a Cultural Site Adaptation Guide

to support Indigenous rangers assess risks (including climate change) to cultural heritage and devise community plans for conservation

It's being damaged, washed away.

1

Introduction

Cultural sites and climate change

Rock art Climate change increases the risk of more frequent, extensive and faster-moving inland riparian flood events, which in turn impact inland rock art

Middens Climate change increases the risk of sea level rise, and more frequent, extensive and faster-moving storm surge events, which in turn impact coastal middens

It's going to be washed away.

Traditional Owner Betty Ngurrabangurraba and vulnerable middens (from the documentary *Places in Peril Archaeology in the Anthropocene*).

Djelk Ranger Greg Wilson assesses coastal middens.

river

Djelk Ranger Ivan Namarnyilk assesses rock art.

The *Cultural Site Adaptation Guide* helps Indigenous rangers to:

- Identify cultural sites that are at the greatest risk of loss or damage from climate change threats *plus also* those at risk from humans, fire, invasive species and natural processes.

- Prioritise the sites most at risk but also sites that are the most valued.

- Identify and assess management options for the prioritised cultural sites.

- Work with their community to write and implement a *Cultural Site Adaptation Plan* for cultural sites, using a bottom-up, ranger-hosted, participatory planning process.

- Develop a site monitoring program.

How was the *Cultural Site Adaptation Guide* constructed?

Participatory Action Research

Djelk and Kakadu Rangers identified the climate change risks to their cultural heritage sites and then conducted research, in collaboration with the ANU, to develop a tool (the Guide) to help community-based management of those risks.
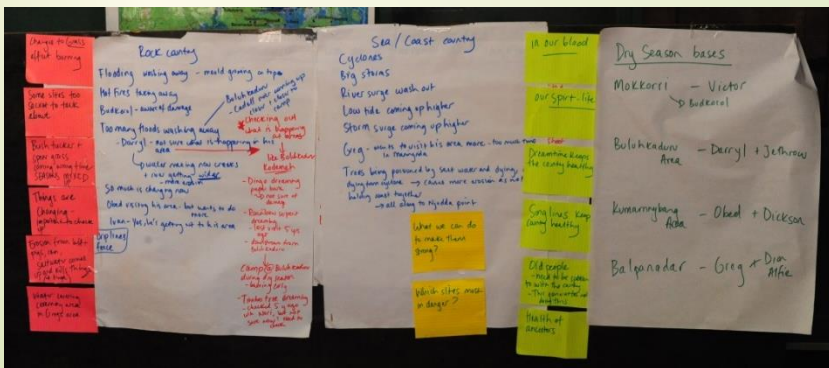
Scoping workshop (top) and notes (bottom)

Indigenous Rangers and Traditional Owners affirm that climate-change adaptation planning for cultural sites is a priority need

Synthesis

| Generic climate change planning tools | Archaeological climate change risk assessment |

Five-step Guide proposed

1. Scoping
2. Risk assessment
3. Options analysis

4. Plan/implement
5. Monitor/review

Rangers tested and modified draft Guide

Final Guide

Step 1. Scoping

Workshop with seven elements

Flood debris (bottom), kangaroo (top right)

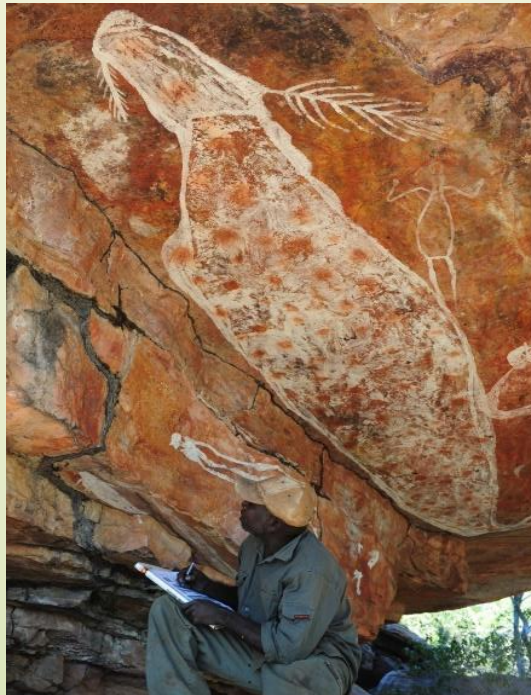|	Scoping questions / issues for consideration by rangers
1	**Problem analysis – Is there a climate change problem for cultural heritage sites?** • Is there a climate change problem for sites? How are sites currently being looked after? How often are sites visited? How often is maintenance done? Often enough? Health of sites? Is what's being done now enough to make sites strong against climate change?
2	**Aims, goals and objectives – What do you want for and feel about sites?** • Why are sites important to you? What do you want for sites and for the next generation? What are the goals of this project?

3	**Methodology – How will we make sites strong against climate change?**
	• Do you know of other projects looking at sites and climate change? What have these projects achieved?
	• If not, facilitator describes Risk Field Survey. What do people think of this? Instead of using the Risk Field Survey we could:
	    o Not focus on sites, but talk about how to make ranger job descriptions more inclusive of climate change adaptation duties?
	    o Not focus on sites or job descriptions, but talk about how to make Park or Aboriginal Corporation natural resource management policies more inclusive of climate change adaptation considerations?
	• Could the chosen approach fit in with current work? What cultural protocols should be considered? Would this benefit for the community? Could this be bad for the community? How will we know when what we do is working or checks-out with sites? What's our time frame?

4	**Stocktaking of resources – What do we have that will help?** • What physical resources do you have? What people / skill resources do you have? What money resources do you have? What maps do you have: For sites? For places where climate change is happening? What is in the Park/ranger database? Can the facilitator access it to build up a map of sites?
5	**Barriers – What might get in the way?** • What difficulties might you face? What are your strengths and weaknesses? Does the Park/ranger group support the project? Might the management plan prevent us from undertaking the project?
6	**Leadership and roles – Getting the full team together** • Who inside the ranger group might also be on the project team? Who else has special authority? Who else needs to be involved and why? Who outside the ranger group in the Park or Indigenous Protected Area (IPA)? Who outside the Park or IPA? Who will do what? • How will we record what is said and decided?
7	**Ownership – How will knowledge be protected?** • Who will have ownership of any outcomes, such as an adaptation plan or documented traditional knowledge?

Step 2. Risk assessment

The Risk Field Survey

Total exposure score

    minus

Total sensitivity score

    =

Risk (of loss or damage) score

Ivan using the Risk Field Survey

EXPOSURE

Risk types	Variables	Assessment Options		
		Option A (Scores 1.0)	**Option B** (Scores 0.6)	**Option C** (Scores 0.2)
Human	1. Proximity of township or outstation	township <4km	outstation <4km	neither <4km
	2. Proximity of tourism or hunting/gathering	tourism <4km	hunt/gather <4km	neither <4km
	3. Proximity of graded road or track	graded road <4km	track <4km	neither <4km
Climate change and extremes	4. Proximity to tidal edge/river	<100m	100 to 400m	>400m
	5. Height above tidal edge/river	<2m	2 to 6m	>6m
	6. Geomorphology: ○ *rock art* – Gorge: location and breadth ○ *floodplain midden* – Proximity of channel ○ *coastal midden* – Proximity of river mouth	narrow gorge <100m <100m	wide gorge 100 to 400m 100 to 400m	none >400m >400m
Biological	7. Feral animals and weeds – impact	strong	some	none
	8. Native flora/fauna – impact	strong	some	none
	9. Fire hazard – vegetation and detritus build up	large	some	none
Natural weathering	10. Fading (*rock art*); Degree deflation (*midden*)	very faded completely flat	some fading minor elevation	none steep sided

Total exposure score = 1+2+3+4+5+6+7+8+9

SENSITIVITY

Sensitivity factors	Variables	Assessment Options		
		Option A (Scores 1.0)	**Option B** (Scores 0.6)	**Option C** (Scores 0.2)
1. Nature of remains	○ *rock art* – Ochre type ○ *midden* – Structure	red solid	yellow soft	black/white/wax scattered
2. Nature of substrate	○ *rock art* – Rock hardness ○ *midden* – Soil type	hard clay	soft soil	crumbling sand
3. Natural protection	○ *rock art* – Rock overhang ○ *midden* – Tree consolidation	deep rock shelter strong	some overhang some	no overhang none
4. Built protection	Fence – effectiveness	well maintained	unmaintained	none
5. Legal protection	Site is: (a) on Indigenous owned land, or (b) listed under heritage protection legislation	both (a) and (b)	either (a) or (b), but not both	neither (a) nor (b)

Total sensitivity score = 1+2+3+4+5

Step 2. Risk assessment (cont'd)

The Risk Field Survey: significance class (cultural value)

Djelk scoping workshop

Using three of five ICOMOS classes of significance:

- **group identity**
- **historical**
- **spiritual**
- scientific
- aesthetic

	Questions	Significance Class	
Group-Identity Value	**No questions:** • A given for all midden and rock art sites.	One	
Historical Value	**Does the site have:** • A name? • Tools? • Depictions of hunting and gathering?	Two	
Traditional Cosmological Value	**Does the site have:** • A Dreaming story? • A burial? • Pictures with cosmological themes?	Three	SACRED SITE NO ENTRY WITHOUT PERMISSION

Step 2. Risk assessment (cont'd)

Combining risk & significance

The Management Priority matrix

Scores for risk and cultural significance are used in a matrix to generate a management priority for each site.

For example: a site with a
Risk Score greater than 2 ...   ... and a *Significance Class* of 2 ...   ... is a '*high*' management priority

		MANAGEMENT PRIORITY		
Risk Score	**Greater than 2**	medium	high	very high
	1-2	low	medium	high
	Less than 1	very low	low	medium
		Class 1	**Class 2**	**Class 3**
		Significance Class (Cultural Value)		

This will be done automatically by i-Tracker

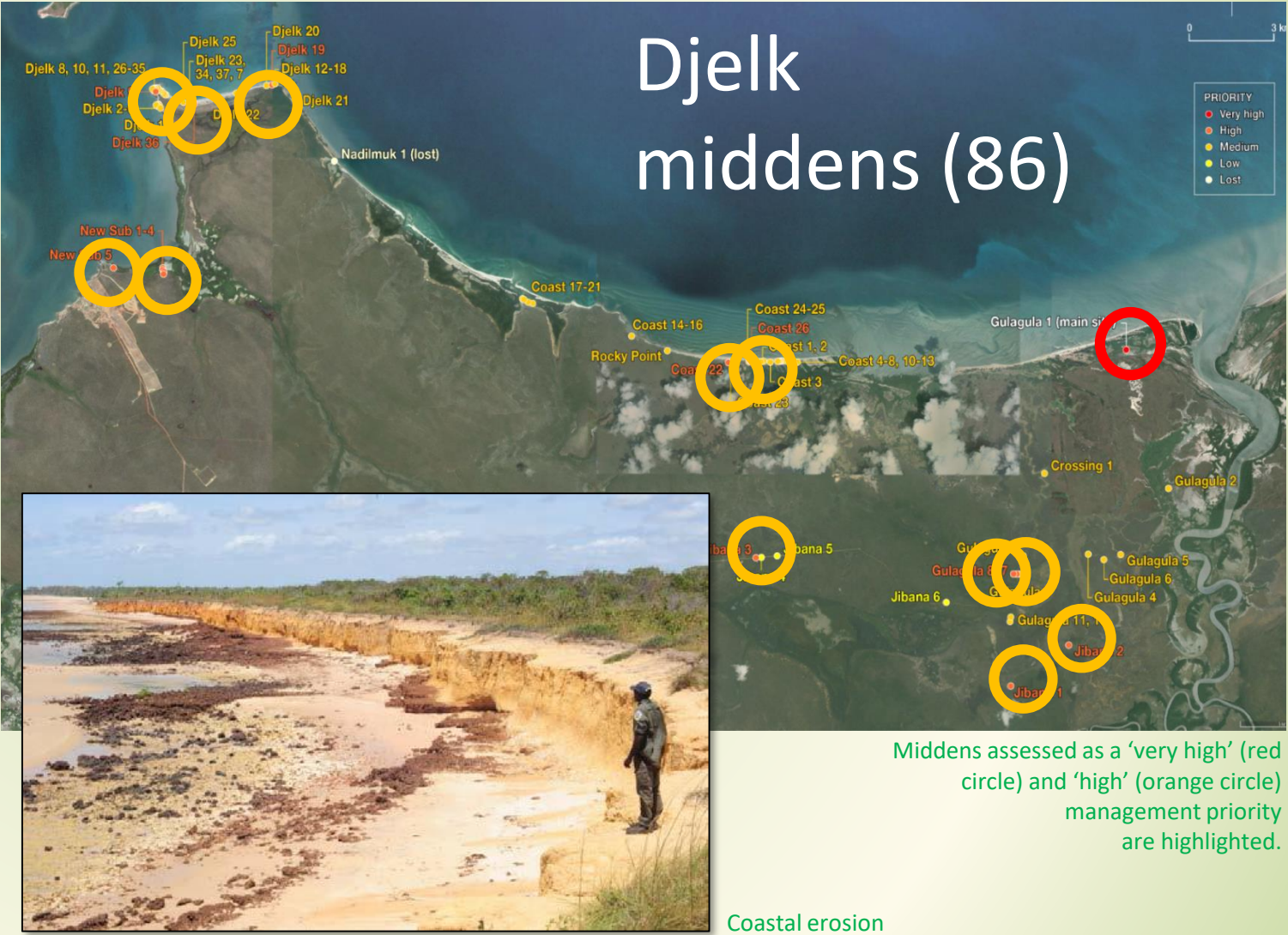Left: Greg indicates former location of midden destroyed by storm surge.

Left and right: coastal erosion leaves trees stranded.
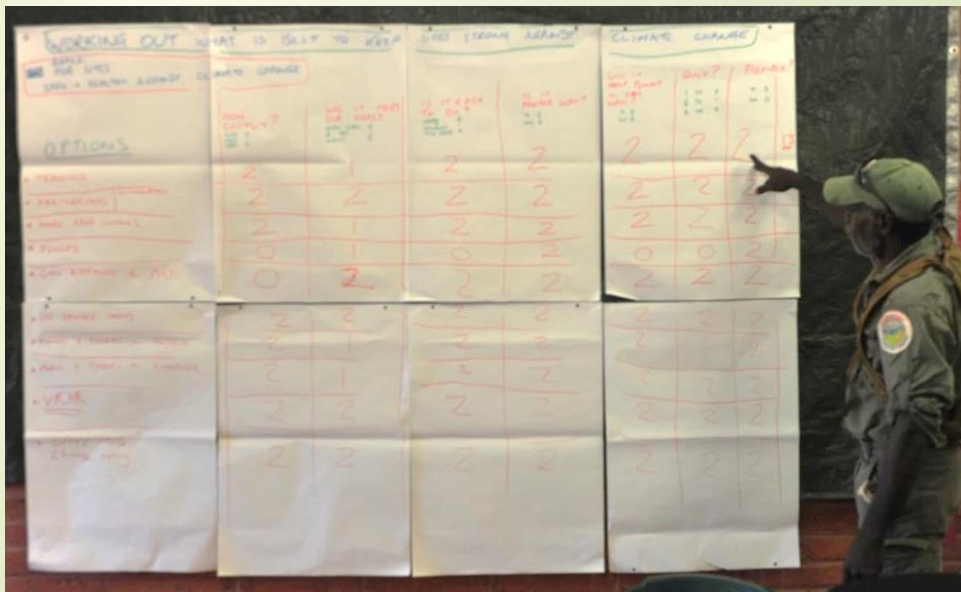
Step 2. Risk assessment (cont'd)

Prioritised sites

	Management priority				
	very low	low	med	high	very high
Djelk middens (86)	0	3	67	15	1
Kakadu middens (15)	1	2	6	4	2
All middens (101)	**1**	**5**	**73**	**19**	**3**
Kakadu rock art sites (15)	0	1	5	2	7
Djelk rock art sites (10)	0	1	2	4	3
All rock art sites (25)	**0**	**2**	**7**	**6**	**10**
All Kakadu sites (30)	1	3	11	6	9
All Djelk sites (96)	0	4	69	19	4
ALL SITES (126)	**1**	**7**	**80**	**25**	**13**

Djelk middens (86)

Middens assessed as a 'very high' (red circle) and 'high' (orange circle) management priority are highlighted.

Coastal erosion

Step 3. Options analysis

Workshop for identifying and appraising options

Scoring options in a matrix

1. Identifying options
1.1 Use options suggested and documented during Scoping and Risk analysis steps.
1.2 Use a generic list of options.
1.3 Use free brainstorming.
1.4 Use the following prompts to elicit responses:
a) options that directly intervene at sites;
b) options to build adaptive capacity of stakeholders;
c) options to build site resilience.

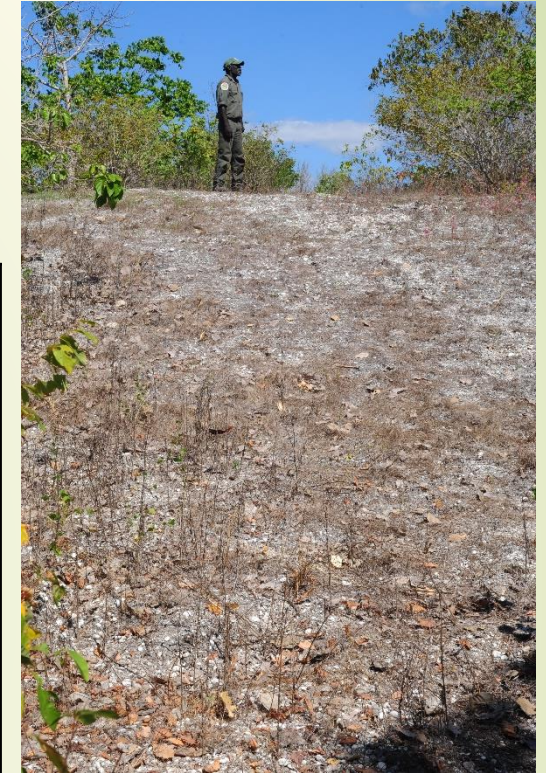| 2. Appraising options	
2.1 Conduct a first-pass option screening.	
2.2 Use the following assessment criteria to rank options in a matrix:	
Criteria	**Question put to rangers**
1. Cost efficiency	'Is the option affordable?'
2. Goal orientation	'Does the option meet our goals?'
3. Practicality	'Does option require *available* skills & capacities?'
4. Cultural appropriateness	'Is the option "proper way"?'
5. Co-benefit provision	'Will option benefit the community in other ways?'
6. Timeliness	'Can we implement option in a short time frame?'
7. Robustness	'Will option work if CC is worse than expected?'

3. Scoring options
3.1 Use the following scoring system in the matrix for answers to the questions put to rangers:
'Yes' = 2pts. 'Possibly' = 1pt. 'No' = 0pts.

Step 3. Options analysis (cont'd)

Result of option step: an adaptation plan

Greg Wilson atop large coastal midden
(over 4m high)

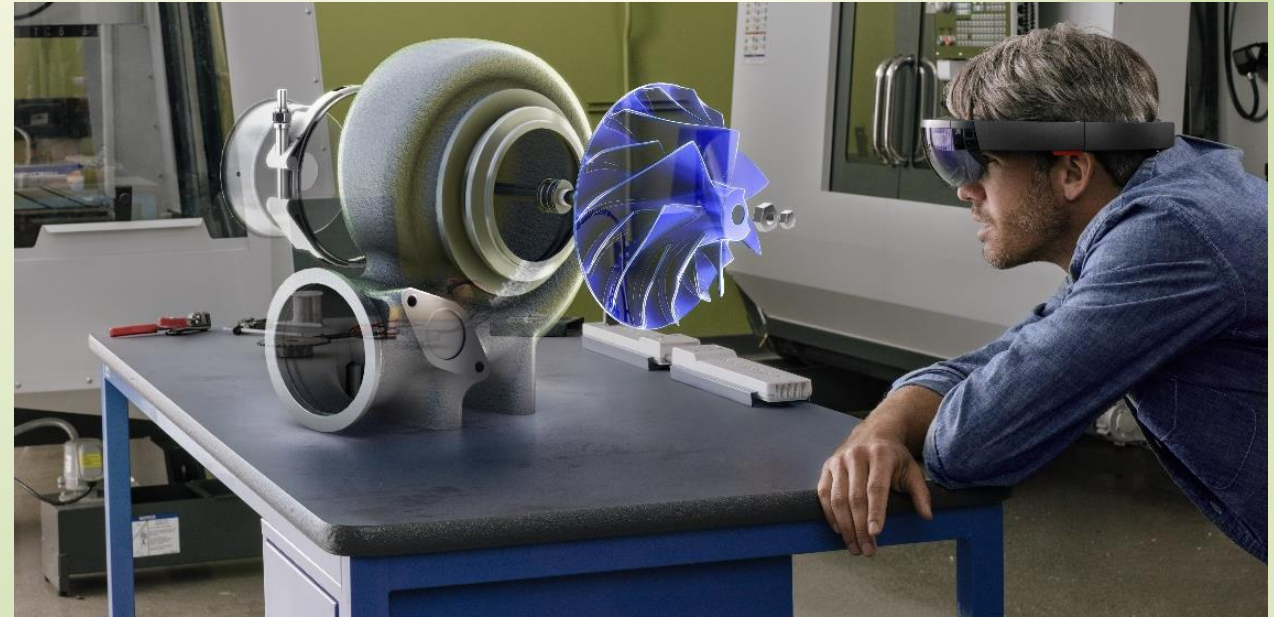|	Djelk Ranger Cultural Site Adaptation Plan	
Rank	**Option**	
1	Communicate to the world the climate threat to cultural sites via a video	Completed
2	Develop partnerships	**ARC Linkage**
3	Digitise the *Risk Field Survey* (in i-Tracker)	**ARC Linkage**
4	Develop a 3D-modelling workflow and Augmented Reality app	**ARC Linkage**
5	Address governance issues	On going
6	Develop training and training-delivery packages	**ARC Linkage**
7	Ensure legal recognition: increase site listings by the Aboriginal Areas Protection Authority	On going
8	Create safe & private storage for cultural site documentation	**ARC Linkage**
9	Cull buffalos	On going
10	Manage fire at sites	To do
11	Fence sites	To do

Step 3. Options analysis (cont'd)

3D surface documentation for Augmented Reality

Surface documentation stored in a data base does not support ongoing cultural practice.

Microsoft Hololens® combines reality with Virtual Reality

Therefore Rangers plan to develop:

- a workflow that allows rangers to routinely make 3D models of the most vulnerable sites, and

- an Augmented Reality app that allows Traditional Owners to one day re-visualise lost sites in their original location.

ARC Linkage grant application

Application title An Indigenous *Cultural Site Adaptation Guide*: implementation, review and transferability

Research aims

A. Investigate the feasibility of **implementing a Cultural Site Adaptation Plan**, as written by Djelk Rangers, using the *Cultural Site Adaptation Guide*.

B. Investigate development of a **Review Step** (which serves to restart what is a cyclical planning process) for the *Cultural Site Adaptation Guide,*

C. Investigate the **transferability** of the *Cultural Site Adaptation Guide* to other Australian contexts.

Questions determined by the **Djelk Cultural Site Adaptation Plan**

Methods Participatory Action Research

Personnel Bawinanga-Djelk Rangers, Australian National Uni, NCIS, CCI, Flinders Uni

Timeframes 3 years

Outputs Digital Risk Field Survey for i-Tracker; digital mapping of Management Priority sites; Routine 3D site modelling and visualisation via Augmented Reality; training and training-delivery packages; Community consultation protocols; Guide Steps 4–5; testing of Guide in (a) central Australia, (b) Canberra and (c) Vanuatu; six journal articles
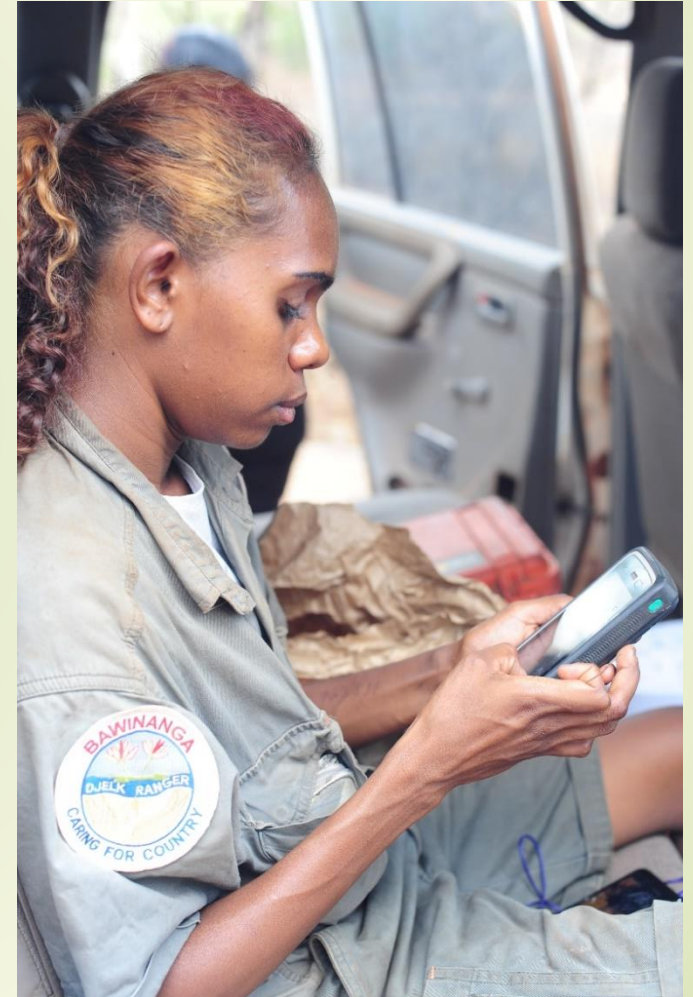
Djelk Ranger Tara Rostron using i-Tracker.

13