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Junior Ranger

Review

Issue 1 2006

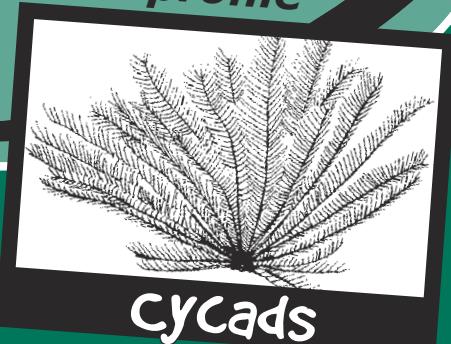


On the BRINK



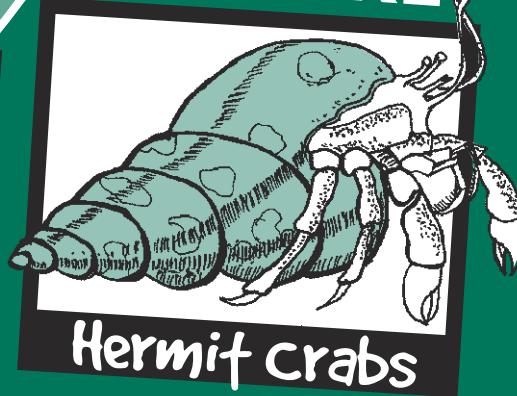
Finke Goby

PLANT profile



cycads

Creature FEATURE



Hermit crabs

Creature Feature

Hermit crab - BYO home

Hermit crabs are unusual because they use sea snail shells for their homes.

Recycling shells has helped hermit crabs wander where their crab cousins fear to tread.

Home Sweet Home

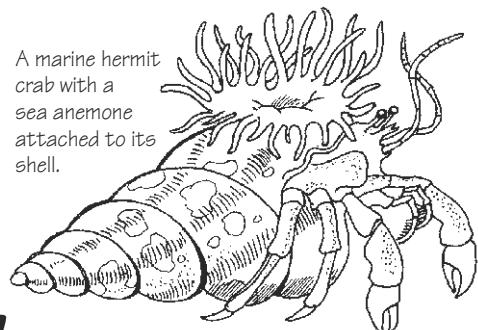
To hermit crabs snail shells are everything! If startled, they use their snail shells for protection. They tuck neatly into a ball, using strong front legs and nippers to block the entrance from intruders. The shell also keeps them wet when they venture onto land, shields them from the sun's rays and is a protected place for them to lay their eggs.

Some hermit crabs allow other marine life to piggy-back on their snail shells. The sea anemone is a welcome hitch-hiker as it stings predators. The anemone benefits from the ride by feeding on tiny particles of food as it is moved around.

This arrangement, which benefits both creatures, is known as **symbiosis**.



This hermit crab has outgrown its shell and will not be able to retract into its shell properly.



A marine hermit crab with a sea anemone attached to its shell.

G'day from Ranger Bill

Welcome to our first edition for 2006. I hope this is a great year for everybody and one where you discover more about the Territory environment.

With new weather records set across the Northern Territory in the first few months of the year, there are a few things we should remember when exploring the bush in hot weather. Unfortunately every year Rangers provide emergency treatment for many people who are not prepared for warm temperatures.

When exploring our Parks and Reserves we recommend that: you carry and drink plenty of water (at least 1 litre per person per hour); wear sensible footwear; be sunsmart by wearing a wide brim hat and clothing that will protect you from the sun, and always apply sunscreen. It is best to avoid the hottest part of the day, so get out and explore in the early morning or the late afternoon.

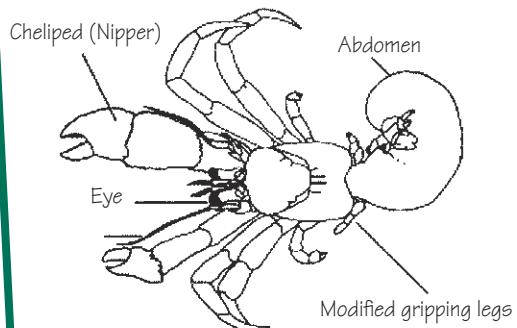
By following these simple safety tips we can enjoy the bush and stay safe.

See you out in the Bush!

Ranger Bill

Shaped to fit!

Hermit crabs are arthropods and therefore have an **exoskeleton** (a hard shell-like covering). The original crab body shape has changed to fit the shape of snail shells, making them look more like a crayfish. The soft abdomen is shaped to curl inside the shell opening. Their four rear legs hang tightly onto the inside of the shell. Their four front legs are used for walking and must be powerful to be able to pull a house along! They have two front nippers used to cut up their food and defend themselves.



Hermit crab anatomy outside a snail shell.

Hermit crab habitat

There are two types of hermit crabs: marine and terrestrial (land hermit crabs). Marine hermit crabs spend their whole lives underwater. Land hermit crabs can live in water but are really 'land-lubbers'. They can also live in freshwater but need to return to the sea for a salt recharge after a few days. Their modified gills allow them to get oxygen from the air as long as they don't get too dry.

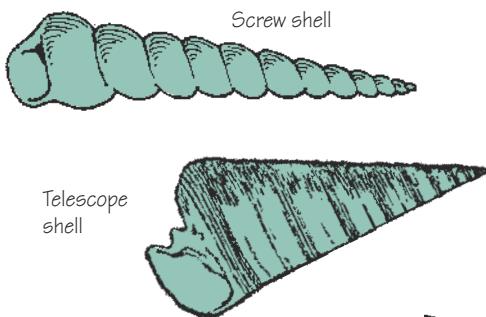


Close up of baby hermit crab (zooplankton)

Hermit crabs lay thousands of eggs at a time. The hatchlings roam the sea as zooplankton. A microscope is the only way to see them.

Shell swapping

Hermit crabs are not social animals spending most of their life alone. They will often fight each other for the other's shell. There is however one strange thing that they do called **co-operative shell swapping**. It works like this: a few hermit crabs come together and discuss their housing needs, then they will all hop out at the same time, and swap shells without complaint. But first they must carry out a full inspection!



These are some of the sea snail shells that hermit crabs use for their homes. See how they all have a basic screw shape. Have a look for them next time you're at the beach but remember someone could be at home!

Hermit crab puzzle

This will test your hermit crab knowledge.
Read back through the article for the clues.

Across

- Plants and animals that live in the sea.
 - Hermit crabs need shells that have a _____ shape.
 - All hermit crabs need one to survive.
 - Crabs, yabbies and crayfish, all belong to the same group (Phylum) of animals called_____.
 - When animals benefit each other.
 - The outside covering of crabs is called an

Down

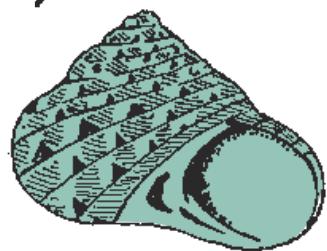
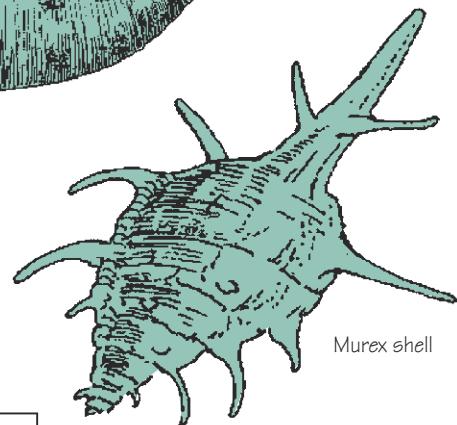
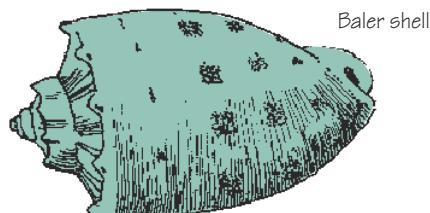
1. The main part of the hermit crabs body inside the shell is called the _____.
 3. Used to chop up hermit crab food and as defence.
 4. All land animals are called animals.

Inspecting the new home

Hermit crabs are fussy about the state of their shell. When they find a new shell, firstly, they pick it up to test the weight and strength by rocking it back and forth. Then, they roll the shell around in order to check the surface for cracks or holes. Finally, they will test for size and fit.

How to find a hermit crab

Land hermit crabs are great fun to look for and study. Simply find the freshest (sharpest looking) tracks you can see and follow them. Big tracks mean big hermit crabs. During the hottest times of the day they'll hide to avoid the heat, so look for them under flotsam and jetsam and sea shore plants.



1 B

2

3

4

5 C

6

7 A P

8 I

9 X

Murex shell

Turban shell

On the Brink

Finke Goby

Fish in the Finke?

Finke Goby are only found in the Finke River system in the southern part of the Northern Territory. The Finke River is very old and mostly dry so any fish that choose to live there must be pretty amazing!

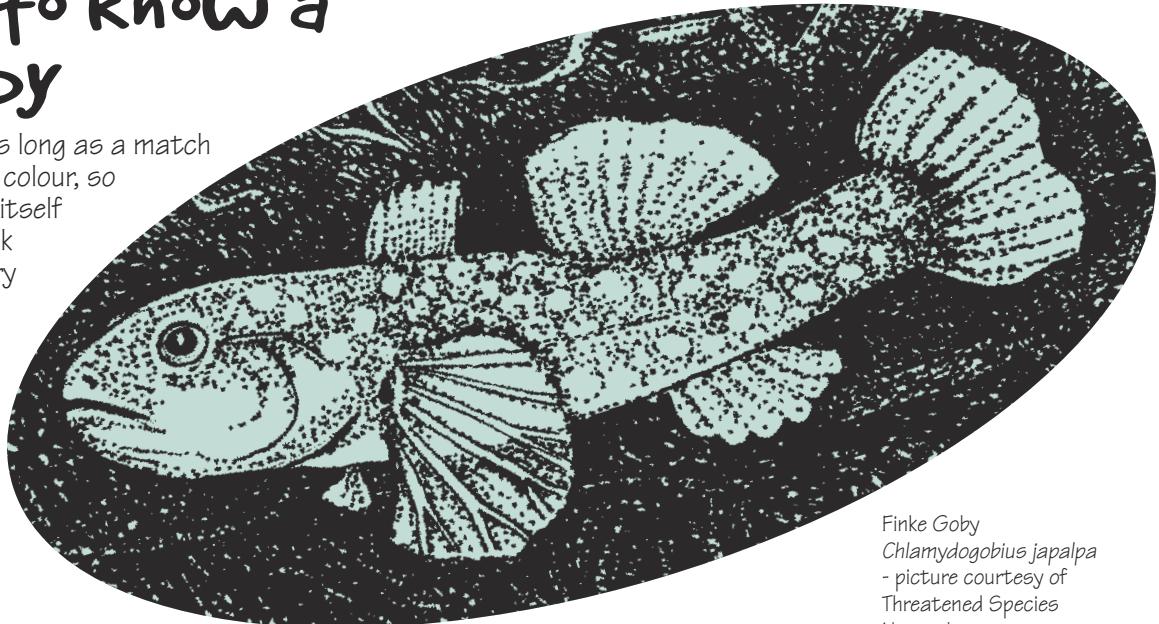
This river is one of the few in Central Australia that has permanent waterholes, which are important for the survival of native fish. Luckily, Finke Goby can live in water that gets very hot and salty and are happy to live in shallow pools.

Strangely they don't have **swim bladders** (internal gas filled sacs that act like 'floaties' helping the fish to swim and float) like many other fish species. Therefore they spend most of their time resting on the sandy or gravelly river bed, hiding in mud or debris and coming out at night to feed.

Getting to know a Finke Goby

This little fish is about as long as a match box (5cm) and greyish in colour, so it can easily camouflage itself on the riverbed. If you look closely you may see a very bright blue patch on the front fin of the male goby. Scientists think this may be used to attract a girlfriend.

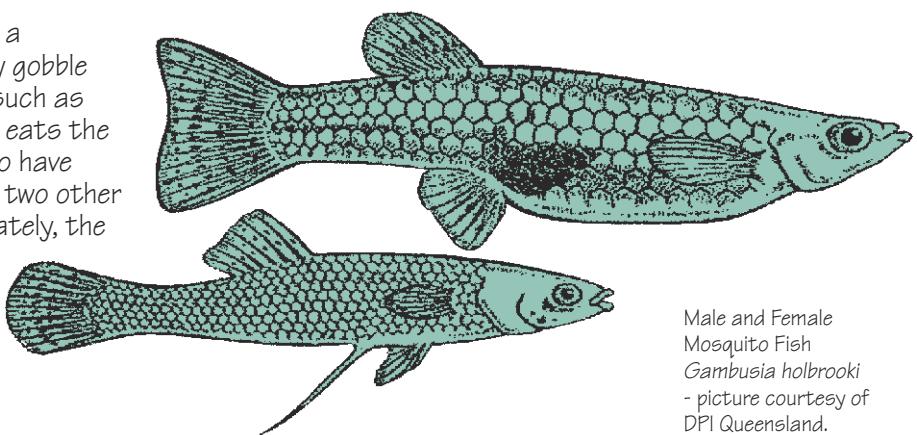
Insects, small crustaceans and algae are all on the menu for a goby.



Finke Goby
Chlamydogobius jopalpa
- picture courtesy of
Threatened Species
Network.

Mosquito vs Goby

The biggest threat to the Finke Goby is not a mosquito (whose larvae a goby would quickly gobble up) but introduced non-native fish species such as the Mosquito Fish! This very aggressive fish eats the eggs of our native fish. It is already known to have played a part in the decrease in numbers of two other goby species in Central Australia. Unfortunately, the Mosquito Fish is spreading quickly through freshwater habitats in Central Australia. It has been found in Alice Springs but at this stage it has not spread to the Finke River system.



Male and Female
Mosquito Fish
Gambusia holbrooki
- picture courtesy of
DPI Queensland.

What's happening to Desert Wetlands?

Freshwater ecosystems in Australian Deserts are not as damaged as others, but they are under threat from feral animals and stock like cattle, horses and camels. Some weeds like the Athel Pine grow thick along rivers and around waterholes, pushing out native plants and changing the natural habitat our native species need. Building dams on rivers, pollution or pumping out water for human use can also cause problems for Desert Wetlands.

How Can I help protect the Goby?

The best way to help native fish like the Finke Goby is to be careful when you visit desert waterholes and rivers. Guess how Mosquito Fish got here? Probably from someone's aquarium! If you have fish or snails in your aquarium at home, never let them go into rivers or waterways. Many of these introduced species can survive in the wild and you never know where they'll end up, or what harm they may cause.

What else? In dry times, when the Finke River isn't flowing the habitat of the Finke Goby is restricted to a handful of water holes or **refuges**. These are also the places that people like to go camping. Avoid swimming in small waterholes. Stirring up the water and letting sunscreen wash off can affect fish, frogs and insect larvae. And most importantly, remember to avoid using soaps and detergents in or near waterways.



There are two other species of fish that are only found in the Finke River.

The 1▲ 4▲ 4★ 1★ 5●
The [] [] [] [] []

3★ 5★ 2▲ 1♦ 3■ 4★ 4● 1●
[] [] [] [] [] [] []

And the

1▲ 4▲ 4★ 1★ 5●
[] [] [] [] []

3▲ 1● 3■ 4● 5♦ 3▲ 5● 1● 4●
[] [] [] [] [] [] [] []

Use this grid to decode their names.

1	2	3	4	5	
●	A	B	C	D	E
▲	F	G	H	I	J
★	K	L	M	N	O
■	P	Q	R	S	T
♦	U	V	W	X	Y

Urban Encounter



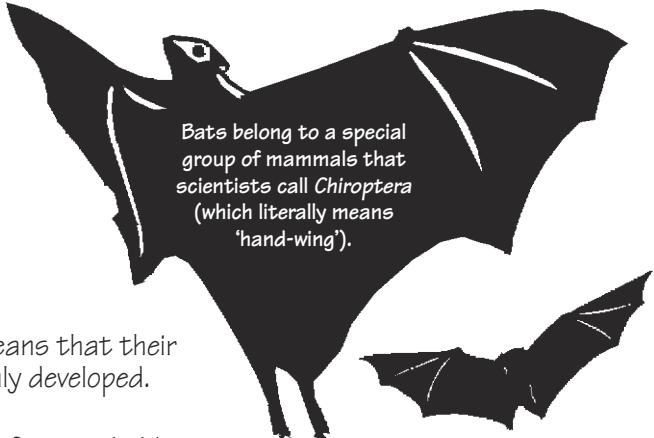
Fabulous Flying Foxes

We are lucky here in the Northern Territory because we have over 35 species of bats, the largest of which are the flying foxes. If you live in the Top End you have surely seen or heard them but you would not have in central Australia as it is way too cold for them.

Just like us

Flying foxes, like all bats, are placental mammals just like us. This means that their babies remain inside their mother's bodies until they are well and truly developed. When born they have all their body bits, but they just need to grow.

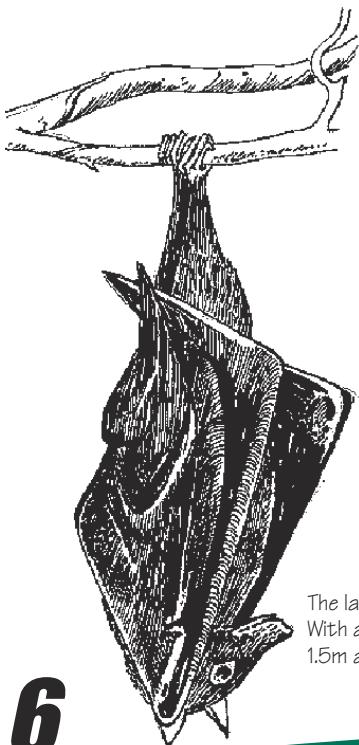
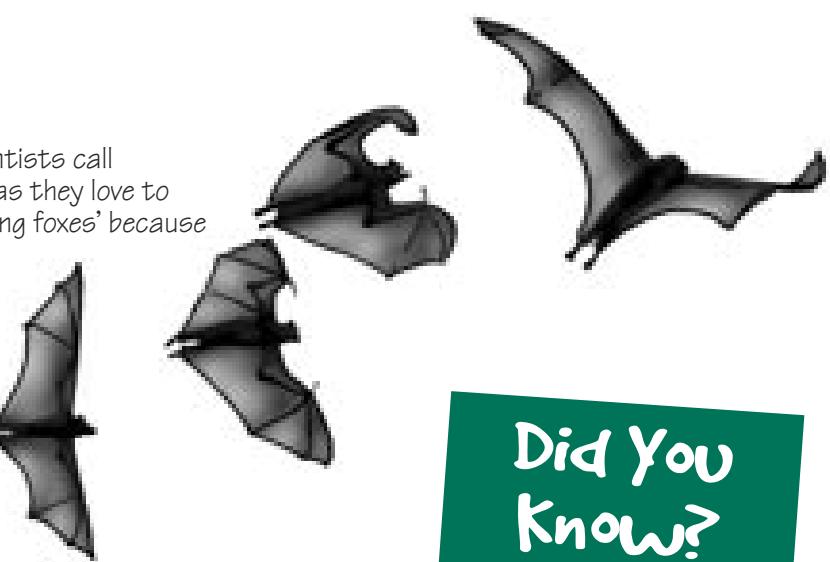
When born (usually in March and April in the Top End) the baby can't fly, so it holds on for dear life to its mother's fur with its clawed feet. All the while its mouth is attached to one of the nipples under her armpit. After about a month mum will leave her baby in a nursery (along with other babies) when she leaves camp to feed at night. After a couple of months the baby can fly and by three months will leave the camp to grab a feed. If they are lucky, flying foxes can live for 15 years.



Bats belong to a special group of mammals that scientists call Chiroptera (which literally means 'hand-wing').

Biiiiig bats!

Flying foxes and blossom bats belong in a group scientists call **Megabats**. They are also often known as 'fruit bats' as they love to feed on fruit, flowers and nectar. They were called 'flying foxes' because their heads look similar to those of foxes. For they have big eyes, ears and noses, all the better to see, smell, navigate and find food with. Most Australian bats belong to another very different group called **Microbats**. These are usually much smaller and eat mostly insects. They use echolocation (animal sonar) to find their way in the dark, as they have poor eyesight and are nearly "blind as a bat".



Spot the Difference

Here are two of our most common Top End flying foxes.

Black Flying Fox
Pteropus alecto

Fur is generally jet black often with a reddish brown patch on the back of the neck.

The largest Australian bat. With a wingspan of up to 1.5m and weighing about 1kg.

Little Red Flying Fox
Pteropus scapulatus

Fur is a rich reddish-brown to light brown.

In flight the wings are almost see-through.



Did You Know?

To a flying fox wings are useful for more than just flying: they make a great coat when cold; can be fanned to cool when hot; are a ready made raincoat; are a cradle for babies and can be flapped to scare off enemies.

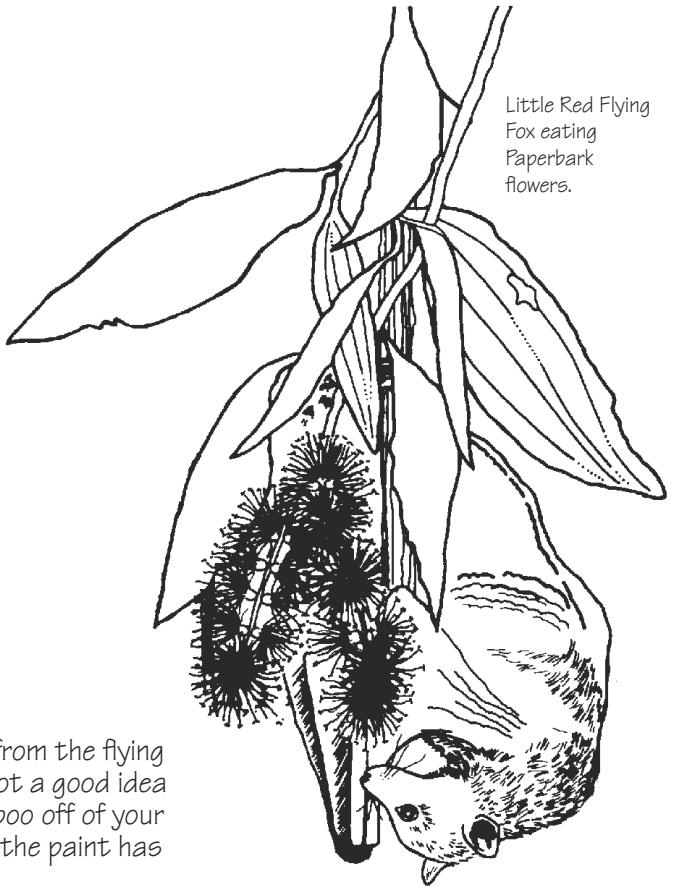
Food for Thought

Black Flying Foxes eat whatever grows in the area where they live. At dusk they stream out from their camps in search of flowers and fruit. They love the fruits of native trees like Billy Goat Plum, Carpentaria Palm and all the native figs. The Little Red Flying Fox has much smaller teeth, so it likes to eat the flowers of trees like paperbarks.

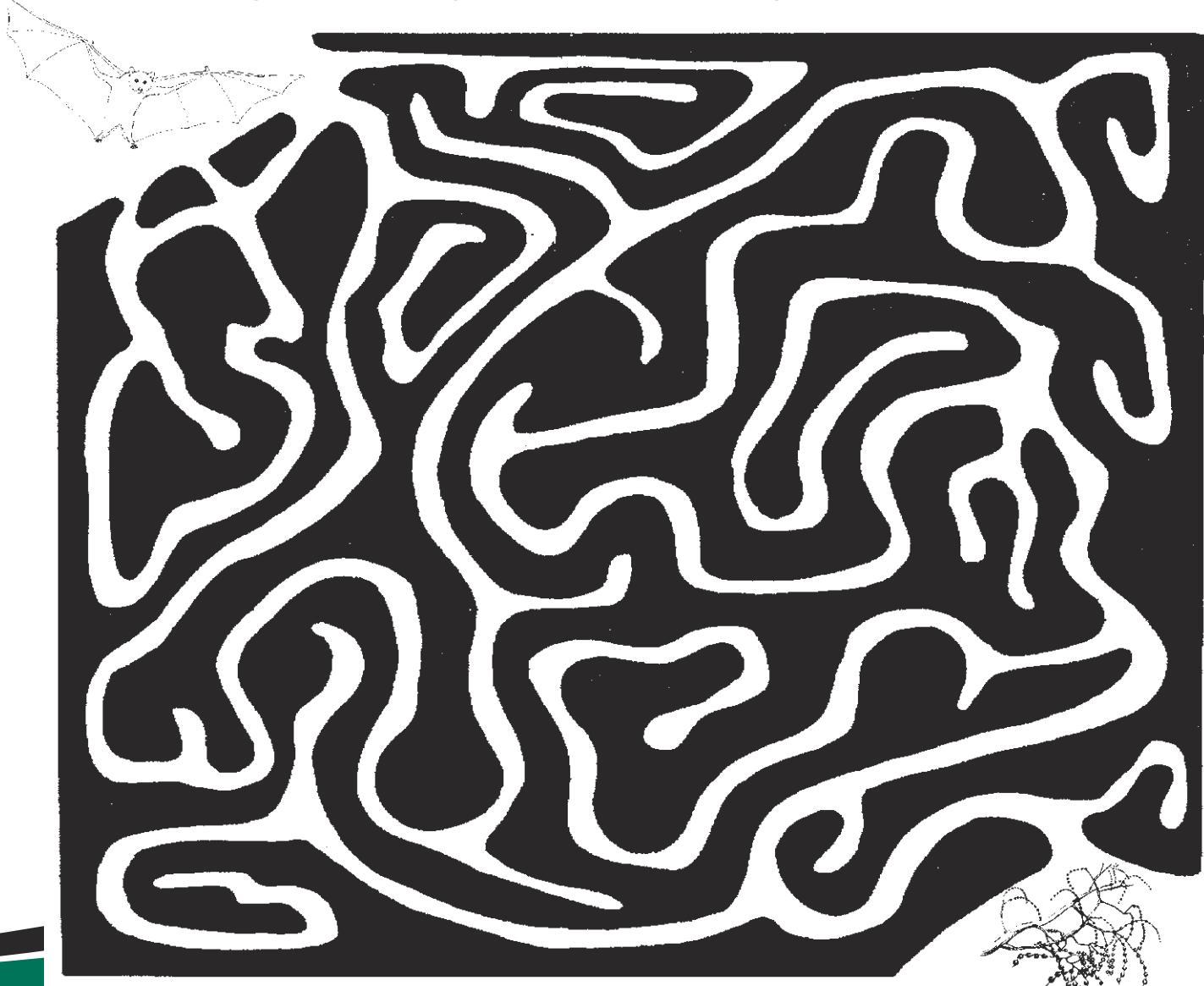
Both are notorious raiders of introduced fruit trees in and around our backyards. They just adore mangoes! They actually crush the fruit in their mouth, then swallow the juices and seeds and spit out the rest. If they swallowed the pulp then they would probably be too heavy to fly. Flying foxes must go to the toilet 'right side-up.' So they must hang from their thumbs to do so or they can go inflight - otherwise they would wear it on their faces!

Driving us batty!

Many Top Enders have been victim of what comes bombing out from the flying fox's rear end. Parking your car under a camp or roost tree is not a good idea unless you want it redecorated! In fact, if you don't wash their poo off of your car straight away then after a couple of days you will find that the paint has been eaten away!



Help this hungry Black Flying fox find its way through the dark to a palm fruit feast!



Plant Profile

cycads: senior citizens of the plant world

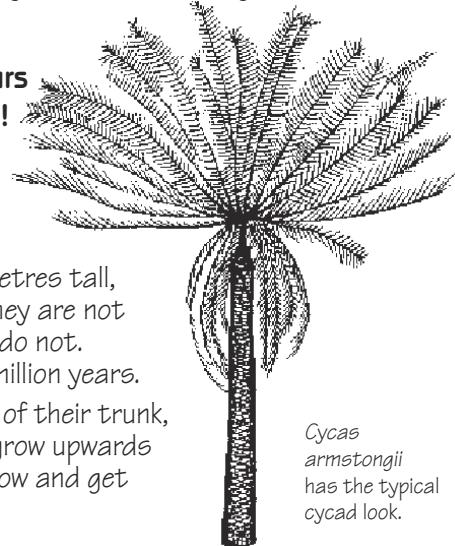


Cycads are the oldest living group of seed producing plants in the world. They have been around for at least 250 million years; long before dinosaurs came on the scene! But unlike the dinosaurs, we can still see them today!

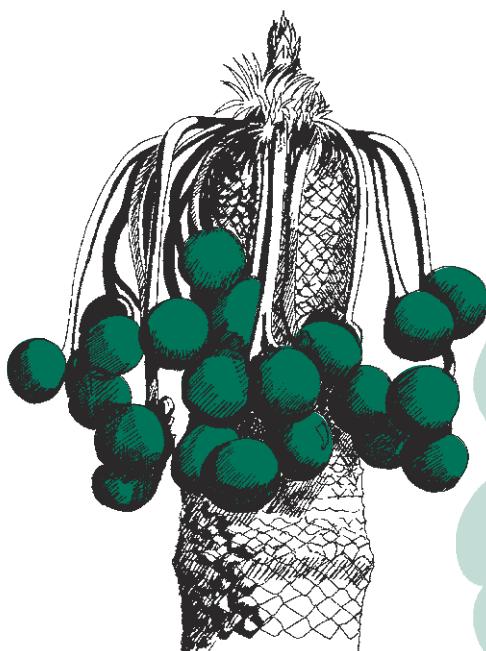
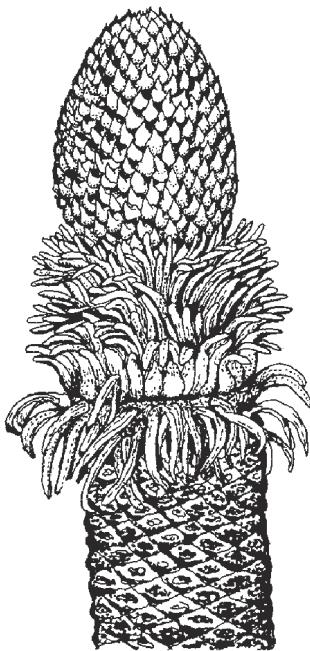
Don't call me a palm!

Cycads have single (sometimes branched) trunks that are rarely bigger than 3 metres tall, topped with feather-like leaves. This makes them look a bit like a palm tree, but they are not actually related at all. One big difference is that palms have flowers while cycads do not. Besides, the palm family are 'youngsters' that have only been around for 70-80 million years.

Cycads have separate male and female plants. The boys grow a large cone on top of their trunk, which produces pollen. The girls grow a cluster of finger like stalks. At first, they grow upwards together to form a sort of cone shape. But when the nuts (or seeds) start to grow and get heavy, they droop down around the top of the trunk.



Cycas armstrongii has the typical cycad look.



Male cone (left) and female seeds (right) of *C. armstrongii* are typical of NT Cycas species.

Did You Know?

Many early explorers, including Captain Cook, Leichhardt and Stuart all discovered the hard way that cycads are poisonous. Luckily, none of their men actually died, they just got really sick.

They built 'em tough in the old days!

Cycads are built tough. No wonder they outlived the dinosaurs! Even if they are broken or burnt to the ground, they can often regrow from underground storage stems. Cycads have coped well with fire over thousands of years. They are usually the first plant to re-sprout after a fire. Their fresh green leaves really stand out against the blackened landscape.

Drought? Long dry season? No worries. Many cycads can 'play dead' and drop their leaves. But as soon as it rains, they spring back to life.

Poor quality soil where nothing can grow? Also not a problem. Cycads have built in 'fertiliser factories' in their roots. They absorb nitrogen (an important element of fertiliser) from the air to improve the soil.

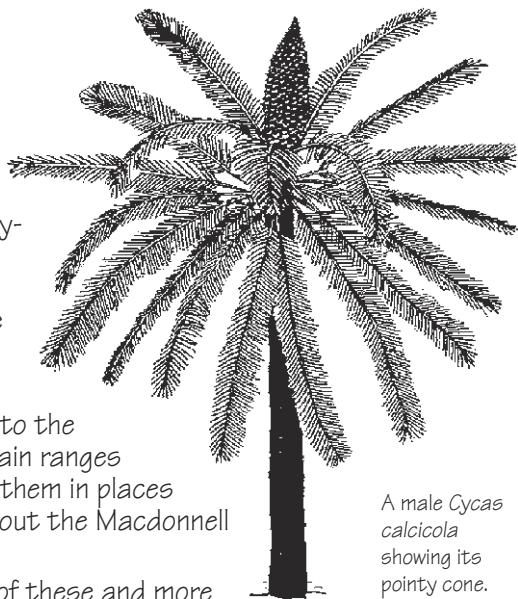
Go see a cycad

Territorians are lucky to have so many species of cycad nearby. In fact, there are ten species of Cycas scattered across the Top End. Everyone from around Darwin should recognise their local *Cycas armstrongii*. If you live in Katherine, or have visited Litchfield National Park, you might have seen the grey-green leaves of *C. calcicola*. If you travel east of Borroloola you should see the giant *C. angulata* along the highway. They're hard to miss at up to 12 metres tall with trunks 60 centimetres across! And just south of Nhulunbuy, massive stands of both *C. arnhemica* and *C. orientis* line the highway.

Central Australians have a slightly different local cycad. Its scientific name is

Macrozamia macdonnellii, and it is restricted to the rocky slopes and gorges of a few mountain ranges around Alice Springs. You can see them in places like Kings Canyon and throughout the Macdonnell Ranges.

Otherwise, you can see all of these and more by simply visiting the George Brown Darwin Botanic Gardens' Cycad Garden.



A male *Cycas calcicola* showing its pointy cone.



Central Australia's cycad,
Macrozamia macdonnellii

Did You Know?

The scientific name, *Cycas* comes from the Greek word *kykas*, which means palm.

Cycads have separate male and female plants. Scientists give plants that do this a special description. Complete this quiz and the word will be revealed in the boxes. All of the answers have been mentioned in this article. Good luck!

1. Female cycads produce _____
2. Extinct reptile
3. Don't touch cycad seeds because they are _____
4. Some Aboriginal groups make and eat cycad _____
5. Male cycads produce pollen in their _____
6. Cycads make their own fertiliser by absorbing what from the air?
7. The giant *Cycas angulata* can be found east of what town?
8. Cycads have single or branched _____
9. Cycads look similar to what type of plants?

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3	<input type="text"/>			
4	B	<input type="text"/>		
5	<input type="text"/>			
6	<input type="text"/>	N		
7	<input type="text"/>			
8	T	<input type="text"/>		
9	P	<input type="text"/>		

Want to know more?

Check out this cool web page,
<http://plantnet.rbgsyd.gov.au/PlantNet/cycad/>
It has pictures, maps and information on nearly every cycad in the world!

Discovering Outdoors

Seeing the world in stereo!

Step outside and try this little experiment. All you need are two working eyes and one finger! Close one eye and look at your finger. Now open it and close the other eye. Notice how your finger seems to 'jump' from side to side?

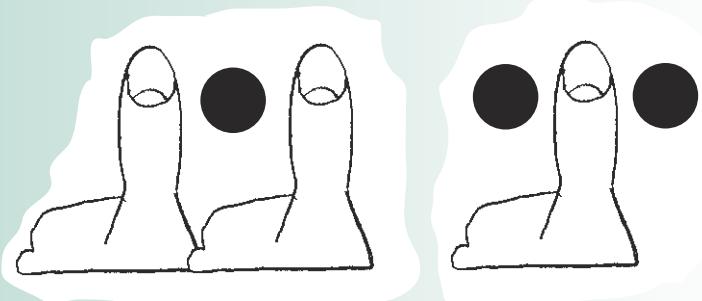
Your eyes are about 6 centimetres apart, so they see your finger from different angles. Your finger seems to 'jump' because your brain is actually seeing two different images as you swap between eyes! When both eyes are open, your brain combines the two different images into one three-dimensional (3D) image. This is called seeing in stereo, or **stereo vision**.



This next experiment will show you if both of your eyes are working together.

It worked!

- Focus your eyes on the dot.
- Put your thumb in front of your nose.
- Continue to focus on the dot. If both eyes are working, you should see something like the first picture.
- Now, switch your focus to your thumb. You should now see something like the second picture.



Don't worry too much if this didn't work for you. About 12% of people can't see in stereo properly.

We aren't the only animals with stereo vision. Some animals have their eyes placed on the front of their head, like we do. They can also focus both eyes on one object and see it in stereo. Other animals have eyes on the sides or even on top of their head, so they can't do this.

But what's so great about stereo vision?

Your brain can judge distance and speed much more easily with stereo vision. So let's see how much easier it is to 'hunt' with stereo vision.

First, use a finger to **rapidly** 'stab' at pictures on these pages with only one eye open. Now open both eyes and try again. Stereo vision makes it easier, doesn't it?

Having forward facing eyes with stereo vision really makes hunting easier!

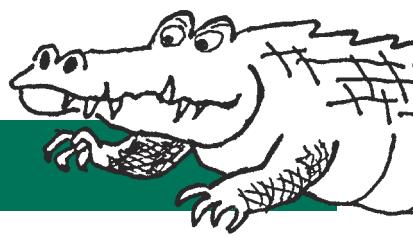
Next, hang up a small object at head height. Now, close one eye, pretend you are a bird of prey and dash in and try to snatch it. Not easy, is it? Try again with both eyes open. 'See' the difference? Birds of prey actually have fantastic stereo vision. This allows them to tell how far away their food is, and how fast they are catching up to it.



Puzzle page

Looking for Danger!

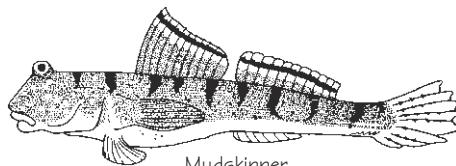
All clear!



Stereo vision is great if you are a hunter, but not so great if you are the hunted! Hunted animals need to be able to see danger coming from all directions, not just in front of them. Having eyes on the sides or on top of their head makes this easier. Sort the animals pictured below into either hunters or hunted by drawing a line to the correct word. Need a clue? Look where their eyes are!



Southern Boobook



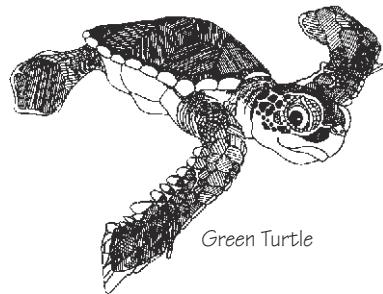
Mudskipper



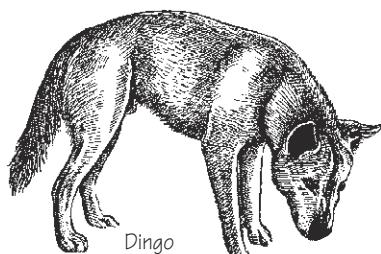
Agile Wallaby

Hunter or Hunted

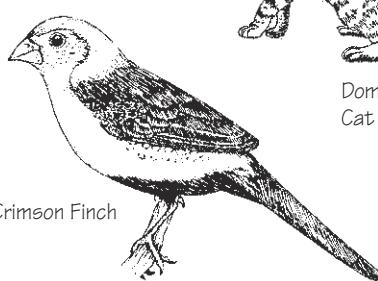
It's all in the eyes!



Green Turtle



Dingo



Crimson Finch



Domestic Cat

Find a word

'Hunted' animals need to spot danger coming from any direction. This type of vision has a special name. Find all of the words in this word search to reveal it. But be careful, they go in all directions! Locate the 10 leftover letters, by working from the top left and across then down. Then place them in the spaces provided.

Angle	Forward	Side
Animal	Front	Sight
Bird	Hunted	Stereo
Brain	Hunter	Thumb
Eyes	Prey	Vision
Focus	See	

H	S	S	E	P	E	D	R	S	I
U	T	I	P	Y	R	P	R	E	Y
N	E	D	H	A	E	E	R	E	A
T	R	E	W	V	I	S	I	O	N
E	E	R	H	U	N	T	E	D	G
R	O	A	L	A	N	I	M	A	L
F	O	C	U	S	D	R	I	B	E
T	N	O	R	F	T	H	G	I	S
N	I	A	R	B	T	H	U	M	B

vision.

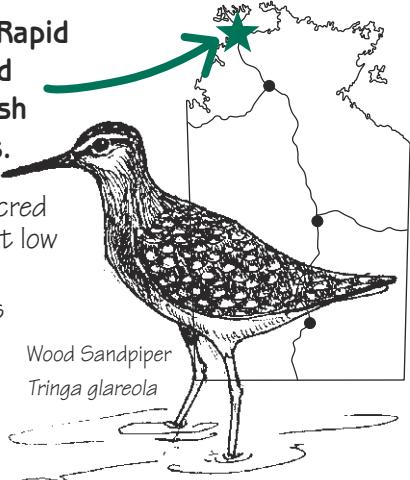
Discover a Territory Park

Casuarina Coastal Reserve

This is a large park that protects some of Darwin's coastal habitats between Rapid Creek and Buffalo Creek. It includes 13 km of sandy beach, dramatic cliffs and shady casuarina trees. Behind the sand dunes lies typical Top End coastal bush including patches of woodlands, monsoon forests, mangroves and paperbarks.

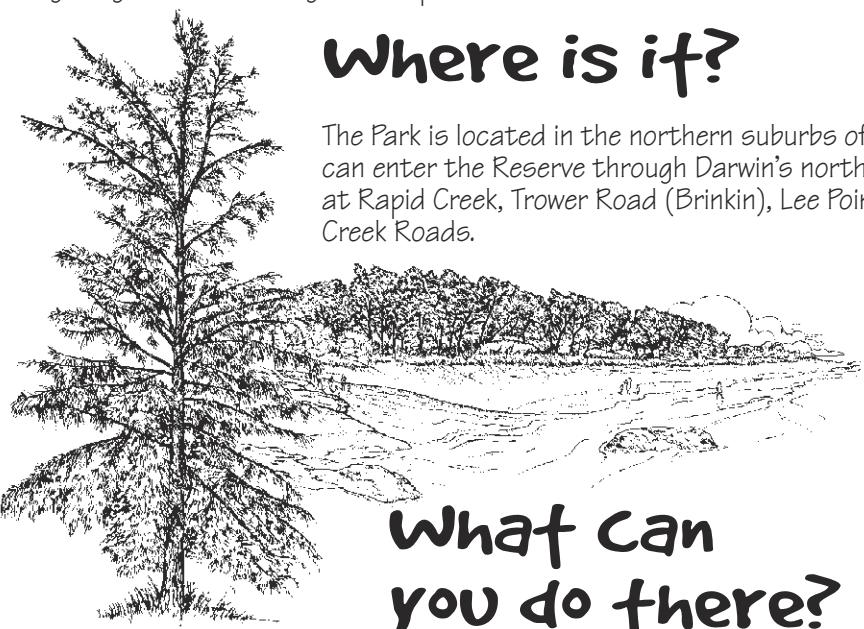
The Larrakia people speak for this area and maintain links with the land. There are sacred and significant sites such as Dariba Nunggalinya (Old Man Rock) which you can see at low tide from Dripstone Cliffs lookout.

At Lee Point, ruins of WW II military beach fortifications reminds us that in the 1940s Darwin was part of Australia's northern defence and a staging post for allied troops fighting in the Pacific against Japan.



Where is it?

The Park is located in the northern suburbs of Darwin. You can enter the Reserve through Darwin's northern suburbs at Rapid Creek, Trower Road (Brinkin), Lee Point or Buffalo Creek Roads.



What can you do there?

There are many fun things to see and do at the Reserve. Have a picnic, build a sand castle, fly a kite or just watch the spectacular sunset. Go for a hike on one of the tracks that take you through the forest patches behind the dunes, or go for a bike ride on one of the many paths. Swim in the cooling waters during the dry season, but watch out for box jellyfish during the wet (Oct.-April), their stings can be deadly! Walk your dog or ride your horse, but please check the signs to make sure you are in the right area.

You can search for tropical marine life in the Lee Point rock pools at low tide or just explore the beach and maybe spot some shells. Wet a line fishing or maybe break out the binoculars and do a spot of birdwatching. The beach areas, especially near Buffalo Creek, are important resting and feeding areas for wading birds including birds that visit from other countries (migratory birds).



You can check out the ruins of a WWII Observation Post on the long walk between Trower Rd. and Lee Point.

Marine turtles, mainly Flatbacks, nest on the beach. Turtle release events occur during the year. Ring 8999 4555 for details.

Puzzle Answers

Creature Feature:

Across:

2. Marine, 5. Screw,
6. Shell, 7. Arthropods,
8. Symbiosis, 9. Exoskeleton

Down:

1. Abdomen, 3. Nippers,
4. Terrestrial.

Plant Profile:

1. Seeds, 2. Dinosaur,
3. Poisonous, 4. Bread,
5. Cones, 6. Nitrogen,
7. Borroloola, 8. Trunks,
9. Palms. DIOECIOUS

On the Brink:

Finke Mogurnda & Finke Hardyhead.

Discovering Outdoors:

Looking for Danger!

Hunters:

Southern Boobook, Dingo, Domestic Cat.

Hunted:

Mudskipper, Agile Wallaby, Crimson Finch, Green Turtle. Find a Word – Peripheral

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