

WE ARE OCEAN PEOPLE: INDIGENOUS LEADERSHIP IN MARINE CONSERVATION

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A First Nations approach to addressing climate change— Assessing interrelated key values to identify and address adaptive management for country

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ABSTRACT

The Yuku-Baja-Muliku (YBM) people are the Traditional Owners (First Nation People) of the land and sea country around Archer Point, in North Queensland, Australia. Our people are increasingly recognizing climate-driven changes to our cultural values and how these impact on the timing of events mapped to our traditional seasonal calendar. We invited the developers of the Climate Vulnerability Index (CVI) to our country in Far North Queensland with the aim to investigate the application of the CVI concept to assess impacts of climate change upon some of our key values. The project was the first attempt in Australia to trial the CVI process with First Nations people. By working with climate change scientists, we were able to develop a process that is Traditional Owner-centric and places our values, risk assessment, and risk mitigation and management within an established climate change assessment framework (the CVI framework). Various lessons for potential use of the CVI by other First Nation communities are outlined.

NOTE

The authors on this paper all worked together to tell the project from a first-person narrative, which was the lead author's voice.

TRADITIONAL OWNER ACKNOWLEDGMENT

This paper is possible only through the knowledge contributions of Yuku-Baja-Muliku Traditional Owners. Their continuing connection to land, sea, and community is unwavering. Communicating this work and the effort that they are going to in looking after country is done with their permission.

INTRODUCTION

As the Traditional Owners of the land and sea country around Archer Point in North Queensland, the Yuku Baja Muliku (YBM) people have been noticing and recording changes to our country, especially through our traditional seasonal calendar. These have led to changes in management practices at some levels (the way we manage our cultural burning regime) or to adapted Indigenous Knowledge in others (using a different flowering tree as an indicator of fish presence). Our Indigenous Knowledge always evolves with time, and we see changes now that are linked to climate events. We wanted to share what is happening on our country and also work with climate change scientists to find a way to put two knowledge systems together to recognize both from a Traditional Owner perspective (our way) and a Western science

perspective—to determine what is actually happening at a local level and what implications that has for us managing our traditional estates (both land and sea).

Climate change information is increasingly being talked about and widely presented, but the dominant source is academic. When we think of the changes that we are seeing on our country, we view things from our current and historical perspective. We know that our cultural and heritage values can be managed only by us. The impacts and pressures that we see and manage can only be understood from our perspective, as these things have value to us that no one else can understand. It was important to us, then, to be able to work in a collaborative space, where scientific research could be discussed, understood, and applied by us for the work that we do to manage our cultural and heritage values.

When looking for scientists to invite onto our country, we were looking for expertise in the scientific sense, but also for people who were prepared to look into our world. The term “two-eyed seeing” (Colbourne et al. 2020; Reid et al. 2021) has been used in projects and research before, and through our past experiences with researchers we know that having the right “fit” is essential to successful outcomes that are inclusive of Traditional Owner views. We were introduced to the researchers who developed the CVI framework and together we explored our needs and looked for

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a common purpose. They were keen to look at how their assessment tool for World Heritage areas could be used with Traditional Owners to assess cultural heritage values. We were keen to have our values and perspectives put at the front of an assessment process. These objectives became the common purpose that was the foundation of our project.

BACKGROUND

Yuku Baja Muliku

The Yuku-Baja-Muliku (YBM) people are the Traditional Custodians of Archer Point, which is located 20 kilometers south of Cooktown in Cape York Peninsula in North Queensland (see Figure 1). Historically, YBM people lived between Annan River and Archer Point and moved throughout this area with the seasons to hunt and gather foods.

YBM country covers 22,500 hectares and is rich in cultural sites and biodiversity. Our region includes

some of the most pristine fringing coral reefs in the tropics and is the crossover zone between the healthy and stable turtle and dugong populations of Cape York and the declining populations to the south. It encompasses parts of two of Australia’s World Heritage areas—the Wet Tropics of Queensland and the Great Barrier Reef.

Our country being healthy means that we can be healthy. At the heart of our country is the Annan River and this is the central cultural anchor for our people. Living in Cape York, we experience high rainfalls in the wet season and the many waterways that cross our country flow out to, and support, some of most diverse mangrove systems in Australia. The wetlands and mangrove systems are vital to the health of our sea country as they filter sediment and other contaminants from surface run-off and trap nutrients, while also protecting the coastline from storm surges.

▼ **FIGURE 1.** Area that is currently under country-based management by Yuku Baja Muliku Traditional Owners (dark solid line is the outer edge).



YBM’s motto is “*Our land, Our people, Our future,*” and our vision is to manage our land and sea country sustainably, to ensure our culture remains strong, to provide real jobs for our people, and to ensure that the rich biodiversity and cultural integrity remain for the current and future generations of all people.

To meet these responsibilities, we have developed several plans and initiatives over the past 14 years, including an Indigenous Land & Sea Ranger Program, a Traditional Use of Marine Resources Agreement (TUMRA) with the federal and state governments, and a Land and Sea Country Strategic Plan. While the area is still relatively untouched, impacts of human use are increasing. More than ever, there is a need for Traditional Owners to add their knowledge of changes to their country into the discussion about climate change.

Climate Vulnerability Index

The Climate Vulnerability Index (CVI) is a systematic and rapid assessment tool that is values-based, science-driven, and community-focused. It was initially developed to assess the

impacts of climate change upon all types of World Heritage areas (CVI, n.d.; Day et al. 2020). With climate change being increasingly recognized as a major threat globally, the CVI’s developers (authors Day and Heron) have begun trialing the process in other types of areas. The standard CVI process is conducted through a workshop and is based on key values identified from the foundational description of World Heritage areas: the Statement of Outstanding Universal Value (OUV), which outlines the values and attributes of the property. Using customized worksheets, a number of steps are applied to conduct a high-level vulnerability assessment of OUV, identifying the World Heritage values and the potential impacts of key climate stressors on them, and considering adaptive capacity in relation to these climate stressors. This all leads to the OUV Vulnerability component of the CVI. The next part of the CVI is the Community Vulnerability component, which is an integral and fundamental part of the framework and is what makes the CVI distinct from many other risk assessment approaches. Assessment of economic, social, and cultural dependencies on World Heritage properties and their adaptive capacity results in the Community Vulnerability outcome.

Through early discussions it was recognized that the approach normally used for applications of the CVI (i.e., a facilitated workshop with diverse participants) wouldn’t be the best fit for Traditional Owners wanting to discuss their cultural values. Consequently, we worked together to find a method of engagement that achieved the outcomes that suited everyone.

Developing a Traditional Owner-centric method of working with CVI
YBM have always taken a collaborative approach to learning best practice in monitoring, mixing both Western science and the Traditional Knowledge of our Elders to collect and reflect on everything that is important to us. We felt that our experience in this would benefit everyone in developing a method of assessing cultural values against climate change stressors.

As this was the first-ever attempt in Australia to trial the CVI process with a First Nations group, care was taken to establish some trust and a level of relationship before the workshops began. Early in the project we and the climate scientists took the time to learn a little about each other. A short

introductory “flyer” was prepared to introduce Jon and Scott to YBM families and the wider community. This was followed by several video conference calls so we could become familiar with the researchers and understand their work, their experiences, and what they wanted to achieve. This was essential for our rangers and Elders to put a face to a name and to become more comfortable talking with the researchers. We also discussed ownership of our Indigenous Knowledge so that there was a clear understanding of where and how data can and should be used.

Due to the successful outcomes from this initial exchange, a preliminary workshop was seen as a key next step and an important precursor to further work with YBM, and it may offer learnings we can share with First Nation communities elsewhere.

Heritage values

Prior to our workshop, we were able to think about some of the key cultural values/knowledge that we wanted to prioritize. Everything on country is important to us, but we needed to select some critical areas that would be good for us to work through and help us refine a method of workshopping that everyone could take part in. We chose twelve cultural values that operate at different levels of complexity (Table 1). Some values are embodied by a single species (e.g., crocodile); some are customary practices that involve complex interactions between activities, seasons, and species (e.g., fire management); and others are situated within cultural protocol (e.g., women’s cultural sites). It was important to explore values that ranged in the complexity of their ecosystem interactions, as we often find that Western science and the scientific process that is enabled during research do not account for these relationships.

▼ **TABLE 1.** Significant values, processes, and cultural protocols chosen by YBM for assessment (not in any specific order).

the Annan River	fire management
crocodile	seagrass
fish (barramundi and black bream)	sea turtle
mussels	stingray
mangroves	traditional hunting
wattle	women’s cultural sites



In preparation for our workshop, we gathered pictures (usually we were able to use a photo of an original painting done by our family or we used photos of our country) that represented the essence of the value; the image was then fixed in the center of a large sheet of blank paper. These images often depicted the key value or process in context with other associated key values. These levels of connectivity can be hard to capture/ describe using Western science techniques but are fundamental part of our culture and heritage. Figure 2 shows the Anna River story; Figure 3 depicts the story of seagrass in art.

PLACING COUNTRY FIRST

To place country at the heart of the workshop, we started the first day by everyone (Traditional Owners

and climate scientists) visiting a number of our important cultural sites on country. We went to rivers, mangroves, beaches, headlands, bush, and wetlands, and we looked out at our sea country. This immersive start was to help everyone understand what we were talking about and ensure caring for our bubu (country) was the aim of the workshop (Figure 4).

TRADITIONAL OWNERS AND SCIENTISTS ASSESSING CLIMATE CHANGE IMPACTS

Being able to see and then discuss the key climate stressors with climate scientists was a key collaborative step in our project. Discussing scientific terms that we may not be familiar with and talking through examples of what they mean and finding alternative terms and explanations that made sense to us, put the

▼ **FIGURE 2.** A painting showing many of the connections to the Annan River. The complex system of animals, seasons and people are all present. When the Annan River was assessed for Climate Change impacts—all of these things were discussed together. Artwork by Irene Doughboy.



Seagrass



▲ **FIGURE 3** shows the seagrass that is found in our sea country. It is painted with the dugong and its feeding trails. Artwork by Larissa Hale.

science into a space that was accessible. Through this, the mutual respect for each other's knowledge was apparent and clear connections were made.

This is important because as managers of our country, we need the best available scientific information to help us make management decisions. Aboriginal science and Western science can deliver a fuller picture of what is happening at the grassroots level that we operate at.

It was explained during our sessions that some climate change stressors were gradual or slowly evolving (i.e., “chronic,” such as changing temperature trends, droughts), whereas others were events occurring over short periods (i.e., “acute,” such as heat waves, cyclones, flash floods).

It was also explained that not all these stressors would necessarily apply to our country, and some



► **FIGURE 4.** YBM Traditional Owners and CVI scientists walking country together along the Annan River.

would have physical impacts while others may also have social or cultural impacts.

Against this background of climate stressors, we were able to then discuss each of the values, processes, or protocols in turn, using a series of key words/phrases as prompts. (See Figure 5 for examples being documented on a worksheet.) These prompts included:

- Traditional (**historic**) perspective of the value (i.e., what happened about 100 years ago);
- **Contemporary** perspective of the value (i.e., what is happening today);
- Expected **future** perspective of the value, thinking about the climate stressors;
- **What has contributed** to these changes? (i.e., considering the above three perspectives);
- **Current management practices** related to that value; and
- Problems arising from **climatic changes** that have impacted (or are likely to impact) the key value.

The responses of the Elders and the Indigenous Rangers to these questions were recorded as dot points on the worksheets (Figure 6). During the discussions, it was recognized that there were many pressures impacting these values/processes, and that climate stressors were only one of these many pressures. The combined impact of many stressors (i.e., cumulative impacts) was also recognized.

WHAT DID WE FIND?

By talking through the value featured on each worksheet, we were able to record the changes that have occurred to our heritage values and that these changes have had a cascading effect on some behaviors, activities, or protocols that sit with the value. A good example that we explored was with our fire management activities. Changes to rainfall



and temperature have meant changes to the timing of high-intensity (hot) fires and low-intensity (cool) fires. That in turn has affected the timing of some of our bush food that flowers or appears after a burn (our collecting or harvesting time has now had to change).

When working through the example of the freshwater mussel (Figure 6), we were able to talk to many of the different pressures that are exerted upon this valuable cultural food source. We could see that climate change was one pressure, but identifying the other pressures that are also impacting mussel numbers was important. Doing so enables us to understand how cumulative effects can accelerate change, and that our management strategies can be targeted to those impacts that we experience at a local level first.



'FIRE' ^{MAN} CHANGES OVER TIME

Traditional burn practices
 - burn for land.
 - " " country
 (60,000 yrs knowledge)
 - adapt

Old people
 - know how to use fire
 - No land tenure problems then
 - part of looking after country

"The ultimate land management tool"

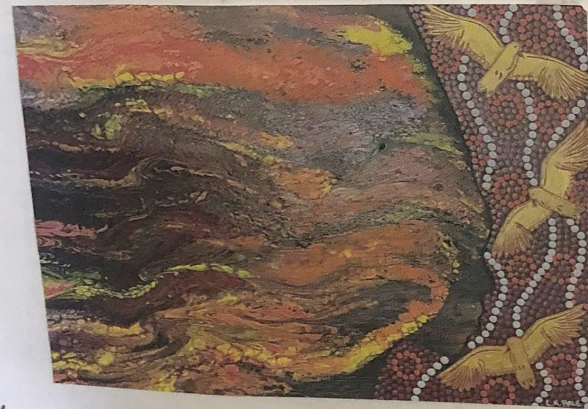
- Fire 'problems' with plant (+/-)
- * Grader grass - ↑ fuel
- * Broad leaf paper bark
 - continuous cool grass - needs 'hot' fire
- * Guinea grass
- * Gamba grass - burns very hot (wetter than grader grass!)
 (Not much YBU) - fire impact?
- X Bally Yam - fire impact?
- Animals
 - parrot spp nest in antmounds
 - burn right way - everything survives

Wt = 5
 - Snake -
 - Dove - use

Pastoralist/campers
 1870 - 1990's
 - focus on cattle (no early mums)
 - 'Smoky beer' - all fire/burn bad!
 - cigarette / lack of understanding of fire → all burnt 'black' burn
 - 'any fire escape' burn
 - 'Wrong-way fire'
 - ~~hot~~

Cultural
 - 'Blow leaf' away for stone
 - Scar - trees don't burn!
 - graves (stone).
 - Women areas special 'cool' burn

FIRE



Contemporary (today)
 - Not burning for just infrastructure protection
 - changed Not past
Victis

early March | med July-Sept | Stone Nov-Dec

Future?
 - Changing climate
 ADAPT!!

Today
 - Lot of planning
 - early / dry / storm.
 - not all areas every year.
 - burning for country first
KNOWLEDGE OF COUNTRY
 - grassy heathlands
 (Xanthoxea - 4-5 years like hot fire)

- open woodland
 - every 3-4 yrs
 - some 2 yrs

Vine thickets
 - burn early/cool
 - Wood control Suber Vine / lantana
 - promote for black scide

Adaptive capacity
 But how many years can fire be put off??

Climate change issues
 Temp change - 'Window' impl for cool + hot fires
 (Wind not a new factor)
 Change in season for storm burns
 Humidity / rainfall

Changes in technology
 NAFI (Nat Aust Fire Inpact)
 - can be unreliable location
 Drones - check
 - No aerial ignition - concerns re plastic face shield / snapper (PPE)

Equipment
 - Hard hats
 - Fire retardant - overall, boots
 - Don't wear Retardants → NEED TO ADAPT!!

▲ FIGURE 5. The workshop notes from the fire management discussion were written around the worksheet as everyone discussed the changes that have been noticed. Artwork by Larissa Hale.

Changes

BIG change
Sudden, drastic
noticeable.

- numbers down
- not as big
- changing location
(patches of mussels)
(ie not everywhere)
one or two of big ones.

- colour (b)
- material (seeing eggs)

Managing

- closed area - locked (must now ask at of)
-

Affected

- Flood ~~H₂O~~ Mussels
- When fresh water (when at night they)
- Getting stuck up high the water
- Flood - clean H₂O - dead
- looking for food - get
- didn't see / notice cracked shells - ones



MUSSEL

Impacts

- Blue stone mining

range
ing
hard.
for them
top
for

food in on
eat fish &
lemon, chilli
& mussel.

ays same,
posed

mussel gone

o food source
hing to show kids

▲ FIGURE 6. The workshop notes for the freshwater mussel were captured around this Annan River story. The mussels sit along the bank while the crocodile watches over his territory. Artwork by Irene Doughboy.

Walking country first was invaluable to help the researchers understand our values and how we relate to them.

Our analysis of many of the values that we workshopped led us to report that climate change has occurred, in terms of changes to typical levels of climate variables (e.g., temperature, rainfall), frequency of extreme events (e.g., hot spells, downpours), and changes to seasonal timing (e.g., early seasonal onset of flowering plants).

Jon and Scott were able to confirm that this analysis correlates with what has also been shown by their broader research: that climate stressors are impacting values of cultural significance, and these impacts are likely to continue into the future (ICOMOS 2019).

WHAT DID WE LEARN?

In addition to the assessment of our values, there was some critical key learnings from the project about the way we want to work with researchers on all of our projects.

1. Establishing a relationship built on trust and respect is essential for work to progress.
2. Walking country first was invaluable to help the researchers understand our values and how we relate to them.
3. Honoring everyone's experience and knowledge is important. Having diverse experience in the workshop (Elders, Indigenous Rangers of various ages) provided more information and examples for the worksheets.
4. Be realistic about what is possible to achieve in the initial meetings. (We felt that we achieved much more than we initially planned, and that was a positive feeling.)
5. Work with researchers who recognize and respect Indigenous Cultural Intellectual Property (ICIP) and can work in a space where knowledge-sharing protocols are essential (that might be working through permissions of cultural authority or establishing data sharing or co-benefit agreements).

CONCLUSION

By working with scientists and addressing climate

change from both an Indigenous and Western scientific knowledge point of view, we were able to record and identify the changes that are happening on our country that are attributable to climate events. Also, we were able to see what impacts were not related to climate change, which allowed us to consider the cumulative impacts that are being experienced.

In addition to this, we were able to see that climate change has created a series of cascading impacts that not only affect our plants and animals but our management efforts and customary activities. It gave us a greater insight into how important our monitoring programs are to record and compare changes that our country is experiencing.

Our seasonal calendar of activities is being modified by the changes that are occurring on our country, and this means that we are adapting our use and management to those changes. We are able to do this quickly as we are on the ground experiencing things for ourselves. Our experiences and expertise can be used to react to the management and care that our country needs. Knowing what future change is likely to occur can inform our management activities now to protect our cultural values.

One of the key outcomes that emerges from this work is a mutually beneficial partnership, and we see this project as the start of a longer working relationship with the CVI scientists. As we move forward together, we would like to involve more of our community in the assessment process and provide more perspectives for even more effective outcomes. There are many more cultural and heritage values that we can assess and wrap adaptive management practices around. There is also the potential to build upon our existing monitoring programs to better understand climate impacts. We need to do this work and communicate it to the wider community and management agencies. Ultimately, we will be working to understand the cultural, economic, and social implications of having our values put at risk by climate change.



REFERENCES

Colbourne, R., P. Moroz, C. Hall, K. Lendsay, and R.B. Anderson. 2020. Indigenous works and two eyed seeing: Mapping the case for indigenous-led research. *Qualitative Research in Organisations and Management* 15(1): 68–86. <https://doi.org/10.1108/QROM-04-2019-1754>

CVI [Climate Vulnerability Index]. n.d. Climate Vulnerability Index webpages. <https://cvi-heritage.org/>

Day, J.C., S.F. Heron, and A. Markham. 2020. Assessing the climate vulnerability of the world's natural and cultural heritage. *Parks Stewardship Forum* 36(1): 144–153. <https://doi.org/10.5070/P536146384>

ICOMOS Climate Change and Cultural Heritage Working Group. 2019. *The Future of Our Pasts: Engaging Cultural Heritage in Climate Action, July 1, 2019*. Paris: ICOMOS [International Council on Monuments and Sites].

Reid, A.J., L.E. Eckert, J.F. Lane, N. Young, S.G. Hinch, C.T. Darimont, S.J. Cook, N. Ban, and A. Marshall. 2021. “Two-eyed seeing”: An Indigenous framework to transform fisheries research and management. *Fish and Fisheries* 22(2): 243–261. <https://doi.org/10.1111/faf.12516>





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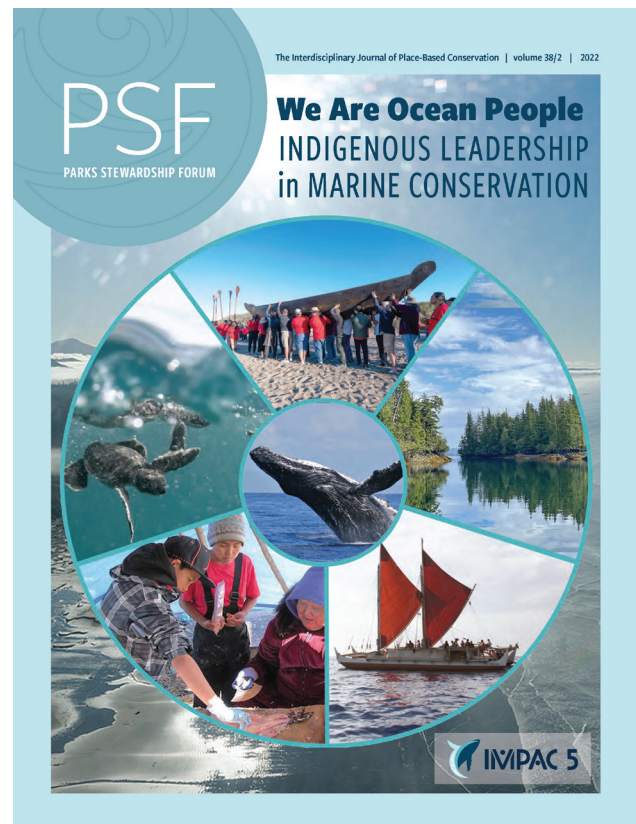
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On the cover of this issue

CIRCLE DESIGN, clockwise from top:

- Northern Chumash ceremony | [ROBERT SCHWEMMER](#)
- Haida Gwaii | [CINDY BOYKO](#)
- The Polynesian Voyaging Society's voyaging canoe Hōkūle'a | [NOAA](#)
- Elder teaching youths, northern Alaska | [US FISH AND WILDLIFE SERVICE](#)
- Baby Honu (sea turtles), Papahānaumokuākea Marine National Monument | [NOAA](#)
- Center: Humpback whale, Papahānaumokuākea Marine National Monument | [NOAA](#)

Background: Pacific Rim National Park Reserve | [PARKS CANADA](#)