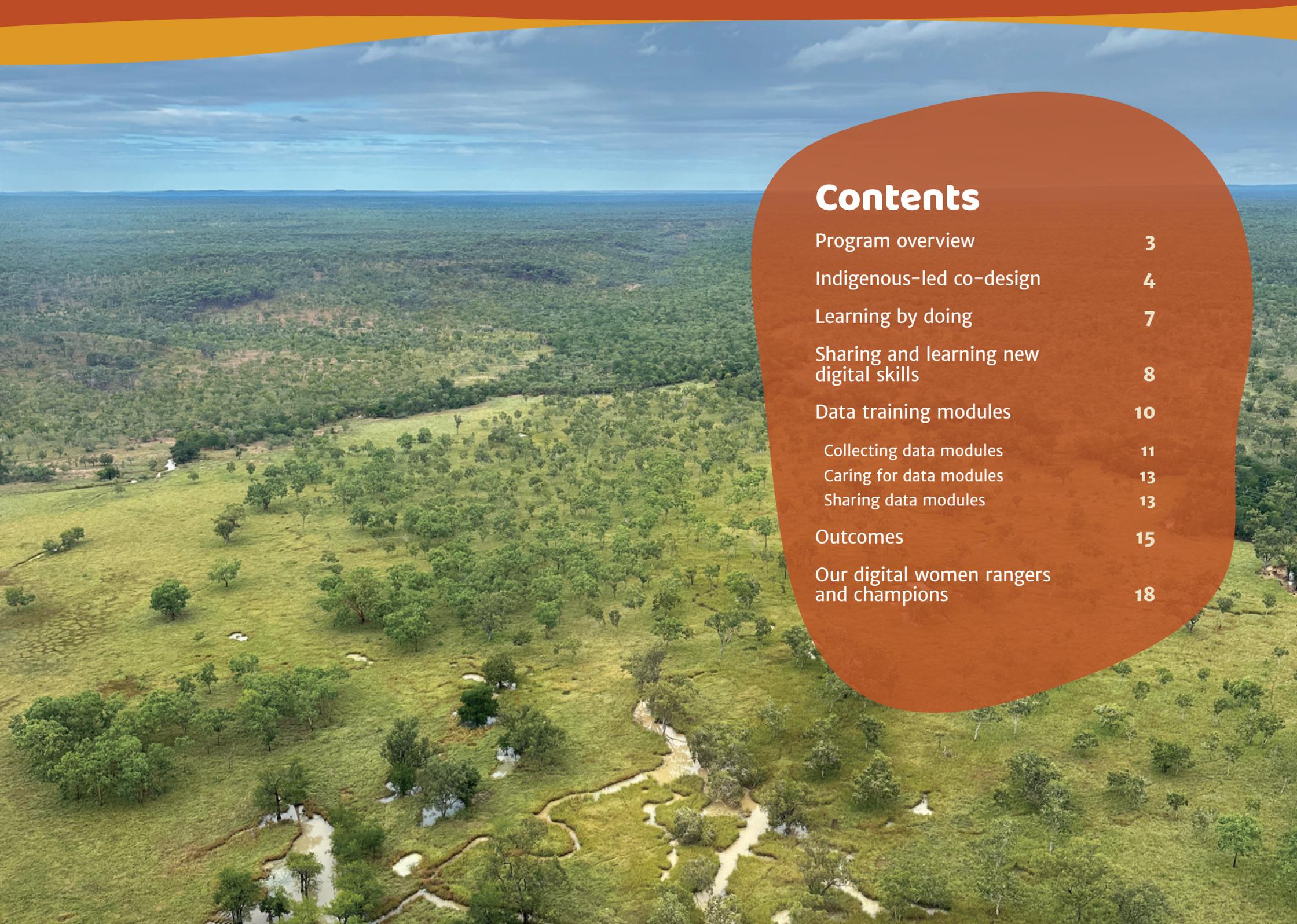


# Digital Women Ranger Program

Learning digital skills to care for Country together







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## Digital women rangers

are Indigenous land and sea managers who are learning and sharing how to use data and digital technologies to help care for Country.

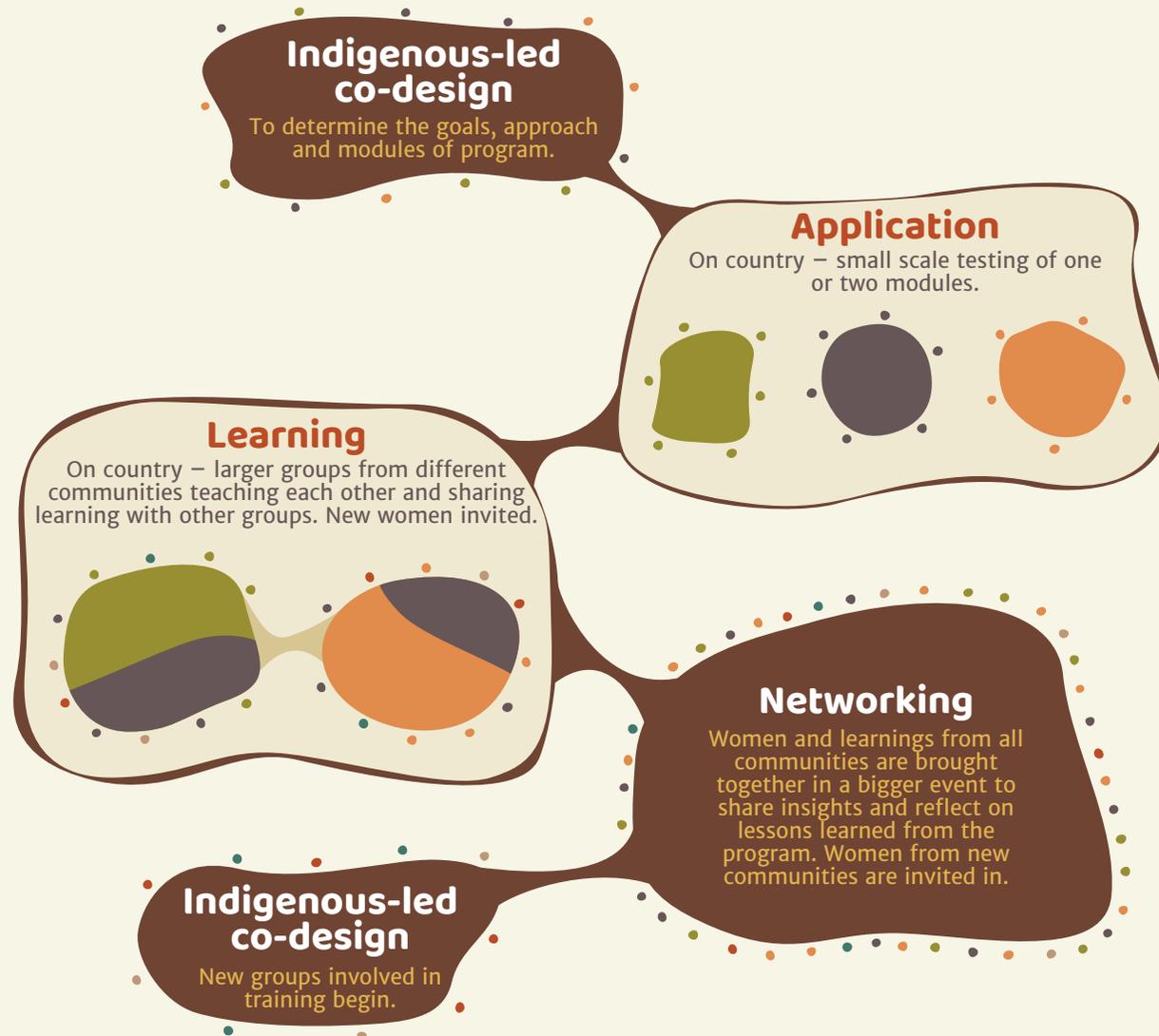
# Program overview

The digital women ranger program began in early 2022 and has been delivered as part of the Healthy Country AI and digital training initiative.

The program was formed following requests from Indigenous women rangers to offer a culturally safe way to collect, use and share data to make decisions to care for Country.

Indigenous women ranger program participants have been supported to co-design and complete training modules to use digital technologies such as camera traps and drones that earn digital badges which are co-verified by senior cultural and technical authorities and awarded through Charles Darwin University. Ranger groups have been supported to apply these skills to collect and translate data to understand changes to their traditional estates, often described by local Indigenous communities as 'Country'.

Through iterative action-based practices, the program has been adapted and improved as women have reflected throughout the program on how we are going and as we have experimented and learnt together.



# Indigenous-led co-design

Indigenous ranger groups across Northern Australia have worked with a team of researchers to co-design the program based on several key principles:

**Indigenous led.** Ensure each component of the program is Indigenous led.

**Self-determined.** Respect for the rights of Indigenous peoples and ensure the program

respects and honours cultural ownership and intellectual property rights.

**Community specific.** Ensure respect for the diversity of Aboriginal and Torres Strait Islander cultures and peoples.

**Deep listening and two-way learning.** Ensure respectful, culturally specific, and culturally safe communication and interactions are practised.

**Impact of design.** Ongoing review and reflection to ensure the program is respectful to Indigenous rights and culture and is delivering the benefits desired by local Indigenous communities and ranger groups.

**Indigenous knowledge.** Ensure that the program recognises, respects and is improved with Indigenous knowledge that Indigenous women and men collaborators wish to share.

**Share and build new knowledge.** To build the program together through collaborative approaches between Indigenous participants, science, AI and technical specialists and supporting programs.

Modules have been co-designed and delivered to ensure training provides Indigenous rangers with skills to responsibly collect data to help monitor the health of significant wildlife and habitats. Training is undertaken during on-Country workshops and ranger groups are provided with digital tools and support to apply their skills to support collaborative research projects or monitoring programs that are part of their



caring for Country work. Based on requests and need assessments from participating local ranger groups modules have been prepared to use drones (remotely piloted aircraft or RPAs), camera traps, video cameras, and touch GIS that are freely available on a public website.

Importantly, the program supports an inclusive and cooperative atmosphere, to welcome women rangers from diverse regions and levels of confidence with digital skills to increase the chance of success.

All workshops were done in the presence of Elder women and their approval has been sought for all major decisions.

A Digital Boss Lady Committee made up of two representatives from each participating group has been formed to govern the next phase of the program.

## Cultural charter

To clarify the purpose of the program, a 'cultural charter' of principles was developed. It is made up of:

- collaborative partnerships
- Indigenous leadership



- mutual benefit
- co-research and knowledge co-production
- building women's confidence
- being guided by Elders
- having fun.

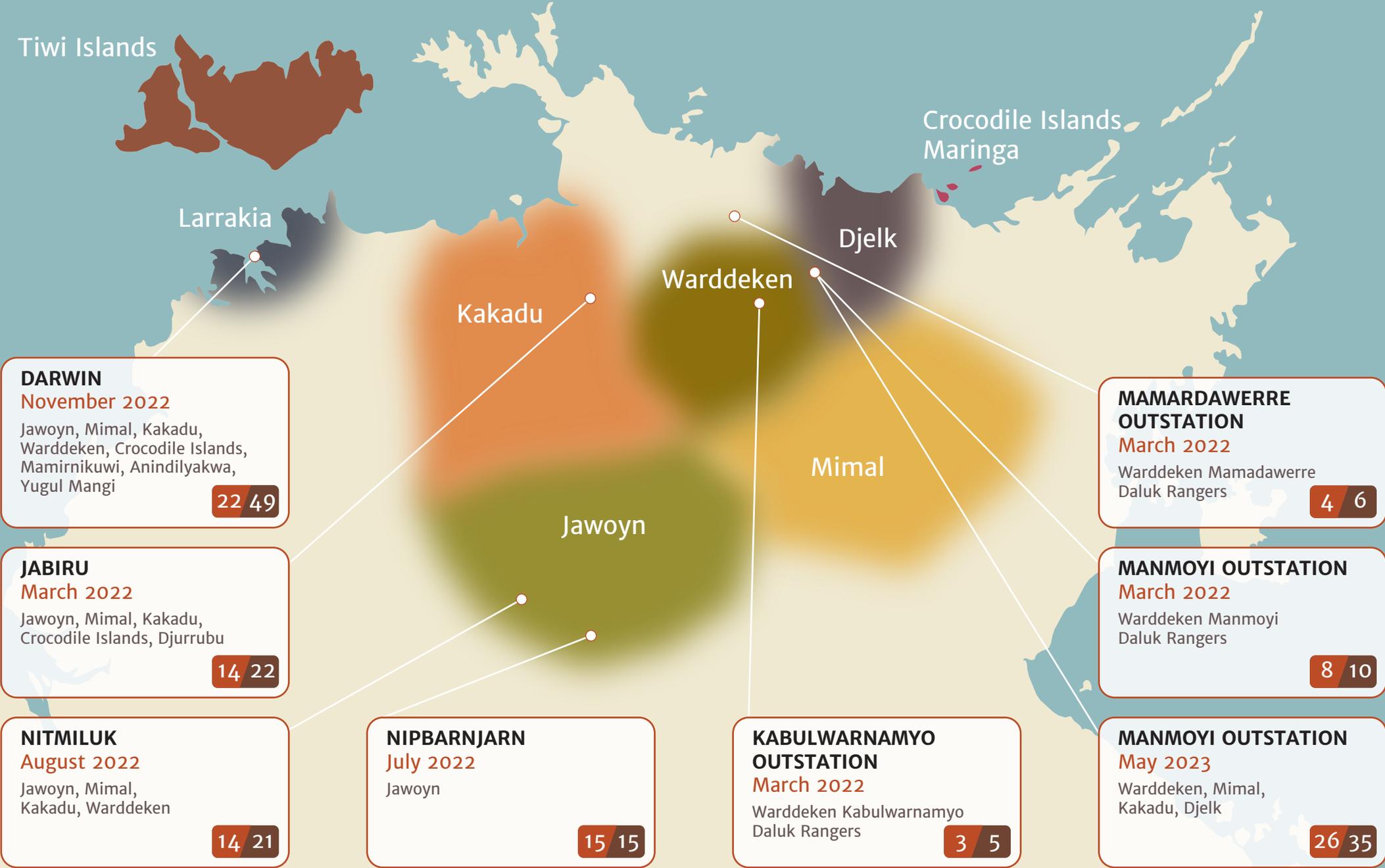
Using this charter as a framework, the design group generated an approach to the practical delivery of the program. Importantly, it

didn't only look at the actual delivery, but also at creating an inclusive and cooperative atmosphere, to increase the chance of success.

All workshops were done in the presence of Elder women and their approval was sought for all major decisions.

# Digital Women Ranger workshops

Indigenous women rangers / Total participants



## Learning by doing

On-Country workshops focused on enabling Indigenous women participants to learn and share a range of digital skills that were guided by short training modules.

The completion of each module was jointly verified by a cultural authority (senior Elder) and technical authority (a scientist who is trained and proficient with this digital technology and/or skill) and the participant is then awarded a digital badge. Digital badges serve as a tangible reminder of these accomplishments, encouraging further collaboration and responsible practices involving researchers, rangers, Elders and the Indigenous community.

Examples of skills include:

- using drones for significant site monitoring
- using camera traps for wildlife monitoring
- using video cameras for interviewing and recording Elders and rangers monitoring Country



- using touch GIS to support the monitoring of feral animal damage to significant waterholes.

This program was flexible, to enable Indigenous land and sea managers to adapted digital skills to each local place, accommodate Indigenous peoples' digital confidence and choices, and accounted for any digital accessibility issues that may be unique to each group.

### Building Digital Confidence

Digital confidence was self-assessed at the beginning of each on-Country training workshop. Women who had participated in previous training workshops reported an increase in their confidence to 'tell a story with Country using data'. Having a women-only space to learn and apply digital skills at workshops and on Country were key reasons identified for this difference.

# Sharing and learning new digital skills

Local Indigenous women rangers have been supported to apply digital training to monitor significant species and threats to significant places that respects and protects local Indigenous data sovereignty protocols.

For example, **Warddeken Daluk** used AI to speed up the process of analysing camera trap images and used time saved to add bilingual labels to wildlife (Mayh) images and communicate findings from camera data monitoring into poster reports that were shared with Elders and local outstation communities.

**Jawoyn Ngalmuka** learned drone skills to assess Country before and after Indigenous-led landscape burning on Jawoyn Country.

**Kakadu Ngalmuka** used camera traps to assess if areas in Kakadu are safe from crocodiles.

## Building skills and confidence to share knowledge with others

As women rangers completed modules, applied their digital skills to help monitor Country and improved their confidence to tell stories about Country with data, they co-led training sessions through peer-to-peer learning processes.

Delivering the training in this manner has meant the women rangers learn in groups and are supported by their family, colleagues

and Elders. The training is culturally safe by being delivered on-Country and in local languages or simple English, and the learning and practice needs to be accountable and connected to kin-Country responsibilities and cultural governance systems.

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*All the girls were sharing knowledge and skills and doing it with confidence*

**JASMINE DALY, DALUK RANGER**

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## Key insights and learnings from the Digital Women Ranger Network

As part of the program's on-Country workshops Indigenous women rangers, researchers and coordinators identified key insights and learnings to guide the next phase of the program.

### Digital skills to support diverse levels of confidence and a range of Caring for Country activities

- Digital skill training needs to continue supporting local on-ground priorities and efforts and reflect diverse local kin-Country contexts.
- Keep enabling all women with different levels of confidence and all parts of Australia to engage in the program.
- Ongoing monitoring of module training activities and impact is important to ensure the program delivers the desired impact to empower local Indigenous women to use data, AI and digital technologies to 'tell stories about their Country using data'.

### Right way, two way digital inclusion pathways, training and collaboration

- Important to share what we have learned to negotiate why, when, where and how each on-Country training and workshop is done and how modules are verified by cultural and technical authorities.
- Recognise and support ongoing 'two-way' learning and training for science and Indigenous partners to build the skills needed to collect, care and share data that protects Indigenous property and cultural property rights, respects local Indigenous data sovereignty protocols, and supports Indigenous-led on-Country decisions.
- Digital infrastructure, skills and resources are expensive and needed to support Indigenous digital technology programs, careers and businesses. Partnerships and training supported by the program are an important step towards this goal.





## Data training modules

The modules are designed specifically for the needs of each community, equipping rangers with digital skills that are directly relevant to the ongoing management of their Country. The skills learned are a continuation of and an enhancement of the caring for Country that has been carried out for generations.

## Collecting data modules

The 'collecting data' modules in the Healthy Country AI and digital training program are designed around site surveys, to ensure training provides Indigenous rangers with skills to responsibly collect useful and usable data for a purpose, to monitor the adaptive management of healthy Country values.

In each module, trainees are supported to mobilise their own knowledge practices to ensure monitoring technologies are used in a culturally safe way on Country, under the authority of appropriate Elders. Training occurs on the job and can be built into collaborative research projects or monitoring programs so rangers can use monitoring technologies as tools to support their caring for Country work in place.

Modules have been developed for popular environmental and cultural monitoring technologies, including drones (remotely piloted aircraft or RPAs), camera traps, video cameras and touch GIS. These technologies can be used to collect ecological, social and cultural monitoring data.



## Site survey using drones

Drones enable Indigenous people to see Country from the sky. Drones are often used by Indigenous rangers and their partners to map and monitor specific sites to assess changes over time, particularly before and after management actions. This includes monitoring the effectiveness of weed control, erosion mitigation and feral animal impacts to waterholes.

The completion of this module is accredited as a micro-credential through Charles Darwin University, as part of the Healthy Country Digital Monitoring collection.

### Skill units

- 1 Culturally safe drone use
- 2 Launch and land a drone
- 3 Fly a drone in a controlled way
- 4 Take photos of Country from the air with the drone
- 5 Set up A survey area in the drone control app to work offline
- 6 Collect monitoring data of site using the drone

## Site survey using camera traps

Camera traps enable Indigenous people to see Country when they are not there. Camera traps can be a simple and effective way to understand what animals are on Country. Camera traps are often used to collect data on the impact of various land management practices on the presence and status of animal populations, like fire and feral animal management practices.

The completion of this module will be accredited as a micro-credential through Charles Darwin University, as part of the Healthy Country Digital Monitoring collection.

### Skill units

- 1 Culturally safe use of camera traps
- 2 Agree on sites to install camera traps
- 3 Set up camera traps for monitoring
- 4 Install camera traps on Country

## Site survey using video cameras

Video cameras are often used to record Elders telling stories about the health of Country. These assessments and reflections provide qualitative data on changes to healthy Country values before and after on-ground management activities and can be used to guide next actions. Oral stories and assessments of the health of Country can be stored by ranger groups for future generations to continue learning from Elders.

The completion of this module will be accredited as a micro-credential through Charles Darwin University, as part of the Healthy Country Digital Monitoring collection.

### Skill units

- 1 Cultural protocols and research ethics for using video cameras
- 2 Basic video camera operation and filming techniques
- 3 Active listening and asking good interview questions
- 4 Plan and capture footage for an interview or video story
- 5 Put together a video story

## Caring for data modules

### Data processing & storage

#### Skill units

- 1 Relevant basic computer skills
- 2 Transfer data from SD card to computer
- 3 Pre-process data
- 4 Upload data to cloud storage

## Sharing data modules

### Mapping – Touch GIS

Touch GIS is a data collection and visualisation tool that is used to create maps to use on Country or to view data collected on Country. Touch GIS can be used to draw and edit points, lines, and polygons, and functions both online and offline, by caching maps before going to places without WiFi or mobile reception.

The completion of this module will be accredited as a micro-credential through Charles Darwin University, as part of the Healthy Country Digital Monitoring collection.

#### Skill units

- 1 Understanding cultural protocols for creating maps
- 2 Create a new project or open an existing project
- 3 Zoom into an area of interest
- 4 Add a point
- 5 Add a line
- 6 Add a polygon
- 7 Export a map
- 8 Import map layers



## Indigenous women who have participated

in on-Country workshops, peer-to-peer training, learning-by-doing activities and sharing their stories about Country using data, have:

- co-designed the purposes and training modules of the program
- identified challenges and strategies for women rangers to access and use digital technologies and data in remote Caring-for-Country work
- learned digital skills that directly apply to their ranger work
- built their confidence through gender-specific practices
- helped create a supportive community of practice
- co-authored research reports, videos and papers.

## Outcomes

The Digital Women Rangers program began in early 2022 and has delivered several outcomes through digital skill training and using these skills in a practical way to enable Indigenous women to care for Country. Importantly, digital confidence-building and women-support outcomes have also been achieved by establishing a network of supportive women.

A Digital Boss Lady Committee made up of representatives from participating ranger groups has now been formed to:

- govern the next phase of the program
- support digital skills and confidence of Indigenous women to independently manage future learning opportunities
- expand the program to support Indigenous women and their caring for Country activities.

### Cultural governance

Digital women rangers were supported by their Elders and families during their digital training activities. Ensuring digital women

rangers are connected in this way means they can learn in a culturally safe way that makes them feel strong and healthy.

This governance also enables Elders to continue to have authority over decision-making for their Country.

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*'[We want to] learn how to use the GPS but also make time to learn traditional navigation way. Two-way learning valuing both as we learn together'*

WARDEKKEN RANGERS

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### Sharing knowledge

Digital women rangers shared skills that they had learned from the program with other communities in a reciprocal way, gaining confidence and strengthening links.

When a woman ranger had built confidence and completed a digital training module, she took the lead in teaching others, a necessary

Workshops were delivered across

10  
communities

training

91

Digital Women Rangers

with the support of

57

and Elders and colleagues

step to ensuring knowledge sharing and digital skill development will continue to be supported beyond the program.



Screenshot of the Healthy Country AI and digital training program website

A website and online video were developed to showcase the achievements of the digital women rangers and to provide ready access to module content.

Women rangers from communities not directly involved were invited to participate in various stages of the program, allowing them to decide whether the program might be brought to their communities. As a result,

there is a strong likelihood that the program will be replicated in new communities in the near future.

### Providing a safe space for women rangers to learn

Learning under Elder authority in a women-only space has enabled the rangers to problem-solve with increased confidence. Learning while surrounded by family, teaching younger women and kids, has provided a more relaxed and cooperative environment.

Tensions are alleviated if ranger groups have resources for separate men's and women's offices, or at least enough rooms that people can move around as needed.

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*'It is easier to speak up and solve problems when [we] ha[ve] a women's only space'*

**MIMAL RANGER**

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### Healthy Country Digital Monitoring digital badges

The digital skills that are learned in the program are recognised by a series of Healthy Country Digital Monitoring digital badges from Charles Darwin University. These verify the credentials of Indigenous rangers.

The training for each badge is authorised by an Indigenous senior authority, which ensures the monitoring technologies are used safely, responsibly and for a purpose. The collection currently include an introductory and advanced badge for 'site survey using drones' and a badge for 'site survey using camera traps' with other badges planned for the future. The digital badges provide an online record of assessment and the student's achievements.

### Ongoing Country management

A direct outcome of the program is that the digital women rangers are increasing their skillset, enabling them to more effectively care for Country. This brings job opportunities, which in turn support local livelihoods and improves care for Country.

## Caring for data

While many modules in the program are focused on developing strong skills in data collection, it is equally important that they learn to store, analyse and use data. This is critical to ensuring they can share the outcomes of management and monitoring activities with Traditional Owners and can tell their own stories to partners and funders. Indigenous authority to own, control and access their own data is a crucial element of data sovereignty.

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*'We need to learn how to access it [the data they have collected]. Make program decisions with it. We want to be part of all of it to make decisions on Country'*

**WARDDEKEN MANMOYI DALUK RANGERS**

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The program includes modules to deliver this training to ensure that the data collected is used to make effective management decisions for Country.

## Weaving knowledge systems

This program provides a critical connection between AI and data-supported monitoring design and application, and the governance and knowledge systems that Indigenous communities have used for thousands of years to care for Country.

Importantly, it has also brought these Indigenous governance and knowledge systems into the process of AI and digital technology co-design and application, extending human-centred design thinking to include Indigenous kin-Country centred ethics and protocols.

Anthea Lawrence became the first person to complete the **'Site Survey Using Drones'** introductory digital badge in the Healthy Country Digital Monitoring collection.

The completion of Anthea's training was authorised by senior Elder and Mimal Ranger Lydia Lawrence, who confirmed that Anthea will use drones safely and responsibly on Country. Anthea showed such skill at using the drone that she confidently delivered peer-to-peer training to the other Indigenous women rangers at the workshop.

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*'The main thing I love is the drone ... seeing other skills, [and] helping each other' to tell stories about Country with data.'*

**ANTHEA LAWRENCE, MIMAL RANGER**

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# Our digital women rangers and champions

Thanks to all those who have participated in the program including the digital women rangers and champions in photos here.



Bernadette Calma



Silvicka Ahwon



Recain Nabarlamarl



Emma Lupin



Cara Penton



Melina Pearse



Tahnee Nabalwad



Gloria Roberts



Kelli Schmitt



Larina Maralngurra



Yvonne Honey



Justine Murray



Solodi Buthunguliwuy



Vicario Dhurrkay



Jennifer Hunter



Amanda Lilleyman



Lydia Lawrence



Tarlisha Redford



Denell Djumbirri



Lewellyn Moulin



Suzannah Nabalwad



Cathy Robinson



Anne-Marie Ahwon



Seraphina Watson



Kathleen Penton



Jackie Coates



Jennifer Macdonald



Joylene Cameron



Bessie Bradshaw



Sylvia Maroney



Danisha Riley



Anthea Lawrence



Alexandria Namarnyilk



Benita Alangale



Deborah Nabarlambarl



Gabriella Maralngurra



Kayla Nagurrurrba



Tinnasha Narrorga

## Building a women's network

One of the largest benefits of the program has been the ability to build and grow a network of digital women rangers across the participating communities.

The network provides invaluable mutual support, in a way that reflects their needs and experiences.

*'[It gives us the opportunity to] address the challenges that women face specifically, like building women's confidence'*

**WOMAN RANGER**

These challenges the women rangers face include not just issues with confidence, but also a commitment to other duties like raising children and cultural duties.

As part of the co-design of the program, the women were able to adapt it to meet these challenges by making it more flexible and responsive. For example, by running repeat sessions for digital training so that participation wasn't limited to those who could make a particular time and place.

*'Mak[ing] us as one, sisters. It builds your confidence within yourself and speak from the heart because you have, you're telling your Elders story and carrying on that knowledge to pass on to the young generation'*

**SYLVIA MARONEY, JAWOYN RANGER**





The Digital Women ranger program is a collaboration led by Traditional Owners and Indigenous rangers, supported by a number of partners including funding from Telstra Foundation, CSIRO, the National Environmental Science Program's Resilient Landscapes Hub and the Australian Government's WiSE program.

To find out more about this program and collaboration visit the Healthy Country AI website



View the Indigenous Digital Women Rangers video

