



A diagram of a savanna scene with a researcher and an Indigenous ranger.



**Northern Australia  
Environmental  
Resources  
Hub**

National Environmental Science Programme



[nespnorthern.edu.au](https://nespnorthern.edu.au)



[nesp.northern@cdu.edu.au](mailto:nesp.northern@cdu.edu.au)



[/NESPNorthern](https://www.facebook.com/NESPNorthern)



[@NESPNorthern](https://twitter.com/NESPNorthern)

IMPACT STORY 2021

# New approaches for monitoring and communicating about environmental resources

Northern Australia is a unique place. Its heat, seasonal inaccessibility and sheer scale mean that new monitoring approaches are necessary to know where in these vast landscapes to safely and efficiently focus monitoring and management efforts. The Northern Australia Environmental Resources Hub has developed new approaches to better detect threatened or invasive species, as well as innovative methods to communicate these discoveries.

► **Find out more about these projects**



APN Cape York archive

An endangered Olive Ridley turtle hatchling makes its way to the sea.



The Northern Australia Environmental Resources Hub has developed new approaches to better detect threatened or invasive species. Researchers have successfully developed an eDNA (environmental DNA) test to detect the endangered Gouldian finch at waterholes where the birds drink and bathe. An eDNA test for cane toads has also been developed that can detect this invasive species if it's visited a waterhole for as little as 5 minutes. An eDNA test for the aquatic weed Cabomba is also protecting the quality of Darwin's drinking water supply.

From waterholes to the air, hub research has also been combining the power of Microsoft artificial intelligence (AI) and cloud computing with Indigenous knowledge to monitor and protect sea turtle nests from feral pigs, helping more baby turtles reach the ocean.

Communicating these discoveries is critical in ensuring broad uptake of these methods, and a new set of publicly available graphical symbols – including a Gouldian finch, cane toad and feral pig – is being used to better tell the research stories of northern Australia.

## Impact snapshots

### Finding finches: using eDNA to track endangered birds

Hub researchers have developed an eDNA test for the Gouldian finch – a first for an endangered bird species. Gouldian finches live in small and mobile groups and are difficult to find using standard survey methods. The test allows the finches to be detected from water samples collected from the small pools where they drink, and the Northern Territory Government is using the test in their regional surveys that provide baseline information for proposed development activities and in their collaborative monitoring of the finches with Jawoyn Rangers in the Katherine region.

[Discover more project findings.](#)



Gouldian Finches drinking at (and leaving their eDNA in) a waterhole in the north of Western Australia.

### A giant leap forward in detecting unwanted visitors

Using an eDNA test developed by hub researchers, we can tell if invasive cane toads have visited a waterhole for as little as 5 minutes – an important early warning in places they are yet to invade. An eDNA test for the aquatic weed Cabomba is also allowing weed managers to monitor Darwin's drinking water supply for this pest that can choke waterways and degrade water quality. The power of eDNA methods means that cryptic or uncommon organisms can be detected without being directly observed, and waterbodies can be sampled quickly and safely to minimise risks to those monitoring invasive threats across northern Australia.

[Discover more project findings](#) or [read the cane toad report.](#)



NESP Northern Hub

Using eDNA can help keep track of cane toads more efficiently than searching for cane toads at night.

### Using AI to protect baby turtles from feral pigs

Indigenous knowledge and artificial intelligence are helping protect baby turtles from predators on Cape York. Sea turtle nests are particularly vulnerable to predation by feral pigs, and a partnership between CSIRO, Aak Puul Ngantam Cape York and Microsoft has given Indigenous rangers a helping hand in analysing tens of thousands of images of Cape York coastline. This analysis is guiding where to focus their nest protection and predator management activities. What used to take one month of difficult on-ground

work can now be achieved in hours. This is increasing the chances of survival for these threatened and culturally important species.

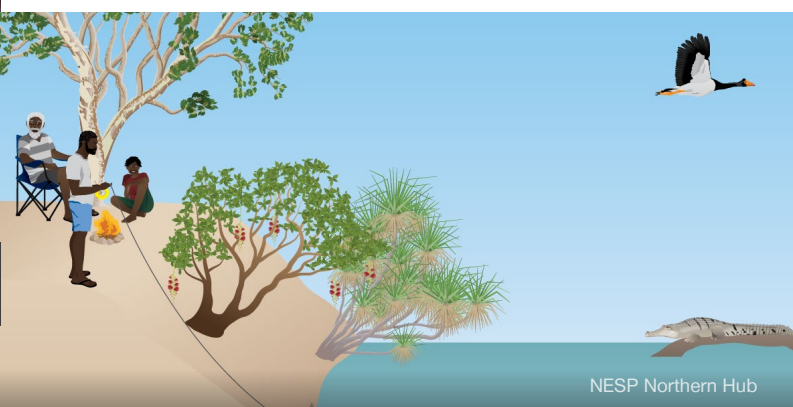
[Discover more project findings or read the final report.](#)



Power BI dashboard showing analysis of Cape York coastline.

## Engagement is a two-way street: creating symbols for science communication

A free collection of more than 100 graphical symbols has been developed to better represent northern Australia in science communication products. Initially conceived and developed for use by hub research projects – where the symbols are effectively delivering research messages to key partners and research users – they have also been released publicly and are being taken up in diverse fields and in exciting and unexpected ways. The range



More than 100 symbols were created that can be used to tell the stories of northern Australia,



National Environmental Science Programme

The Hub is supported through funding from the Australian Government's National Environmental Science Program.

and diversity of symbols, including plants, animals, people, land uses, livelihoods and aspirations, are fostering inclusive two-way communication and better representing the landscapes and stories unique to northern Australia.

[Access the graphics library here](#) or find other examples of symbol use throughout many of the finalised hub resources.

## Research outputs

The online version of this impact story has a complete list of outputs from these projects.

## Attributions

- Project leaders: Karen Gibb (Charles Darwin University [CDU]), Alaric Fisher (NT Dept of Environment, Parks and Water Security [DEPWS]), Damien Burrows (James Cook University [JCU]), Justin Perry (CSIRO)
- Alea Rose, Kimberley Day (CDU), Brydie Hill (NT DEPWS), Simon Jarman (UWA)
- Ryan Barrowei, Kenny Duffill, Mike Allangale (Jawoyn Rangers)
- David Loewensteiner, Hamish Campbell (CDU), Andrea Crino (Deakin University), Paul Barden, Joanne Heathcote (EMS Consulting)
- Territory Wildlife Park
- Cecilia Villacorta-Rath, Richard C. Edmunds, Roger Huerliman, Jan M. Strugnell, Lin Schwarzkopf, Adeshina I. Adenkunle, Madi K. Cooper, Agnes Le Port, Heather L.A Robson & Dean R. Jerry (JCU)
- Christopher J. Collins (Northern Territory Government)
- Napau Pedro Stephen AM (Torres Strait Regional Authority)
- Dion Koomeeta and the ranger team (APN Cape York), Kerri Woodcock (Cape York NRM/Western Cape Turtle Threat Abatement Alliance)
- Lee Hickin and Steve van Bodegraven (Microsoft)
- Jonathan Marshall, Peter Negus and Alisha Steward (Department of Environment and Science Queensland)
- Nathan Waltham and Jason Schaffer (JCU)
- The Hon Sussan Ley, Australian Minister for the Environment
- Phil Schouteten (Phisch Creative)
- Hub science communicator Jane Thomas (CDU)
- Professor Stephen van Leeuwen, Curtin University
- All project leaders and research teams who contributed ideas and feedback during development of the symbols