



How is nutrition, health and wellbeing conceptualised in connection with seafood for coastal Indigenous Peoples'

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ABSTRACT

Coastal Indigenous people access and maintain customary connections to seafood for nourishment, livelihoods and Indigenous values. It is recognised that seafood contributes significantly to coastal Indigenous people's diets. Despite this, global fisheries sectors have overlooked the role seafood plays in contributing to nutritional, health and wellbeing outcomes of coastal Indigenous communities. Global entities have called for 'nutrition sensitive policies' to improve nutritional, health and wellbeing outcomes. The aim of this study was to apply an 'Indigenist' inquiry lens and 'yarning' as a method to further understand from an Indigenous perspective how concepts of nutritional, health and wellbeing outcomes are represented and connected to seafood. Research involved 16 Aboriginal informants, six women and ten men from a fishing enterprise, arts and culture centre and a women's centre with a connection to commercial and customary fishing in Maningrida community in the Northern Territory of Australia, 2019–2022. Key themes related to respecting of Elders, culture, country, Aboriginal nutrition, traditional medicinal knowledge, Aboriginal fishing enterprises, barriers to accessing seafood, lived experience, intergenerational knowledge transfer and interconnectedness. It is clear that fishing and access to seafood for Aboriginal people is a pathway to healthier food provision within coastal Indigenous communities. It needs to be recognised however, that Indigenous nutritional, health and wellbeing concepts and self-determination principles need to be integrated into 'nutrition sensitive policies' within fisheries and mariculture sectors.

1. Positionality statement:

The lead author of this study is a Larrakia and Wadjigan Aboriginal man from the Northern Territory (NT) of Australia. Both the Larrakia and Wadjigan people have maintained on going connections to their customary coastal waterways and seafood and this positioning by the author has been incorporated into this study design through co-constructed knowledge (Olmos-Vega et al., 2022; Wilson, 2008). The participants herein, referred to as informants for this study, are Aboriginal people residing in the coastal community of Maningrida in the NT and/or neighbouring outstations with ancestral and cultural connections to several language groups including but not limited to Burarra, Kunwinjku, Ndjebbana, Kune and Nakara. The two co-authors of this study are non-Indigenous with extensive experience working with Aboriginal and Torres Strait Islander Australians and who provided

critical support to the lead author and insight to enable the Indigenous voices to be reflected in this research (Morton Ninomiya et al., 2022). The authors have expertise in Indigenous and qualitative methodologies, Aboriginal fisheries, nutrition, food systems, food security, natural resource management and small-scale fisheries.

The authors of this paper have used the term 'Indigenous' to represent a global community that reflects many heterogeneous cultures, nations and diversity across the globe (Cunningham & Stanley, 2003; U.N., 2021) The term 'Aboriginal' in this study will represent the first people of Australia and 'Torres Strait Islander' will represent the first people of the Torres Strait Islands. It is acknowledged that these broad terms reflect culturally and linguistically diverse groups of people. The term 'Traditional Owners (TO)' throughout this research will refer to Aboriginal people with ongoing pre-colonial connection to customary land and waterways with inherit rights and responsibilities (ALRC, 2014;

Abbreviations: NT, Northern Territory; BAC, Bawinanga Aboriginal Corporation; TO, Traditional Owner; ACL, Aboriginal Coastal License.

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Bock et al., 2022). For the purpose of this study seafood is defined as wild captured marine species of fish, crustaceans, invertebrates and mammals that are accessed by Indigenous people.

2. Introduction

Seafood remains an important contributor to coastal Indigenous people's diets with global consumption up to 15 times higher than that of non-Indigenous people (Cisneros-Montemayor, Pauly, Weatherdon, & Ota, 2016). This is significant as seafood provides essential protein, fatty acids and micro nutrients needed for healthy human growth and function (Berkes & Farkas, 1978; Khunlein, Erasmus, & Spigelski, 2009). Despite this recognised important dietary contribution of seafood to coastal Indigenous people's diets, the fisheries and mariculture sectors have largely overlooked this nutritional contribution and focused on political, conservational and economic development outcomes (Allison et al., 2017; Arthur et al., 2022; Koehn et al., 2022). Therefore, in order to maximise the benefits of seafood to coastal Indigenous people's livelihoods and nourishment there needs to be a greater degree of recognition of the nutrition, health and wellbeing value of seafood within the fisheries and mariculture sectors (Farmery, Kajlich, Voyer, Bogard, & Duarte, 2020; Kuhnlein and Chotiboriboon, 2022). Further, global research agendas and roundtable discussions have recognised the need to address the determinants of nutrition outcomes through complementary sectoral policies, referred to as 'nutrition sensitive policies' (FAO, 2017; Pinstrup-Andersen, 2013; Ruel & Alderman, 2013; WHO, 2014). This is significant as Indigenous people are continually experiencing a gap in nutrition- and health-disparities compared with benchmark populations, including lower life expectancy, lower birth rate, and a higher rate of non-communicable diseases and lower social (economic and education) outcomes (Sherwood, 2013; Lancet, 2020). In order for fisheries and mariculture sectors to coherently align and contribute to global roundtable aspirations for 'nutrition sensitive policies' and improved nutritional, health and wellbeing outcomes of Indigenous people, there first needs to be a greater understanding of the way in which Indigenous people's concepts of nutrition, health and wellbeing are connected to seafood. Currently the nutrition literature and understanding of Indigenous concepts of nutrition, health and wellbeing in connection to seafood, beyond a dietary contribution and a nutritional composition lens, is limited (Brimblecombe et al., 2014; FAO, 2016; Wilson et al., 2020). This is an important as for many Indigenous people, nutrition, health and wellbeing is a collective concept and is inclusive of social and cultural values that place community health above individual health in contrast to biomedical models of health that focus on absence of disease within an individual (Gee, Dudgeon, Schultz, Hart, & Kelly, 2014; Pulver et al., 2010; Wilson et al., 2020). Nutrition literature to a very limited degree has recognised this as Brimblecombe et al suggest, that when considering strategies for greater nutritional outcomes for Indigenous people's there is a need for a broader "systems/socio-ecological approach" that reflects the social and cultural context (2014, p. 396). The broader literature identifies that Indigenous peoples have a customary connection to seafood that incorporates subsistence, livelihood and Indigenous values; yet this has not been explicitly linked to nutrition, health and wellbeing outcomes (Marushka et al., 2021; Noble et al., 2016; Shamsi, Williams, & Mansourian, 2020; Smyth et al., 2018).

These values therefore need to be further recognised and translated within nutrition discourse to strengthen integrated nutrition sensitive policies that align with Indigenous concepts of nutrition, health and wellbeing in the fisheries and mariculture sectors. In addition, this study recognises that due to the historical experiences Indigenous people have had with colonisation and the subsequent assimilation and oppressive policies, there is consequently a lack of representation of Indigenous perspectives within policies that impact their livelihoods and communities (Aldred et al., 2021; Moreton-Robinson, 2015; Wensing, 2021; Wolfe, 2006).

In response to the identified literature gap the study reported herein

aimed to demonstrate how nutrition, health and wellbeing in connection to seafood is conceptualised by Aboriginal people in the coastal community of Maningrida in the Northern Territory (NT). This study has been conducted as a localised case to demonstrate the complexity in the relationship Aboriginal people may have to seafood. In order to strengthen Indigenous perspectives, this study applied an 'Indigenist' inquiry lens to theoretically position the research within an Indigenous worldview and give resistance to dominant colonial structures within scholarship and policy (Rigney, 1999; Smith, 2021). The qualitative method of 'yarning' was utilised to facilitate the knowledge exchange process and inductive thematic analysis was applied as the knowledge analysis method.

3. Context and setting:

3.1. Maningrida: Study location

Maningrida is an Aboriginal community and is located 500 km east of Darwin city the capital of the NT and is situated on the lands of the Kunibidji people in central Arnhem Land, along the coast of the Arafura Sea and the mouth of the Liverpool river (Fig. 1: Map of the Top End region of the Northern Territory of Australia). The climate is tropical and in the wet season (approximately November-April) due to high rainfall, the roads are completely impassable with air and sea-barge the only options for travel and freight. The estimated population of Maningrida in 2016 was 2,065 with Aboriginal people comprising of 89% of the total population (ABS Census, 2016). There are currently five main Aboriginal language groups in Maningrida which include Burarra, Kunwinjku, Ndjebana, Kune and Nakara, however there are many more language groups and dialects present in the region (Altman, 2005; Australian Government, 2022). The Aboriginal people in the central Arnhem Land region including Maningrida, like the rest of Australia, felt the impacts of colonisation by the British Empire, although Aboriginal people residing in the region still maintain strong customary connections to culture, land and marine waterways. Prior to colonisation Aboriginal people of the region lived on traditional country estates with inherent rights and responsibilities with an ongoing connection and cultural significance to a specific area of land and water, now referred to as 'outstations' or 'homelands' (Myers & Peterson, 2016). In Maningrida however, the Aboriginal people prefer to call their 'outstations' by their Aboriginal names and there are over 32 outstations neighbouring Maningrida (Altman and Anu, 2008; Myers & Peterson, 2016). The central location of Maningrida community was initially established by non-Aboriginal Government officials as a trading post for mining, fishing, forestry and other industrial development and later in 1957 declared a settlement by the Australian Government (Altman, 2005; Bawinanga Aboriginal Corporation, 2022). The Australian Government assimilation policy (1951–1962) required Aboriginal groups from neighbouring outstations to live in the established Maningrida settlement with aspirations for the community to become centralised and self-sustaining and it was expected that all the heterogenous Aboriginal groups in the area would live like non-Aboriginal Australians (ALRC, 2010; Altman, 2005; Hunt, Smith, Garling, & Sanders, 2008). This centralised idea however was abandoned in 1972 (Altman, 2008). Shortly after, the Australian Commonwealth *Aboriginal Land Rights Act (Northern Territory) Act [1976] (Cth)* legally recognised that Aboriginal people in the NT could live on their outstations and it was eventually hoped that land access would lead to economic and social equality (Altman, 2020; Australian Government, 1976; Yap et al., 2018).

3.2. Governance

Bawinanga Aboriginal Corporation (BAC) is an Aboriginal controlled centralised entity that currently represents the Aboriginal people of Maningrida and the surrounding outstations and offers a range of services and administration (Altman, 2008; Bawinanga Aboriginal

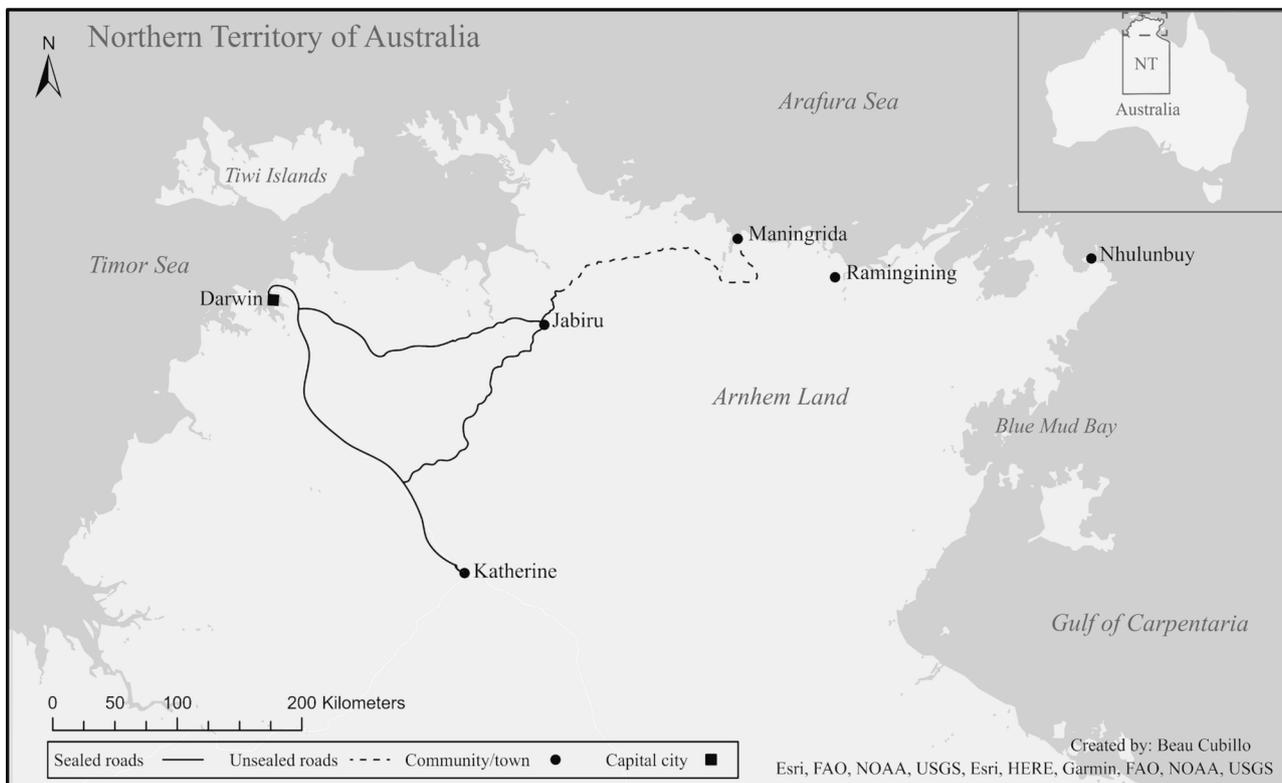


Fig. 1. Map of the Top End region of the Northern Territory of Australia. Description: This map indicates the location of Maningrida Aboriginal community located in the Central Arnhem Land region of the Northern Territory along the coast of the Arafura Sea.

Corporation, 2022). The current services include but are not limited to housing, Maningrida Arts and Culture Centre, Bábarra Women's Centre and the Djómi Museum. BAC also has an Indigenous enterprise development arm and manages the fishing enterprise referred to in this study. BAC reports they service 32 different outstations over an estimated 10,000 km², highlighting the size and diversity of the region (Bawinanga Aboriginal Corporation, 2022). In 2008 the High Court of Australia recognised the cultural and ongoing significance of coastal waters for NT Aboriginal people in which the *Aboriginal Land Rights (Northern Territory) Act [1976] (Cth)* was extended to incorporate the intertidal zone (Australian Government, 1976; Jentoft et al., 2018a). This was established through *Northern Territory of Australia v Arnhem Land Aboriginal Trust [2008] HCA 29*, which is commonly known as the 'Blue Mud Bay' as the case related to the Yolngu People are the TOs of the Blue Mud Bay region in North East Arnhem Land of the NT (Altman, 2013; Butterly, 2020; Jentoft et al., 2018a). The rights are now applicable to 85% of the NT intertidal zone. The recognition of Aboriginal access rights to coastal waters enabled the NT Government to introduce new regulations under the *Fisheries (Northern Territory) Act [1988]* and in 2014–15 an Aboriginal Coastal Licence (ACL) scheme was introduced (Northern Territory Government, 2021). This enabled TOs from Aboriginal communities in the NT to obtain a limited commercial fishing licence that would support small scale fishing businesses (Jentoft et al., 2018a; Northern Territory Government, 2021).

3.3. Fishing operations

At the time of this study, BAC held a NT commercial Mud Crab (*Scylla serrata*) licence, a leased portion of a Barramundi (*Lates calcarifer*) licence for one year, and supported TOs to obtain three ACL which had increased to four throughout the study duration from late 2019 to early 2022. The TOs who hold fishing licences in this study are all respected elders within their families and have on-going life experiences with both commercial and traditional fisheries. The fish and seafood obtained

through these licences are caught on reefs and in estuaries via boat as well as coastal beaches which are accessed for shore fishing. Methods may include vertical and troll line, cast and scoop net, 100 m net with mesh size 6.5 cm or less, 200 m gill net with 15.24 cm mesh, dilly and crap pots and traditional fishing techniques such as hand spear and fish traps (Northern Territory Government, 2021). Seafood that is caught is recorded, processed and sold mostly to community members and neighbouring Aboriginal communities. The species targeted under the ACL at the time of this study include Bluetail Mullet (*Moolgarda buehanani*), Diamond Mullet (*Liza vaigiensis*), Golden Trevally (*Gnathododo speciosus*), Milkfish (*Chanos chanos*), Barracuda (*Sphyraena barracuda*), Queenfish (*Scomberoides commersonianus*), Blue Threadfin (*Eleutheronema tetradactylum*), Whiting (*Sillago sihama*) and under a restricted capacity also Barramundi (*Lates calcarifer*), Giant Trevally (*Caranx ignobilis*), Spanish Mackerel (*Scomberomorus commerson*), Beach Salmon (*Leptobrama muelleri*) and Threadfin Salmon (*Polydactylus macrochir*).

3.4. Customary fishing

Customary fishing includes a much broader scope of seafood species with different cultural and social values (Shamsi et al., 2020). All the informants of this study had significant knowledge of traditional fishing practices that were highly contextual to their individual outstations and family protocols. While a large focus of this study was on the wild caught fishing enterprise, traditional fishing was also included as this could not be separated from the story being told within data collection. Traditional fishing is an important part of the Aboriginal culture in the region and is connected to cultural and social values and has and continues to be important for subsistence and food security (Noble et al., 2016; Smyth et al., 2018).

4. Methods:

4.1. Theoretical Approach:

Over many centuries, Indigenous peoples' histories and knowledges have been subjugated by western representation which has reinforced Eurocentric ideologies as superior (Smith, 2021). Moreover, the lack of Indigenous values, beliefs, prejudices and voices portrayed in research has contributed to power imbalances in academia that continues to impact Indigenous communities through misrepresentation of their knowledge systems (Moreton-Robinson, 2015; Smith, 2021). This has contributed to the mistrust that can exist in Indigenous communities towards researchers (Harfield et al., 2020; Martin & Mirraboopa, 2003; Nakata, 2007). In response, this research positions itself within an Indigenous worldview to represent Indigenous voices in a localised context to strengthen Indigenous representation. The theoretical approach applied herein is the 'Indigenist' research lens which is targeted at framing three key principles in the conduct of research in the Australian context, as described by Rigney: resistance as the emancipatory imperative (research that intends to enable Aboriginal Australians to build their own ways of 'being' to enable healing from oppression); political integrity (research that is done by Aboriginal Australians where an Aboriginal person is responsible for their community and is a part of the struggle to contribute to the political agenda); and, Indigenous voices privileged in data interpretation and research dissemination to address the social inequities (Indigenist research that is focused on Indigenous interests and lived experiences and done by an Indigenous person with Indigenous people to serve the best interest of self-determination) (Rigney, 1999, p. 116).

The design of this study is a qualitative research design with data collection methods including 'yarning' and reflective notes, with inductive thematic data analysis. Situating of Indigenous values were incorporated into the study design to reflect Aboriginal contextual knowledge as accurately as possible. The creation of new knowledge from this research and its dissemination and communication, incorporates the key principles of the 'Indigenist' research lens to reflect Maningrida community's core values and interest. This research was also conducted according to the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) code of ethics to support meaningful research and reciprocity between the researcher and the Aboriginal community (AIATSIS, 2020).

4.2. Ethics

This study was approved by Charles Darwin University Human Research Ethics Committee (CDU-HREC and reference number H20081 'Indigenous Knowledges' of the nutritional health and wellbeing benefits of seafood'. All informants of the study were reimbursed for their time with cash payments as per BAC guidelines which included a rate set by BAC and distributed through BAC financial team.

4.3. Community engagement and informants

The study and ethics were co-designed in 2019 with input from key informants and staff members at BAC. The Maningrida Arts and Culture Subcommittee which comprises of 13 TOs was identified by BAC as the study's reference group and approved the research. All who participated in the research are described as informants. The lead researcher travelled to Maningrida community on three separate occasions over 2019 and 2020 to finalise the research design, ethical approach and consent then commenced data collection from 2020 to 2021, and in 2022 returned to member check and feedback the draft findings of the study to available informants and BAC. Informants from this study were selected through existing relationships within the community and identification of people who were deemed knowledgeable of seafood. This selection process was done by community members and not the researchers. In

this study 16 informants participated, six women and ten men.

4.4. Yarning

Yarning is a recognised conversational practice amongst Aboriginal and Torres Strait Islander researchers in Australia and has been applied in this study as a qualitative data collection method (Bessarab & Ng'andu, 2010; Shay, 2021; Walker, Fredericks, Mills, & Anderson, 2014). Yarning involves a two-way sharing of knowledge process between the lead researcher and the informants with the focus to freely conceptualise the research topic versus asking structured questions in an interview style (Atkinson, Baird, & Adams, 2021). This approach was applied to encourage and support the informants to describe their narrative in response to the research questions in any way they determined (Atkinson et al., 2021; Bessarab & Ng'andu, 2010; Walker et al., 2014). Yarning facilitates the sharing of stories that can include contextual, historical, political, cultural identity and expression of Indigenous worldviews of the individual, their families and wider community (Bessarab & Ng'andu, 2010; Martin & Mirraboopa, 2003). As yarning is a two-way sharing of knowledge process, the relationship, trust and accountability between the researcher and informants is important (Walker et al., 2014). The authors felt an immense importance for the research to reflect the community core values and the lead author as an Aboriginal researcher felt the responsibility to uphold trust to 'our' people and the knowledge systems that govern 'our' being (Bessarab & Ng'andu, 2010; Murrup-Stewart, Atkinson, & Adams, 2022; Nakata, 2007). The lead author therefore attempted to achieve accountability and responsibility of yarning by first spending time communicating and listening to what informants were saying and what was important for them to get out of the research. This also included transparency on what the information collected was being used for, which in this case, it was used for the manuscript but also for future resource development and part of a PhD thesis (out of the scope of this study to describe). Informants included current and previous ACL fishing licence holders, fishing workers and Maningrida Arts and Culture Centre and the Barrada Bábarra Women's Centre workers as these people expressed interest in the study. The lead author spent a total of 34 days in Maningrida not only conducting yarning but understanding community dynamics and building relationships. While this was enough time to conduct the knowledge collection, more time would have provided opportunity to potentially speak with other community members however due to the Covid-19 pandemic several trips were not possible. The yarning guide was developed by the lead author with input from the co-authors over a considerable time frame which also included input through the engagement with informants and other community members to gain an understanding of the local context, history and values of the community as well as the fishing operations.

The lead author used the guide to loosely ask questions to prompt the yarn, this included "what does nutrition, health and wellbeing mean for you personally?" and "how is seafood connected to nutrition, health and wellbeing?" and "what do you see as the benefits of seafood for the wider community?" The questions were broad in scope to not preconceive concepts of health or wellbeing and connection to seafood. Yarning involved some photo elicitation only to help identify certain species of seafood due to language barriers in regards to species names. The resources used for this were the online data base 'FishBase', physical poster of the 'NT Government: Common fish of the Northern Territory' and 'Coastal fish of the Maningrida region' (Bawinanaga Aboriginal Corporation, 2022; FishBase, 2022; Northern Territory Government, 2016). Some of the informants voluntarily brought to the yarning sessions maps, photos, story booklets and pieces of art to compliment the stories that were shared with the lead author. The yarning sessions were recorded in multiple ways in this study; either through audio of recording and/or note-taking by the lead author (Bessarab & Ng'andu, 2010; Lukaszuk et al., 2017). Notes were taken to document the everyday experience in the field and the research process and to add context to the research

(Goodall, 2000). Notes were also used by the lead researcher to reflect on and identify their own positioning in the research. Member-checking occurred with all informants and extra feedback of the manuscript findings occurred with eight informants.

4.5. Knowledge analysis

Notes from all yarning sessions were cross-checked with informants during and after the sessions in an attempt to accurately present a shared understanding and interpretation of the knowledge (Weber-Pillwax, 2001; Wilson, 2008). Yarning sessions were transcribed into a word document. A six-step inductive thematic analysis method was applied to analyse the transcripts and notes (Braun & Clarke, 2006; Maguire & Delahunt, 2017). An inductive method of analysis was applied as it had the theoretical flexibility to incorporate Indigenous ways of knowing (Braun & Clarke, 2006; Murrup-Stewart et al., 2022). Through the use of applying an Indigenist lens to the research it was essential that the Aboriginal informants had the ability to express their interpretations and knowledge in the research (West, Stewart, Foster, & Usher, 2012, p. 1584). This also included during knowledge analysis where informants had the chance to evaluate the interpretations as it is important to present the data in a way that represents Aboriginal voices between the Aboriginal informants and Aboriginal researcher. The lead author first became familiar with the knowledge and stories shared by informants by reading transcripts line by line and listening to the recordings. Basic codes were then generated by identifying reoccurring phrases, words or concepts related to nutrition, health and connection to seafood. Codes were then refined and re-applied to all the notes and transcripts to identify patterns, prevalence and re-occurring points of interest amongst the knowledge holders. The next phase involved grouping the codes into 10 themes using the informant's own expression of their views and knowledge about nutritional, health and wellbeing across all notes and transcripts. These themes were then refined and named by the authors and included in the findings of this paper as a way to broadly understand the connection of seafood to nutrition, health and wellbeing (Table 1).

5. Findings:

Based on the 13 yarning sessions that ranged from 30 min to 120 min with 16 different informants, several informants attended more than one yarning session, 10 co-constructed themes (Table 1) were explicitly represented to give a summary term to the views and knowledge of informants according to significant areas of interest relating to the research aim. It is understood that the Indigenous knowledge systems are intertwined and deeply rooted into the context, land, culture and language amongst other values (Aldred et al., 2021; Greenwood &

Table 1
Constructed themes and codes about nutrition, health and wellbeing values connected to seafood generated from the thematic analysis.

Themes	Codes
Respecting elders	Elders, old people, ancestors
Culture	Song lines, cultural spirit, dreaming, sharing
Country	land, country, place
Aboriginal Nutrition	Taste, food preference, variety of foods, food security, hunger, health benefits, energy levels, longevity
Traditional medicinal knowledge	Medicine, bush medicine
Aboriginal fishing enterprise	Fishing enterprise, income, fish markets, selling fish, community benefits
Lived experience	Memories, stories, whole experience
Intergenerational knowledge transfer	Knowledge holders, passing knowledge to young generation, young people have different priorities
Interconnectedness	Latent representation in the data to describe the complex relationship amongst other themes
Barriers to access seafood	Lack of knowledge, drugs, alcohol, family disruption, sick people, policy

Lindsay, 2019). The presentation of knowledge in separate deconstructed themes with individual meanings is an artificial construct when considering Indigenous ways of knowing and being (Nakata, 2002a; Wilson, 2008). This study recognises this and the connectedness of themes has been described in the specific theme 'interconnectedness'. While this theme was not explicitly mentioned by informants it has been constructed through the latent representation within the data. The themed approach applied in this study was undertaken to progress an understanding of Indigenous values of seafood for both Indigenous and non-Indigenous audiences which can be used practically to advance Indigenous values into scholarship and policy.

5.1. Respecting Elders

In the context of this study an Elder is referred to loosely as a person connected to a system of knowledge that is held by members of the community, and is not an absolute concept bound by timelines of past and/or present. Informants directly referred to Elders as either particular persons with extensive knowledge and/or respect in the community, or as non-living ancestors whose spirits are present and who represent the Aboriginal knowledge system. This study does not describe the in-depth concept of Elders but rather demonstrates that the Elders' connection to seafood exists and was significantly important to informants in their connection of nutrition, health and wellbeing. Living Elders were identified and described by informants as knowledge holders whom had a responsibility to pass knowledge on. An informant described "old people knew bush medicine" (yarning session, male) and made it known to the lead researcher that their ancestors could survive in the bush with their Aboriginal knowledge systems, reinforcing the importance of the knowledge system. A particular informant when asked what it means for people in Maningrida to be healthy and strong, gave a detailed description of how Aboriginal people should go "fishing like the old people" (yarning session, male) and of how previous generations had to physically exert themselves to catch fish and implied that this combined with the consumption of a nutritious source of food was beneficial to health. When prompted to talk about what role seafood has for living Elders, informants said that prior to them going out fishing or upon returning, Elders who were unable to source their own seafood, would ask: "did you get any fish" (yarning session, male) and say: "we miss our fish" (yarning session, male). There was a lack of access to fish and seafood for some Elders and this impacted on feelings and behaviour as described. Informants held enormous respect for Elders and a responsibility to them, and they either did not feel good about not being able to share some of the catch with Elders or felt obligated to try and bring fish to the Elders. Informants made it clear that many Aboriginal people believed that "fish made old people happy and strong" (yarning session, female) and that this gave them 'the energy' to 'go out walking' which referred to their ability to complete daily activities. Several senior women described that the Elders had preferences for certain fish species as they wanted to reconnect and consume the species that they had grown up eating such as "catfish", "Shark" and "Sting ray" (yarning session, female). Overall, informants referred to the deep connection and respect Aboriginal People in Maningrida have for their knowledge holders. They spoke of how important it is to enable Elders to consume species of seafood, and how this is connected to nutrition, health and wellbeing through cultural/social responsibility to their Elders.

5.2. Culture

Seafood was described by informants as connected to identity, the natural world, and community, as well as to the act of sharing, song lines, languages, dreaming and spirit. These codes were used to formulate the theme 'culture', with each informant giving a different description of how they viewed their cultural connection to seafood. Culture was central to all yarning sessions and embodied the way people described how they feel, connect and express their relationship to

seafood. Informants explained that the practice of culture was intertwined with the entire process of gathering, preparing and consuming seafood. They expressed their cultural connection to seafood in many ways such as through song lines and spiritual connections: “dreaming of fish is important to ancestors” (Yarning session, male) and “culture through song lines, eating fish, and ceremonies” (Yarning session, female). Cultural identity was linked with seafood where it was often described that seafood is a part of themselves, and thereby people are connected, physically, spiritually and metaphysically, with the seafood. Informants referred to the respect that is shown to particular seafood species of cultural significance to them, such as to the sting-ray, where through being caught or consumed, this respect is presented to the ancestors. The informant’s voices often reinforced that not only does seafood connect people to their identity but it also connects Aboriginal Peoples to their cultural knowledge systems including the knowledge of how to capture, prepare and consume seafood. Respected older informants expressed that while it is important for the younger generations to use contemporary methods of fishing they need to also know of their traditional ways “go outstation and learn fish trap a part of culture” (yarning session, male). Another aspect of culture that was referred to by informants was the cultural obligation to share. “Sharing is important for families” (yarning session, male), “sharing is part of the lore” (yarning session, male).

5.3. Connection to country

This theme ‘connection to country’ was created from data where informants referred to different places where they had ancestral connection and accessed seafood. It is centred on the experience and process of being physically and spiritually present on ones’ country to catch or harvest seafood. Country was expressed by informants as land, place, beach or outstation and was often the centre of an experience shared with the lead researcher, and expressed by the informants as a “place connected with feelings” (yarning session, female), or “connect to the country” (yarning session, male). Informants expressed that when accessing seafood, they would “camp on beach” (yarning session, male) or would access “beach country place” (yarning session, female), which highlights the important role country has in being able to access seafood as well as being able to connect spiritually to seafood. Informants when they were physically present on their country described that catching seafood would be done together with family and that it would be a happy experience.

5.4. Aboriginal nutrition

The theme ‘nutrition’ incorporates the codes taste, food preference, variety of foods, food security and hunger that arose directly from the yarning question, ‘what are the nutritional benefits of seafood for Aboriginal people in Maningrida and why is seafood important to improve and maintain health?’ Taste and food preferences were found to be desirable and enjoyable components of eating seafood: “good taste mullet” (yarning session, male), “feel good and taste good mollusc” (yarning session, male). Preferred tastes for certain species were associated with having grown up eating particular types of seafood, as well as with the fat content and seasonal knowledge of different species. Traditional knowledge of seasons was stressed by informants to be important for the fishing enterprise. If fish were caught out of season, consumer demand was impacted, as the fish contained less fat and were therefore not desirable “fish doesn’t have fat too dry and no good” (interview session, male), or “out of season no fat” (yarning session, male). Certain species were referred to as important in the past for food security, due to their ease of access and reliability: “Mud mussel important in old days” (yarning session, male). Hunger, was briefly mentioned by one informant as influencing their preference for certain species, as when they were hungry they looked for particular species “mangrove worm good for hunger” (yarning session, male). Several

informants explained that seafood was an important energy source: “power and energy” (yarning session, male), “keeps you going so you have the strength to fish” (yarning session, male). Informants attributed consumption of seafood in Maningrida to a longer life and associated it with being healthier: “fish and seafood health benefits, live longer” (yarning session, male). Most informants showed knowledge of the health benefits of seafood in relation to chronic conditions such as sickness, heart disease, kidney disease and diabetes which were the most common conditions referred to. The informants described seafood as particularly good for the blood, referring to blood pressure and iron in the blood:

“seafood good for heart, cleanses you” (yarning session, female), “seafood good for blood pressure” (yarning session, male) and “bush foods good for blood” (yarning session, female).

5.5. Traditional medicinal knowledge

This theme arose from responses to the question of ‘what are the health benefits of seafood for Aboriginal people?’ A difference of this theme to the ‘nutrition’ theme is the focus on treatment of an illness, whereas the nutrition theme related to subsistence, food qualities and dietary choices for health or preventive measures. This theme encompasses the traditional knowledge of a cure or a treatment of a particular condition that was referred to by informants. For example, when a child is constipated or has diarrhoea, they are prescribed a particular seafood from a knowledge holder in the family. Informants articulated the concept of ‘seafood as medicine’, and used the term ‘bush medicine’ to distinguish for the lead researcher between western medicine and Aboriginal medicine. Seafood was considered a part of this bush medicine system and as having medicinal properties “Fish and seafood are medicine” (yarning session, male) and “long bum and mangrove worm [are] a part of bush medicine” (yarning session, male). Informants explained that different fish and seafood species hold different medicinal qualities that are linked to the Aboriginal knowledge system, and that have been passed down through the generations. One example given by most informants, was a species used for the treatment of diarrhoea, constipation and stomach ache: “***** is good for diarrhoea and stomach ache” (yarning session, male), with the particular species name removed to protect the traditional knowledge of the community. Informants also explained that Aboriginal people in Maningrida who are sick as well as those who have had to relocate to larger metropolitan locations to receive healthcare, request seafood and that seafood is cleansing for Aboriginal People: “sick of western medicine so got to get seafood” (yarning session, male) “patients at the clinic want bush foods to help the cleanse” (yarning session, female).

5.6. Aboriginal fishing enterprise

Fishing licence holders and fishing workers, explained the numerous benefits to selling seafood, primarily fish, to the community. First, it provided an income which varied among informants and provided the informants’ families with money. Second, the fishing enterprises enabled the informants to apply their knowledge systems to contemporary methods to catch fish, thereby increasing catch efficiency. This included utilising seasonal and location knowledge to fish “Seasonal fish important for business because of the fat” (yarning session, male). Third, it allowed the TOs of the land on which fishing takes place [which can also be the ACL holders] to provide access to nutrient-rich seafood for the community benefit, which can lead to improved nutrition “fish business better nutrition” (yarning session, male). Forth, having a fishing business allowed an opportunity to sell seafood to surrounding Aboriginal communities and provide those communities with benefits “selling to Ramingining (neighbouring Aboriginal community) good” (yarning session, male). Whilst informants spoke of the many positive nutrition, health and wellbeing benefits of seafood through consumption it was clear that the fishing enterprise had wider economic e.g. income and employment, as well as cultural and social benefits. It provided

opportunity to fulfil cultural obligations such as being able to provide seafood to older community members who were not able to access seafood themselves, thus having a positive impact on fishing workers wellbeing. Limiting factors to the fishing enterprise were raised by the informants including regulations restricting catch of some species such as Barramundi, and limited availability of some infrastructure and resources such as fishing equipment, cars, boats.

5.7. Lived experience

Informants told of memories, stories and experiences, expressed in length and with depth and substance, when asked what the nutritional, health and wellbeing benefits of seafood are for Aboriginal people. “Memories and stories” (yarning session, male) in themselves are important to health and wellbeing as they are shared and told to the next generation. The stories told, detailed the entire process of preparing, collecting and consuming seafood and the interrelatedness of the whole traditional food system. The stories would often start with the informants explaining that you need to collect the equipment that will be needed to access and collect or catch seafood. People would often use their knowledge of the season and the weather to select what seafood to target. Informants would then describe the gathering of family and travelling to the fishing location which was usually on the informant’s traditional country. Once at the destination, which sometimes could be a several hours drive from Maningrida community, the specific camping location would be selected which would often be near the beach due to the close proximity to fishing sites “camp on beach” (yarning session, male). Family members would work together throughout the day to gather food and then return to camp to prepare, cook and consume the food. The stories often incorporated information on social, kinship and cultural characteristics of the experience that were important to the telling of the whole story. This whole experience made people feel good and connected to the other themes identified such as country, health, respecting Elders and culture. All Informants had positive memories of gathering seafood with family on country and found it difficult to be disconnected from culture and identity when they were unable to live the experiences of fishing with family.

5.8. Intergenerational knowledge transfer

This highly emotional theme was identified from a question asked to informants about why it is important to pass knowledge on to the younger generation and how this can be done, as well as the role seafood plays in this. Informants described inter-generational knowledge transfer as an important aspect of affecting the health of the community as it plays a role in ensuring that knowledge of seafood is passed on to the younger generation. Informants wanted to ensure that the younger generation have knowledge of which seafood species to target for food and which are potentially dangerous such as poisonous sting-ray barbs and cat-fish spikes: “knowledge transfer of dangerous fish too” (yarning session, male). The importance of this knowledge for identity and culture was also stressed. Informants wanted to ensure that the people of Maningrida were eating their own culturally significant food and that the younger generation know which seafood is important for their culture and spirituality “eating their own food” (yarning session, male). Young children learning how to make and use both modern fishing equipment as well as the fishing spears and nets of their ancestors was stressed. Informants strongly believed that this knowledge should be incorporated into school education and schools. They explained how ‘on country’ learning was already happening at the Maningrida school through the ranger program “Catch easy with spear” (yarning session, male), “schools have role in intergeneration knowledge transfer” (yarning session, female), “traditional fishing methods” (yarning session, male).

5.9. Interconnectedness

An overarching theme is the interconnectedness Aboriginal people in Maningrida have with their knowledge systems and how this is represented and reflected. While no informant stated explicitly that the knowledge system is interconnected, informants spoke of the importance of accessing country, culture and intergenerational knowledge transfer in their story of why seafood is connected to nutrition, health and wellbeing. For example, an informant described taking a younger family member to country to learn how to make a fish-trap, which is an important cultural tool for catching fish. The informant described this process of teaching and passing knowledge down ‘*go outstation and learn fish trap a part of culture*’ (yarning session, male). When yarning about nutrition, health and wellbeing it was difficult to separate seafood from this interconnected story as animals, plants and country were all important for health. Informants explained in great depth the importance of balance and consuming all Aboriginal bushfoods including seafood. When prompted to explain further what it means to consume all Aboriginal foods it was explained that a variety of foods are needed to stay healthy “*variety of bush foods fresh water and salt water are important*’ (yarning session, male).

5.10. Barriers to accessing seafood

Barriers that restrict Aboriginal people’s access to seafood in Maningrida play a role in how seafood impacts nutrition, health and wellbeing. Informants told stories as a way to describe the wider burden and impact that lack of access to seafood has on their community’s nutrition, health and wellbeing. This theme emerged from questions relating to how nutrition, health and wellbeing could be improved in Maningrida using seafood. Informants spoke in detail about the disruption to knowledge transfer due to many barriers including drugs, alcohol, family disturbance, sick people and fishing regulations that make it difficult to access seafood. It was stressed that these barriers impact on people’s health and wellbeing in many different ways, such as causing emotional distress and disconnection from country and culture, which in turn affect people’s spirit. Informants expressed the worry they had for the younger generation and young people’s “Lack of knowledge” (yarning session, male), due to older family members or knowledge custodians being affected by these barriers. The physical health condition of the Elders in the community was a concern as it was explained that some people are physically impaired and/or inflicted by chronic disease and cannot take the younger generation to country to learn about seafood as well as to access seafood for themselves “people can’t move to access” (yarning session, male). It was greatly concerning for informants that “substances” (yarning session, male) including drugs and alcohol impacted inter-generational knowledge transfer as well as exacerbating “family disruption” (yarning session, male). Informants strongly believed that substance misuse was diminishing inter-generational knowledge transfer. Other barriers referred to include the restricted access for community members to purchase the fish caught through the fishing enterprise: “night market only one night a week, restrictive” (yarning session, female). It was also reported that people who purchased the fish would have to cook it immediately or within a day or so due to a lack of storage equipment in their homes such as freezers and refrigeration. This made for a difficult choice as informants felt they had to decide on whether to buy fresh nutritious seafood from the fishing enterprise in Maningrida or processed food such as tinned meats with a longer shelf life. This choice is significant for diet quality as tinned meats have traditionally been high in sodium. Informants were aware of this but needed to make these decisions for food security. Previously, in early years of the fishing enterprise start up, the fish was cooked on a barbecue style and sold. This pre-cooked fish was popular; however, this was ceased due to food safety concerns. There were also concerns that seafood accessibility in the future could be impacted by the effects of environmental changes such as reduced species

reproduction: “breeding concerns” (yarning session, male).

6. Discussion and policy implications

This study applied a qualitative approach to realise how coastal Aboriginal people in Maningrida community conceptualise nutrition, health and wellbeing in connection to seafood. The applications of ‘Indigenist’ inquiry lens with ‘yarning’ as the data collection method were applied as the authors attempted to position Indigenous values in research as a resistance to dominant colonial discourse (Bessarab & Ng’andu, 2010; Rigney, 1999; West et al., 2012). This study provides an original contribution to research that realises the importance of incorporating and advocating for both Indigenous values connected to seafood and the opportunity for nutrition sensitive policies within fisheries to improve nutritional and health outcomes for coastal Indigenous people. This would align to global calls for action to improve the livelihoods and health of Indigenous people such as ‘Health in all Policies’, ‘Strengthening Sector Policies for Better Food Security and Nutrition Results’, ‘United Nations Declaration on the Rights of Indigenous Peoples’ and the ‘The White/Wiphala Paper on Indigenous Peoples’ Food Systems’ (FAO, 2016, 2021; UN General Assembly, 2007; WHO, 2019).

Collectively, seafood for the informants in this study, was considered beneficial for themselves, their families and the wider community through the fulfillment of Indigenous values. Several of the values the informants manifested in relation to seafood have similarly been described in the Indigenous health and wellbeing literature such as ‘connection to country, kinship, spirit and physical health’ and the interconnectedness to the socioecological system (Brimblecombe et al., 2014; Butler et al., 2019; Fredericks et al., 2017; Gee et al., 2014; Noble et al., 2016). This study also draws attention to Aboriginal people’s ability to connect and represent their traditional knowledge system within governance structures to reduce barriers to accessing seafood, which has been described in the literature and policies as an underlying principle of ‘self-determination’ (Rademaker & Rowse, 2020; Yap et al., 2018). The reduction in barriers is seen as a way that would enable the sharing of seafood to Elders and family who are unable to access it themselves which would fulfil cultural obligations (Shepherd, Li, & Zubrick, 2012). Seafood was also described by informants as being a part of their identity with inherit customary connections and is connected to wellbeing (Gall et al., 2021). Cultural practices linked with seafood is expressed in many ways however, for the informants it is viewed as a means to respecting ancestors and spiritual health; this is described in Aboriginal health literature as a means of connecting with “deep wellbeing” (Grieves, 2009, p. 7). The expression of culture and access to country is also a mechanism for intergenerational knowledge transfer which is critical for cultural continuation and survivability (Nakata, 2002b). In addition, seafood was also described as providing nutritional nourishment, protecting health and providing the potential for greater economic growth in the community through business opportunities.

6.1. Indigenous self-determined policies

As described Indigenous people globally have greater health disparities than benchmark populations (Anderson et al., 2016). The magnification of these health disparities has brought attention and resources to the topic of inequity; however, literature has continually highlighted the failures of Indigenous health and wellbeing research, frameworks and policy, with Indigenous people often seen as the problem (Aldred et al., 2021; Fforde, Bamblett, Lovett, Gorringer, & Fogarty, 2013; Watego et al., 2021). In order to shift this pathologizing view of Indigenous health, global agendas such as ‘United Nations Declaration on the Rights of Indigenous Peoples’ have called for the self-determination, rights and interest of Indigenous people to address their concerns and interest (UN General Assembly, 2007). This is important when considering this study, as the values shared by the informants highlighted that their integration with their ecological system connects

their Indigenous values with nutrition, health and wellbeing. This concept needs to be reflected in policies that represent Aboriginal values; this has similarly been identified in natural resource management literature (Gratani, Bohensky, Butler, Sutton, & Foale, 2014; Sangha, Le Brocq, Costanza, & Cadet-James, 2015).

6.2. Nutrition sensitive policies in fisheries

Currently discourse surrounding ‘nutrition-sensitive policy’ agendas globally are particularly focused on agriculture, maternal nutrition, gender and dietary diversity with little focus on sectors like fisheries despite fisheries being an industry based around food (FAO, 2017; Ruel & Alderman, 2013; Thilsted et al., 2016). This study amongst other literature has highlighted the importance of coastal Indigenous communities’ connection to seafood which is vital for livelihoods, nourishment, food security and Aboriginal values (Farmery et al., 2020; Jentoft et al., 2018a; Marushka et al., 2021). Global literature has also recognised the lack of Indigenous food provision values represented within fisheries and mariculture policies, such as the importance of providing for families and older people through customary sharing or cultural obligations (Arthur et al., 2022; Fisher et al., 2017; Koehn et al., 2022; Toussaint, 2014). From the findings of this study and existing literature, global aspirations to improve the health and wellbeing outcomes for Indigenous people need sectors such as fisheries to incorporate Indigenous values and realise the nutrition, health and wellbeing benefits. Considering this, nutrition sensitive policies need to ensure not to overlook the potential positive contribution of seafood to Indigenous people’s diets, livelihoods, food security and Aboriginal values and thereby health and wellbeing outcomes (Allison et al., 2017; Cisneros-Montemayor et al., 2016; Durie, 2004; WHO, 2019).

6.3. Suggested action

It is clear from this study that in Maningrida access and consumption of seafood can be realised as a pathway to healthier food provisions. In order to achieve this, there needs to be a greater investigation into the role of integrative nutrition sensitive policies within sectors such as fisheries. This study has highlighted that nutrition is not a standalone health concept from the lens of an Indigenous person but is inclusive of an interconnected system of values (Brimblecombe et al., 2014; Martin & Mirraboopa, 2003; Murrup-Stewart, Whyman, Jobson, & Adams, 2021). In order to represent these values outside of a vacuum there needs to be a multi-sectoral approach that incorporates the needs and concerns of the community and reflects interconnectedness (Gee et al., 2014; Verbunt et al., 2021). A greater degree of self-determination principles and Indigenous values needs to be conceptualised and recognised in nutrition sensitive policies to incorporate a holistic view of the role of seafood has in improving health and wellbeing outcomes for Indigenous people (Bryant et al., 2021; Wilson et al., 2020; Yap et al., 2018).

7. Strengths and limitations

The strengths of this study include the methodological approach of utilising an Indigenous lens to contextualise Aboriginal perspectives. The ‘Indigenist’ inquiry lens enabled the lead researcher to feel comfortable utilising their Indigenous identity to explore together with the informants, research that is focused on community concerns such as strengthening the role of fishing for Aboriginal people (Rigney, 1999; Wilson, 2008). The lead researcher-built trust and relationships with the Aboriginal community of Maningrida through consultation, existing relationships, cultural identity, significant time and listening (West et al., 2012). A limitation to this study is the time with informants; it was initially planned to incorporate a greater number of field trips with more informant yarning. During the Covid-19 pandemic many places in Australia had travel restrictions and the location of this study had been

impacted by such restrictions. Therefore, the lead researcher was unable to travel to the community as often as originally planned. While phone and video interviews were considered it was deemed inappropriate due to the lack of phone and internet services in the community. However, the lead researcher remained in communication with some informants throughout the duration of the study and had opportunity to do several follow up sessions via zoom. Another limitation was the use of language. There were resources available to conduct yarning in Aboriginal languages, but all informants declined and believed their English was sufficient. However, in some circumstance's language, culture and metaphors/words were difficult to translate. The results of this study are able to reflect a generalised view of how Aboriginal people in Maningrida connect to seafood, however caution must be taken when applying the results to the general Maningrida population due to the limited informant size as not all language groups from the Maningrida region are included in the study and therefore creating a framework or conceptual model is not appropriate without further investigation. It would be assumed that seafood holds important meaning for Aboriginal people but the individual values reflected in this study may not represent all Aboriginal people in Australia. This study does however offer a local contextualised deep insight into the knowledge system of a remote Aboriginal community in the NT, who continue to access their seafood resources for individual, family and broader community needs.

8. Conclusion

An 'Indigenist' inquiry lens and 'yarning' method were applied to this study to realise the nutritional, health and wellbeing connection of seafood for Aboriginal people in Maningrida community located in the Northern Territory of Australia. The findings demonstrate that seafood is interconnected to Indigenous knowledge systems and incorporates key values that are important for the wider community to sustain and maintain a connection to health and wellbeing. These findings highlight the need for future policies and research agendas to incorporate integrative approaches that consider a wide degree of key concerns impacting individual communities. When considering seafood in the context of Indigenous people it must be acknowledged that seafood is not only for subsistence or an economic commodity but is also integral to Indigenous values. While further research is needed a possible suggestion identified by the authors is for more research that applies Indigenous research paradigms to enable Indigenous representation within academic literature and policy. One such practical suggestion is to analyse policy, strategies or initiatives that impact coastal Indigenous people and to assess if Indigenous values are represented beyond the framing of economic and political development.

CRedit authorship contribution statement

Beau Cubillo: Conceptualization, Funding acquisition, Methodology. **Julie Brimblecombe:** Conceptualization, Funding acquisition, Methodology, Supervision. **Natasha Stacey:** Conceptualization, Funding acquisition, Methodology, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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