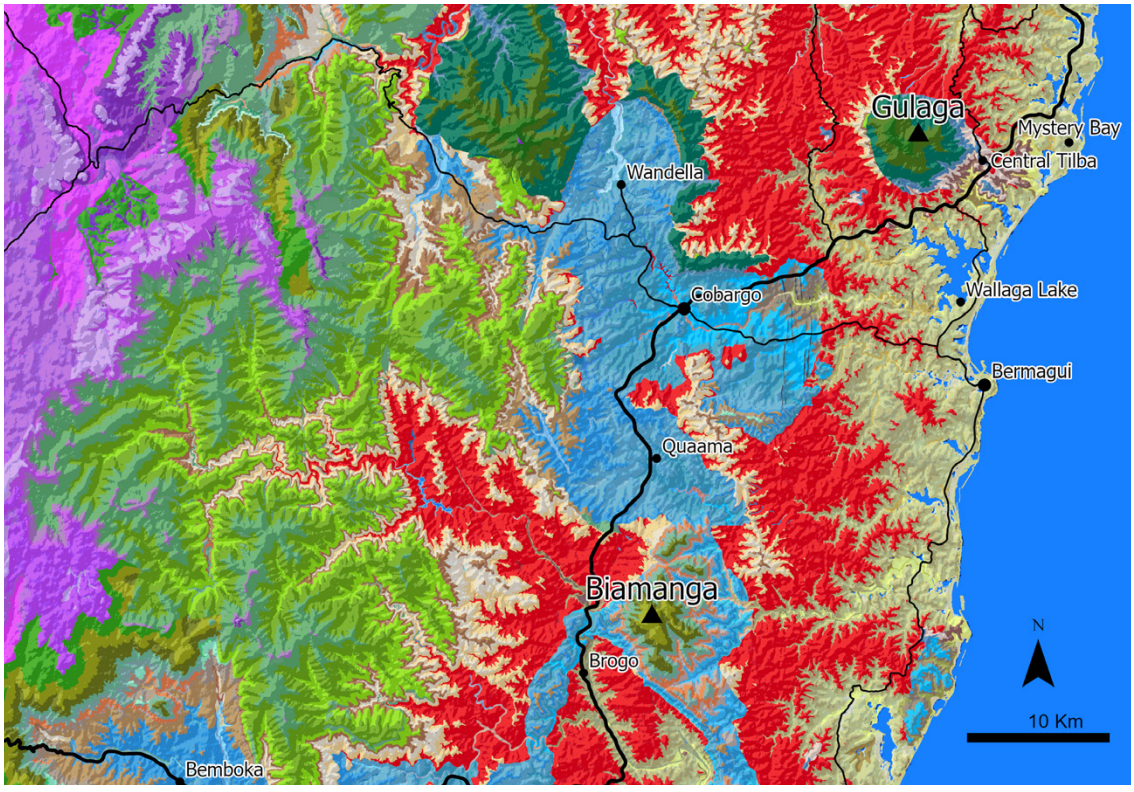

Figure 3: A representation of the dominant types of Country within the study area shown with hill shade from a digital elevation model.

Note: The change in dominant colour represents a change in Country type. The Country type reflects how knowledge holders and Elders interpret Country by recognising soil composition and landscape positions. To reflect this knowledge, a spatial layer of major soils groups and landform features such as ridge tops to lower slopes has been combined. The Country type map is continually refined as field validation occurs on Country.

Seasonal calendar

The development of the seasonal calendar is a long-term goal of the project. Huffman (2013) outlines traditional knowledge of Country from around the world and how that should play a greater role in fire management. For the cultural calendar, we will follow an approach similar to McKemey et al. (2021). Its purpose is to provide indicators from Country (McKemey et al. 2020) to guide Aboriginal land management practices that should be implemented and when they should be implemented. This provides evidence for how activities such as cultural fire management can and should be implemented on Country when Country asks. The seasonal calendar approach adds value to the Western approach to determine a fire season but also to outline when they oppose each other and the reasons why. This is particularly important with the challenges of climate change (Metcalfe and Costello 2021) lengthening the fire season (as defined in the Western approach). This is shortening the safe periods for Western-based approaches to hazard reduction. In other words, a seasonal-calendar approach could unlock more opportunities to implement fire in the landscape to care for Country.

The Merrimans Aboriginal ranger team members make observations of seasonal indicators from Country. They record notes of the indicators as well as taking photos of what's happening on Country. They shared those observations with Community members to seek advice and the story of what it could mean for Aboriginal land management decisions. In this way, the whole community is involved in how knowledge is re-discovered. The project team will spatially map the seasonal calendar with data layers such as those represented in Figure 3. The intent is to demonstrate where the knowledge would apply across Country. Thus, when Aboriginal rangers are at the BFMC planning table, they can represent their knowledge and ideas across tenure. For example, they could say: 'this is what we plan on doing on the land we are responsible for, and this is the same Country that covers your farm, or your national park'. This could open up dialogue about the many options and opportunities for the wider community to care for Country together.

Recording the journey

This Community-led project evolves at a pace that Community and Country are ready for and as new learnings are revealed and developed. To tell the story of this project, it was necessary to record the journey with and for everyone involved (yellow/brown circle, Figure 2). This is done through observation and reflection, testimonials, interviews, videos, photos, cultural storytelling and creation and paintings. The multiple methods are opportunities to include everyone and to reach varied audiences, depending on the communication style that suits them best. Culturally, the most effective way to share is through cultural exchanges and gathering. In particular, focusing on the core values of Community for the issue at hand (Ridges et al. 2020).

Testimonials

As a young generation Elder reflecting on growing up in the old ways talking about land and Country and being taught our ways, this project is providing opportunities to teach the younger generations coming into the future, bringing together all the circles of old ways and new ways. The Elders and knowledge holders have kept this journey going and we always need to keep them present, because they amplify our cultural ways on this project.
Mandy Foster Gamilaroi / Yuin Merrimans Local Aboriginal Land Council

The integration of teaching and on-Country learning is what will give this project longevity. It's all the behind the scenes work that makes this project successful and that is what will set the foundations for a legacy for all our communities.
Blann Davis Wodi-Wodi CEO/ Merrimans Local Aboriginal Land Council

Kinship connections

This project provides opportunities to reunite kinship. One example was a cultural exchange to Rick Farley Soil Conservation Reserve that was the turning point for this project. Rick Farley is close to the Lake Mungo National Park in south western NSW in rangeland Country. The Rick Farley cultural exchange took place in October 2023 to highlight the connection to Country via pathways and people's roles and responsibilities. This was a very important part of the training component for the Aboriginal ranger teams where they could connect spiritually as well as physically. Attendees undertook a personal journey of positive cultural discovery; a reward, a rekindling. The ancient lands taught and are still teaching. The meeting on Country with a knowledge holder and an Elder gave the respect that set the theme for the camp. This was not just a physical knowledge gathering but occurred on levels that everyone could take back to their Country; a spiritual awakening for most, a new strength and resilience. The Elders and non-Aboriginal members of the group found it incredibly rewarding to watch the young people grow in many positive ways. Many kinship systems across NSW remain vibrant and active (Rose et al. 2003).

Representatives from the Merrimans, Batemans Bay and Bega Aboriginal ranger teams, the DCCEEW cultural science team, ABSP team, Elders and knowledge holders on Country at Rick Farley Soil Conservation Reserve in 2022.

Image: Graham Moore

Land council fire planning

All LALCs hold various parcels of land and each comes with different fire risk responsibilities. These could be people, property, public assets and infrastructure, the environment and cultural assets and values. For this project, the Merrimans Aboriginal ranger team worked on 2 different parcels of land to determine approaches to return the cultural landscape (as the land is very degraded) while managing the bushfire risk.

Aboriginal engagement in bushfire planning

Revitalising the kinship relationship in the area between the many LALC Aboriginal ranger teams across south eastern NSW is creating the confidence and unified voice to provide representation in the BFMC process. The BFMC non-Aboriginal members are able to understand better ways to engage and provide a culturally safe place for respectful dialogue. In essence, capacity building for BFMCs to understand cultural assets and values as well as Community knowing what information to take to planning meetings and who and when to express that knowledge, so it is effective and listened to.

Results: project outcomes, evidence from 2 case study examples

Indicators of early achievement of the project: inclusion of cultural values in bushfire management

In the early stages of this project, we experienced 2 wider outcomes due to the growth in relationships and trust that were created between the BFMC and the south coast LALC communities. Examples are the Cooma North Ridge and the Cultural Incident Management Exercise to explore the inclusion of cultural assets and values.

Cooma North Ridge

Through this project a new partnership in bushfire management emerged between the Merrimans Aboriginal rangers and the Snowy Monaro BFMC. Cooma North Ridge is a lightly forested ridge line in Cooma that neighbours a significant section of the town. Two works were proposed to reduce the bushfire risk to the neighbouring houses and people. The first, to widen the tracks to allow larger firefighting machinery safe access under emergency conditions (safer standards) and, second, a prescribed burn to reduce fuel loads.

The Cooma North Ridge is known by traditional knowledge holders as an Aboriginal transitional pathway that remains in use today by the local and broader community. The current walking tracks and vehicle tracks are on these pathways. Multiple sites of cultural artefacts have been found in the area where the proposed mitigative works were due to be undertaken. Partnership between the Aboriginal rangers, NSW RFS and Fire and Rescue NSW (FRNSW) led to the following positive outcomes.

Mitigative objective: widening of fire trails

The general areas of the cultural asset were identified on works maps and the Aboriginal ranger teams supplied and installed 2 steel posts about 10 metres either side of each identified cultural asset. Posts were sprayed with red and yellow paint so machinery operators would know not to conduct soil conservation works within this zone (Red - stop works, Yellow - continue works). An inspection of 5 planned turnaround bays occurred, and cultural assets (scatters) were identified. If they were found, they were removed away from the works area.

Mitigative objective: prescribed burn

Given the identification of the cultural assets, the draft prescribed burn plan outlined the general location of the sites and where to keep fire intensity low, if possible. It was recommended this could be done by implementing initial ignitions on these sites before the larger areas were treated via hazard reduction measures and that initial ignitions were conducted by the Merriman Aboriginal rangers. A pre- and post-cultural assets monitoring plan was included so all participants could learn from the exercise through an action-based research approach.

The method allowed a quick and easy solution by liaising and partnering with the Aboriginal ranger teams (as traditional custodians) to ensure the planned works for Cooma North Ridge included cultural considerations without delays or excessive additional costs. Without engagement, the protection of cultural assets would have led to 100 metre exclusion zones making the planned mitigative works difficult to implement.

The engagement of the Merrimans Aboriginal rangers goes beyond current protocols and is testimony to the success of the work to build cultural safety and trusted relationships between the local community, NSW RFS and FRNSW. The teams were able to work together, and modifications were made to the planned activities to allow a mix of cultural and prescribed fire management to take place to ensure asset protection goals were met without damaging cultural sites.

Incident Management Exercise to explore the inclusion of cultural values, South Coast NSW

Following the success of the Cooma North Ridge project, the BFMC members and project team discussed opportunities for the Aboriginal rangers to be included in the control room during a bushfire emergency to provide information on cultural assets and values. To achieve this aspirational goal, significant investment was needed to build deeper relationships and a shared understanding of the significance of protecting cultural sites and Western bushfire management. Training was needed so agency staff and the Aboriginal rangers could learn how to communicate and share the right knowledge at the right time in the right way so quick decisions could occur. Eriksen and Hankins (2014) reported on similar approaches when integrating Indigenous knowledge into firefighting on the ground.

The Cultural Incident Management Exercise occurred in November 2024 and was the first of its kind to bring Aboriginal rangers into the incident control room to experience being involved in the fire management decision-making process. The exercise demonstrated the importance and benefits of ensuring there are cultural custodians present or available who can provide advice to personnel in an emergency response situation. The aim was to consider alternative methods and resource deployment to protect cultural values as well as strengthen relationships between government authorities and the Community. The exercise was attended by 7 Aboriginal ranger teams from south east NSW that were brought together through kinship relationships. These relationships were reinvigorated through this project. In total, 25 Aboriginal rangers attended as representatives of their kinship to Country and its people.

Conclusions

The NSW Bushfire Inquiry 2020 recommendations to include Aboriginal knowledge in decision-making and planning provided the authorising instructions for agencies to interpret how this can be done. Agencies, when responding to changes in the way they undertake business, often create top-down processes for rapid and expansive change. The NSW Government provided this opportunity to explore how we can achieve this (for cultural values and assets) from a grass roots approach. For Aboriginal peoples, this means Community-led (at the pace of the people and Country) and empowering co-design approaches to bring the strengths of the traditional knowledge alongside science-based approaches.

Although it is still early in this project and some aspects (e.g. the seasonal calendar) are longer-term goals, the project team sees the responsibilities of this project's

objectives as a longer journey. The project provides opportunities for relationship development between government agencies and Community. The NSW RFS and NSW National Parks and Wildlife Service have expressed the desire for DCCEEW to support more LALCs and BFMC, given the project's successes to date. Through this trust, people's hearts and minds are opening to explore and try new ways to understand how we can protect the cultural values and assets of Country. The shared learning is what the participants are proud of, regardless of their identity. This is the important to sustain the transformational change we are creating through this project.

Acknowledgments

The authors acknowledge the ABSP and cultural science team of DCCEEW. We deeply thank the LALCs across south eastern NSW who are sharing this journey and expanding the footprint of this project through kinship. We also thank the NSW Far South Coast and Snowy Monaro BFMCs (and the NSW RFS and NSW National Parks and Wildlife Service in general) for allowing this project to participate in BFMC meetings and programs to explore (with open minds and hearts) how to incorporate cultural values into bushfire risk planning and emergency response. Two years of funding was obtained from the NSW Government in response to the NSW Bushfire Inquiry followed by a 3 year grant from the NSW Reconstruction Authority. Thanks also to Dr Melanie Taylor who assisted with this manuscript.

References

Andersen A (1999) 'Cross–cultural Conflicts in Fire Management in Northern Australia: Not so Black and White', *Conservation Ecology,* 3(1):6 http://www.consecol.org/vol3/iss1/art6/

Avery K (2025) Gumbayngirr-Djiringanj, Djiringanj Country, Far South Coast, Community Member and Senior Cultural Scientist – Cultural science Team – Department of Planning and Environment.

Cavanagh V (2022) 'The (re)emergence of Aboriginal women and cultural burning in New South Wales, Australia', in J. Weir & J.D. Scasta (eds.), *Global Application of Prescribed Fire,* CSIRO Publishing, Clayton, Vic.

Chilisa B (2020) *Indigenous Research Methodologies.* (2nd Ed.) Sage Publications Inc. California.

Costello O, Dilworth T, Haynes K, Jansen T and Neale T (2021) Cultural Land Management in southeastern Australia, Developing the foundation for an Indigenous-led and co-designed research program for land management with Traditional Owners. Report. Bushfire and Natural Hazards CRC, Melbourne. NHRA website www.naturalhazards.com.au/resources/publications/report/cultural-land-management-southeastern-australia-black-summer-final, accessed on 28 January 2025.

Country B, Wright S, Suchet-Pearson S, Lloyd K, Burarrwanga L, Ganambarr R, Ganambarr-Stubbs M, Ganambarr B, Maymuru D and Sweeney J (2016) 'Co-becoming Bawaka: Towards a relational understanding of place/space', *Progress in Human Geography,* 40(4):455–475. https://doi.org/10.1177/0309132515589437

Department of Climate Change, Energy, the Environment and Water Threatened Species Working Group (2024) *Weaving Traditional Ecological Knowledge into Conservation Assessments: a guide for project officers.* Environment and Heritage website www2.environment.nsw.gov.au/publications/weaving-traditional-ecological-knowledge-conservation-assessments-guide-project-officers, accessed 28 January 2025.

Eriksen C and Hankins D L (2014) 'The Retention, Revival and Subjugation of Indigenous Fire Knowledge through Agency Fire Fighting in Eastern Australia and California', *Society & Natural Resources,* 27(12):1288–1303. https://doi.org/10.1080/08941920.2014.918226

Graham M (2008) 'Some Thoughts about the Philosophical Underpinnings of Aboriginal Worldviews', *Australian Humanities Review,* 45:181–194. AHR website https://australianhumanitiesreview.org/2008/11/01/some-thoughts-about-the-philosophical-underpinnings-of-aboriginal-worldviews/, accessed 28 January 2025.

Huffman M R (2013) 'The many elements of traditional fire knowledge: synthesis, classification and aids to cross-cultural problem solving in fire-dependent systems around the world', *Ecology and Society,* 18(4). http://www.jstor.org/stable/26269435

Lake FK, Wright V, Morgan P, McFadzen M, McWethy D and Stevens-Rumann C (2017) 'Returning fire to the land: celebrating traditional knowledge and fire', *Journal of Forestry,* 115(5):343–353. https://doi.org/10.5849/jof.2016-043R2

Lissoway J and Propper J (1988) 'Effects of fire on cultural resources'. Panel paper, presented at the Effects of fire in management of southwestern natural resources. Tuscon, AZ. November 14–17, 1988. www.frames.gov/documents/catalog/lissoway_propper_1990.pdf

Maclean K, Hankins DL, Christianson AC, Oliveras I, Bilbao BA, Costello O, Langer ER, Robinson CJ (2023) 'Revitalising Indigenous cultural fire practice: benefits and partnerships', *Trends in Ecology and Evolution.* 38(10):899–902. https://doi.org/10.1016/j.tree.2023.07.001

Marrion CE (2016) 'More effectively addressing fire/disaster challenges to protect our cultural heritage', *Journal of Cultural Heritage,* 20:746–749. https://doi.org/10.1016/j.culher.2016.03.013

Metcalfe DJ and Costello O (2021) 'Extreme Events' (Chapter), in Australia State of the Environment Independent Report to the Australian Government Minister for the Environment. Commonwealth of Australia, Canberra. https://soe.dcceew.gov.au

McKemey MB, Banbai Rangers, Ens EJ, Hunter JT, Ridges M, Costello O and Reid NC (2021) 'Co-producing a fire and seasons calendar to support renewed Indigenous cultural fire management', *Austral Ecology,* 46(7):1011–1029. https://doi.org/https://doi.org/10.1111/aec.13034

McKemey M, Costello O, Ridges M, Ens E, Hunter JT and Reid NC (2020) 'A review of contemporary Indigenous cultural fire management literature in southeast Australia', *EcoEvoRxiv.* http://dx.doi.org/10.32942/osf.io/fvswy

McKemey MB, Rangers B, Rangers YM, Costello O, Hunter JT, Ens EJ (2022) ''Right-way' science: reflections on co-developing indigenous and Western cross-cultural knowledge to support indigenous cultural fire management', *Ecological Management & Restoration,* 23:75–82. https://doi.org/10.1111/emr.12532

O'Kane M and Owens D (2020) 'Final report of the NSW Bushfire Inquiry'. Report. NSW Government. www.nsw.gov.au/sites/default/files/noindex/2023-06/Final-Report-of-the-NSW-Bushfire-Inquiry.pdf

Pascoe J, Shanks M, Pascoe B, Clarke J, Goolmeer T, Moggridge B, Williamson B, Miller M, Costello O and Fletcher M (2024) 'Lighting a pathway: Our obligation to culture and Country', *Ecological Management and Restoration,* 24(2-3):153–155. https://doi.org/10.1111/emr.12592

Ridges M, Kelly M, Simpson G, Leys J, Booth S, Friedel M and Country N (2020) 'Understanding how Aboriginal culture can contribute to the resilient future of rangelands: The importance of Aboriginal core values', *The Rangeland Journal,* 42(5):247–251. https://doi.org/10.1071/RJ20031

Rose D, James D and Watson C (2003) *Indigenous Kinship with the Natural World in New South Wales.* NSW National Parks and Wildlife Service. https://nswdpe.intersearch.com.au/nswdpejspui/handle/1/2809

Steffensen V (2020) *Fire country: How Indigenous fire management could help save Australia.* Hardie Grant Explore.

Williamson B (2021) 'Cultural Burning in New South Wales: Challenges and Opportunities for Policy Makers and Aboriginal Peoples'. Working Paper No. 139/2021, Centre for Aboriginal Economic Policy Research, Australian National University. https://doi.org/10.25911/Q1PY-8E04

Williamson B (2022) 'Cultural burning and public forests: convergences and divergences between Aboriginal groups and forest management in south-eastern Australia', *Australian Forestry,* 85(1):1–5. https://doi.org/10.1080/00049158.2022.2054134

Victorian Traditional Owner Cultural Fire Knowledge Group (2019) 'The Victorian Traditional Owner Cultural Fire Strategy'. The Federation for Victorian Traditional Owner Groups, Melbourne. https://fvtoc.com.au/documents/victorian-traditional-owner-cultural-fire-strategy

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Note: The 4 co-authors, R Foster, V Parsons, R Parsons and Z Campbell are Aboriginal rangers from the Merrimans community and have worked closely with the research team for 3 years. Moore, Avery and Hoskins are Aboriginal community members and share Djiringanj kinship connection with the Merrimans Aboriginal rangers. They are employed by NSW DCCEEW as full-time cultural scientists. They live and walk in 2 worlds (cultural and Western).

Haynes and Summerell are non-Aboriginal. They have worked for many years with Aboriginal colleagues and friends who have generously shared their knowledge and understanding to enable them to see and understand an holistic and relational way of being on, with and for Country. Their outlook, work and personal lives have been profoundly changed for the better.

Working in partnership on cultural fire: application of a lessons management approach

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Introduction

This report documents learnings for working effectively in partnership on cultural fire, drawn from the on-Country[1] experiences of the Department of Fire and Emergency Services (DFES) Cultural Fire Program (CFP). The CFP is based within the Karla Katitjin Bushfire Centre of Excellence[2] on Bindjareb Boodja (Country), located approximately one hour south of Boorloo (Perth) in Western Australia.

Since its establishment in 2020, the CFP has worked towards 3 strategic objectives:

- To collaborate with partners to facilitate two-way learning to build capacity to undertake and support delivery of cultural burning across Western Australia.
- To enable First Nations Australians to develop, implement, coordinate and promote existing and future cultural fire programs and activities.
- To promote sector and community understanding and awareness of cultural fire.

Over the last 3 years, the CFP has been fortunate to have been invited onto Country by Elders to participate in, and support the undertaking of, cultural burns. Importantly, many of these cultural burns signified a 'return to Country', where, due to the multi-generational effects of colonisation and resulting injustices, Elders and traditional custodians have not undertaken cultural burning on their ancestral lands for many decades.

Cultural burning 'connects the next generation with their Country, maintains cultural obligations and traditional stories, and is an expression of custodial responsibility and cultural continuance' (Standley et al. 2022). A return to on-Country burning can enable traditional custodians to re-engage with cultural practices, share cultural knowledge, meet cultural obligations to Country and exercise their right to self determination (McKemey et al. 2021). Maclean et al. (2018) recognised significant co-benefits of cultural burning and Costello et al. (2021) state: 'Cultural land management is an essential part of creating well-prepared and resilient communities and landscapes anywhere in Australia'.

While collaboration between government agencies and First Nations peoples in Australia is growing, there remains many barriers (Costello et al. 2021). Barriers identified through Australian-based research identify a lack of fundamental understanding by non-Indigenous organisations on how to effectively collaborate with First Nations Australians (Sithole et al. 2021) including limited knowledge and awareness of governance structures (Russell-Smith et al. 2022) and engagement protocols (Woodward et al. 2020). Cultural fire programs may assist in moderating these barriers and provide opportunities for the public sector to develop deeper understanding about cultural burning while influencing positive change in public sector practice, including greater willingness and capability to listen to, and engage with, First Nations Australians (Freeman et al. 2021).

Goreng-Menang Elder, Uncle Eugene Eades, said following the first cultural burn in over 60 years on Nowanup Boodja:

> *In the spirit of true reconciliation, we've got to make a step towards one another and make some of the wrongs right again. That was achieved in a big way. It was a long time overdue.*

1. The majority of our on-Country work that informed this report, was undertaken on Noongar Boodja (Country) in southwest Western Australia.
2. Karla Katitjin Bushfire Centre of Excellence at www.dfes.wa.gov.au/hazard-information/bushfire/bcoe

This report describes the application of a formal lessons management approach, aligned with the Australian Institute of Disaster Resilience framework (AIDR 2019), to the CFP and the on-Country activities. To the authors' knowledge, this is the first time that the AIDR lessons management framework has been applied to a cultural fire program in Australia. The lessons identified here may help individuals, agencies and organisations develop and maintain culturally informed and appropriate methods of engagement to create a culturally safe, respectful and equitable foundation for cross-cultural collaboration.

Methodology and results

The CFP has applied the 'Observations, Insights, Lessons Identified, Lessons Learned' (OILL) methodology as described in the AIDR Lessons Management Handbook (AIDR 2019). Figure 1 shows the OILL process as a structured, replicable methodology that enables large amounts of data and information to be distilled into key messages.

Figure 2 shows how lessons are based on multiple pieces of evidence (observations) that can be grouped into insights that, in turn, can point to a lesson identified.

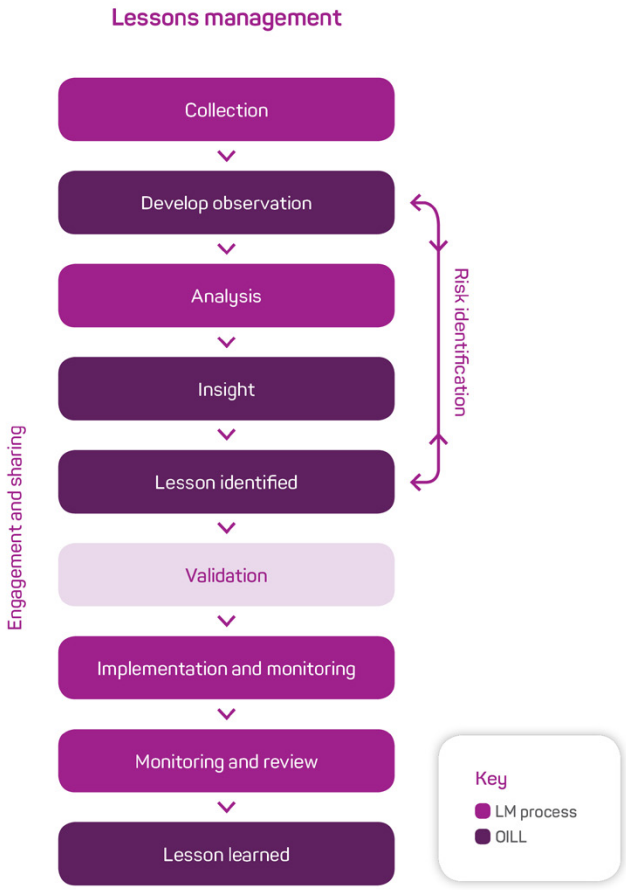

Figure 1: Elements of a lessons management process (AIDR 2019).

Data collection and observations

For the CFP lessons, observations were collected from events, including training courses, workshops and on-Country activities. Observations were sourced through debriefs, interviews, quotes and personal reflections of Elders, participants, staff and observers involved. Where possible, observations were structured against the elements of a 'good' observation (AIDR 2019) and distributed back to those who provided the raw data to check for accuracy and to avoid misinterpretation.

Between May 2022 and March 2024, a total of 547 observations were collected. These were sourced from 14 separate events (n=475) and general reflections on program delivery (n=72). DFES staff contributed 67% of the observations (n=368).

Coding and analysis

A tailored coding framework was developed for the cultural fire observations with support from Dr Christine Owen, University of Tasmania. The final coding framework, comprising 6 primary and 13 secondary themes, is shown in Table 1. All observations were allocated a primary and secondary code in March 2024. A breakdown of coding results is shown in Figure 3. The primary codes most frequently assigned were Two-way Learning (n=179, 33%) and Cultural Competence (n=162, 30%). Observations were also notably present in Authorising Environment (n=106) and Knowledge Management (n=73). The primary collection methods for observations were debriefs (n=286, 52%) and personal reflections (n=250, 46%).

Table 1: Tailored coding framework for CFP.

Primary theme	Secondary theme
1) Two-way learning	1.1: Creating two-way learning environments
	1.2: Facilitation methods / techniques
	1.3: Formal learning / training considerations
	1.4: Integrated cultural and contemporary practices
2) Cultural competence	2.1: Creating culturally safe spaces
	2.2: Ways of working with First Nations Australians
3) Physical safety	3.0: Physical safety
4) Authorising environment	4.1: Government authorising environment
	4.2: Cultural authorising environment
	4.3: Program / project planning
5) Knowledge management	5.1: Government knowledge management
	5.2: Cultural knowledge management
6) Empowerment	6.0: Empowerment

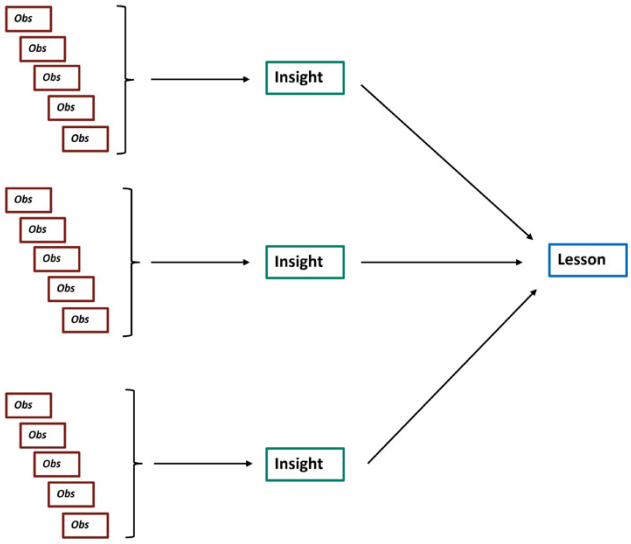

Figure 2: Visual depiction of the OILL process from many observations that can be grouped into insights that create one lesson.

Developing insights

Insights are developed by grouping similar observations to elicit recurring themes. Applying the coding framework (Table 1) to the observations and producing graphs and tables aids the analysis required to group the data. A total of 91 insights were finalised in May 2024.

Developing lessons identified[3]

To mitigate potential biases in lesson consolidation, the process transitioned from individual analysis to a group-workshop approach. Following a group workshop, and a process of refinement and internal review in September 2024, a total of 23 lessons were identified from the 91 insights and 547 observations.

Across the 23 lessons, 3 overlapping focus areas emerged, as shown in Figure 4:

1. Enabling two-way learning (7 lessons).
2. Demonstrating cultural competence (7 lessons).
3. Navigating authorising environments (8 lessons).

The key message for each lesson is shown in Table 2.

Validation of lessons by subject-matter experts

Validation of lessons by subject-matter experts ensures that lessons are accurate, relevant and suitable for implementation (AIDR 2019). Additionally, and significantly, this process is critical to ensuring the appropriate management of cultural knowledge. Respected cultural knowledge holders and experts in cultural burning were approached in December 2024 to review the lessons summaries and provide feedback. The purpose of the validation stage in the cultural fire lessons work was so that lessons:

- respected the intellectual property rights of First Nations Australians
- were presented in a culturally safe and respectful manner
- were accurate and aligned with experience of others.

3. There is an important distinction between 'lessons identified' and 'lessons learned' (see AIDR 2019, p.6). Lessons identified are referred to as 'lessons' from this point forward.

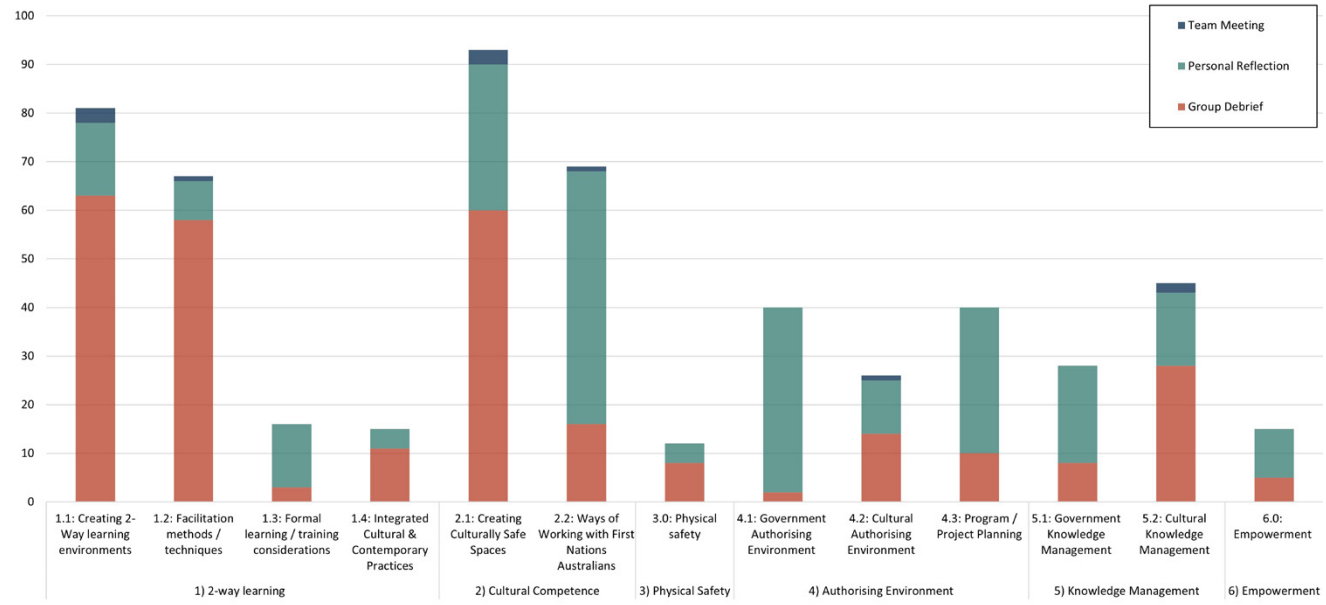

Figure 3: Observations sorted by coding framework (x axis) and collection method (legend).

Findings from the validation process were compiled from written feedback and a group meeting held in February 2025. Importantly, validators agreed that learnings were presented in a culturally safe and respectful manner and were aligned with personal experiences of cultural fire initiatives. Validators also identified opportunities for improvement aimed at framing and contextualising the lessons with real-world examples to assist in practical implementation. These opportunities for improvement have been actioned in the following discussion section.

Discussion

Lessons in practice – Case Study One

In May 2023, the CFP was invited to participate in a cultural burn by Goreng-Menang Noongar Elders on Nowanup Noongar Boodja, undertaken in southwest Western Australia. Burn delivery was led by Goreng-Menang Noongar Elders to achieve a range of Elder-determined cultural objectives and was supported by the CFP plus research and not-for-profit organisations. The burn followed a previous cultural burn in 2022 that involved similar stakeholders and was the first time in over 60 years that Noongar Elders had applied cultural fire to Nowanup Boodja.[4] Table 3 and Figure 5 show the 3 lesson focus areas illustrated during this on-Country activity; providing a practical example that may be useful to individuals, agencies and organisations undertaking cultural fire programs.

Lessons related to Focus Area 2: Demonstrating Cultural Competence suggest that non-Indigenous people need to demonstrate culturally informed and competent approaches to build relationships. This can underpin meaningful and respectful engagement with First Nations peoples and organisations. This might include an understanding of engagement protocols (e.g. the importance of invitations – Lesson 10), ensuring Elders are appropriately involved (e.g. when speaking on behalf of a community – Lesson 12) or creating culturally safe spaces (e.g. enabling safe passage for visitors to Country – Lesson 13). While there are recurring principles and protocols across different Country and communities, central to cultural competence is appreciating that there are nuances and differences and seeking to understand these is important.

Consideration of the cultural authorising environment is critical and significantly overlaps with Focus Area 2: Demonstrating Cultural Competence. Cross-cultural engagements often see 2 governance systems operating as different ways of knowing and doing that run in parallel on the same project. These are the government way and the cultural way (Russell-Smith et al. 2022). Sithole et al. (2021) suggest that agencies should ask First Nations communities 'how do we connect with your structures, and how do you want us to work with you?' rather than imposing their own agency governance structures. Typically, agencies often rely on their own internal governance arrangements (e.g. committees or working groups) that can lack legitimacy for First Nations peoples (Russell-Smith et al. 2022). Such arrangements can become barriers to collaboration.

4. For further examples of cross-cultural collaboration on cultural burning at Nowanup, see DFES (2022) and DFES (2023).

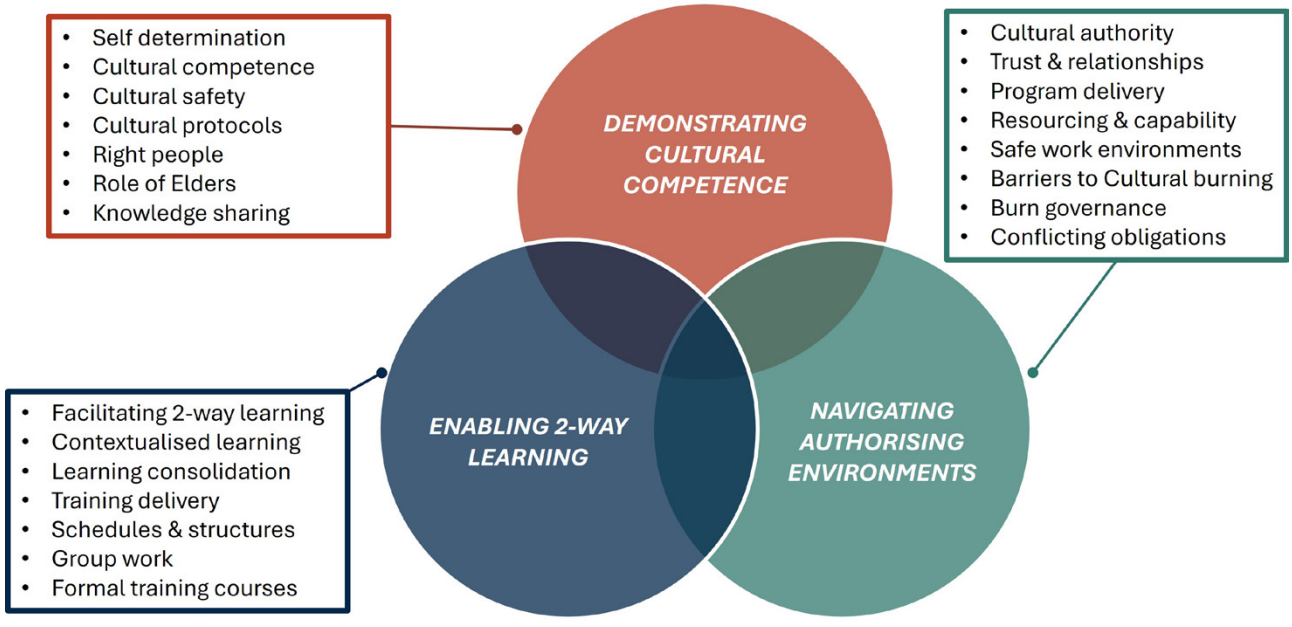

Figure 4: The 23 lessons identified were organised into 3 focus areas.

Table 2: Key messages for the 23 lessons.

Focus area	Lesson #	Lesson title	Key message
Focus Area 1: Enabling Two-way Learning	1	Respecting and recognising two-way knowledge sharing opportunities	To maximise the effectiveness of cross-cultural collaborations, two-way knowledge sharing opportunities need to be identified, prioritised and facilitated.
	2	Appropriate training delivery methods	Training and capacity building methods that are experiential, repetitive and rotational will likely be more effective for knowledge creation and retention.
	3	Contextualised learning	Contextualising training content to settings that are relevant and familiar to participants will enhance learning outcomes.
	4	Adaptable training schedules and structures	To cater for different learning needs, facilitators need to ensure learning schedules and structures are flexible and adaptable.
	5	Recognising and adjusting to participant cues and feedback	To maximise participant engagement, facilitators need to be able to recognise participant cues and feedback and make adjustments in real time.
	6	Group work and group structures	Structure and arrangement of small groups will influence how people interact due to cultural, social and community dynamics.
	7	Recognising opportunities to consolidate learning	Facilitators need to recognise and act on opportunities to consolidate learning to support participants gaining greater depth of knowledge, experience and competence.
	8	Considerations for formal training courses	When delivering formal training programs, facilitators may need to adjust typical delivery methods (to facilitate two-way knowledge transfer) and assessment methods (to enable demonstration of competence)
Focus Area 2: Demonstrating Cultural Competence	9	Cultural competence	To ensure cross-cultural collaborations are respectful and meaningful, non-Indigenous people need to develop and demonstrate cultural competence.
	10	Cultural communication and engagement protocols	Aligning to cultural communication and engagement protocols will generate better results when working with First Nations Australians.
	11	Cultural protocols - the role of Elders	Elders play very important roles when engaging, planning and delivering with First Nations organisations and their participation is critical to ensure success.
	12	Cultural protocols - the right people	Ensuring you are connecting with the right people is critically important for culturally safe and effective engagement with First Nations people.
	13	Cultural safety	The extent to which First Nations people perceive an environment to be culturally safe will have a significant influence on their level of participation and engagement in cross-cultural collaborations.
	14	The importance of cultural knowledge sharing	Sharing of cultural knowledge, including across generations, is very important to First Nations Australians and this can be supported through cultural burning.
	15	Prioritising principles of self determination	To be culturally relevant, meaningful and effective, government programs need to ensure principles of self determination and empowerment for First Nations Australians are a primary priority.
Focus Area 3: Authorising Environments	16	Adhering to the cultural authorising environment	To facilitate First Nations self determination and empowerment, government programs should embed cultural governance and authority at the core of direction setting and decision-making processes.
	17	Building trust, reputation and relationships	Effective cross-cultural partnerships are underpinned by strong working relationships which are built on trust, respect and investment over time.
	18	CFP delivery considerations	To deliver effectively, the CFP needs to plan diligently yet maintain flexibility, while meeting the needs of our authorising environment.
	19	CFP staffing and capability considerations	To be effective, the CFP requires staff with a diverse skillset, emotional intelligence and a willingness for continuous learning.
	20	Creating safe work environments	Creating safe working environments is critical, including risk management and consideration for organisational policy and procedure.
	21	Barriers to cultural burning	To enable cultural burning initiatives, cultural fire programs need to understand and actively address social, economic, legal and political barriers that can prevent participation for First Nations people.
	22	Adhering to best practice burn governance	Effective and appropriate risk management requires cultural fire programs to adhere to best practice burn governance when supporting planning, preparation and delivery of cultural burns.
	23	Respecting and managing conflicting obligations	First Nations people working in cultural fire programs can experience conflicting obligations and commitments across cultural and government settings.

Figure 5: Cross-cultural collaboration while commencing a cultural burn at Nowanup in May 2023.

Image: Peter Galvin, DFES

Table 3: Demonstrated examples of the lessons focus areas in practice (linking to Figure 5).

Focus area	First Nations example	Government / agency example
Focus Area 1: Enabling Two-way Learning	The First Nations ranger team are learning about integration of cultural and contemporary methods (e.g. different ignition patterns) and equipment (e.g. wogga (hessian) bags and knap sacks).	Agency staff are learning about cultural knowledge, how this is applied and the benefits of knowledge connection and transfer. Agency staff are learning about cultural protocols.
Focus Area 2: Demonstrating Cultural Competence	Cultural knowledge is being shared across multiple generations of Noongar families. Noongar Elders have created a culturally safe environment by welcoming visitors.	Agency staff are respecting the space for Elder led decision-making and direction. Agency staff are acting in accordance with Elder led directives (e.g. exclusion of fire from sensitive or important areas).
Focus Area 3: Navigating Authorising Environments	Noongar Elders are exercising cultural authority by determining cultural objectives and overseeing burn delivery. Elders have invited Noongar traditional custodians and non-Indigenous agency representatives to work collaboratively.	Agency staff provided guidance on adhering to relevant approval processes and planning requirements. Fire agencies have contributed contemporary methods, knowledge and resources to manage burn delivery risks and spread of fire (e.g. mineral earth control line).

While acknowledging the need to respect parallel governance structures, Focus Area 3: Navigating Authorising Environments reinforces that it's critical for government programs to consciously operate within internal governance policies and procedures, particularly for risk management and health and safety matters. Failure to do so can compromise program reputation, 'license to operate' in a government context, resource efficiency and the creation of culturally and physically safe working environments.

Lessons in practice – Case Study Two

The CFP delivered 2 bushfire training courses to Danju Rangers in October 2022 and a further one to the same group in September 2023. The purpose of the training was to develop practical skills and knowledge in fire management for the ranger team. The 3 courses are roughly equivalent to the minimum requirements for volunteer firefighters in Western Australia.

Figure 6: Fire training undertaken with Danju Rangers using traditonal delivery methods (left, 2022) and adjusted delivery methods (right, 2023). Images: Pyay Chan, DFES (left top and bottom), David Windsor, DFES (right top and bottom)

In 2022, the courses were delivered using standard fire training delivery approaches with a heavy focus on theory (written training manuals, presentations) delivered in a large training room using largely one-way communication between trainer and trainees with limited practical activities that were undertaken in an urban / built landscape ending with written competency assessments.

Following the 2022 course delivery, the team carried out a debrief to identify opportunities for improvement. While all course participants passed their assessments, it was felt that the standard training delivery approach did not maximise learning outcomes for the ranger crew and adjustments could be made to improve the participant experience, their levels of engagement during the training and the retention of learning outcomes.

In September 2023, the CFP team was grateful to be invited to deliver further training with Danju Rangers. This time, significantly adjusted delivery methods were used. Training was delivered over 2 days while camping out on-Country and activities focused on creating immersive, experiential learning environments (including multiple small burns), prioritising two-way learning principles, providing opportunities for rangers to lead different sessions and using a range of assessment methodologies. Figure 6 visually compares the differences in training approaches taken from traditional training to on-Country activities.

Through post-training debriefs, the participant experiences and learning outcomes of the 2023 training were significantly enhanced due to the adjustment of training delivery methods. Danju Rangers noted better knowledge retention, greater confidence, improved facilitator and participant interactions and enhanced teamwork. Feedback from the rangers was that this led to a more satisfying and enjoyable experience and, ultimately, a more effective learning environment.

The adjustments made in 2023, and the improvements in outcomes, are directly attributable to a learning culture and iterative refinement of the program delivery.

Importantly, these learning outcomes have been applied to further fire training initiatives such as the Southwest Cultural Burning Project which brought together multiple First Nations ranger teams to enable cultural burning. Participant feedback from fire training delivered by the CFP in 2023 highlighted the value arising from application of the lessons drawn from the Danju experience:

> *Communication between trainers and trainees reflected a 'conversation' style. People were asking questions, bringing others into the conversation, working off each other, discussing things, sharing ideas; it was like a big brainstorm! This style worked well; it was engaging, inclusive and demonstrated everyone had valuable knowledge that can be shared with others.*

A range of factors are required for successful two-way knowledge sharing: trust with knowledge holders (Woodward et al. 2020), acknowledgment that different knowledge systems have equal value (Muller 2012) and the need for non-Indigenous peoples to shift from 'resistance' or 'scepticism' of cultural fire knowledge to a willingness to learn new things (Smith et al. 2021).

Careful facilitation is required to create such environments, which include encouraging dialogue, interpreting cultural cues and feedback, diversifying delivery methods, catering for different learning styles and competence, allowing role models and mentors to lead, structuring small groups appropriately and providing experiential learning opportunities.

Conclusion

Adherence to the AIDR lessons management process has ensured these lessons are directly shaped by demonstrated, real-world experiences. People contributing to debriefing and the collection of observations were physically immersed in the undertaking of the activities and, thus, provided an experiential perspective rather than that of an observer. The CFP will use the learnings from this process in 2 primary ways:

- We will continue to embed learnings in our program delivery and in the establishment of partnerships and collaborations with First Nations people for mutual benefits.
- We will develop knowledge products, resources and trusted advice that provides guidance to other agencies on how to apply these learnings in their cultural burning programs.

For other outcomes, we hope that this will:

- increase the success of cross-cultural collaborations on cultural burning in Western Australia, with potential for broader application
- lead to greater empowerment for First Nations Australians to undertake more cultural burning on their Country.

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References

AIDR (Australian Institute of Disaster Resilience) (2019) Australian Disaster Resilience Handbook Collection: Lessons Management. Commonwealth of Australia. www.aidr.org.au/media/1760/aidr_handbookcollection_lessonsmanagement_2019.pdf

Costello O, Dilworth T, Haynes K, Jansen T and Neale T (2021) Cultural Land Management in Southeast Australia. Bushfire and Natural Hazards CRC. www.naturalhazards.com.au/sites/default/files/2023-09/cultural_land_management_in_southeast_australia_black_summer_final_report_0.pdf

DFES (Department of Fire and Emergency Services) (2022) A return to cultural burning for the Goreng-Menang Noongar Elders. Government of Western Australia. DFES website https://publications.dfes.wa.gov.au/publications/cultural-nowanup-2022-information-sheet, accessed 24 February 2025.

DFES (Department of Fire and Emergency Services) (2023) Strengthened connections to Country and people at Nowanup. Government of Western Australia. DFES website https://publications.dfes.wa.gov.au/publications/cultural-nowanup-2023-information-sheet, accessed 24 February 2025.

Freeman D, Williamson B and Weir J (2021) 'Cultural burning and public sector practice in the Australian Capital Territory', *Australian Geographer,* 52(2):111–129. https://doi.org/10.1080/00049182.2021.1917133

McKemey M, Neale T and Costello O (2021) Principles for enhanced collaboration between land and emergency management agencies and Indigenous peoples – green paper. Bushfire and Natural Hazards CRC.

Maclean K, Robinson CJ and Costello O (2018) A national framework to report on the benefits of Indigenous cultural fire management. CSIRO.

Muller S (2012) 'Two Ways: Bringing indigenous and non-indigenous knowledges together', in: J.K. Weir (Ed.), *Country, Native Title and Ecology,* pp.59–79), ANU ePress.

Russell-Smith J, James G, Maratja Dhamarrandji A, Gondarra T, Burton D, Sithole B, Bulmaniya Campion O, Hunter-Xenie H, Archer R, Sangha K and Edwards A (2022) 'Empowering Indigenous natural hazards management in northern Australia', *Ambio,* 51:2240–2260. https://doi.org/10.1007/s13280-022-01743-x

Sithole B, Campion OB, James G, Burton D, Dhamarrandji M and Hunter-Xenie H (2021) Developing effective emergency management partnerships in remote north Australian communities - final project report. Bushfire and Natural Hazards CRC.

Smith W, Neale T and Weir J (2021) 'Persuasion without policies: The work of reviving indigenous peoples' fire management in southern Australia', *Geoforum,* 120:82–92. https://doi.org/10.1016/j.geoforum.2021.01.015

Standley P, Steffensen V, Ridley K, McMurray L, Foley R, Hunter B, Villaflor S and Cavanagh R (2022) *Cultural Fire Credit – Philosophy and Guidelines.* Aboriginal Carbon Foundation and Firesticks Alliance Indigenous Corporation. www.abcfoundation.org.au/wp-content/uploads/Cultural-Fire-Credit-Philosophy-and-Guidelines-2022.pdf

Woodward E, Hill R, Harkness P and Archer R (eds.) (2020) Our Knowledge Our Way in caring for Country: Indigenous-led approaches to strengthening and sharing our knowledge for land and sea management. NAILSMA and CSIRO. CSIRO website www.csiro.au/en/research/indigenous-science/Indigenous-knowledge/Our-Knowledge-Our-Way, 24 February 2025.

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Walking alongside, building resilience: the First Nations Recovery Group

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Background

The vision of a 'real' voice and footprint for First Nations peoples and communities in emergency management began in 2019 when Sam Savage joined Australian Red Cross Emergency Services program as a recovery officer. With Sam's appointment came the realisation that the presence of Aboriginal and Torres Strait Islanders had limited representation relating to discussions or decisions about community disaster resilience, preparedness and recovery. Sam acknowledged Indigenous communities are built on recognising and supporting Elders who were actively involved and are 'at the community table'. Australian Red Cross leadership supported Sam's work and approach of walking alongside communities and to increase the existing strengths in community.

In 2020, the First Nations Recovery Group (FNRG) was formed to support communities affected by the events of the summer bushfires and floods of 2019–20 in Queensland, New South Wales and South Australia. The FNRG works consistently to deliver, build capacity and advocate for the inclusion of First Nations peoples and communities in planning for disasters. The dedicated work undertaken by FNRG will add value in the sector to support better preparedness, response, resilience and recovery from disasters now and in the future. This paper discusses how Aboriginal and Torres Strait Islander peoples are creating a voice within Australian Red Cross (advocate), forging footprints for First Nations peoples through partnerships and collaborations (build capacity) and empowering communities by a strengths-based and community-led approach (deliver) while walking alongside First Nations peoples and communities.

Introduction

First Nations peoples and communities in Australia are between 3 and 5 times more likely to be living in areas that are affected by increasingly severe natural hazards than non-Indigenous peoples (McNicol 2023). However, emergency management and disaster resilience approaches have typically overlooked the unique strengths and needs of First Nations peoples (Colvin 2024).

First Nations Centrality is enshrined in the Australian Red Cross organisational strategy. Australian Red Cross also works with and for First Nations peoples and communities, placing cultural knowledge, leadership, values and perspectives at the centre of its strategy.

Australian Red Cross has been supporting the disaster resilience of First Nations peoples and communities for over 20 years. The FNRG was established by Australian Red Cross drawing on its experiences and in recognition of the disproportionate effects disasters have on First Nations communities. This acknowledges a gap in culturally safe disaster resilience programs and services.

Since 2020, the FNRG has delivered culturally appropriate response, relief, resilience and recovery programs and services to First Nations peoples and communities across Australia. This has included:

- working closely with Elders, leaders, youth, and emerging leaders in communities
- building ongoing insights and learnings from First Nations peoples and communities before, during and after emergencies and disasters
- recognising, systematising and embedding existing work, or 'Formalising the Informal' in work practices

- developing the First Nations monitoring and evaluation framework that is currently being finalised to be published later in 2025
- measuring the impacts and outcomes for First Nations communities for continuous improvement.

In 2024, the work undertaken by the FNRG was recognised with the group winning both the Queensland and National Resilient Australia Community Award. It was also nominated for the Resilient Australia National Collaboration and Partnership Award, and the Resilient Australia National Award.[1]

Creating a voice

By creating a voice, the Australian Red Cross hopes to empower First Nations peoples and communities to lead community resilience and recovery efforts in Australia, and to inform the emergency management sector on best practice principles for working with First Nations peoples and communities.

The group takes a First Nations community-led approach, which allows the FNRG members to walk alongside communities to strengthen people's capacity to respond to community priorities and to strengthen the communities they live in. This work follows principles including:

- taking a place-based approach to ensure change is community-led and builds on strengths
- incorporating a community voice to ensure initiatives are culturally appropriate and support community needs
- strengthening local and culturally strong governance to amplify community voice and decision-making
- acting as Community Changemakers to pursue sustainable community-led solutions through community reflection processes
- creating plans to 'hand over' activities to community to ensure true community control and ownership
- advocating for the strengths, priorities and needs of First Nations communities.

To support and guide its work, the FNRG developed a First Nations Recovery Framework, which is aligned with the Red Cross Emergency Services Theory of Change (Kelly et al. 2022) and Phoenix Australia's ReCap First Nations Peoples and Recovery Capitals (Quinn et al. 2021). The First Nations Recovery Framework aims to empower First Nations peoples to lead community resilience and recovery. Outcomes of the First Nations Recovery Framework were adapted for First Nations peoples and communities and include:

- being empowered to lead and drive decisions and practice around community resilience
- taking localised, community-driven action to build resilience and recover from disaster
- having the knowledge and information needed to make decisions
- feeling safe, calm and hopeful
- demonstrating an understanding of the psychosocial effects of disaster
- having access to quality psychosocial support.

To embed culturally safe approaches and practices, the FNRG developed Terms of Reference to:

- provide a support base for Aboriginal and Torres Strait Islander staff and volunteers working in Red Cross Emergency Services
- support specialist and outreach services for Aboriginal and Torres Strait Islander communities
- coordinate community development, support and referral to assist Aboriginal and Torres Strait Islander disaster-affected people, families and groups
- provide advice to internal and external leadership groups to enable learning from their experiences to better prepare for future disasters.

The FNRG collaborates with First Nations community leaders, members and organisations as well as government departments and agencies and non-First Nations organisations to deliver its work. Feedback from one community member and services provider was:

> *…it was such a positive thing to happen for the community. We've had the bushfires, we've had the trauma from all of that, we've had COVID-19, we've had floods. People not being able to visit their relatives, aunties and uncles and grandparents, that was quite a traumatic time. The last 2 years have been awful for us. To be able to celebrate and get together as a whole family, community family, if that was to continue, that would be an awesome thing. …It's a feel-good thing, isn't it? Everybody felt good. To have that (community events) after, like I said, the trauma of the last 2 years is really amazing.*
> (Leppold et al. 2022, p.49)

Forging footprints

The FNRG has walked alongside First Nations peoples and communities in New South Wales, Queensland and South Australia to support recovery and resilience across events including COVID-19, bushfire, flood, cyclone and support for collective trauma events. The FNRG has worked in the following First Nations communities:

New South Wales

- Baryulgil
- Bundjalung

1. Awards recognise Queensland disaster resilience builders, www.qra.qld.gov.au/news-case-studies/news/awards-recognise-queensland-disaster-resilience-builders

- Darkinjung
- Darug
- Dhungatti
- Gambayggir
- Gumbaynggirr
- Kamilaroi
- Malabugilmah
- Yaegl
- Yuin

Queensland

- Bindal
- Gudjal
- Girramay
- Gurambilbarra Wulgurukaba
- Juru (Birri Gubba)
- Manbarra Bwgcolman
- Nywaigi Warrgamay Bandjin
- Wanamara
- Yerunthully

South Australia

- Bindjali
- Boandik
- Bodaruwitj
- Ngarrindjeri
- Meintangk
- Narungga
- Meru
- Peramangk/Ramindjeri

Using a strengths-based approach and the First Nations Recovery Framework as a guide, the FNRG has designed, delivered and supported a range of culturally safe community initiatives co-designed with First Nations leaders, emerging leaders and organisations including:

- advocacy
- cultural burns, yarning circles, dances and storytelling
- disaster preparedness for school children through the Pillowcase Program[2]
- disaster resilience and emergency preparedness workshops
- first aid, psychological first aid and mental health first aid training and healing days
- First Nations staff are present at evacuation centres
- initiating and contributing to events such as Bermagui Survival Day, Eden Dreaming Garden Project, NAIDOC Big Day Out, Narungga Family Day, Safer Communities barbeques and Warramali Building Group launch
- information and advice on housing and rebuilding
- psychosocial recovery support services
- support for grant applications
- training and resources for volunteers
- wellbeing workshops
- women's groups and Aboriginal fathers' groups
- workshops on understanding fire, traditional fire-starting practices and lessons on an ancient fire spirit.

Importantly, the FNRG has provided ongoing, culturally safe wellbeing and psychosocial support to help with the extended disaster effects.

Empowering community

The FNRG provides a space for culturally safe communications, access to peer support, a place for celebrations and a personal approach when supporting members in times of challenge.

The FNRG operates as an advisory group and has contributed to the strategic planning of Australian Red Cross Emergency Services with First Nations recovery considerations embedded in workplans, advocacy priorities, strategies and responses. The FNRG also developed its 'First Nations Peoples and Communities in Recovery' induction online platform for new Red Cross emergency services staff to build cultural capacity when working with First Nations peoples and communities.

The FNRG is guiding the development of the Australian Red Cross needs assessment documents to encompass the Phoenix Australia's Recovery Capitals and Indigenous Peoples Resource (Quinn et al. 2021) as a reference point and tool for recovery teams completing community assessments following emergencies and disasters. Specific areas of importance for a holistic understanding of Indigenous peoples are now included in needs assessments to support inclusion, being:

- caring for Country
- connections
- culture and identity
- Elders
- gathering places
- healing
- Indigenous organisations
- food, fibre and medicine
- self-determination and leadership
- traditional and contemporary knowledge.

In addition, the FNRG reviewed and redesigned *Communicating in Recovery* (Australian Red Cross 2022, p.90) and created content taking a strengths-based

2. Pillowcase Program at www.redcross.org.au/pillowcase-workshops

A NAIDOC Cultural Cook Up in 2023 was supported by the FNRG in the Narungga and Nunkunu community and hosted by the Aboriginal health team from the Yorke and Northern Local Health Network, Port Pirie Hospital and the Nunkuwarrin Yunti Community.

Image: Australian Red Cross

approach in recovery when communicating with First Nations peoples and communities.

The FNRG presented at the 2023 Australian Disaster Resilience Conference and is regularly invited to speak about experiences in advocating for and enabling First Nations community resilience. This provides the opportunity to share expertise and insights to inform and educate the emergency management sector about better approaches of working with First Nations communities.

The FNRG is supporting and guiding the work of other projects, including the National Indigenous Disaster Resilience (NIDR) research program[3] and Fire to Flourish.[4] FNRG presented at the inaugural Brisbane National First Nations Resilience Summit in 2023 (McNicol 2023) and FNRG members attended the NIDR Indigenous Disaster Resilience Policy Roundtables in South Australia (McNicol 2024a) and Queensland (McNicol 2024b) to co-design the First Nations footprint in state disaster management arrangements.

In South Australia, work by the FNRG has helped build relationships and trust between First Nations communities and local emergency services. This has included providing advice and information to local emergency management organisations of the effects of emergencies from a cultural and community perspective. This has been exemplified in the relationship between the Narungga community and the emergency management sector on the Yorke Peninsula. Increased understanding of First Nations peoples' relationships to Country has led to cultural burns training for rangers and greater sensitivity in firefighting. The relationships between the Aboriginal Land Trust, South Australian Country Fire Service, Point Pearce Aboriginal Corporation, Firesticks and the South Australian Fire and Emergency Services Commission are now stronger. There are further plans to build relationships with local Police.

In addition, a reconciliation event in Adelaide saw the FNRG provide opportunities for First Nations community

3. National Indigenous Disaster Resilience at www.monash.edu/arts/social-sciences/national-indigenous-disaster-resilience.
4. Fire to Flourish at www.monash.edu/firetoflourish

members to connect with health services, housing support, grief counselling, Aboriginal legal services and bushfire legal services.

Footprints and walking together in New South Wales

In New South Wales, the FNRG began by building connections in the community to understand what would be helpful. This approach informed the planning and delivery of new types of recovery support activities for cultural healing as well as connecting service providers in ways that had not existed before. An evaluation found that:

> *…this is highly significant given that across the entire disaster sector, there has been limited work to collaborate with First Nations communities; the work of First Nations recovery officers in the program appears to be driving forward a new wave of disaster recovery work.*
> (Leppold et al. 2023, p.77)

The NAIDOC Big Day Out event, conceived by members of the FNRG, was noted by the Australian Parliament for its significance in bringing First Nations and non-First Nations people together. Thirteen organisations collaborated to deliver this major event that was attended by more than 1,000 people. A community member and service provider commented:

> *I think see many mobs out there, seeing so many mobs, connecting back with each other, as growing up, we were always camping, we were always having big family dinners. We've lost a lot of that….We stopped doing that stuff. On Saturday, it was that feeling coming back of, "Yes. My mob's coming back together".*
> (Leppold et al. 2022, p.49)

Another community member stated:

> *Even the NAIDOC day, that was a healing thing. As First Nations people, we see our family more for sorry business, so to be able to have something that's not sorry business, something to celebrate, something to acknowledge our culture, that was really awesome. That was a good healing source as well for the whole community. There were Elders out that I hadn't seen for a long time, and kids. …I think that was really, really helpful for the whole community. Not just the Aboriginal community either. … I think it's good for closing the gap and reconciliation and cultural appreciation. It was awesome for the whole community.*
> (Leppold et al. 2022, p.50).

A service provider working on suicide response in the region commented that they saw the role of the recovery officer bringing people together and supporting individuals through extremely challenging circumstances in the community and credited their work as contributing to suicide prevention in the area. The service provider stated:

> *To me, the work that [recovery officer] does…on the ground is so important …My day job is to sit down with people in a post-[suicide] attempt situation and try and work through that. To me, the work that [recovery officer] does in the community is so vital, because that's the prevention work, and identifying the work that's done there so that they don't end up sitting across a coffee table from me.*
> (Leppold 2022: P53)

Other activities in New South Wales included the Australian Red Cross partnership with Miyay-Birray Youth Service. Led by the FNRG, the partnership supports First Nations resilience in Moree. The project evaluation identified lessons learnt and possible improvements to strengthen and sustain the partnership. A key factor in its success was the shared values. 'We are all bound to each other to delivery to community. This is our shared goal' (Woodward 2024, p.16). The Miyay Birray-Red Cross partnership is an example of how working with the strengths and networks already embedded in First Nations communities has mutual benefits for First Nations and mainstream organisations alike. These features have broader application for the creation of other partnerships in disaster response, recovery and preparedness.

The Understanding Psychological First Aid training (Richardson et al. 2023) was adapted to the cultural needs for the Moree Aboriginal Fathers Group. This was supported by the FNRG and the fathers with outcomes including and increased awareness of how to support families to become more aware of how to support their families. In addition, a cultural healing day, attended by First Nations and non-First Nations community members, included a workshop on understanding fire, traditional fire-starting practices and lessons on an ancient fire spirit. There was also didgeridoo playing and a reflective circle.

> *Evaluation of work in Mogo, New South Wales, focused on events, cultural healing activities, connecting service providers through new working groups and advocacy activities which '…highlighted the innovative, creative, and respect-driven approaches that were taken by the First Nations recovery officer to champion this community and deliver support in ways that were meaningful'.*
> (Leppold et al. 2023, p.76).

Footprints and walking together in Queensland

In Queensland, a FNRG member was commended for their role in supporting an increase in COVID-19 vaccinations in First Nations communities. A stakeholder noted the:

> *…profound comprehension and adept leadership in orchestrating collaborative endeavours among government and non-governmental agencies was pivotal in enhancing easily accessible COVID-19 service leading to First Nations Vaccination rates to among the highest in the state.*
> (personal correspondence to Sam Savage, 15 September 2023)

An independent evaluation report to assess the 2019–20 bushfire recovery program referenced pillars of the Australian Red Cross Emergency Services Theory of Change. The evaluation highlighted:

> *…the strong advocacy work happening around this community along multiple intended outcomes of the Theory of Change. Beyond advocating for psychosocial needs … but specifically (advocating for) the impacts on First Nations communities as a group that has been historically overlooked or ignored in disaster recovery spaces. Advocacy for Mogo, linking First Nations service providers with national disaster recovery bodies, and facilitating up-skilling training sessions for Red Cross volunteers, all underscore relevant and inclusive practices to progress towards outcomes on the Theory of Change.* (Leppold et al. 2023, p.57)

It should be noted that adaptive approaches extended to the evaluation where the university research group remained flexible to adapting research methods to align with ways the community was most comfortable with sharing information. For example, while in all other settings interviews and focus groups were typically 45–60 minutes long, a 3-hour 'walk and talk' focus group discussion on Country with a group of emerging leaders taught the researchers about reading Country in addition to discussing bushfire recovery and experiences (Leppold et al. 2023, p.15).

Conclusion

The FNRG is working towards 'Formalising the Informal', documenting and systematising principles, approaches and practices of its work to ensure longer-term sustainability, scalability and transferability across the emergency management sector.

This paper discussed how Aboriginal and Torres Strait Islander peoples are **creating a voice** at Australian Red Cross, **forging footprints** for First Nations peoples through partnerships and collaborations, **empowering communities** by taking a strengths-based and community-led approach and walking alongside First Nations peoples and communities.

This paper provides real-life strategies and examples of the work undertaken by the FNRG to date. With consequences of climate change increasing, this work is more important than ever. By walking with community and taking a community-led, strengths-based and culturally safe approach, the emergency management sector can help change the game so everyone can bounce back better.

Acknowledgment

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References

Australian Red Cross (2024) *Walking alongside First Nations peoples.* Australian Red Cross website www.redcross.org.au/services/for-first-nation-peoples/, accessed 23 September 2024.

Australian Red Cross (2024) Case Study, Australian Red Cross delivers community emergency preparedness initiatives with the Yuin-Monaro Peoples of the Bega Valley, New South Wales.

Australian Red Cross 2nd edition (2022) *Communicating in Recovery.* www.redcross.org.au/globalassets/cms-assets/documents/emergency-services/communicating-in-recovery-resource.pdf

Australian Red Cross and Australian Psychological Society 3rd edition (2020) *Psychological First Aid: Supporting people affected by disaster in Australia.* www.redcross.org.au/globalassets/cms-assets/documents/emergency-services/psychological-first-aid-guide-2024.pdf

Colvin A (2024) *Final Report Independent Review of Commonwealth Disaster Funding.* Deloitte. www.nema.gov.au/sites/default/files/2024-10/Independent%20Review%20of%20Commonwealth%20Disaster%20Funding%20-%20Final%20report%20-%20Medium%20Res.PDF

Kelly L, Goodall J and Lombardi L (2022) 'Developing a monitoring and evaluation framework in a humanitarian non-profit organisation using agile methodology', *Disaster Prevention and Management,* 31(5):536–549.

Leppold C, Quinn P, Gibbs L, Foliente G, Block K and MacDougall C (2022) Review of the Mid-Stage (second year) of the Black Summer Bushfire Recovery Program: *A Case Study Evaluation Report for the Australian Red Cross, Report.* University of Melbourne.

Leppold C, Phoebe Quinn, Lisa Gibbs, Greg Folient and Colin MacDougall (2023) *Final Year and Exit of Black Summer Bushfire Recovery Program: A Case Study Evaluation Report for the Australian Red Cross*, University of Melbourne.

McNicol E (2023) Introducing the National Indigenous Disaster Resilience Project. Zone Emergency Management Symposium, Adelaide. See also www.monash.edu/msdi/news-and-events/news/articles/2023/reflection-on-the-national-indigenous-disaster-resilience-summit

McNicol E (2024a) Policy Roundtables for Aboriginal Disaster Resilience spark new collaborations and reform discussions. www.monash.edu/firetoflourish/news-and-events/news/2024/policy-roundtables-for-aboriginal-disaster-resilience-spark-new-collaborations-and-reform-discussions

McNicol E (2024b) "Disasters are story-telling time": Queensland's Indigenous Disaster Resilience Policy Roundtable offers fresh insights into disasters. www.monash.edu/firetoflourish/news-and-events/news/2024/disasters-are-story-telling-time-queenslands-indigenous-disaster-resilience-policy-roundtable-offers-fresh-insights-into-disasters

Richardson J, Kelly L and Mackay A (2023) 'Australian Red Cross psychosocial approach to disaster preparedness', *Australian Journal of Emergency Management,* 38(3):31–36. http://www.doi.org/10.47389/38.3.31

Quinn P, Williamson B and Gibbs L (2021) Recovery Capitals and Indigenous Peoples Resource. Bushfire and Natural Hazards Cooperative Research Centre, Melbourne, Australia. https://mspgh.unimelb.edu.au/__data/assets/pdf_file/0003/4170171/Indigenous-Peoples-and-Recovery-Capitals-1.pdf

Woodward A (2024) *Evaluation of the Partnership Between Miyay Birray and Australian Red Cross.* Australia: Alan Woodward Consulting.

About the authors

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Kauraka e Mataku, kia Takatū! Don't be scared, be prepared! A collaborative video campaign for raising awareness of the next large Alpine Fault earthquake

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Crisselda De Leon-Singson
Te Rūnanga o Ngāi Tahu
Keela Atkinson-Cranwell
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Te Rūnanga o Ngāi Tahu, in partnership with the AF8 Programme[1] and supported by the Natural Hazards Commission (NHC)[2], launched a multimedia campaign that weaves Ngāi Tahu creation stories in with scientific insights. The initiative aims to enhance public understanding of the Alpine Fault, its potential harms and the importance of preparedness.

A magnitude 8+ earthquake on New Zealand's Alpine Fault is highly likely within the next 50 years, which would cause significant damage and disruption across Te Waipounamu (South Island). Using storytelling, this campaign follows a Ngāi Tahu whānau as they travel to Te Tai Poutini (West Coast) to explore the stories related to the Alpine Fault. They delved into the stories of the land, learnt about future risks and shared knowledge on how to prepare and protect their homes and whānau.

Combining Mātauranga Māori and science

Ngāi Tahu creation stories attribute earthquakes to Rūaumoko, the son of Ranginui [Sky Father] and Papatūanuku [Earth Mother]. The Alpine Fault is a major tectonic boundary that has shaped the Southern Alps over millions of years. It ruptures roughly every 300 years. The last event was in 1717, making the next eruption imminent. A significant rupture will drastically alter Te Waipounamu, causing landslides, liquefaction, river changes, flooding, tsunamis and aftershocks. Infrastructure in the area such as electricity, roads and communications will likely be disrupted, which will challenge the population's ability to support each other.

The power of storytelling

Māori culture relies on oral traditions to pass down knowledge, history and beliefs. Storytelling helps connect us to places, makes sense of the world and shares critical information. By integrating storytelling with scientific modelling, this campaign aimed to make the information of the Alpine Fault accessible and encourage greater understanding and preparedness among whānau.

The approach of the campaign was to use storytelling and creative thinking to share confronting messages and to reach diverse audiences effectively. The video in the campaign features a pōua [grandfather] sharing stories with his mokopuna [grandchild] to explain the Alpine Fault and reassure her that their preparedness will help them to keep safe. The campaign's tagline, 'Kauraka

Storytelling helps connect us to places, makes sense of the world and shares critical information.

Image: Maui Studios

e Mataku, kia Takatū! Don't be scared, be prepared!' was a strong call to action to urge everyone to take proactive steps for their emergency preparedness.

Channels and target audience

The campaign used a multimedia approach to reach a broad audience. Te Rūnanga o Ngāi Tahu and the AF8 Programme posted videos on their social media platforms, which have a combined following of 33,000. These videos were boosted by paid promotion to maximise reach across social media platforms. The primary target audience was adults and rangatahi [youth] aged 13 and above living in Te Waipounamu, where a magnitude 8 earthquake could be devastating. However, the campaign's content is also suitable for tamariki [children] and encourages families to have discussions about the risks and actions to take.

Email campaigns were used to share the campaign with AF8 science partners and partner agencies, while Te Rūnanga o Ngāi Tahu reached out to all 18 Papatipu Rūnanga and over 30,000 registered Ngāi Tahu members. People were encouraged to watch the videos, go to the campaign website to access the preparedness resources and to start the kōrero [conversation] with their whānau [family].

Te Rūnanga o Ngāi Tahu leveraged its other channels to connect with Ngāi Tahu whānau, including radio TahuFM, which broadcasts across Te Waipounamu to an estimated 1.5 million listeners as well as the publication, *Te Pānui Rūnaka,* which is delivered to over 13,000 households. The Kaiwhakahaere [Chairman] of Ngāi Tahu, Justin Tipa, highlighted the campaign in his regular kōrero [news] updates on TahuFM, and the Senior Advisor Whānau and Emergency Response Team discussed the campaign in an interview.

Outcome and way forward

The AF8 emergency preparedness campaign engaged a wide audience through a multichannel approach that combined social media, video content, print and digital publications, radio advertising, email marketing and media coverage. The feedback received via social media and partners from other agencies was overwhelmingly positive. It was encouraging to see people participate constructively and positively with a sensitive topic such as preparing for a significant emergency event. Many people shared the steps they are taking to prepare, and others contributed their experiences and learnings from the Christchurch earthquake. In addition, we received comments from people who were uncertain about where to start but appreciated the campaign's prompt and the resources provided.

The high levels of reach across the platforms and audience participation indicate the campaign's effectiveness to raise awareness and provide valuable resources about emergency preparedness. The positive engagement and active participation of the audience demonstrate the campaign's success in fostering a proactive approach to emergency preparedness. A final success for this campaign was receiving an EMPA New Zealand Award for Excellence in Emergency Communications (Readiness and Resilience) in 2024.

Moving forward, partnership with agencies and maintaining a diversified strategy will be crucial for continued success in efforts to raise awareness and encourage whānau to be prepared for natural hazard events.

Access the video on YouTube at www.youtube.com/watch?v=os2-biC_bb8.

Endnotes

1. Alpine Fault magnitude 8 Programme at https://af8.org.nz/.

2. Earthquake Commission at www.govt.nz/organisations/natural-hazards-commission/.

Total

268,294
total organic & paid reach

3,653
reactions, comments & shares

Facebook

Co-published video posts, including organic and paid content.

228,798
organic & paid reach

2,502
reactions, comments & shares

Instagram

Co-published reels.

10,848
organic reach

584
shares, likes & comments

LinkedIn

Te Rūnanga o Ngāi Tahu LinkedIn posts.

21,262
organic reach

387
shares, likes & comments

LinkedIn

AF8 Programme LinkedIn posts.

7,750
organic reach

180
shares, likes & comments

Most watched on Facebook

The next Alpine Fault rupture will change our whenua.

Kauraka e Mataku, kia Takatū!

Don't be scared, be prepared!

Developing marae roles and responsibilities for Te Whanganui-a-Tara, Aotearoa New Zealand

Hinemoa Kātene
(Ati Awa/Raukawa/Ngāti toa)

HONO Māori Emergency Management Network
Joint Centre for Disaster Research
Massey University
Te Whanganui-a-Tara
Aotearoa

Previous disasters in Aotearoa New Zealand, including Cyclone Gabrielle in 2023, have highlighted that Māori have carried out effective and rapid responses during events by providing equipment, resources and support for all people in their local area.

Responses from iwi [tribes], hapū [extended family], whānau [family] and marae [communal gathering spaces] were seen to be highly effective compared with other agencies that were much slower to act during Cyclone Gabrielle. The importance of marae [communal place] during the response and recovery from disasters has been well illustrated following many disasters over the last 2 decades in Aotearoa. However, the wider emergency management system has frequently struggled to fully understand how to support, assist and respect marae operations and opportunities.

Since 2022, we have been working with local marae in Te Whanganui-a-Tara, Aotearoa New Zealand to identify the roles and responsibilities that they may perform in response to and recovery from emergencies to provide better outcomes for whānau, hapū and communities. Marae and Māori entities have the unique capacity and capability to serve communities with on-the-ground manaakitanga [paying respect] in times of response. Marae and Māori entities are spread across the country. Marae can provide food, water and accommodation for large numbers of people and can mobilise kai mahi [volunteer workers] quickly. The evolving Coordinated Incident Management Systems (CIMs) arrangements in Aotearoa New Zealand propose to introduce a new iwi liaison function titled 'tākaihere', which means to wrap around.

The tākaihere function will liaise with iwi and hapū during a response event. How marae whānau choose to work and connect with the tāikaihere function in the local Emergency Operations Centre is entirely up to them. Each marae can fluidly operate and move their response levels within any of the levels of operation status as indicated by different colours in Table 1.

Marae operating framework

A marae operating framework is presented here that can inform tikanga [static] and kawa [flexible] processes that are applied at each marae. Having this framework, along with the different levels and types of service that might be needed (considered pre-event, but flexible post-event and shared widely and transparently) enables all partners to work together effectively. This minimises cultural safety risks and operational pressure.

The framework's structure was developed from matauranga [knowledge] of Te Ao Māori, tikanga, kawa and marae practices by the Senior Māori Advisor [the author of this paper]. The framework was discussed as a draft in collaboration with emergency managers to determine how New Zealand Ministry of Civil Defence and Emergency Management (CDEM) might support marae who exercise rangatiratanga [self-determination] during disruptive events to manaaki whānau [support families] and the wider community.

Figure 1. Takapūwāhia Marae community emergency training.
Image: Professor David Johnston

Table 1 provides a summary (at a glance) of service levels and support needed for each marae. It shows how marae might support other marae with their own response. It is anticipated that CDEM and marae could respond to an emergency better with this basic resource. The table illustrates how marae can determine their operation status and flexibly move between, and up or down, as capacity changes during a response. This table can assist planners when communities are moving from response to recovery phases after an emergency event. Training and exercising have been undertaken so people can understand how to apply the framework in a real emergency. Testing of the framework as represented in Table 1 during exercises has highlighted that it was well received and considered a good foundation resource that is simple to use and effective.

Māori emergency advisors can use this framework to expose marae to the options they have to quickly stand up their response teams and quicken the support they might require during activation from CDEM. This helps to minimise risks to communities. This framework can also determine how emergency managers who have access to resources can support marae to manaaki whānau, and possibly the wider community, in a disruptive event. This framework can inform what tikanga [static] and kawa [flexible] processes are applied at each marae. Consideration of this framework before an emergency or disaster strikes, and being flexible after the event, will help all parties to work together effectively and minimise cultural mistakes.

Table 1: Marae operation framework.

Marae operation status	Service description	Service recipients	Varying levels of response based on individual marae (Tikanga adjusted if needed and determined by marae).
Kiwikiwi	Inoperable	No one	No capacity to operate (e.g. affected by the event, inaccessible/no capacity).
Māwhero	Whānau only	Whānau, hapū only	Support is available for whānau, hapū, and/or immediate village/pā community.
Pounamu	Marae to marae support	Marae to marae	Manaaki - marae to marae operation, run between 2 or more marae that coordinate their (mutual) support (e.g. One marae to another or iwi to iwi).
Kowhai	Distribution centre	No services provided	Used as a distribution centre only (e.g. receiving goods for distribution).
Kahurangi	Local residents support	Residents closest to the marae	Full operation for any residents in the immediate area (to be determined by marae).
Karaka	Full community response	General public	Full operation for any person arriving at the marae for services or resources (led by marae or iwi).
Kawakawa	Partial community response	General public	Partial operation for certain services only (e.g. medical/food/sleeping facility/triage/assessments/social services/mental health services).
Poroporo	Marae-led Emergency Assistance Centre	General public	Emergency Assistance Centre status - managed by marae (full or partial operation open to anyone needing assistance).
Pango	CDEM-led Emergency Assistance Centre	General public	Emergency Assistance Centre status - managed by emergency management personnel. (full or partial operation open to anyone needing assistance).

The 2024 National Indigenous Disaster Resilience Gathering

National Indigenous Disaster Resilience

Monash University
Melbourne

In September 2024, Indigenous and non-Indigenous people came together on Bundjalung Country [Lismore] in northern New South Wales for the 2024 National Indigenous Disaster Resilience Gathering.

The gathering followed the inaugural National Indigenous Disaster Resilience (NIDR) Summit in Brisbane in 2023. The aim was to showcase Indigenous excellence and leadership in emergency and land management and disaster resilience across Australia.

The event was convened by the NIDR program at Monash University, led by Dr Bhiamie Williamson, in collaboration with local event partners, Jagun Alliance, the *Koori Mail* and Resilient Lismore.

Delegates came together united by a common understanding that, despite catastrophic events like bushfires, floods and cyclones that disproportionately affect Indigenous peoples, Indigenous leadership is largely missing from emergency management arrangements. In addition, Indigenous priorities are often overlooked in longer-term recovery processes.

The gathering was an opportunity for leaders from various sectors and regions engaged in building resilience to identify common challenges and share ideas on how to respond to threats posed by climate change and more frequent, severe environmental disasters.

The 2024 NIDR Gathering

Only 2 years before, in March 2022, Lismore and the wider Northern Rivers region of New South Wales experienced significant flooding that destroyed thousands of homes and businesses. Ongoing recovery from those floods has been a collaboration between Indigenous and non-Indigenous community leaders.

The 3-day gathering was intentionally designed for delegates to share knowledge while also connecting with local places and Indigenous cultures. Keynotes, panel sessions and workshops were collected around a full day of on-Country activities so that attendees could learn from local community leaders and Elders about effective post-flood recovery. Delegates, including researchers, policy makers and community leaders, observed first-hand the lingering effects of the floods on the community that remains in recovery. They heard stories of the recovery and resilience-building efforts that have been made.

The gathering was opened with a keynote address from Naomi Moran, CEO of the *Koori Mail.* The keynote was due recognition of the extraordinary leadership demonstrated by the *Koori Mail* that championed the humanitarian response to the floods in the days and weeks following.

International keynotes included Dr Amy Cardinal Christianson from Turtle Island in Canada, Litea Biukoto from Fiji and Jamie Ruwhiu from Aotearoa New Zealand, all of whom reflected on the challenges in their own regions and the larger international struggle of Indigenous groups being affected by major disaster events.

Carlie Atkinson shared her insights as both a resident of the Northern Rivers area who experienced the floods and as a leader working with communities to promote healing alongside the recovery of physical townships.

Keynote speakers were complemented by presenters facilitating diverse sessions that included the role of ranger groups in disaster responses, experiences of Aboriginal health services as well as legal issues in post-disaster

settings. There were also workshops about embedding Indigenous data sovereignty into grant evaluation, cultural burning as a method for disaster mitigation and harnessing the anger and hope that define people's emotional responses to climate change.

Delegates were given the opportunity to participate in men's and women's yarning circles as well as a wellbeing and weaving hub.

Delegate feedback

This gathering highlighted the vital role of First Nations leadership in disaster planning, resilience and recovery. It was an outstanding event that showcased powerful First Nations stories from around the world. It also provided a valuable opportunity to learn from and connect with First Nations experts working in disaster preparedness and recovery.

It was Indigenous-led; on Country, in community and place-based, which made the gathering more contextual, relational and transformative.

Attending the gathering was educational, inspiring, confronting and wonderful. It was also a deeply moving and healing event, personally and collectively, that walked the talk about the urgency of listening to and respecting Indigenous knowledge. Thank you for putting humanity, sustainability, and love at the heart of the gathering. It felt like a big warm embrace from an extended family I didn't know I had. What a privilege to be able to attend.

More government agencies need to adopt a co-design approach with First Nations peoples when it comes to disaster prevention, preparation and relief. It's not enough to be getting feedback from mob. Aboriginal and Torres Strait Islander peoples need to be in the driver's seat when it comes to decision-making. Attending a gathering on Country is much more meaningful than sitting in a conference room and I hope to see more organisers adopt this approach for future events.

Connection, conversation, collaboration

Connection, conversation and collaboration were the fruits of healthy debate and deliberation by delegates who shared experiences of environmental disasters in their own communities. Presenters shared personal, professional and organisational accounts of responding to disaster events and the opportunities and challenges they have found in longer-term recovery processes.

Conversations were grounded by still-raw experiences of the floods shared by residents of Lismore. As well as being raw, these stories were also uplifting. The on-Country activities presented additional opportunities to connect with the community and Country through excursions and

The on-Country activities meant that attendees could learn from local community leaders and Elders about effective recovery.

Image: Gabrielle Connole

activities such as cultural tours of the Byron Shire, a bus tour exploring flood-hit landmarks of the Lismore township and participating in a cultural burn led by local partners, Jagan Alliance.

The gathering as un-conferencing

The 2024 gathering provided opportunities to learn from the insights of Indigenous communities, how to harness the strength of community-based organisations and the scope of possibilities in adopting a Caring for Country mindset in disaster mitigation and adaptation. The gathering also offered a glimpse of what is possible by redefining how people come together. This 'un-conference' offered an immersive experience and provided a depth of engagement and a unique perspective of the nature of disasters as well as what is required to support communities recover from previous hazard events, while preparing for the next.

Adapting to climate change is not limited to technology, law or policy; it also requires adapting the way various leaders in disaster resilience, including Indigenous leaders, engage with one another, while providing direct benefits to recovering communities.

The gathering will return to a new location in 2026.

Cyclone Gabrielle: the Torere experience

Kelvin Tapuke

Massey University
Aotearoa New Zealand

On 5 February 2023, Tropical Cyclone Gabrielle struck the North Island of Aotearoa New Zealand and affected parts of Vanuatu and Australia. Torere Marae Controller, Kelvin Tapuke, provides some personal reflections of a marae-centred community response to the cyclone, actions taken by marae and lessons learnt for future events.

Torere is a small coastal settlement located 20 km east of the of Ōpōtiki in the Bay of Plenty area in Aotearoa New Zealand's North Island. It is linked by the bay waters of Te Moana nui a Toi and connected by the steep Raukūmara ranges. Torere faces the 2 volcanic islands of Paepae Aotea and Whakaari. Since 1924, there has been a consistent population of around 180 people. Torere is a marae-centric community and, in recent times, has been affected by colonisation, urbanisation, emigration, technology and transportation.

Cyclone Gabrielle 5 February 2023

Cyclone Gabrielle reached Tairāwhiti on the 13 February 2023 with devasting effect on the region. For only the third time in New Zealand's history, a national state of emergency was declared.

Kelvin's interest in cyclones comes from previous experiences as a cadet in hydrology with NIWA[1] in Gisborne and as a surf lifesaver during Cyclone Bola in 1988. Kelvin attended an environmental team training session with Te Rūnanga o Ngāti Porou and Joint Centre of Disaster Research, Professor David Johnston and PhD student, Jon Mitchell, in January 2023. The training covered the Coordinated Incident Management System (CIMS)[2] and the development of a local contextualised systems. Roles were discussed and were enacted through a scenario situation the following day.

This was the first time that the community had used the full CIMS model. In the past, the community had only been asked to complete the welfare function of the model, which was successful. There were initial challenges around legitimising the new functional roles. Once each role was explained fully, they adjusted to their normal leadership tangihanga roles.

Torere experience

During the cyclone, a 23-year-old Torere rangatahi [young person] passed away. His tangi [funeral] was held at Torere marae on 13 February 2023. Whānau pani [bereaved family] and the tūpapaku [deceased body] were present during the Torere activation. During tangi, it is customary for the family to stay with the tūpapaku until the conclusion of tangi, which usually occurs over multiple days. Some whānau pani chose to participate in the marae activation and response activities.

On 6 February 2023 at 1pm, the local iwi gathered inside the marae wharenui. A whaikorero [formal speech] was given by Kelvin to explain the context of the cyclone and the potential risks to the community. Iwi leaders correctly identified that the cyclone was immediately over Mayor Island. Iwi members identified a threat of the whipping winds from a south easterly direction rather than the north westerly cyclone eye. An additional potential risk to the local community was the recently logged Torere 64 Pine Tree Block. The area is situated on the steep Raukūmara ranges and the area had a large amount of pine debris left behind after harvesting the trees.

This presented the potential for landslides in the forestry block. There also existed flooding risk from the Wainui River that had potential to block roads and damage houses and Torere marae.

To effectively prepare and respond to the cyclone, the recently learned CIMS was operationalised by iwi members at Torere marae. Kelvin was mandated by the iwi to be the Cyclone Gabrielle Torere Marae Controller and roles were explained and allocated to the group. The decision was made to adapt the traditional CIMS categories into 9 thematic functions that were of particular concern for the group. These were: public communication, food security, intelligence, evacuation centre, communication, road security, power, energy sources and whānau pani [bereaved family].

Plans for each of the functions were drafted and taped to the 2 central tables. Function leaders were checked on throughout the activation to ensure they had a good understanding of their roles. Only the mandated Torere CIMS function leader would communicate to the Marae Controller. This was to avoid confusion caused by duplication and misinformation.

Public communication: Communication to the iwi was regularly updated inside the wharenui at 7pm, 10pm and 7am. Communication via Facebook was sent out to quell nerves of relatives living outside the iwi rohe [region].

Food security: A refrigerated trailer was hired from Ōpōtiki and all the food for the tangi was transferred to the trailer. The chiller trailer and some multi-gas cookers were attached to utility vehicles and were ready for evacuation. Multi-gas cookers were offered by individual whānau.

Intelligence: An attendance register was collected and housed at the marae. Further information of the households was gathered by 2 female leaders in the district of Hinahinanui, Torere and Hawai. Houses were surveyed for individual needs and impending notice. Poverty in this area meant that most residents do not have communication outside their homes. Notices were issued through the intelligence team that Te Kura o Torere would become the evacuation centre if people required accommodation and shelter. Animals were moved to higher ground. In total, 129 people were housed at Torere marae with tangi attendees making up most of this number.

Evacuation centre: A centre was set up at Te Kura o Torere [local school]. Mattresses, linen, toilets, first-aid essentials and food were provided. An attendance register was established. The evacuation centre leader stayed throughout the night to welcome evacuees. A classroom fire was lit to provide warmth and lights were left on and the school doors were open to indicate that the space was open and ready.

Communication: The community was informed that the Torere marae wharekai would act as the main communication centre. Updates would be held at the marae wharekai if needed. If the marae complex had to be evacuated, this function would move to the Torere school. Social media communication was not acted on as all households were in motion. The Ōpōtiki Council radio system had been moved without mandate to the Assembly of God building. The return to Te Kura o Torere was requested by the intelligence team. The new Ōpōtiki District Controller has been informed.

Road security: State Highway 35 bridges were monitored hourly by Kelvin throughout the night from Hinahinanui to Hawai. Flash flooding from the Raukūmara River arrived with little warning. Culverts were cleared by local people. Knowledge of the aftermath of Cyclone Bola informed Tapuke actions.

Power: Downed power lines in Waiotahe interupted electricity supply in the Ōpōtiki District from around 8.30pm to 10pm.

Energy sources: Alternative sources like firewood and gas bottle supplies were identified.

Whānau pani: Whānau pani decided to stay at the low-lying wharenui.

Preparations: A utility vehicle was stationed immediately outside the wharenui to evacuate the tūpapaku [deceased body]. All other vehicles were prepacked and turned around for speedy evacuation to the school. All who stayed were aware of the risks.

The weather was relatively calm through the night with the last check on leaders at 10.30pm. Due to Kelvin's knowledge of the speed of flash flooding he continued to check conditions throughout the night.

The Ōpōtiki District emergency ceased at 7.30am the following morning. The tangi continued the following day. Kelvin and the other tangihanga attendees in the area saw a New Zealand Airforce C130 flying by at low altitude doing a site check of the Tairāwhiti region.

Lessons learnt

The main lessons taken from this experience is that there is a need for further CIMS practice in the Torere community to prepare for emergency events. Of importance is the immediate need to establish the Ōpōtiki District radio at Te Kira o Torere (the Torere School). Preparation and practice need to be undertaken on a Ōpōtiki District-wide basis.

Endnotes

1. NIWA at https://niwa.co.nz/climate-and-weather/regional-climatologies/gisborne.

2. Coordinated Incident Management System at www.civildefence.govt.nz/resources/coordinated-incident-management-system-cims-third-edition.

Supporting Tangata Whenua development in disaster management and research in Aotearoa

Distinguished Professor Christine Kenney Te Kunenga Ki Ourehuroa
Massey University
Aotearoa New Zealand

Aotearoa New Zealand has a specialised national incubator for Māori scientists of disasters to develop the next generation of researchers and to build risk reduction and resilience strengths of Māori communities.

In October of 1878, 2 large vessels, the barque *Felixstowe* and immigrant ship *City of Auckland,* were bringing British settlers to Aotearoa New Zealand. Both sank offshore from the entrance to the Ōtaki River on the southwest coast of New Zealand's North Island. Local tangata whenua [Indigenous peoples] responded to the sinkings and all the ships' passengers survived. A large kōhatu [stone] now stands at the river mouth to commemorate the sinkings and as testament to the disaster response abilities of local tangata whenua. The plaque by the stone reads: 'The Māori of the Ōtaki district acted with great skill and courage to bring passengers ashore'.

The 19th Century exemplar of Māori managing emergencies is one of many and is typical of the ways tangata whenua apply holistic approaches that are underpinned by relationships, intergenerational knowledge, values and cultural practices when responding to environmental challenges in Aotearoa. As a result of historical and recent disaster management successes, Māori bodies of knowledge and approaches to whakaoranga [creating and enhancing wellbeing] within communities are being recognised in New Zealand Government disaster management policies and practices. However, research centres within te ao Māori [Māori world] and dedicated to Māori risk reduction aspirations in partnership with iwi [tribes], hapū [subtribes] and whānau [families] have, until recently, been lacking.

The large kōhatu stands at the mouth of the river as a memorial to the sinkings and the response of local tangata whenua.

Image: Christine Kenney

Te Toi Whakaruruhau o Aotearoa Hui-a-noho, Te Tauraka Waka a Maui Marae, Bruce Bay, Aotearoa New Zealand.
Image: Christine Kenney

Te Toi Whakaruruhau o Aotearoa ([Māori Disaster Risk Reduction Research Centre] was established with funding support from the Natural Hazards Commission (NHC) Toka Tū Ake. The centre launched on 10 July 2020, a date aligned with the rising of the star, Puanga, the herald of Matariki [Māori New Year]. The centre is a partnership between the NHC and Massey University. Centre research and capability development initiatives are designed and conducted in partnership with iwi hapū and whānau, in response to needs identified by Māori and in accordance with kaupapa Māori [Māori values]. This is in response to needs identified by Māori and in accordance with kaupapa Māori [Māori values].

Māori research affiliates and partner institutions are situated throughout Aotearoa New Zealand, and the centre has become the leading national incubator of Māori disaster researchers through growing a significant membership (n=60+) of senior and emerging scientists. Postgraduate mentorship opportunities, study stipends and cultural support in the form of writing retreats and workshops are available for emerging researchers. Te Toi Whakaruruhau o Aotearoa facilitates iwi whānui [the broader Māori community] to increase Māori response capabilities through developing the next generation of Māori researchers and building risk reduction and resilience strengths of Māori communities.

Centre leaders regularly support Māori community disaster risk reduction aspirations and support grants are available on a case-by-case basis. Areas of research and capability development include safe housing, climate change and flood effects, land use planning, disaster recovery, digitised risk profiling, community resilience, disaster risk reduction, emergency management, urban design as well as seismic and environmental engineering for natural hazards resilience.

For more information about Te Toi Whakaruruhau o Aotearoa, go to www/tetoiwhakaruruhau.co.nz

Planning Evacuations with Indigenous Communities

Dr Bhiamie Williamson

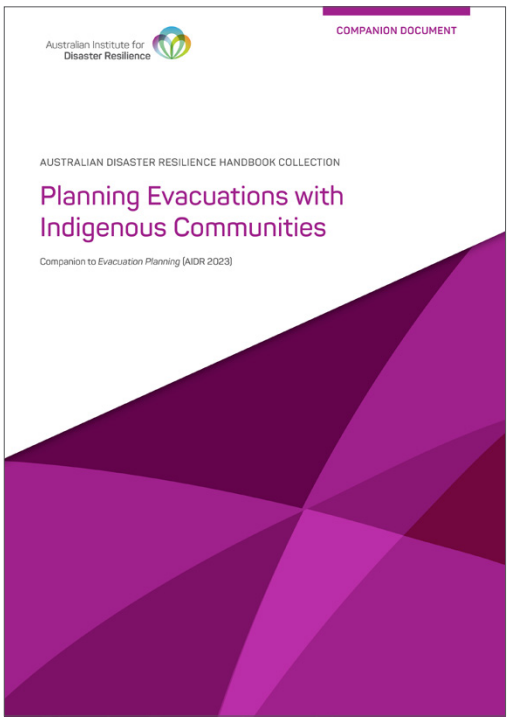
National Indigenous Disaster Resilience
Monash University

Nell Reidy

National Indigenous Disaster Resilience
Monash University

Evacuations are challenging for anyone who experiences them, however, Indigenous peoples and communities have distinct needs and can face additional risks throughout these processes.

Recognising a gap in policy and practice guidance regarding the evacuation of Aboriginal and Torres Strait Islander peoples and communities, the National Indigenous Disaster Resilience program, supported by the Australian Institute for Disaster Resilience (AIDR), developed the Planning Evacuations with Indigenous Communities Guide (Evacuation Guide) as a companion document to the Evacuation Planning handbook.[1] The AIDR Handbook Collection provides authoritative knowledge and guidance on national principles and practices for disaster resilience.



Decisions by emergency management personnel to evacuate a community are based on a suite of complex and interconnected factors. Making the decision to evacuate can be equally complex for community members. For Indigenous peoples and communities, these complexities are deepened because of factors that uniquely affect them.

In developing the Evacuation Guide, particular consideration was given to the ongoing traumas that colonisation inflicts on Indigenous people across Australia, and the need for research, policy and practice that is trauma-informed and centres on healing.[2] The Evacuation Guide was developed with this in mind and encourages social rather than solo processes, strengths-based and community-led processes as well as the need for socially and culturally safe spaces. These are key elements of Indigenous healing.[3]

Of equal importance are Indigenous peoples' unique connections and relationships with Country[4], which is in contrast with non-Indigenous settler understandings of ownership.[5] When Indigenous peoples are instructed to evacuate, this can be a complex and difficult decision and consideration may be given to responsibilities to Country and cultural heritage as well as homes and property.

The Evacuation Guide acknowledges the critical role Aboriginal Community-Controlled Organisations play in supporting Indigenous communities during and after disasters, acting as first responders and the main provider of immediate relief, support and safety.[6]

Know and respect peoples' rights
It is important that rights, including those recognised under the United Nations Declaration on the Rights of Indigenous Peoples, are not neglected or dismissed in emergency situations.
Foreground connection with Country
Indigenous peoples and communities have deep connections to Country which should be respected and prioritised.
Work within existing community governing institutions
Knowing and working within community-controlled organisations and institutions respects existing arrangements and is critical for working with communities effectively.
Provide a safe and welcome environment for Elders
As community leaders and knowledge holders, Elders should be engaged early and respectfully, and feel safe and welcome throughout evacuation planning and implementation processes.
Acknowledge the sanctity of family
Family and kinship are essential to Indigenous peoples' cultural identity and it's important that this is acknowledged and respected.
Relieve anxiety, don't add to it
Emergencies are stressful for anyone involved, however, it's important that people are given information in a calm and respectful way so that they can make informed decisions.

Figure 1: Principles outlined in the Evacuation Guide.

Cross-jurisdictional application

The Evacuation Guide takes a principle-based approach to planning and executing evacuations with Indigenous peoples and communities using processes that are safe and effective. The guide is intended to support evacuation planning and implementation processes that involve Indigenous communities and communities with high Indigenous populations in remote, regional and urban settings.

In Australia, emergency management arrangements and laws are complex and vary across state and territory jurisdictions, which hold primary responsibility for emergency management. The Evacuation Guide is structured to enable broad application. The Evacuation Guide is underpinned by 6 principles (see Figure 1) to be considered and applied throughout the planning and implementation stages of evacuations. These include lists of questions for each stage of the evacuation process for consideration by Indigenous people, communities and organisations as well as by emergency management and recovery personnel, agencies and organisations. This enables Indigenous and non-Indigenous cohorts across different locations and hazards to plan and execute evacuations with consideration of their individual situation.

The evacuation process

The Evacuation Guide reconsiders the traditional and linear stages of evacuation which are:

- Decision to evacuate
- Warning
- Withdrawal
- Shelter
- Return.

The revised process is encircled by 'Relationships and Dialogue' to emphasise the importance of building relationships prior to a hazard event and the need for emergency management personnel and Indigenous people, communities and organisations to communicate with each other, rather than authorities only communicating out to communities. The reconceptualisation of this process to one that is circular acknowledges that during a major hazard event, evacuation orders may be issued more than once (see Figure 2).

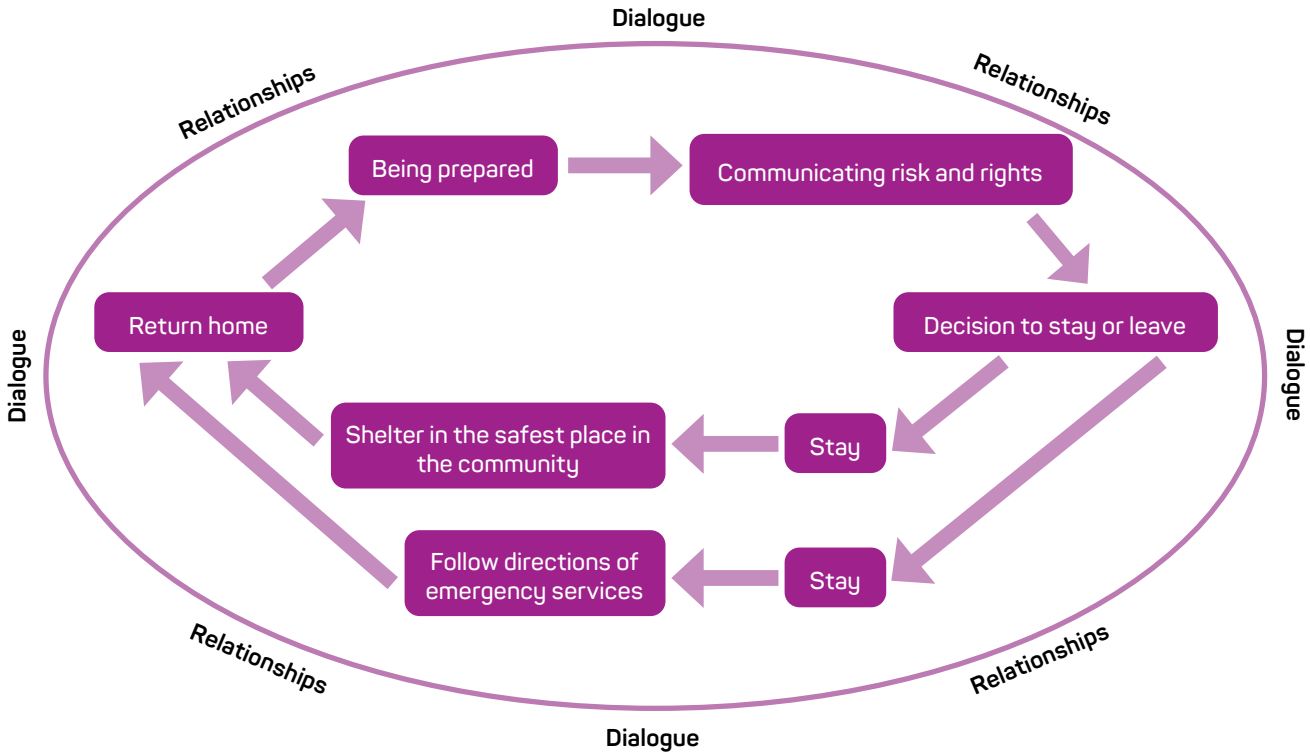


Figure 2: Evacuation process as depicted in the Evacuation Guide.

Conclusion

The Evacuation Guide supports emergency management agencies and Indigenous communities to prepare and plan for evacuations. The guide adopts a trauma-informed and healing-centred approach and recommends forging long-term relationships that enable deep mutual understanding and continual and honest dialogue. By posing questions to emergency management agencies and Indigenous community members, the Evacuation Guide is a framework to enable effective and culturally safe processes for Indigenous communities.

Endnotes

1. Evacuation Planning Handbook at https://knowledge.aidr.org.au/resources/handbook-evacuation-planning

2. Atkinson J (2000) *Trauma Trails, Recreating Song Lines: The Transgenerational Effects of Trauma in Indigenous Australia.* 1 ed. 2000, North Melbourne: Spinifex Press.

3. Quinn P, B Williamson and Gibbs L (2022) 'Indigenous-informed disaster recovery: Addressing collective trauma using a healing framework', *Progress in Disaster Science,* 16:p.100257. https://doi.org/10.1016/j.pdisas.2022.100257

4. Weir J, Stacey C and Youngetob K (2011) *The Benefits Associated with Caring for Country: Literature Review.* Australian Institute of Aboriginal and Torres Strait Islander Studies: Canberra. https://aiatsis.gov.au/publication/35297

5. Moreton-Robinson A (2015) *The White Possessive: Property, Power, and Indigenous Sovereignty.* London: University of Minnesota Press.

6. Williamson B (2022) *Aboriginal Community Governance on the Frontlines and Faultlines in the Black Summer Bushfires.* Australian National University, Centre for Aboriginal Economic Policy Research. https://caepr.cass.anu.edu.au/research/publications/aboriginal-community-governance-frontlines-and-faultlines-black-summer

Principles and protocols for cultural land management governance and research in Australia

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Research projects are moving from *consulting* with First Nations communities to *partnering* with them. This is a move from business-as-usual approaches towards greater First Nations peoples self-determination.

Over several years, we have collaborated on a series of research projects that seek to understand the interface between researchers, state land management agencies and First Nations organisations.[1,2,3] A key part of this has been supporting projects where these parties are trying to do things differently to how they have been done in the past, usually by moving from a model where First Nations people are treated as stakeholders to a model where they are treated as partners.[4,5,6]

There are many drivers for these changes, including policy drivers (e.g. Native Title or whole-of-government reform) and ecological drivers (e.g. extreme bushfires and biodiversity losses), but among the most important are what might be called personal or ethical drivers; that is, it feels like the right thing to do. There is an increasing number of people within research and land management who want to do things differently; to move from just consulting with First Nations communities to following or partnering with them. This is a move from business-as-usual approaches towards greater First Nations peoples' self-determination.

However, changing practices is challenging. What are the pathways between models? What principles to use? How do you put those abstract principles into practical action?

When we were designing the cultural land management research and governance in south-east Australia (CLMRG) project[a], we were cognisant of how we had heard from many non-Indigenous and First Nations people that they felt there was no roadmap for the collaborations they were starting or trying to sustain. They knew there was guidance out there, but it was not tuned to their contexts for policy and practice. We were also very aware of findings in previous research projects on cultural fire management. For example, at both a personal and institutional level, these parties are often strangers who are unfamiliar with the protocols and processes appropriate to their respective contexts.[7] Additionally, because universities, government agencies and similar organisations operate from a dominant position (often complete with legal authority and resourcing) such that their protocols and processes can easily dominate even when people are trying to centre Country and First Nations priorities.

In response, the CLMRG project team reviewed academic research and other reports about cultural land management collaborations as well as general guides on leading practice research methods with and by First Nations peoples. We synthesised this material into a draft set of 6 overall principles, each with aligned processes to support those principles and specific protocols that suggested how the principles could be put

a. Cultural land management research and governance in south-east Australia project at www.naturalhazards.com.au/research/research-projects/cultural-land-management-research-and-governance-south-east-australia.

into practice. The draft was circulated through the project team (Timothy Neale, Oliver Costello, Dr Bhiamie Eckford-Williamson, Andrea Rawluk, Michael-Shawn Fletcher, Shaun Hooper, Tasmin-Lara Dilworth and Gabrielle Miller) and the steering group (Matthew Shanks, Vikki Parsley, Daniel Miller, Jack Pascoe and Teagan Goolmeer). This led to a revised draft that was circulated again for refinement. The principles are:

- self-determination to practice culture on Country
- reconciliation, equity and social justice
- healthy Country, healthy spirit, healthy people
- empowerment of Indigenous knowledge-holders
- benefits with and for Indigenous communities
- respect diversity of Indigenous peoples and cultures.

Nonetheless, certain as we were of the merit of these principles, the final report states that:

> *This is a work in progress and will remain so even after publication for serval reasons. First, collaboration is always open-ended and evolving and attempting to produce definitive guidelines would disguise this fact. Second, the practices of good collaboration look different in different contexts. This document is not intended to act as an authoritative guide and was purposefully created to act as one set of guidelines for use in local conversations. Third, collaborative governance and research are developing fields of inquiry, with new work relevant to these guidelines continue to emerge. This document represents an account of relevant literature at a point in time, and necessarily contains gaps.*

It is important for non-Indigenous peoples to understand that there is no imperative for First Nations communities to collaborate with them. Many First Nations communities may have diverging or competing priorities or interests stemming from their unique cultural connections, rights and responsibilities. Their decisions to engage or not with non-Indigenous people are each expressions of sovereignty and self-determination.

Nonetheless, many people do choose to engage and collaborate. It is evident that in southern or temperate Australia the number, size and scope of cultural land management collaborations between government land management agencies and First Nations organisations are all growing. These projects have faced and will continue to face significant headwinds from doubters and the inertia of business-as-usual. But, for those people seeking to embark on these opportunities to work together, and ensure they are strengthened wherever possible, we hope that the principles and protocols we have helped co-create are useful, usable and used to create positive change.

Endnotes

1. Costello O, Dilworth T, Haynes K, Jansen T and Neale T (2021) Cultural land management in southeastern Australia: Developing the foundation for an Indigenous-led and co designed research program for land management with Traditional Owners, Melbourne: Bushfire and Natural Hazards CRC.

2. McKemey M, Neale T and Costello O (2021) Principles for enhanced collaboration between land and emergency management agencies and Indigenous peoples: green paper. Melbourne, Vic: Bushfire and Natural Hazards CRC.

3. Smith W, Weir J and Neale T (2021) Hazards, Culture and Indigenous Communities: Final Project Report. East Melbournce, Vic: Bushfire and Natural Hazards CRC.

4. Neale T, Carter R, Nelson T and Bourke M (2019) 'Walking together: a decolonising experiment in bushfire management on Dja Dja Wurrung country', *cultural geographies,* 26(3):341–359. https://doi.org/10.1177/1474474018821419

5. Maclean K, Robinson CJ and Costello O (2018) A national framework to report on the benefits of Indigenous cultural fire management. Canberra, ACT: CSIRO.

6. Rawluk A, Neale T, Smith W, Doherty T, Richie E, Pascoe J, Murray M, Carter R, Bourke M, Falconer S, Nimmo D, Price J, White M, Bates P, Wong N, Nelson T, Atkinson A and Webster D (2023) 'Tomorrow's Country: Practice-oriented principles for Indigenous cultural fire research in south-east Australia', *Geographical Research,* 61(3):333–348. https://doi.org/10.1111/1745-5871.12596

7. Smith W, Neale T and Weir JK (2021) 'Persuasion without policies: the work of reviving Indigenous peoples' fire management in southern Australia', *Geoforum,* 120(March):82–92. https://doi.org/10.1016/j.geoforum.2021.01.015

Artwork: ©Jack Green.

Cyclone Megan: waiting for the plane that never came

Artist Statement

'We knew the cyclone was going to come and maybe smash us. Many of us wanted to get out early. "Time to go" some said. But we heard nothing from the government.

When the cyclone was real close, we all got rounded up. Not by the government or the Roper Gulf Council. They kept their motorcars in their compounds, all nice and white. It was us Aboriginal people using our vehicles and boats to get the families out of the camps across the flooded river to the airstrip. Government finally said: 'A plane is going to come and rescue everyone'.

We got to the airstrip at 7.30 am and waited. No one told us nothing. Hundreds of us, wet cold and hungry all trying to keep calm and still no one told us nothing. I felt that the way we were being treated just the same as the way government rounded us up off our country and yarded us up in town. It's our country, our families, our community yet government treats us like cattle.

We waited all day and no plane came to rescue us. Government said, "It's too late now, not safe to land". And that was it. How about in the future government talks with us, let us organise and look after ourselves in a disaster and no more of this yardin' us up like cattle.'

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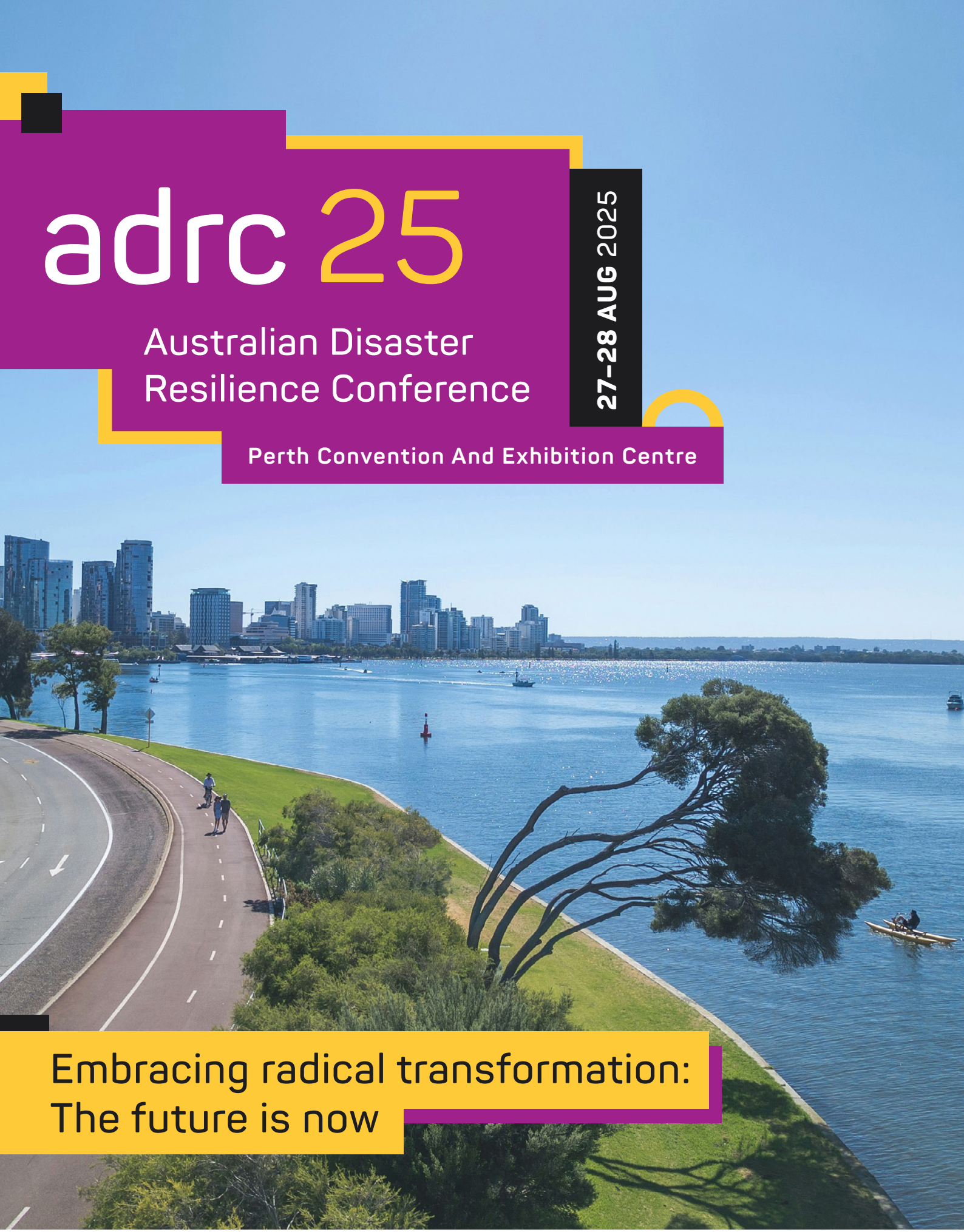

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