THE FINNISS REYNOLDS NORTHERN LONG-NECKED TURTLE PROJECT

COMMUNITY REPORT 2018 AND 2019

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INTRODUCTION

The northern long-necked turtle (*Chelodina rugosa*) is found in lowland waterways, billabongs, and seasonal wetlands on coastal floodplains across Northern Australia.

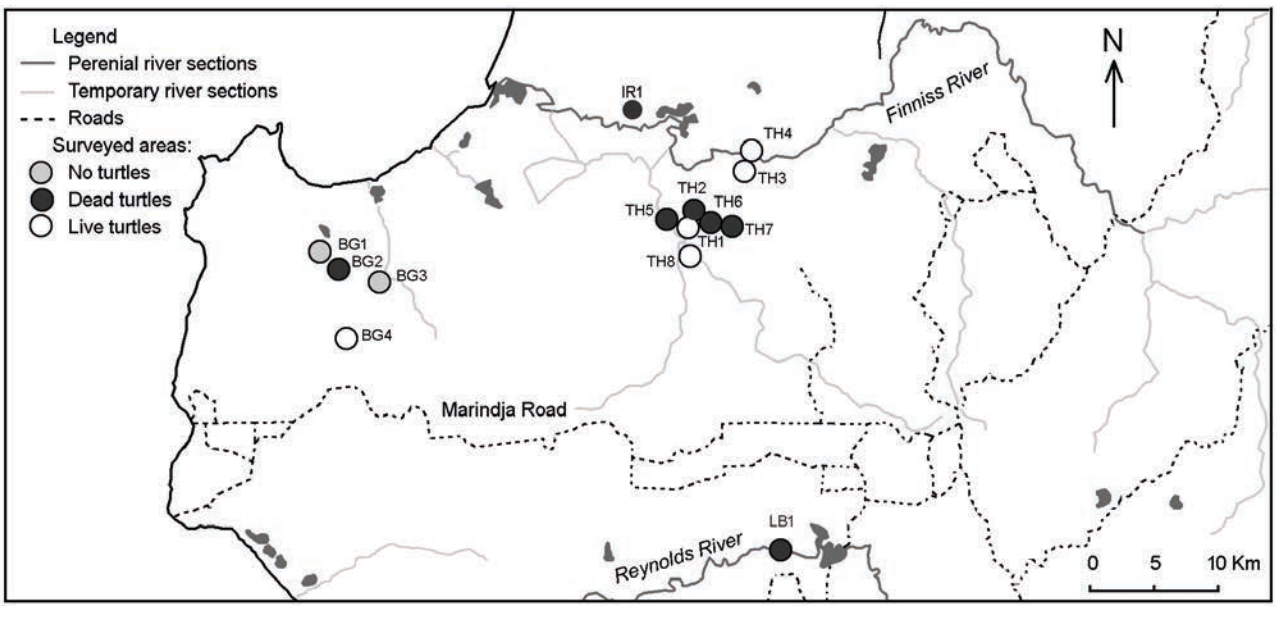
Recently, the traditional owners from the Finniss River catchment have reported a decline in the health of harvested turtles, as well as more frequent sightings of dead turtles.

PROJECT OBJECTIVES

This project was located in the Finniss-Reynolds catchments and aimed to:

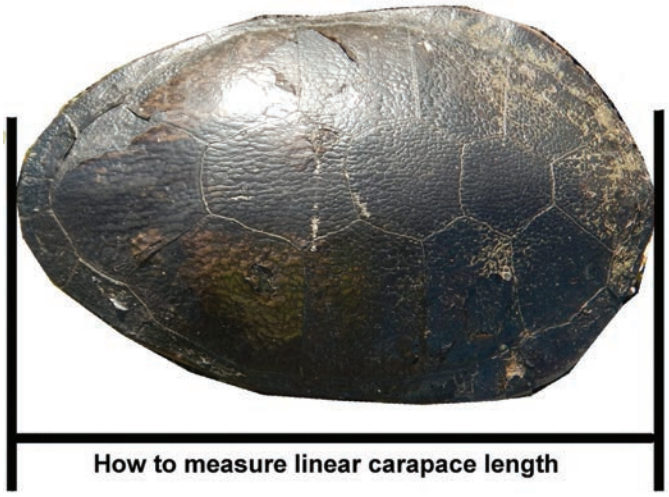
- Map the presence of live and dead long-necked turtles in some key areas.
- Examine the levels of heavy metal contamination of dead and harvested turtles.
- Identify the main threats to the long-necked turtle.

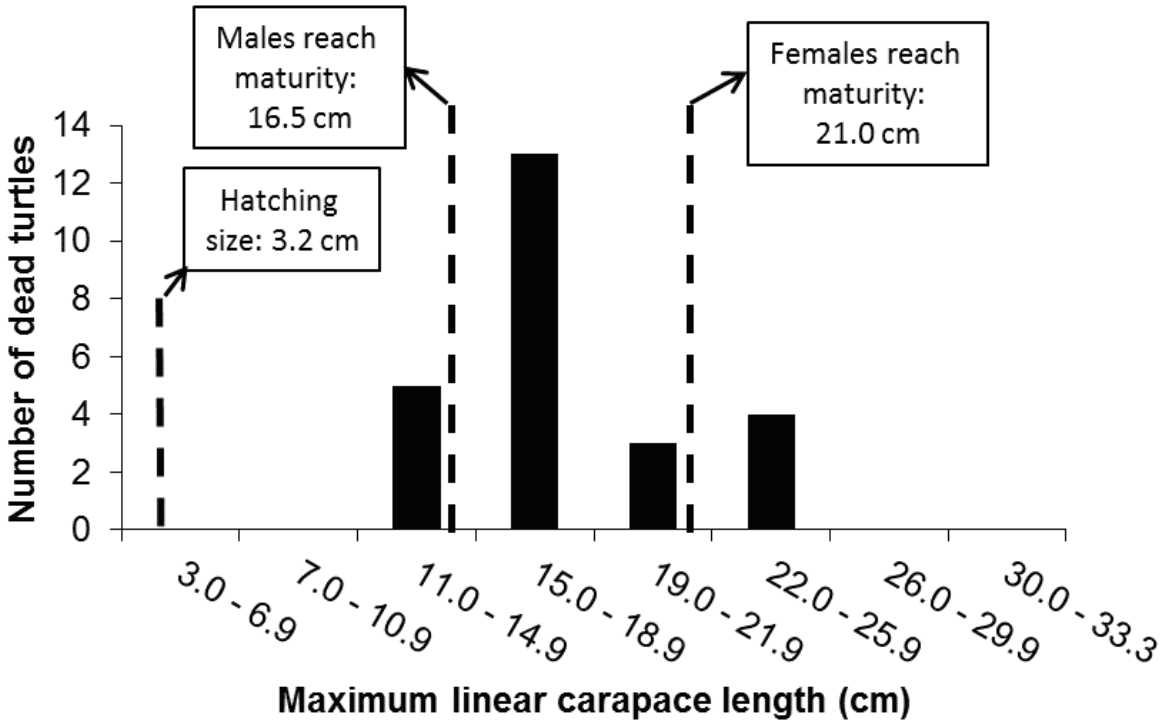
From May to October 2018, we surveyed 14 locations along the Finniss River floodplain and found a total of 21 dead long-necked turtles.



RESULTS

The linear carapace length (LCL) of dead turtles ranged from 12.1 cm to 25.9 cm. Most turtles observed dead were mature animals (adults) - refer to graph below.





Heavy metals accumulate through the food chain, and carnivorous animals, such as the long-necked turtle, are good indicators of environmental contamination.

We measured mercury concentration in the shell and skin of 18 long-necked turtles found dead on the Finniss-Reynolds River floodplain.

RESULTS

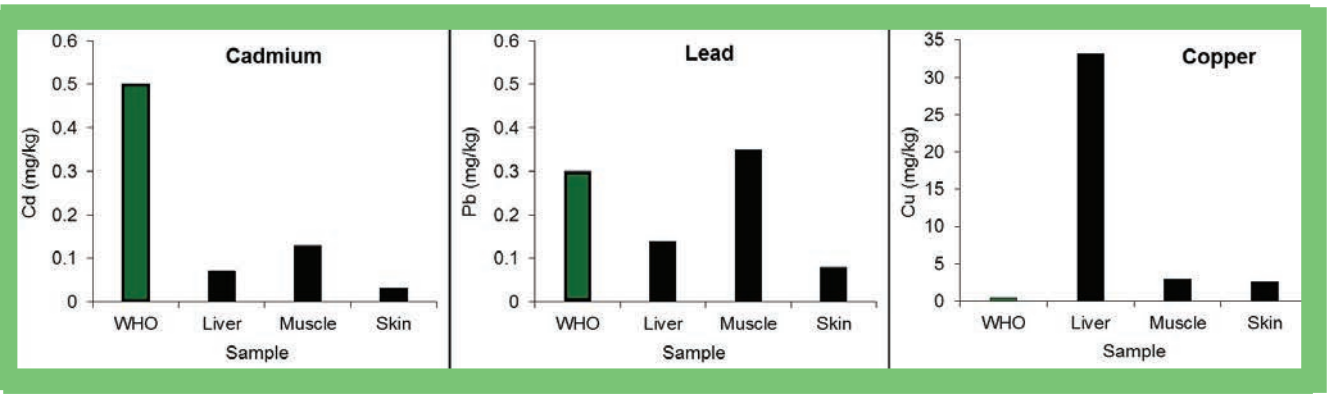
Mercury accumulates particularly well in shells of turtles because shells are composed of keratin, the same protein found in human hair. Mercury has a chemical affinity for keratin, hence turtle shells usually have a higher mercury concentration than muscle and skin.

Location	Date	Area	ID	LCL (cm)	Sample	Mercury (ng/g)
Twin Hill	14-Jul	TH5	1	18.8	Shell	130.8
		TH6	2	15.5	Shell	400.4
			3	18.8	Shell	421.3
					Skin	69.2
		TH7	4	17.2	Shell	78.6
			5	17.9	Shell	79
			6	16.0	Shell	93.8
			7	17.6	Shell	66.6
			8	17.4	Shell	90.2
			9	13.5	Shell	114.5
			10	16.2	Shell	103.8
			11	12.1	Shell	160.9
			12	14.7	Shell	184.3
	30-May	TH2	13	20.8	Shell	260.6
			14	20.9	Shell	146.4
					Skin	35
			15	18.5	Shell	195.7
					Skin	81.8
Ironstone	5-Sep	IR1	16	21.9	Shell	373.6
Labelle	28-Sep	LB1	17	2.37	Shell	2,409.9
Knuckeys Lagoon	28-Sep	Control	18	22.3	Shell	828.2
					Skin	50.9

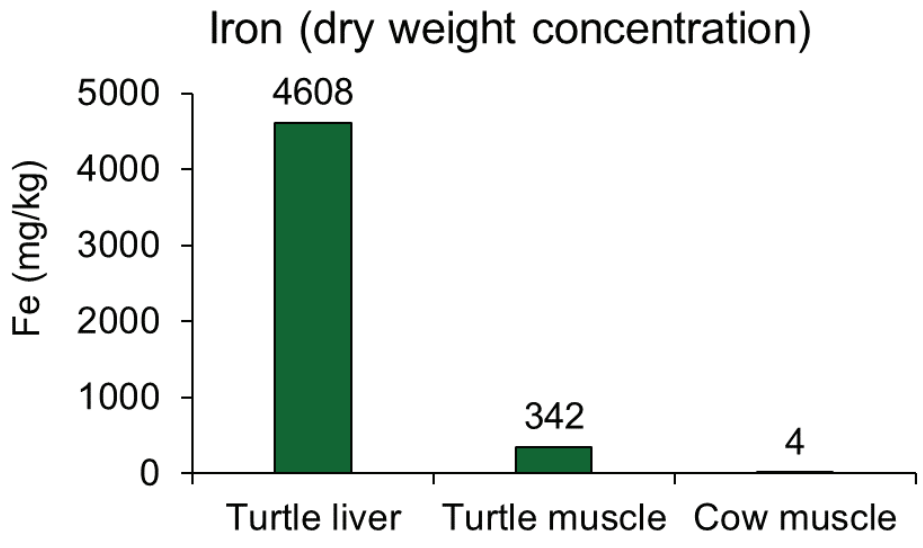
There are no official consumption guidelines for turtles. These turtle shell and skin samples provided baseline data and an initial evidence for potential high levels of mercury. However, more samples are needed from more types of tissues and areas before it is possible to provide recommendations.

RESULTS

The values in the figure below are the average concentrations of cadmium, lead and copper in liver, muscle and skin from five long-necked turtles harvested in Bulgul. Some animals had heavy metal concentrations over the maximum level recommended for fish meat consumption according to WHO (World Health Organisation) guidelines for copper and lead. However, it is important to note that when these heavy metal concentrations are translated to consumption of turtle kilograms per week, a person can eat up to three kilograms per week of turtle (meat, liver etc.) without risking their health.



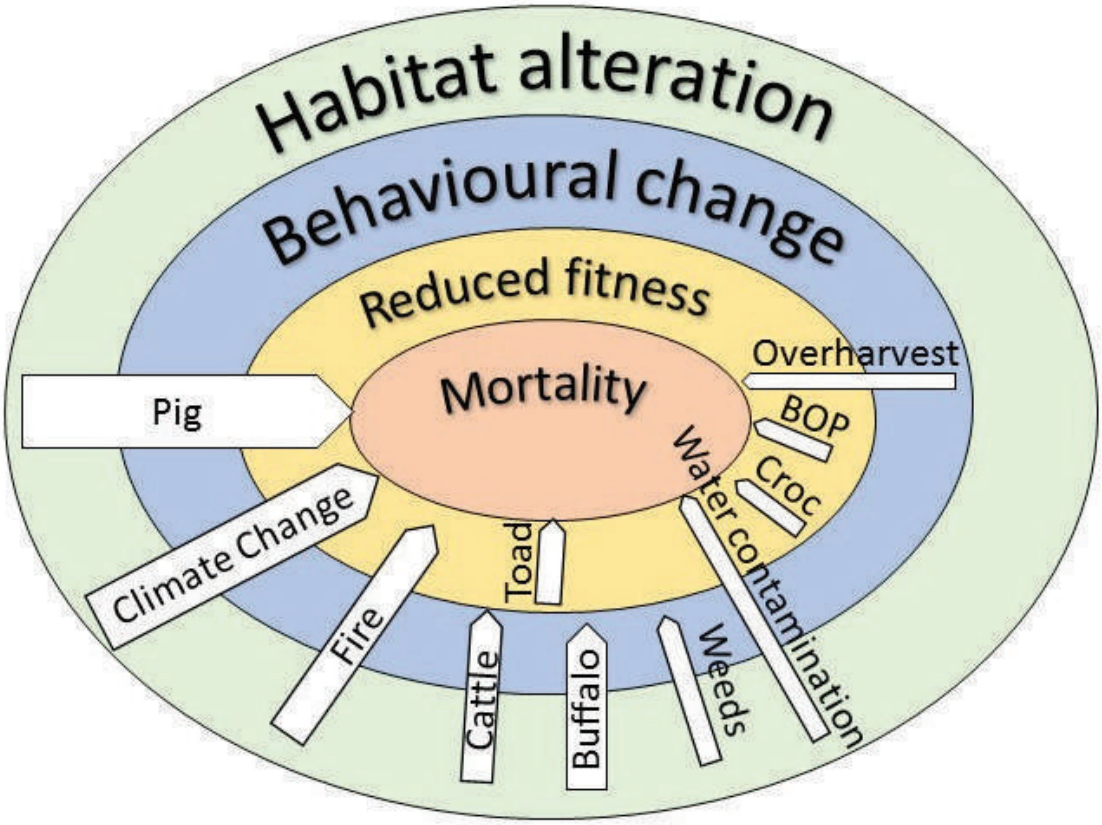
An unexpected result from this research was the observed high levels of iron in the long-necked turtle liver and muscle. The amount of iron in beef (cow muscle) is shown for comparison in the graph below.



RESULTS

These results validate the importance of turtles in the diet of aboriginal communities. Anaemia is a serious issue in the Northern Territory, where 15% of pregnant women and up to 25% of children (0 to 5 years) are anaemic. If anaemia is to be halted in remote communities, there is an urgent need to better understand the role of bushmeat as a source of iron, and how water contamination, introduced species, fire, climate change and other threats could endanger the turtle populations and those harvesting them.

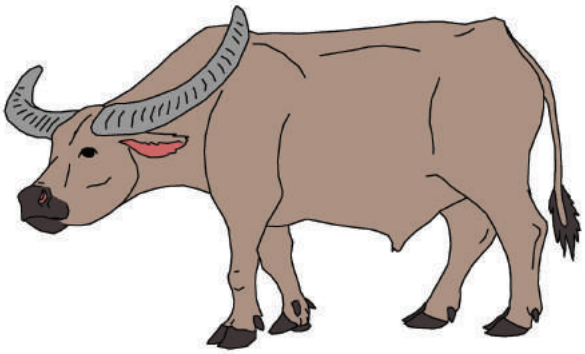
In collaboration with traditional owners and turtle specialists, we identified 11 main threats to this species. In the figure below, the larger and wider the arrow, the greater the severity of the threat.



*Croc = Crocodile; BOP = bird of prey (falcons, eagles, etc.)

THREATS

Fire can decrease vegetation cover and consequently the capacity of turtles to avoid natural predators such as birds of prey, as well as directly killing turtles.



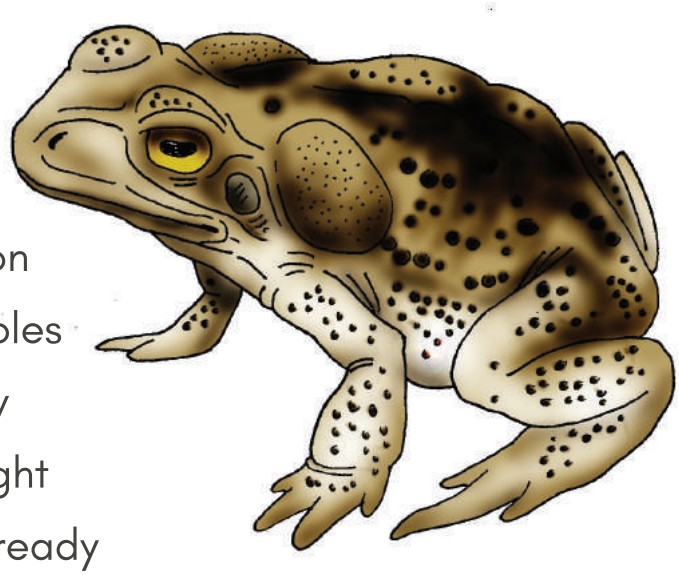
Cattle and **Buffalo** are perceived as threats only when they are in high densities as they destroy turtle habitat and trample the aestivating animals.

Invasive weeds (Alligator weed, Para grass, Mimosa, Olive Hymenachne) can form dense monocultures, which may prevent the long-necked turtle from migrating, foraging (by providing shelter for turtle prey, making it harder for the turtles to successfully locate food, such as fish) and finding locations to aestivate (dormancy underground during the dry season).

The use of **herbicides** against these weeds might also be affecting the long-necked turtle health directly or indirectly by decreasing the vegetation cover and decreasing the availability of prey, as a result of alterations to the food chain.

THREATS

Cane toads were considered a potential threat. Very small cane toads were found in extremely high densities at Twin Hill in late May 2018, in the same locations where dead mummified long-necked turtles without signs of predation were found. Although the consumption of a few eggs and tadpoles is unlikely to kill a healthy long-necked turtle, it might affect turtles that are already debilitated due to other threats that are destroying their habitat and decreasing the availability of food.

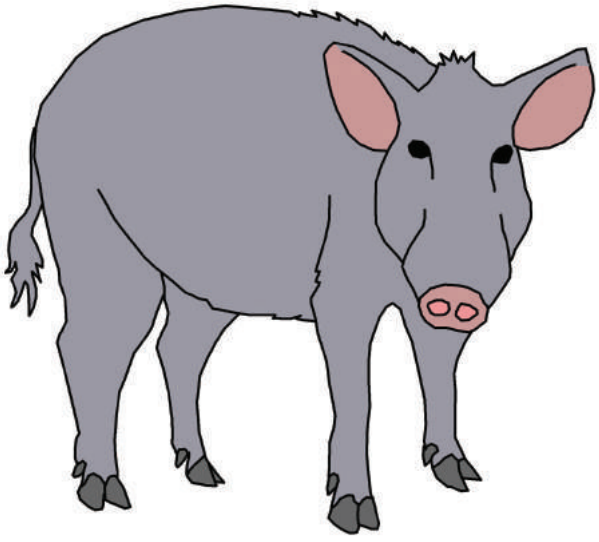


Climate change predictions are imprecise for northern Australia. Some of the possible consequences of climate change are the delay in the start of clear, dry-season flows and the consequent delay on benthic primary production which could decrease food availability for long-necked turtles. Higher water temperatures and consequent lower dissolved oxygen levels in the water, during the dry season, could also result in the spread of bacteria and disease in turtle populations.

THREATS

Harvest was considered a minor threat to the long-necked turtle. This turtle has been traditionally harvested sustainably for thousands of years. However, studies by Fordham and collaborators have shown that traditional levels of harvest are not sustainable in locations where there is intense turtle predation by feral pigs.

Feral pigs are likely the main threat to the long-necked turtle in the Finniss River Floodplain. Pigs eat both eggs and adults and destroy the turtle habitat while digging in billabongs for tubers and roots. Many turtle shells found in the areas surveyed had signs of pig predation.



OUTREACH

This project also raised awareness about the biology and threats faced by the northern long-necked turtle by creating and distributing a children's book and developing a short interactive theatre play. The book and play were aimed towards early primary students.

We distributed 1,125 copies of the book entitled "The northern long-necked turtle – Let's protect our freshwater turtles". A PDF of this book is freely available online via the following link:

https://www.tropicalturtlegroup.com/s/Long-neck-turtle-final-booklet.pdf

OUTREACH

The interactive play introduces interesting facts about the northern long-necked turtle, with one of the team members dressed as the turtle. During the play, children help the turtle to untangle from plastic bags and protect its eggs from feral pigs.

The books were distributed at the Finniss Reynolds stakeholder meeting, Bulgul culture camp (via NLC), GARMA, Barunga Festival and CDU open day.

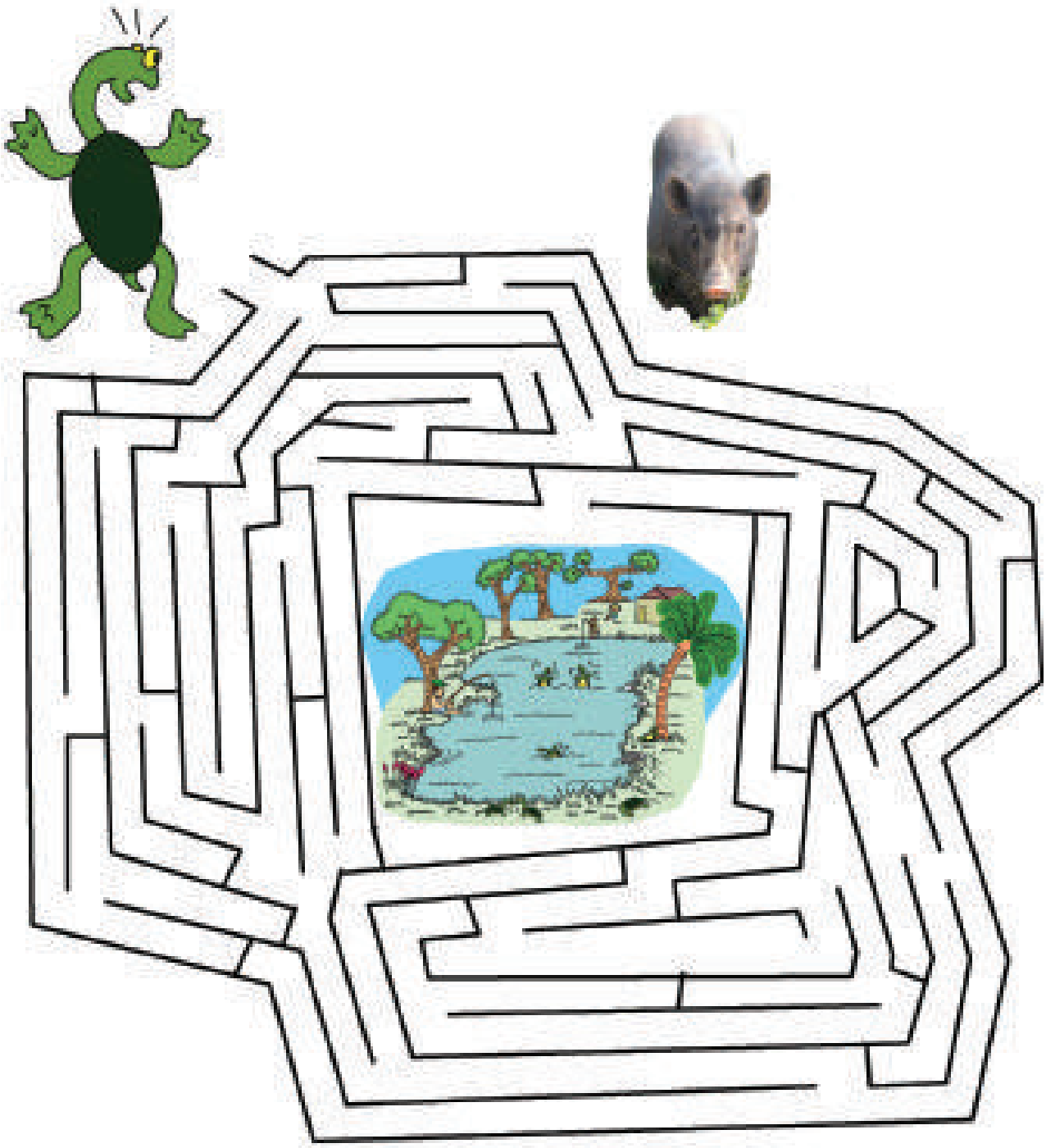
The turtle play was acted and books were distributed at the Sea Breeze Festival, Woolaning School, Anula Primary, Girraween Primary, Nakara Primary, Alawa Primary and Jingili Primary.

Acknowledgements: This research was undertaken by Charles Darwin University (RIEL) and TNRM in partnership with the traditional owners of the Finniss River floodplain and members of the Finniss Reynolds Catchment Group. It was sponsored by the Ichthys LNG Project.

OUTREACH

Page extract from the book: "The northern long-necked turtle – Let's protect our freshwater turtles":

Turtles are very scared of pigs! - they like eating us. They can find us in our holes, where we hide during the dry season. Pigs are also good at finding our eggs.



Help the turtle to find a safe billabong where he can hide from the pigs.

Territory Natural Resource Management

INPEX Ichthys Project

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