

Climate Change and Adaptation on Karajarri Country and 'Pukarrikarra' Places



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'Seeing Country' by Nyaparau Laurel

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Nulungu
Research Institute
The University of Notre Dame Australia

WARNING: This document may contain images and names of people who have sadly passed away.

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Cover Artwork: 'Seeing Country' by Nyapuru Laurel

Nyapuru Laurel was a Walmajarri artist and educator from the Kadjina Community (part of Millijidee Station) in the Kimberley region of Western Australia on the edge of the Great Sandy Desert.

Along with her sisters, brothers and mothers, Nyapuru advocated to set up the remote Wulungarra Community School and, through her work, contributed to the passing on of knowledge of the land, law and culture to future generations. She passed away in August 2015.

Extracts from 'Seeing Country' are also located throughout the document.



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Acronyms

AIATSIS:	Australian Institute of Aboriginal and Torres Strait Islander Studies
KTLA:	Karajarri Traditional Lands Association
Nulungu:	Nulungu Research Institute, The University of Notre Dame Australia, Broome Campus
UNDA:	University of Notre Dame Australia



Figure 1 Corkbark (fishing place), Karajarri Country.

ABSTRACT

I am a Karajarri woman and one of the Traditional Owners of Karajarri Country. I come from Bidyadanga Aboriginal Community which is on Karajarri Country, approximately 190 km south of the township of Broome in the Kimberley region of Western Australia. I am a linguist, interpreter and researcher at the Nulungu Research Institute, located on the Broome campus of the University of Notre Dame Australia, on Yawuru Country. I am often required to bring together traditional knowledge and Western rationalist approaches to knowledge generation in my research endeavours.

The aim of the project described in this paper was to explore people's concerns around climate change on Karajarri Country. It reflects on my cultural background, knowledge, traditional language and beliefs concerning changes to Country caused by changing climate. It also includes the ways my people adapt to changes to Country. During the research, Karajarri People talked about the importance of culture and heritage, and the importance of protecting Karajarri '*Pukarrikarra*' (dreaming) places from changes to the land and waters. The importance and connectedness of language to Country is highlighted, and the significance and value of Country is demonstrated through our spiritual understandings and cultural practices, especially around climate change on Karajarri Country.

INTRODUCTION



My name is Anna Dwyer. I am a Karajarri woman and one of the Traditional Owners of Karajarri Country. I come from Bidyadanga Aboriginal Community which is on Karajarri Country, approximately 190 km south of the township of Broome in the Kimberley region of Western Australia. I am a linguist, interpreter and researcher at the Nulungu Research Institute, located on the Broome campus of the University of Notre Dame Australia, on Yawuru Country. In conjunction with the Karajarri Traditional Lands Association (KTLA), the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) and the University of Melbourne, I collaborated on a Climate Change Adaptation Research Project during 2012. I worked as a researcher with this team for six weeks.

The aim of the project was to explore people's concerns around climate change on Karajarri Country. This involved explaining what the overall effects of climate change may be and how we may be able to minimise its impact on the community. As a researcher, I asked the people who will make decisions responding to climate change many questions, including what role the KTLA should be playing on Country in regional planning. I also talked to Karajarri people and community members about how they feel about climate change, the risk factors for Karajarri Country and how to manage the effects of climate change. In addition, the research partners looked at the priorities for Karajarri culture and the people's relationship with Country. I also spoke to members of the community about their cultural governance structure and heard cultural stories of Country and waters on Karajarri land.

To produce this report I used my cultural knowledge and language, to ask Traditional Owners about challenges around climate change adaptation on Karajarri Country. Karajarri People talked about the importance of culture and heritage around the changes to country and the protection of Karajarri 'Pukarikarra' (dreaming) places from change to the land and waters. Through my research endeavours in the Climate Change Adaptation Research Project, the information I collected from the Karajarri Traditional Owners gave me the opportunity to understand more deeply about changes to Karajarri lands and waters. During this research project, I had the opportunity

to reflect on research protocols and processes commonly used when conducting research with Aboriginal people and how to accomplish research work properly and effectively. I discuss this further below.

The primary data presented here is also supplemented by material collected by various anthropologists who have worked with Karajarri people over the last few decades, and which relates directly to questions around climate change. Through Nulungu, I participated in other projects such as the Caring for Country plan¹, and I understand the challenges we face to look after Country in the right way. Country is a beautiful place and, as the Karajarri people, we need to learn to adapt to the different weather patterns and other effects of climate change so we can protect Karajarri Country, and ensure that the Bidyadanga community is a healthy place, and a functional place, for Karajarri people and other groups who live there.

My keen interest is in working with my people and I hope to be able to contribute to further important collaborative research projects and initiatives in the future. The Climate Change Adaptation Research Project has given me the opportunity to explore and work closely with other researchers and the Traditional Owners of Karajarri Country.

¹ The *Kimberley Aboriginal Caring for Country Plan* is the result of decades of pressure from Kimberley Aboriginal people — in meetings, during consultations and in the practice of looking after the land — about the need to be resourced to keep Country healthy. This can be done through the Elders, through language and through cultural activities (Griffiths and Kinnane 2011).



Figure 2 Sand dunes, pushed back from high tides at Whistle Creek (fishing place) in 2014.

BACKGROUND

Karajarri Country

Karajarri Country is very important to all people living in Bidyadanga and surrounding communities and outstations. Local activities include fishing, hunting and gathering of bush fruits when they come into season. Karajarri Country covers the seas, the land and coastal areas. Karajarri people have maintained a connection to *Pukarrikarra*, (creation ancestral being) which has existed from ancient times to today, through the storyline belonging to Karajarri Country, and other *Pukarrikarra* (dreamtime places) and stories about underground water flows that extend to other places such as Wolf Creek Crater, located in the central Kimberley region, to the south of Halls Creek. Anthropologist Geoff Bagshaw (2003:86) described Karajarri Traditional Owner rights and responsibilities to Country in his anthropological native title claim report as central to Karajarri life and culture:

Karajarri People hold the full sole and inalienable authority and responsibility for, and in respect of, their traditional territorial domain as the eternal source and sustaining foundation of all life.

We call this '*wankayi*', meaning alive.

Karajarri people have an obligation to care for Country in the right way, and monitor the possible impacts of climate change. Traditional knowledge relating to weather, and how seasonal shifts are manifest in plants, animals, tides, storms, streams and groundwater flows all combine to form a unique and holistic view of Karajarri Country. While Western scientists gather data from many different sources to demonstrate that climate change is occurring, and argue about the accuracy or extent of the climate change story, Karajarri Traditional Owners bring their own wealth of knowledge of Country, their keen observations, and have their own views about what is happening to the climate, and how this is impacting on Country and on people residing on Country.

Karajarri Country and Bidyadanga Community

Bidyadanga Aboriginal Community is located in Karajarri Country which comprises 31,000 square kilometres of land and is the traditional homelands of the Karajarri people. Native Title for Karajarri Country was determined through three different claims that were handed down by the Federal Court of Australia in 2002, 2004 and 2012 (*Nangkiriny v Western Australia* (2002) 117 FCR 6; *Nangkiriny v Western Australia* [2004] FCA 1156; and *Hunter v State of Western Australia* [2012] FCA 690).

The name Bidyadanga comes from a Karajarri word for 'emu watering hole' (*pijarta*).

Around 850 people permanently reside in Bidyadanga community (WA Department of Planning 2013). Crucially, the population at Bidyadanga also includes members of another four language groups — *Juwali*, *Mangala*, *Nyangumarta* and *Yulparija*. These neighbouring language groups were displaced, sometimes violently, from their traditional lands from the 1950s onwards, as part of government policy which sought to 'bring people in' from the desert. Many were brought to the La Grange Mission, which operated in the area where Bidyadanga community now is, from 1956–1981. There are also a number of non-Indigenous people living and working in the community. Bidyadanga is the largest remote Aboriginal community in Western Australia, and services a number of family outstations that radiate from Bidyadanga.

Local Organisations

Climate change will bring new challenges to the organisations and the governance environment of Bidyadanga and beyond. The business of Karajarri Traditional Owners is managed by the KTLA, while the Bidyadanga Aboriginal Corporation (known locally as the 'Bidyadanga Council') has historically managed community affairs, since the days before Native Title. The latter organisation represents all people that live in the community, across all language groups.

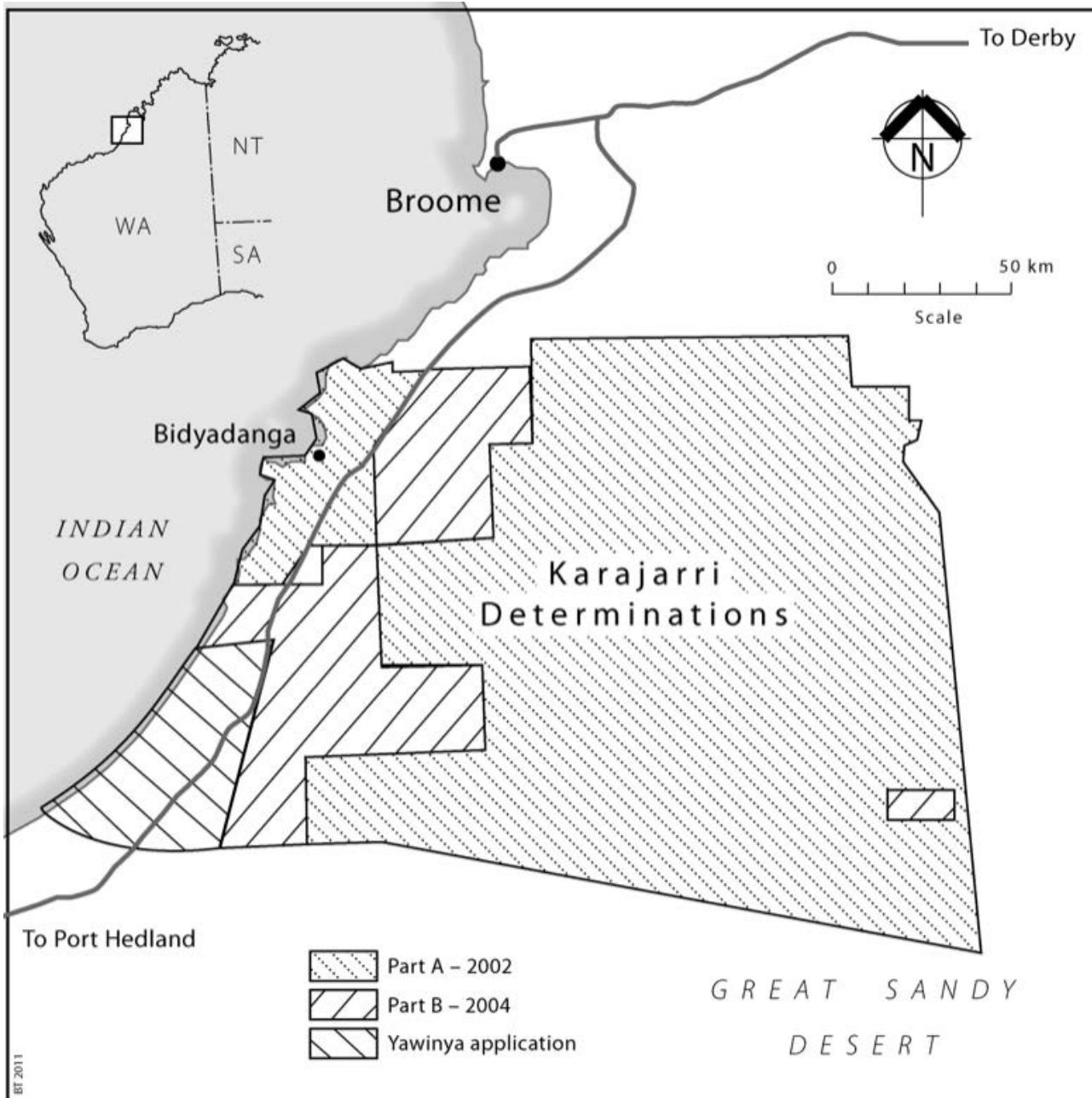


Figure 3 Map of Karajarri Country showing the area of lands claimed by the Karajarri people (from Weir, Stone and Mulardy 2012).

As Traditional Owners, Karajarri people feel responsible for managing the effects of climate change on Country. In practical terms, this will require the KTLA and the Bidyadanga Council to work collaboratively, and to work alongside other state and federal government agencies who also have obligations around land management.

Karajarri people have the ability, knowledge, and opportunity to make decisions on their land and decide how the land can be used effectively. The Bidyadanga Council and KTLA members are slowly working together for the future. While KTLA is directed by the Traditional Owners, climate change is something that will affect the entire community. Local organisations will therefore need to work together to address the impacts, and build a community-wide and inclusive response.

STUDY METHODOLOGY

A list of questions were developed by myself and AIATSIS researchers in advance. Before conducting interviews, the research team travelled to Bidadanga to hold a workshop in order to introduce the idea of climate change to Karajarri people, as well as the benefits that the research might bring to the community.

For the interviews, I stayed and worked in the community for six weeks. Interestingly, while we were talking about climate change the temperature increased. During the time of the interviews, it was extremely hot, many bush fires were around the community, and so people were deeply aware of the changes happening on Country. To undertake my research, I set up a community outdoor office based at my uncle's house so I could have somewhere to work.

Gaining consent and assuring confidentiality

Before asking any questions, I explained the project and asked community members for their consent to talk about climate change. I also explained that every detail that was gathered would be confidential and stay safe.

Analysing results

In all, I interviewed eight people and they were recorded on a digital recorder. The interviews went for between one hour and two and a half hours. Interviews were transcribed and analysed back at the Nulungu Office in Broome. I was assisted in this process by Gillian Kennedy, Nulungu researcher and lecturer. Using butcher's paper, we looked at the transcript of each respondent's questions and determined common themes. In addition, we highlighted important parts from the recorded transcript to look at similarities from each of the questions gathered. Then, we came up with headings for the final report.

Reflecting on the research methodology

As a researcher, I found that the aims of the research became clearer after the analysis was underway. During the interviews I hadn't understood what the

other researchers meant about 'Climate Change Adaptation' and when I started on the analysis this became clearer. At this time I realised that the questions should have been written in a way more appropriate to Aboriginal people, rather than the '*kartiya*' (non-Indigenous) way. This is a common problem for *kartiya* researchers working with our communities. Even though they tried to explain it beforehand and asked me if I could make suggestions about the questions, I still wasn't confident and didn't feel comfortable altering other people's work. Looking back, it would have been better to spend more time face-to-face with the researchers at the start (rather than over the phone and emails), working together slowly, to make sure that the questions they were asking were going to get the information they were looking for.

It is important for outside researchers to understand that while we know there are specific questions they wish to have answered, Karajarri Traditional Owners operate Karajarri way. People may listen, but feel the need to consult other community members before responding so as not to break protocol or speak on issues they may need other people's permission to discuss. Knowing this, I stayed longer in the community, discussing issues over time and waiting until people were ready to be interviewed. They had time to reflect and talk with others, which meant that interviews represented many more hours of discussion and consultation, and appropriate people were chosen to speak — right people for right Country.

I also supplemented the approach with a methodology known as auto-ethnography (Ellis, Adams and Bochner 2010). Auto-ethnography is a form of inquiry whereby the autobiographic materials of the researcher are utilised as a primary data source. As a traditional Karajarri woman, with considerable responsibilities to Country, my own personal reflections on the matter of climate change are also a part of the story to be told.



Figure 4 Anna Dwyer in her 'outdoor office' at Bidyadanga Aboriginal Community (photo by Jessica Bangu).

RESULTS

Cultural Concerns

Seasonal changes and their impact on food sources

Seasonal changes are currently happening and half of the respondents said that climate change may have an impact on them and the livelihood of the community. In the past, seasonal changes were more predictable and, as such, people knew when to hunt for animals and bush tucker, and that the system had been consistent for as long anyone could remember.

Some weather events also can be read through the *Pukarikarra* (dreaming). According to Yu (1999:19):

Evidence of active pulany (water snake) is the formation of clouds and the generation of storms, with lightning and rain.

Some of the respondents personally have found that seasonal signs are no longer reliable. For example, 'heat' used to give signals for the clouds to form rain, and certain flowering plants are a sign of particular seasons. People observed that it can be extremely hot in the evenings and people can see the black clouds forming, but still no rain. Such unusual weather patterns are confusing for the people living in Bidyadanga. In addition, people know fruiting times for bush tucker is important, but have noticed that the flowering times are indicating the wrong season, for example '*nyaminyarri*' (*Terminalia ferdinandiana*, billy goat plum) traditionally fruits and is harvested in *Mankala* season (December–March). However, Karajarri Rangers have noticed that *nyaminyarri* has been increasingly fruiting in *Marul* season (March–May). This is also a concern to local people.



Figure 5 *Hibiscus apodus* commonly found on the beaches near Bidyadanga.



Figure 6 Morning glory (*Ipomoea pesaprae*) and vine commonly found on the beaches near Bidyadanga.

Karajarri people rely on the sea for essential food sources. Some of the respondents noticed hotter temperatures are affecting the patterns and predictability of coastal and sea food resources. For example, salmon usually run in *parrkana* season (cold weather). However, people reported during the course of these interviews that they were catching salmon in the hot season:

That's strange and people going fishing and they getting salmon and, you know, and it's not time for the salmon season.



Figure 7 (Above) Tracks cut off by high tides near Rollah (fishing place).

Figure 8 (Right) Roebuck Bay, 2012 (photo by Louise Beames).



In addition, increasing heat is making access difficult. On one particular day during interviews the temperature reached 41.5 degrees (BOM 2012)! This made access to important places for traditional coastal food sources almost impossible. Tracks leading to fishing areas were harder to drive on due to higher tides and erosion.

Another phenomenon that people were very concerned about is jellyfish blooms. In 2012 the beaches around Bidyadanga were covered in red jellyfish². People noted that in the past, on red warm water called 'kalamunta', you might see numerous jellyfish glued together floating on top like an Aboriginal dot painting. In fact in, Karajarri language, *kalamunta* is also another name for jellyfish. But people have no recollection of seeing jellyfish in numbers like those witnessed in 2012. People expressed concern about the effect of jellyfish blooms on their fishing and fishing places.

Some people were also worried that coral ocean reef fish are affected by warmer water too, and sea animals may migrate elsewhere further south, again leading to less available traditional food sources.

While seafood is considered the most important food source for the community, people also regularly practice the hunting of inland animals. Five out of eight people interviewed said that animals are harder to find for hunting on Karajarri Country, and that this may be related to lower rainfalls, and heat waves. One respondent interviewed said:

What we hunt for like kangaroo and turkey and stuff, you don't see them here anymore.

Respondents also commented that in some areas the waterholes are drying up.



Figure 9 Jellyfish in Roebuck Bay, 2012 (photo by Louise Beames).



Figure 10 Dianne and Anastasia Hopiga collecting oysters at Black Rock.

² For a media report on the jellyfish, visit <https://au.news.yahoo.com/thewest/a/14842122/broomes-quivering-red-sea/>



Figure 11 Jellyfish bloom, 2012 (photo by Kandy Curran, Roebuck Bay Working Group Inc.).

Fresh water and rising sea levels

In the early days, a lot of *'pijarta'* (emus) used to live and roam around the Karajarri Country and drink from the water holes called *'pitjatangka'*³. As discussed earlier, the word Bidyadanga comes from a word for 'emu watering hole' (*pijarta* or *'bidyada'*), demonstrating both the literal and spiritual importance of water in this area. In order to appreciate the cultural significance of ground water, it should be noted that all of the respondents commented about the importance of water to the Country and the environment. Water is our life on Country. This of course is true for all cultures, but particularly true for arid coastal regions in the north of Australia — the availability of fresh water throughout the long dry season has always been vital to people of the area.

Some of the respondents interviewed said 'water' revolves around the story line of our *Pukarrikarra* dreaming and creation stories. Some of these stories are about *'pulany'* (water snakes) which live in *'jilas'* (springs, waterholes):

Some Pukarrikarra are said to have travelled through the Country, naming places and, in many instances, transforming themselves into environmental features. For example hills, stones, tree, and water places (Yu 1999:16).

Some people were concerned that our water holes are drying up around Bidyadanga. If this happens, then this becomes a major concern to the Karajarri people who are responsible for this Country:

We have to look after this water. If the water go, everything will be finished. Life gone. Spirit gone. People gone. The Country will have no meaning (Yu 1999:32).

People interviewed for this research worry about how the impact of climate change may affect our water wells and that our drinking water may be drying up. They worry that the fresh water might become saltier and not good for re-growth, vegetation, and lasting springs. The longer dry season, less rain and hotter weather will mean greater evaporation, water

in coastal areas will be saltier and, overall, less fresh water will be available.

Seventy five per cent of respondents (six out of eight interviewees) have concerns for rising sea-levels and erosion on Karajarri Country. Most could provide examples of erosion occurring in the region, especially the fishing areas in and around Mud Creek:

... the main area is Mud Creek ... the most places where we go fishing it's just like it used to have hills, now it's all flat (Community interviewee 2012).

³ Today *pijarta* are hard to find; it is thought that they may have moved inland or further south.



Figure 12 Coastal erosion from sea level rise has already claimed one bough shed at Whistle Creek. The remaining one shown here is clearly also under threat from coastal erosion.

Significant burial sites

Traditional Owners have carefully chosen the community burial grounds. These sites were explicitly selected because they were safe from water or storm damage. The old people who chose these sites could not have envisaged the current problem of changing sea levels and new levels of storm intensity. Some of the respondents interviewed were worried about human remains that have been found washed up, or shallow graves near the sand dunes being exposed by erosion. For example, one respondent commented that:

...finding these bones, these human bones on the beaches being washed up because of the high tides ... it sort of indicate to you that old people used to bury these bones further back into the sand dunes and it didn't affect these bones in the early days when they were laying down.

'Lalarrjartu' is another significant burial site, where ancestral remains repatriated from overseas were re-interred in October 2011. This is another burial site that we will worry about in the future, especially with sea level rise and increasing storm surges from cyclones.

Other cultural sites and fishing places

At the Climate Change Adaptation on Karajarri Country Workshop in August 2012, people identified significant sites, amongst which were waterholes (*jilas*) and fishing places. Some of these places include: *Nankuna* (soak), *Nankuna* (fishtrap), *Palitangka* (fishing place), *Wapuna* (fishing place), *Witirrimal* (spring), *Wangkupalpal* (spring), *Wanangurta* (spring), *Injitana* (spring), *Piliny Pilinyja* (soak), and *Punturrpunturr* (soak).

Half of the respondents interviewed expressed their concern about the risk of Country changing and worry that sea level rise, high land and air temperatures, fires, cyclones, and storm surges are a threat to Karajarri Country. These special places are frequently monitored by Karajarri Rangers and people living in the community.

According to a Karajarri Elder, near *Lalurrjartu* there is a red hill where the bubbly fresh water meets with salty water we call 'warrwarrjangka'. This Elder recounted a *Pukarrikarra* (dream time) story for that place:

Long time pukarrikarri jangka in that place, near Lalarrjartu old woman use to hit 'emself on kurnkulu (head) and bleed 'emself' e cry too much for old people big mob blood waste on ground like tears (pers. comm. April 2013).

This unique place is significant and must be sheltered from storm surges, erosion and the impacts on climate change according to this story. That is why the red hill represents blood from the *Pukarrikarra* from that dreaming place.



Figure 13 Burial site at Lalarijartu, near Black Rock fishing place, 2012.

Environmental Concerns

Heat

Six out of the eight respondents talked about how they have felt the extreme heat, and that they know it has become substantially hotter than usual. Karajarri people are concerned that hunting practices are being affected because of climate change, and the heat is one factor of this. The hotter temperatures are extreme, even for people who are used to very hot weather. According to the Bureau of Meteorology (2013), maximum temperatures were “well above average for WA as a whole, with the State recording its ninth-warmest year on record”, supporting the observations made by the interviewees at Bidyadanga. Furthermore, “monthly mean maximum temperatures ... were consistently above average from April to December 2012, and WA recorded its third-warmest April to November period since comparable records commenced in 1950” (Bureau of Meteorology 2013).



Figure 14 Evidence of melted pen left on car dash board during the Climate Change Adaptation Research Project, 2012.

Fire

At the time of conducting the fieldwork at Bidyadanga in November 2012, there were fires near Munroe Springs, Shamrock Station and Mil Mijil Miya Community. The smoky air and hot wind hovered over Bidyadanga and 25% of the Karajarri people interviewed said that this will have an effect on animals and plants (food source) to regrow, and that the smoky air was making people sick. Cultural burning is important to Karajarri people and this means that the land is clean, ready for new regrowth of vegetation such as grassland, and easier for hunting practices. However, the people believe there will be more fires and smoke happening due to hotter temperatures and this is one impact to the health (both physical and spiritual) of our people living in the community.

People’s health and wellbeing would also be affected due to the changing weather’s effect on the sea and Karajarri Country.



Figure 15 Anna Dwyer in her outdoor office transcribing interviews at Bidyadanga (photo by Felicity Brown).

Community Concerns

Emotional and physical wellbeing

People who are living in Bidyadanga have seen many cyclones and storm surges locally, and three of the people interviewed are worried that tsunamis may occur in future. The people hear about tsunamis all the time, especially on the news or by radio and worry about what impact to Country may occur from such events. Most of the respondents said that these types of unusual weather patterns could wipe out the community and they worry that something unpleasant might happen due to climate change.

It is clear to me that the people are frightened and worried about the impacts of climate change, and how people are going to face these unexpected changes. I have listened and heard what the respondents said in the interviews and what they are saying about their fears. For example, one person said that:

... because we will be frightened you know how they get all these tsunami and things, we gotta be really careful for them and water in the ground, you know ... that's where we get scared and people do talk about these changing now, what you saying about this climate change
(Community interviewee 2012).

Education

I don't think the people in this community is realising that the climate is changing. All they know is bigger tides, or it's getting extra hot, you know, real boiling hot
(Community interviewee 2012).

In terms of the actual causes of global warming and rising sea levels, only one of the eight people interviewed attributed this to melting ice caps, suggesting that traditional and expert Indigenous knowledges about ecology and the environment are local, rather than global, knowledge.

A number of respondents interviewed are worried that the community is not learning enough about climate change and missing the proper information around different weather patterns. Some of the respondents know that weather changes can be serious and understand that education is important; however, this information must be factual and relevant, rather than television reports of disasters happening elsewhere in the world. Information should also incorporate both traditional Karajarri environmental knowledge and scientific evidence so that the community can take positive action to prepare for the local impacts of climate change, and to address people's anxiety about the matter.

Some interviewees suggested local workshops around climate change would be ideal for people living in Bidyadanga. The Karajarri people also want to see young people have more involvement around climate change. This approach could involve the cooperation of the local school, the 'Yiriman Project', Foundation for Young Australians, (an Aboriginal Youth and Culture Programme) and Karajarri Aboriginal Rangers' projects on Country.

Community housing

The Bidyadanga population has grown very rapidly in the past 20 years and it is expected that the community will continue to experience growth in the future. New houses have been built in the community and people have moved into them. Some of the respondents interviewed said that housing in the future need to be planned out and designed properly so it can handle severe cyclones, flooding and any unusual weather change. Karajarri people talked about having clean energy and suggested that plans for future housing should include solar power systems. A number of people were worried about the possibility of relocating inland, and about having to move to higher grounds due to the impact of sea level rises, stronger cyclones, storm patterns, erosion and hotter temperatures.

People also expressed worry about major damage to the infrastructure such as houses, airstrips, sewerage plants, water tanks and power (in the case of flooding). Proper planning for cyclone and storm response by emergency services, and with the community, might ease peoples' worries about these impacts.

Access to fresh food

If a major cyclone or storm event were to occur, resources like food and water might be significantly impacted for the people living in Bidyadanga. Very little food is grown or produced locally, with Bidyadanga being dependent on fresh food and dry goods trucked in from Perth. Future planning to be self-sufficient in terms of developing agriculture or market gardens should be initiated and discussed by Traditional Owners, KTLA and the Bidyadanga Community councils.



Figure 16 Dianne and Anastasia-Hopiga, having a feed of oysters when low tide at Black Rock near Bidyadanga Community (photo by Ms Felicity Brown).

MANAGING CLIMATE CHANGE ON KARAJARRI COUNTRY

The majority of Karajarri people interviewed feel that in responding to climate change, the first priority is taking care of the people living in Bidyadanga. Training and education about the possible impacts of climate change is a high priority and considered very important.

One point that was repeatedly raised as an essential element of managing climate change was that KTLA needs to build relationships and partnerships. This included firstly the Bidyadanga Community council, but also other agencies within the community, as well as state and federal government. The issue of communication was important, as was decision-making and good governance. This is discussed further in the next section.

Governance of Country, on Country

Some of the respondents interviewed said that the outstations need proper housing, vehicles and better services in case of a cyclone emergency, as cyclones may increase with climate change in the future. At present, if they are issued with a red alert cyclone warning, there is little adequate shelter or the ability to evacuate should the need arise. The planned cyclone shelter at Bidyadanga also needs to be finalised, but is waiting further funding to finish the project. When finished, this shelter will assist Bidyadanga's growing population in the face of severe cyclonic activity in future.



Figure 17 Karajarri Traditional Owners during the decision making process.

Rangers

Indigenous rangers across the Kimberley perform many activities to support environmental and cultural conservation. Activities include the management of cultural sites, tourism facilities, fire regimes, biodiversity, feral animals, weeds, pollution, and climate change impacts. Respondents were united in their insistence that it is not just the Rangers' role, but also all Karajarri peoples' role to manage climate change, including the people living in the community alongside the Karajarri Rangers. It was strongly suggested that everybody should help when a major impact of climate change happens, especially from severe cyclones, storm monsoonal and different weather patterns. It was agreed that the people should acknowledge that climate change is happening now and should act on it now, and not later. For example, community members can begin to assist the Karajarri Rangers by reporting any changes to Country that they are noticing on a day-to-day basis. This simple act of monitoring Country is one way that the whole community can be involved in managing climate change.

The KTLA and the Karajarri Rangers are already playing a role in climate change adaptation through their work such as town/community planning, water planning, coastal erosion monitoring, feral/animal eradication, and cultural mapping.



KTLA's partner in managing climate change: Bidyadanga Council

Some Traditional Owners said that to address the impacts of climate change on Karajarri Country, the whole community must work effectively as 'one'. It is very important that the KTLA and Bidyadanga Council continue to build a good relationship with each other to enable future planning about how to respond to climate change. Some people mentioned that there have been problems with the relationship between KTLA and the Bidyadanga Council in the past, possibly because there were few opportunities for working together. However, as one person noted:

... the current relationship ... has developed quite a lot over the years (Community interviewee 2012).

This is a positive step because dealing with climate change will require a joint approach.

The existence of tensions between a pre-existing resource agency, and the post-native title PBC — in this case, KTLA — are not exclusive to Karajarri people or to Bidyadanga (Tran Tran 2016). The emergence of Prescribed Body Corporates (PBC) — who have a Custodial and a legal responsibility to talk for and manage Country — has resulted in tensions with the existing historical resource agency structures which have traditionally had their own power bases not answerable to the PBC.

Despite these ongoing tensions, examples of good collaboration between these two organisations can be found in the three existing Indigenous Land Use Agreements already in existence, and signed in 2011 and 2012.

KTLA have made it clear that they are willing to take a leading role on climate change, but in order to do so, will need to be seen as legitimate partners in the process, as one respondent commented:

Figure 18 Incoming tide at Black Rock (photo by Felicity Brown).

... no endorsement or support by council, no endorsement or support by other stakeholders including the state and commonwealth, you know, if they don't acknowledge us as people on the ground wanting to do something to manage climate change then we only can do so much.

It is clear that barriers in communication between the KTLA and the Bidyadanga Council, government, government agencies and other stakeholders, and

issues related to governance and decision-making need to be tackled as an immediate priority for the benefit of the whole community.

In terms of barriers to resources for dealing with climate change, there is little or no funding for KTLA from governments to protect Country and people from cyclones and the different weather patterns. Funding is required for cyclone-proof housing on the outstations, to build the planned cyclone shelter at Bidyadanga and to provide training to act on climate change, and information and education to learn about the effects of climate change.



Figure 19 Karajarri Rangers, 2015.

RECOMMENDATIONS

The Karajarri people have suggested that any research by Nulungu needs to be returned to the community to provide feedback about where things are at in the community and discuss with the Traditional Owners what the future community planning should include. Recommendations emerging from this research include:

Local organisations and governance

Supporting opportunities for KTLA to achieve good governance structures and good relationships with the Bidyadanga Aboriginal Corporation and other government agencies.

Suggested Actions

- KTLA to undertake both strategic and governance planning and training.
- KTLA to look to employ an operations manager with suitable skills.

Ensuring that agencies such as Kimberley Land Council (KLC), KTLA, Bidyadanga Aboriginal Corporation and the Karajarri Rangers have a good partnership and continue talking with each other.

Suggested Actions

- KTLA to develop and sign a Memorandum of Understanding (MOU) with key partners.
- KTLA to develop communication strategy for sharing and exchange of information.

Community education

There needs to be a clear information pack developed in plain English, about the impact of climate change on Country and surrounding local Aboriginal communities. These could be left in the KTLA office, Bidyadanga community office and the local school so the people living in the community can access this important information. The KTLA and Bidyadanga Council could also consider making decisions that climate change can be a central platform of its work based in the KTLA office.

Suggested Actions

- Karajarri Rangers to develop monitoring project of seasonal calendar to be able to provide evidence of change around bush tucker and culturally important, plants, animals and food sources.
- Karajarri Rangers and Bidyadanga Council to develop information pack in plain English to educate the community.

First Aid training

People in the community would like to be given the opportunity to do first aid training, to have those skills in the case of any injuries occurring to people living in Bidyadanga from the impacts of natural disasters.

Suggested Actions

- Karajarri Rangers and Bidyadanga Council to continue to foster interagency training around First Aid, firefighting and other emergency services.

Community infrastructure and agriculture

There is a need for:

- Improved infrastructure and future planning for Bidyadanga community will help families adapt to the effects of climate change, such as improved designs of housing, making sure that there is efficient lighting, improved cooking stoves, and improved insulation and passive solar design for heating and cooling.
- Renewable energy: Housing in Bidyadanga could be supplied with solar systems to help prevent climate change to reduce reliance on fossil fuel consumption.
- Discuss further with Traditional Owners and the people about community needs and future planning, for example, the rubbish tip, roads, houses, cyclone shelter, and future education and training.
- Agriculture: talking to people about how to grow their own food and manage underground waters flows by learning horticulture skills, so they have a backup plan before and after any impact happens, especially on Country and in the community.

Suggested Actions

KTLA to:

- Follow up with Bidyadanga Aboriginal Corporation about the cyclone shelter for the community to find out how long it is going to take to complete.
- Develop a policy around the building of future houses and the need to consider sustainability principles.
- Lobby the Department of Housing to undertake to develop these sustainability principles.
- Work closely with Bidyadanga Council to develop a agriculture plan for growing community food.

Country and culture

Further research is needed into what it is the community want the Karajarri Rangers to monitor on Karajarri Country, e.g. sea level rise, salinity, plant and flowering times, changing of wild life numbers on Country and beaches. However, there are immediate actions the Rangers can take to ensure that climate change threats are being assessed.

Suggested Actions

- Karajarri Rangers to monitor all significant sites such as the *Lalarrujartu* burial site, from high tides, erosion and monitor our *jilas* and beaches on Karajarri Country.
- Karajarri rangers to ensure that tracks frequently used are not cut off from high tides and erosion so the community can access to traditional foods, such as bush fruits, fish, edible seashells, kangaroos and turkeys.
- KTLA and Karajarri Elders to meet and discuss about the removal of shallow gravesites to higher ground to prevent high tides and erosion from exposing human remains.
- KTLA to ensure the continuation of climate change monitoring by the Karajarri Rangers is put into the Indigenous Protected Area (IPA) work plan.

These are concerns of high priority, that the Karajarri people have a responsibility to bring forward to ensure that the IPAs and the people are safe from any different weather patterns and other effects of climate change.

RESPECT FOR TRADITIONAL KNOWLEDGE SYSTEMS AND COMMUNICATION

In earlier days, Karajarri people had enormous knowledge about seasonal changes and the change on Country. The Karajarri Traditional Elders have passed down this cultural knowledge and practices from generation to generation. On Karajarri Country, life is full with animals and birds, the right season it is very important and people know when to hunt for food and where to find it.

A written record of the seasons in Karajarri language exists in some documentation of Karajarri Country [see, for example, Yu (1999) and Bagshaw (2003)]. The seasons are: *Maruly* (dry season), *Wirrarrlpuru* (southeast winds, rains are finish), *Parrkana* (cold season), *Wilpuru* (warming period), *Laja* (hot season) and *Mankala* (rain season). As Aboriginal culture has traditionally used oral forms of communication, the written word is new and somehow unnatural compared to the oral passing down of knowledge and information, and people are reluctant to read the seasonal calendar, even if it is written in Karajarri language. At the moment, this written publication

is not being used by the people themselves, and intimate knowledge of Country continues to be passed down orally.

While it is important to document our community knowledge in different ways, including the written word, our people need to have this information shared in ways that they will own and use, such as through more trips on Country where Elders can share knowledge with young people and climate change can be discussed on Country.

Western knowledge often seems to assume that the Aboriginal oral tradition is not considered as equal to the written word in the eyes of the broader community (even with the best intentions). It is important to acknowledge that when we share information about climate change, people prefer yarning (talking face-to-face) because it attracts them and would be more effective in getting across the importance of the issue. We need to have both written and oral records.



Figure 20 Incoming tide at Whistle Creek (photo by Felicity Brown).

CONCLUSION

As a researcher and a Traditional Owner of Karajarri Country, I can see that the climate is changing now, and therefore Karajarri people need to act now rather than later. Karajarri people are Native Title Lands Owners and responsible for people from all language groups — the *Mangala*, *Juwaliny*, *Yulparija* and *Nyangumarta* people — living in the Bidyadanga Community.

The KTLA must work with other agencies such as KLC, Bidyadanga Aboriginal Corporation and the Karajarri Rangers to build good partnerships for examining future planning on Karajarri Country, and at Bidyadanga and surrounding outstations. With the increased pressure on the country through irrigated agriculture, increased wildfires and commercialisation of pastoral stations (including Fraser Downs Station) it is essential that we are watching Country carefully.

It is necessary for the KTLA to work with the La Grange School to deliver information about climate change to young people so that they can understand the impact of their actions on their environment and on Karajarri Country. These young people will be the future custodians and Traditional Owners, and will need to be able to manage the impacts of climate change themselves.

I am a Karajarri woman and researcher. From my own perspective, I worry about my Country, the effects of climate change and the challenges we will face in the community. As a Karajarri woman and cultural advisor, I believe planning is essential to get ready for these changes that we can already see coming, and that people will need to work together as 'one' especially for our Karajarri Country, the community and most of all the future of our generations to come.

Mapu yarra, Kaliyo,

Anna Dwyer.



Figure 21 Karajarri Traditional Owners during the decision making process.

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Author Biography

Anna Dwyer is a Karajarri Aboriginal woman from Karajarri Country, 190 km south of Broome in the West Kimberley, Western Australia. Her primary language is Karajarri. Throughout her life, Anna has resided in either Bidyadanga, Broome, or Derby.

Anna's primary and secondary education was completed at St Mary's Primary School in Broome, Broome District High School, and Pundulmurra College in Port Hedland. Anna's professional background is as a linguist. In 2005, she completed an Advanced Diploma of Australian Languages and Linguistics Studies at the Batchelor Institute of Indigenous Tertiary Education in the Northern Territory. In 2013, Anna completed a nationally accredited unit of competency entitled 'AHCILM404 Record and Document Community History' at Nirrumbuk Aboriginal Corporation in Broome.

Anna commenced her professional career as a Trainee Coordinator for Kimberley Aboriginal Law and Cultural Centre in 1982. During this period, she also worked to establish the Goolarabooloo Aboriginal Arts and Craft enterprise in Broome. Subsequently, she left Broome to commence working with the Kimberley Land Council (KLC) in Derby. Between 1992 and 2004, Anna performed a range of support roles for the KLC CEO, Directors, Book-Keeper and Native Title Project Officer. From 2005 to 2008, Anna worked as Project Officer for the Kimberley Older Indigenous People's Health Project in Derby. Since June 2009, Anna has been an 'early career' researcher in the Nulungu Research Institute at the Broome campus of the University of Notre Dame Australia. As a researcher, Anna's interest is working closely with her people living in Bidyadanga Aboriginal Community and doing further research relating to Karajarri Country.

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