Junior Ranger Review

Issue 4, 2000

Bush Survival

Desert Survivors

Spinifex Hopping-mouse

Creature Feature

European Bees & Native Bees

Plant Profile

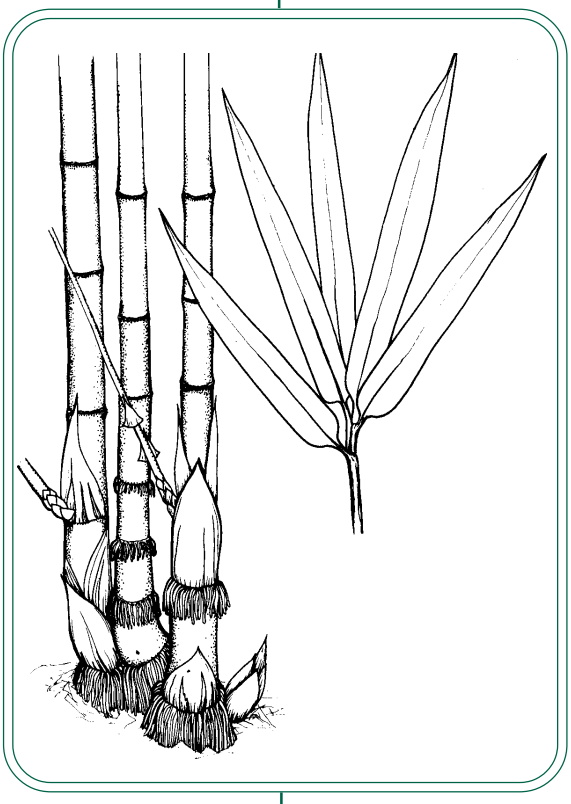
Bamboo

Native Bamboo is common along the banks of the Adelaide River, southeast of Darwin. However, in November 1999, the Parks and Wildlife Commission received reports that large areas of the bamboo along the river were dying.

Bamboos are giant members of the grass family. Worldwide, there are about 500 different species, mostly in southeast Asia.

They are easily recognized by their woody, jointed stems, called culms, which grow from horizontal, underground rhizomes.

Australia has only two species. One grows in the Top End and the other in Queensland. The NT species, *Bambusa arnhemica*, is found along the banks of freshwater streams and occasionally in rocky outcrops. It grows approximately 15 metres high.



Bamboos have tiny, inconspicuous, brown flowers. Flowering is a very rare event. A large clump of bamboo flowers just once in its lifetime, sets seed and then dies. This is what happened along the lower reaches of the Adelaide River at the end of 1999, leaving swathes of dead bamboo along the river banks.

Presumably, all of the bamboo was the same age and possibly also of similar genetic material.

There is a lot we need to learn about these unusual plants. For example, no one knows how old the plants are when they flower. Nor has anyone solved the riddle of why the plants die after flowering and setting seed? One theory is that the intense shade cast by the parent plants would make it very hard for seedlings to grow. So, the death of the parents might be a way of ensuring the new generation becomes established.

Also, why do all the plants flower simultaneously? Might this be a way of ensuring there is more seed produced than can possibly be eaten by all the hungry seed-eaters?

On investigating the area, Commission officers saw large numbers of Red-tailed Black - cockatoos feasting on the glut of seeds. However, they also noticed that new seedlings were already sprouting at the feet of their dead parents.

They concluded that the death of the Adelaide River bamboo was a rare but natural phenomenon, and one which has probably occurred many times in the past.

Brain Teaser

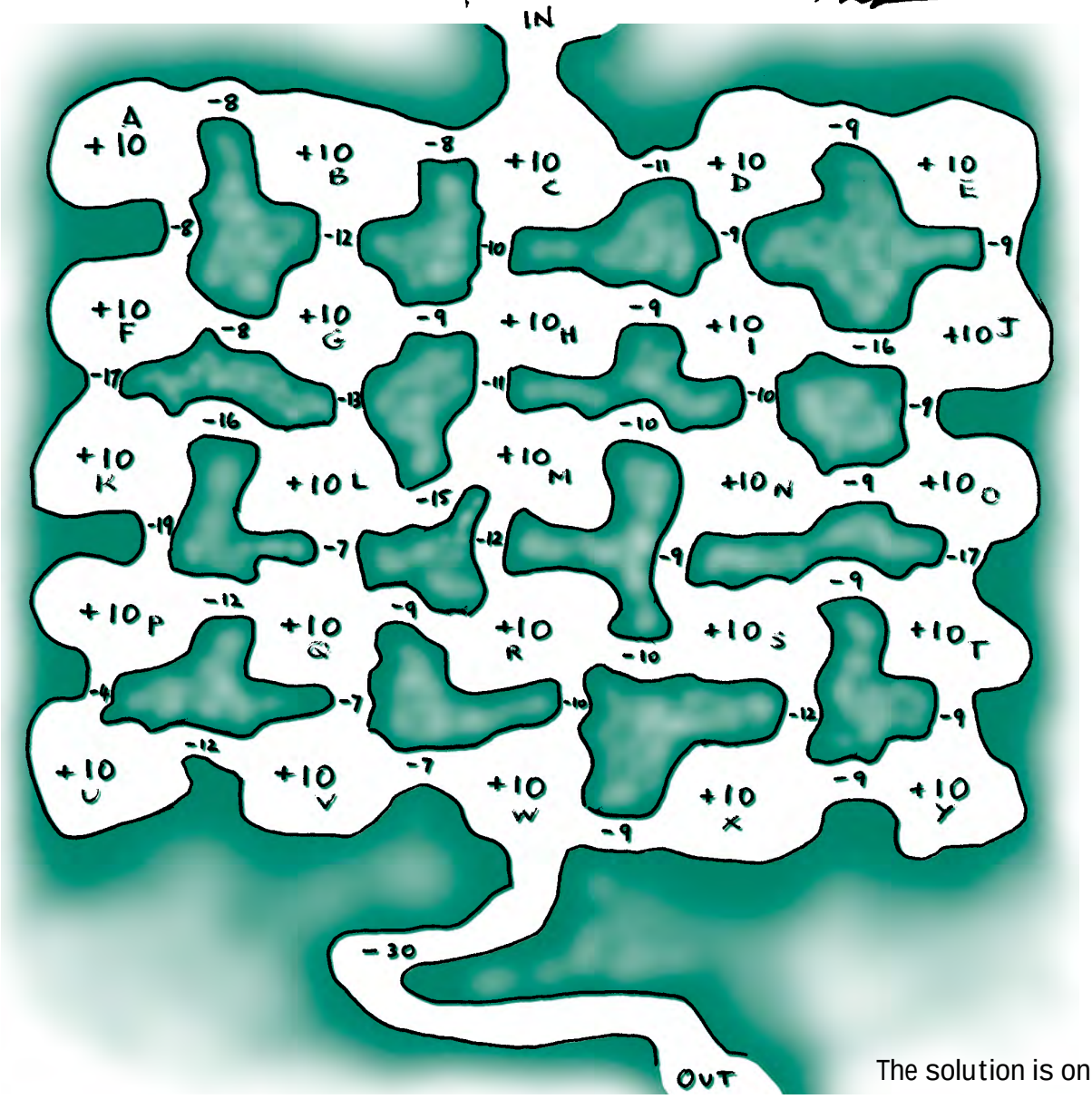
The Pale Field-rat *Rattus tunneyi* is a very attractive and gentle native rodent. It can be distinguished from the European import *Rattus rattus* by its yellow-brown fur, bulging eyes, small ears and a tail that is shorter than its body. It inhabits grassy areas of the Top End, close to water.

What route should she take?

Can you help this Field-rat get through the bamboo thicket?

There are 25 clearings, labelled A to Y. In each clearing she'll find 10 seeds. These will give her energy but she'll burn up lots of it as she moves through the thicket. Different routes will require her to use up different amounts of energy.

She'll need 30 seeds in her tummy to get through the final part of the thicket. What route should she take?



The solution is on page 11.

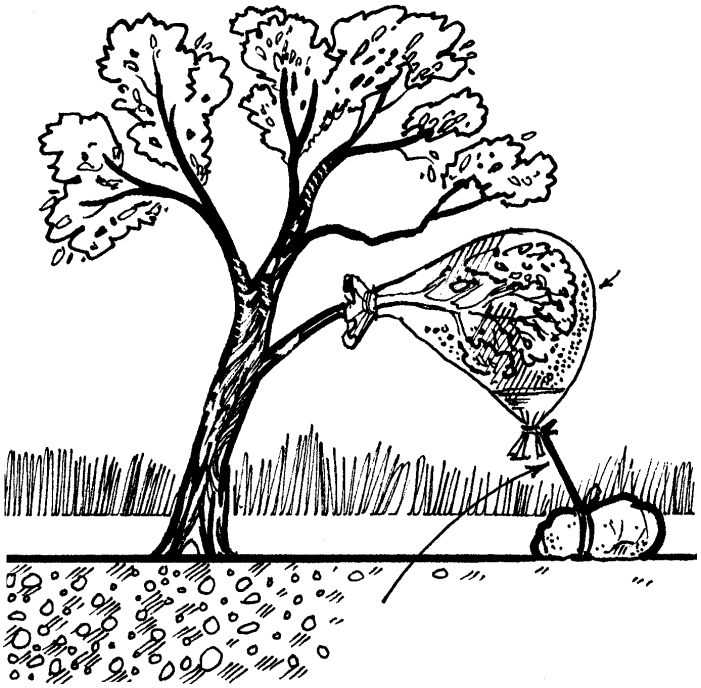
Project Page

Bush Survival

In a survival situation, water is more important than food. You can survive many days without food but less than 3 days without water.

Emergency Water

You can collect quite a lot of water from a tree using the **transpiration method**.



You will need:

- a large, clear plastic bag
- a large rock
- pocket knife
- string

What to do:

Place the bag over a branch of a tree, enclosing as many leaves as you can.

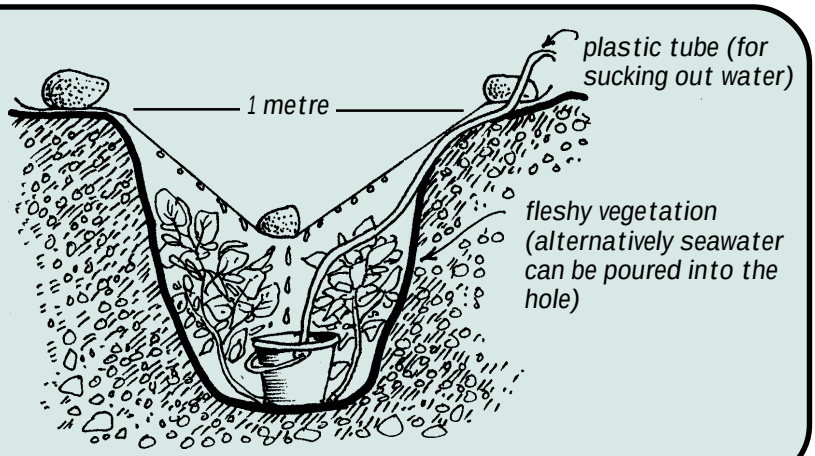
Use some string to tie it onto the branch.

Tie one corner down with a large rock to collect water evaporating from the leaves.

You'll be surprised how much water collects in the bag on a sunny day. You'll need to cut the corner of the bag to drain it into a drinking container.

An alternative method

Another way of obtaining emergency water is by constructing a solar still. But it's not as effective as the transpiration method. Also, you may sweat a lot digging the hole. The best use for a solar still is getting freshwater from seawater.



Dirty Water

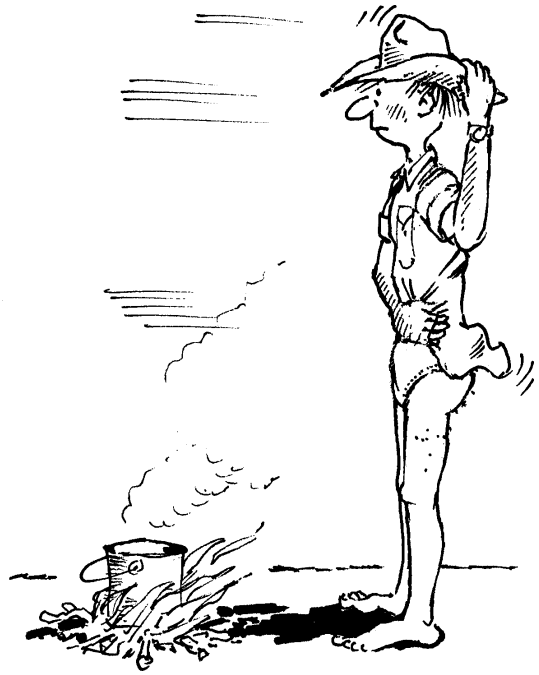
Even in the arid outback there are waterholes that can save your life. But you may have to treat it before it's fit to drink.

Filtering

The leg of a pair of jeans makes a good filter. Tie the bottom with a bootlace. Then fill the leg with sand.

Sterilizing

Water may look clear but can still make you crook. If you're unsure, boil it for at least 10 minutes to kill any germs.



Bush Survival Wordfind

These words go in all directions and some are written backwards.
Colour the boxes as you find each letter.

AIR
CALM
CAVE
CPR
DEHYDRATION
DIE
DRY
EAT
FIND
FIRE
FIRST AID KIT
FROST
HAT
HELP
HOPE
HYPOTHERMIA
LIE
PLAN
PROTECTION
RADIO
RED
RELAX
RESCUE
RIFLE
SAFE
SEARCH
SHELTER
SHOE
SIGNALS
STRAIN
SUNSCREEN
SURVIVAL
TEAM
WARM
WATER
WEATHER
WOUND
YELL

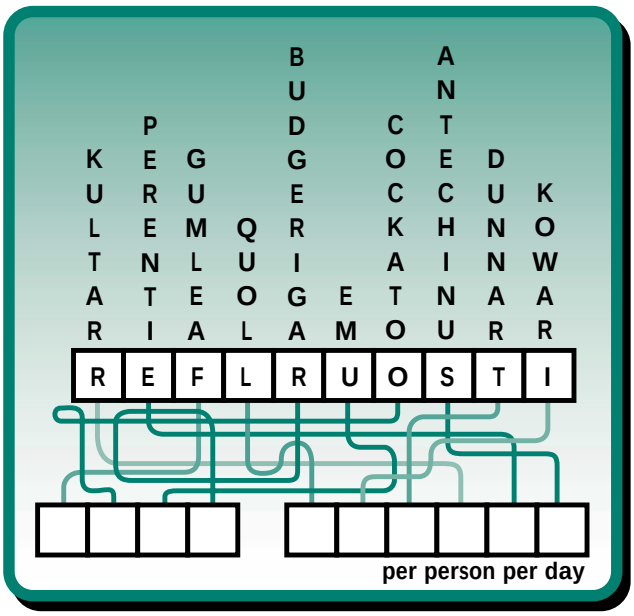
N	E	L	F	I	R	E	T	L	E	H	S
O	O	S	S	E	E	D	I	A	A	A	U
I	H	E	L	P	T	N	K	V	T	T	N
T	S	A	A	R	A	U	D	I	E	I	S
A	X	R	N	O	W	O	I	V	A	D	C
R	L	C	G	T	E	W	A	R	M	N	R
D	L	H	I	E	A	C	T	U	L	I	E
Y	E	O	S	C	T	S	S	S	A	F	E
H	Y	P	O	T	H	E	R	M	I	A	N
E	R	E	D	I	E	O	I	D	A	R	A
D	D	T	S	O	R	F	F	C	P	R	L
C	A	L	M	N	R	E	S	C	U	E	P

Great Desert Survivors

Spinifex Hopping -mouse

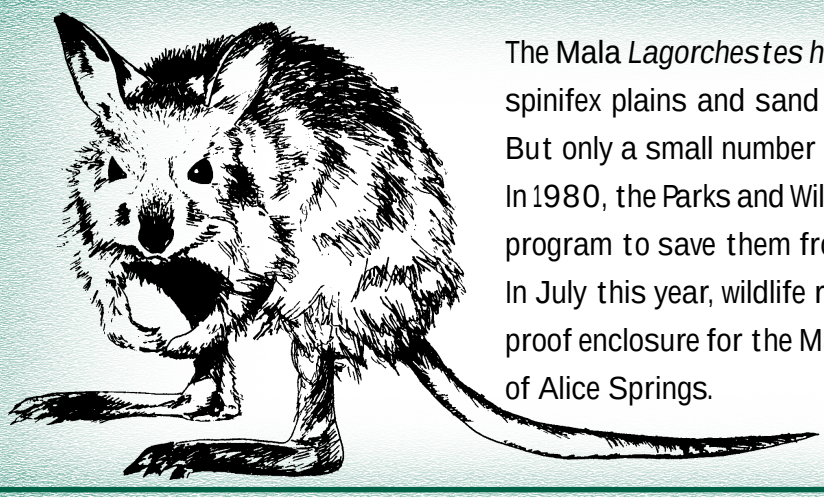
How we do it.....

"Stay up all night when it's cool to play,
Sleep down under during the day."
"Hop, don't run. It's much more fun, and saves you energy by the ton."
"Be a water miser just like me. Squeeze every drop from your poop and your pee."



More Great Desert Survivors

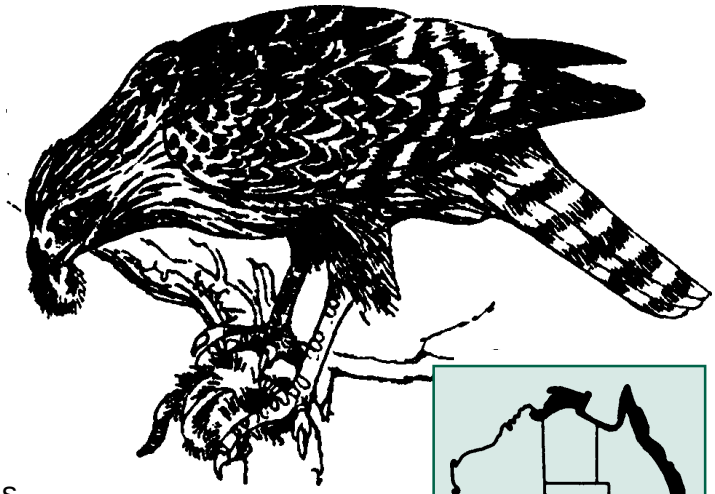
Many desert animals can survive without drinking. But people need a lot of water.
Find out how much we need by rearranging the 10 letters in the boxes.



The Mala *Lagorchestes hirsutus* was once common throughout the spinifex plains and sand dunes of central and western Australia. But only a small number survive today.
In 1980, the Parks and Wildlife Commission began a captive-breeding program to save them from extinction.
In July this year, wildlife researchers and rangers built a predator-proof enclosure for the Mala at Watarrka National Park, southwest of Alice Springs.

The Red Goshawk

The Red Goshawk is Australia's rarest raptor. There may be only 350 pairs in all of Australia.



Goshawks have large, powerful yellow legs.
The Red Goshawk has black streaks on its white neck and a rusty-red tummy.

This little-known bird of prey inhabits coastal forests and woodlands from the Kimberley region of WA, across the Top End, and down the east coast to northern NSW.

The Red Goshawk has black streaks on its white neck and rusty-red tummy.

Goshawks have large, powerful yellow legs.

Like other types of goshawks, it flies through the trees, snatching unsuspecting birds from their perches or catching them on the ground. The main targets are honeyeaters, parrots, pigeons, kookaburras and ducks. It mostly hunts at dusk and dawn.

Goshawks are very territorial. Breeding pairs use the same nest year after year. It is built from sticks and twigs, and placed high above the ground, in a tall eucalypt. The birds choose a tree within a kilometre of water.

The female renovates the nest at the beginning of the breeding season and lines it with fresh green leaves. She also incubates the eggs on her own. However, her mate does all the hunting while she is on the nest, supplying tucker for her and the young chicks.

Why are Red Goshawks threatened?

The Red Goshawk has been placed on the Australian Government's endangered species list.

The clearing of coastal forests to create farmland in Queensland and New South Wales has led to a significant decline in bird numbers. Robbing of nests by egg-collectors and shooting by pigeon and poultry owners may also have had an impact.

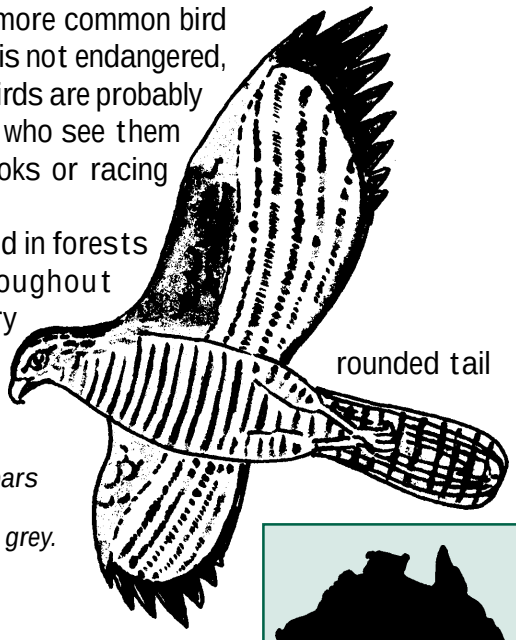
The species appears to be more secure in northern Australia than in the eastern states. The Parks and Wildlife Commission has carried out studies of Red Goshawk breeding habits and conducted surveys to locate nests.

Even though the birds are rare, they are managing to breed successfully in the Northern Territory. However, the Commission is keeping a close eye on the situation.

The Brown Goshawk

The Brown Goshawk is a more common bird than the Red Goshawk. It is not endangered, even though a number of birds are probably killed each year by people who see them as a threat to their chooks or racing pigeons.

Brown Goshawks are found in forests and woodlands throughout Australia, including the dry inland.

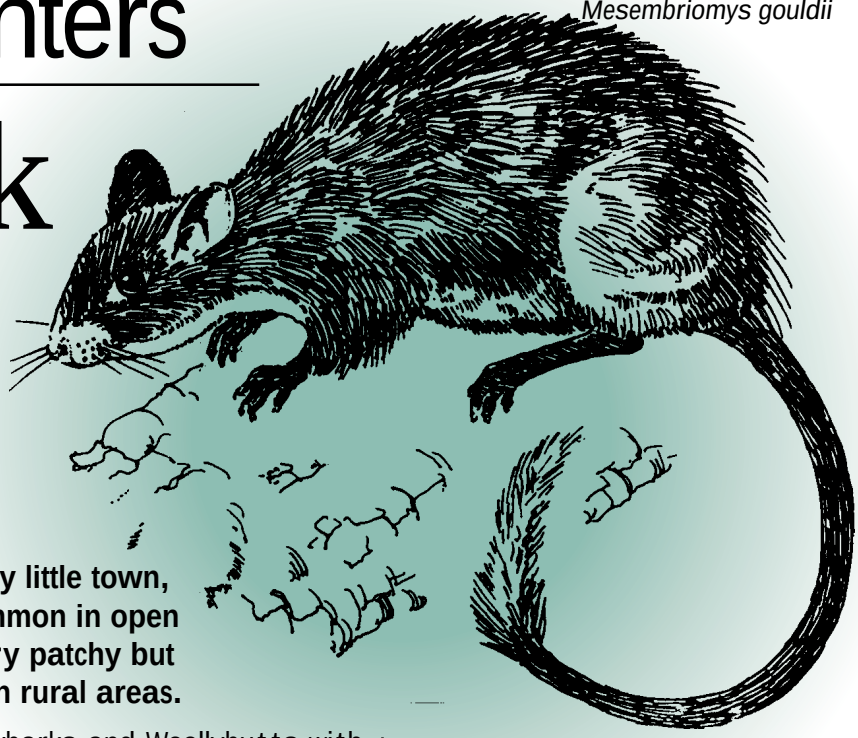


The Brown Goshawk has distinctive rusty-brown bars across its tummy.
The tops of its wings are grey.

Goshawks have prominent, black stripes on the undersides of their short, rounded wings and long tail.

Urban Encounters

The Black footed Tree-rat



Black-footed Tree-rat
Mesembriomys gouldii

100 years ago, when Darwin was a sleepy little town, Nunjala the Black-footed Tree-rat was common in open forest country. Today its distribution is very patchy but it is still seen occasionally near buildings in rural areas.

It is Australia's largest rodent with a body the size of a wild rabbit, dark grizzled fur and a long, white-tipped tail.

In the daytime it shelters in a tree hollow or in a clump of palm fronds. Sometimes it takes up residence in the roofs of buildings.

Your best chance of seeing it is to go spotlighting in moist parts of the forest where there are tall Stringybarks and Woollybutts with a dense understorey of Fan Palms, Pandanus and shrubs.

You won't find it in areas that are often burnt or where the trees are small.

The Tree-rat's habits are a bit like those of the squirrels of America and Europe. It spends the night feeding on flowers, seeds, fruits and young shoots. Ripe Pandanus nuts are one of its favourite foods. In the middle of the dry season, you might be lucky enough to spot it squatting on the ground gnawing its way through the orange flesh with its sharp teeth.

The Olive Python is its main enemy when it is on the ground.

Breeding

Pregnancy lasts 43 or 44 days and Mum usually gives birth to twins. Breeding can occur throughout the year but there is a peak season. Solve this puzzle to learn when this occurs.

START HERE EACH TIME

	1	2	3	4	5	6	7
1	A	B	C	D	E	F	G
2	N	M	L	K	J	I	H
3	O	P	Q	R	S	T	U
4	B	A	Z	Y	X	W	V
5	C	D	E	F	G	H	I
6	P	O	N	M	L	K	J
7	Q	R	S	T	U	V	W

Clues

1. Go across 3 and down 5.
2. Go across 2 and down 4.
3. Go across 2 and down 7.
4. Go across 5 and down 6.
5. Go across 4 and down 4.
6. Go across 2 and down 5.
7. Go across 4 and down 3.
8. Go across 4 and down 4.

ANSWER

Nature Quiz

Every 4 years, we get the chance to enjoy the amazing efforts of our elite Olympic athletes. But who would win the medals if all the creatures on the planet were allowed to enter? (You'll find the answers on page 11.)

The Wildlife Olympics

1. The world's fastest humans run 100 metres in less than 10 seconds. Which animal would win if there was a four-legged race?
2. Who would take out the long jump at the Wildlife Olympics?
3. The Olympic marathon is run over 42 kms. An Australian, animal however, has recorded a personal best of 990 km in cross country running. Who?
4. Dolphins can reach speeds of 40 kph but even they would struggle to reach the final in swimming. Who would win the gold medal in the pool?
5. If there were medals for intelligence, humans would win. Who would get the silver and the bronze?

Answers on page 11.

National Emblems

Australia's floral emblem is the wattle. This is why our national sports team wear gold and green uniforms.
Many of our teams have also adopted the names of

Aussie animals.

What do the following Olympic teams call themselves?

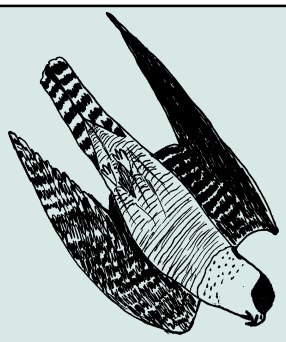
1. Our womens hockey players?
2. Our mens basketballers?
3. Our swimmers?

Top Flyers

The White-throated Needletail is the world's fastest bird, clocking 171 kph. It breeds in Northern Asia but migrates to Australia's east coast in summer.
It spends most of the day high in the sky, usually only coming lower down in the mornings and evenings to feed on flying insects.
It stays in the air long after dark, but eventually comes down to roost in trees in forested hill country.

Did you know?

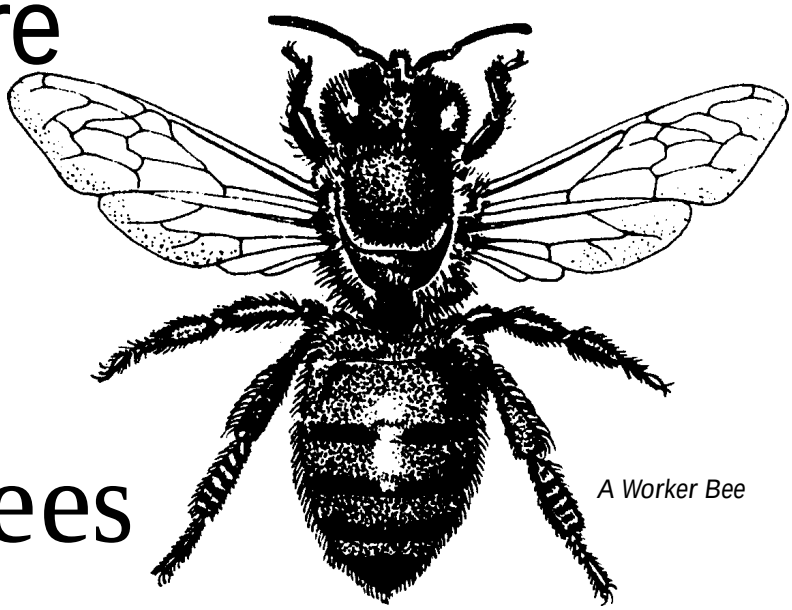
The Spinifex Hopping-mouse *Notomys alexis* is a world record holder.
It has the world's most concentrated pee!
These amazing little creatures occupy most of the central desert areas of Australia. They feed at night on seeds, shoots, roots and insects.
During the daytime, groups of them sleep, huddled together, in deep, humid burrows.
Hopping-mice mums drink their babies' urine. This sounds pretty revolting but it helps conserve water!



The **Peregrine Falcon** is also considered to be one of the world's fastest birds and exceeds the White throated Needletail when it catches its prey in spectacular dive known as a 'stoop'. The White-throated needletail is considered to be fastest during normal flight.

Creature Feature

European Honey Bees and Native Bees



A Worker Bee

What feral animal is very hairy, has 4 wings, 5 eyes, 6 legs, a tongue like a straw and a sweet tooth? It's *Apis mellifera,* the European honey bee.

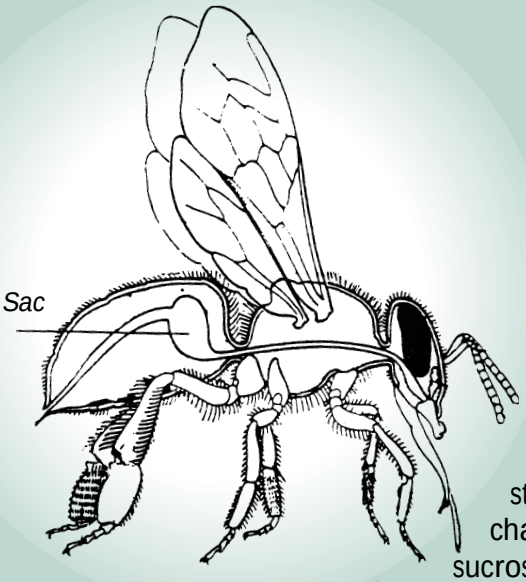
Honey bees first appeared in Australia in 1810. They were English bees but did not survive. Today's populations are the descendents of Italian bees imported in the 1880's.

A hive of honey bees may contain 50,000 individual bees.

The queen is the largest but the name is a bit misleading because she doesn't actually rule the hive. All the decisions are made by the workers. She has a fairly dull life. Her only job is to lay eggs.

The overwhelming majority of bees in the hive are the workers: sterile females who collect all the tucker, feed the queen, look after the kids, do the cleaning and other housework, as well as any building and maintenance work that's required, and fight off any intruders who might threaten the hive. It is not surprising that most of them only live about 9 weeks. Their muscle fibres get worn out, from all the hard work, and their wings torn and frayed.

The drones are male bees. They have a short life, of only 5 or 6 weeks. For much of the time there are no drones in the hive. A crop of them will be raised at swarming time, when some young queens are being reared. Apart from acting as sperm donors, they don't do any work and can't even act as security guards because they have no sting. They don't even feed themselves. (They just poke out their tongues when they're hungry and the workers give them food.)



Honey Sac

Making Honey

As a honey bee collects nectar, she stores it temporarily in a special honey sac in her abdomen. The honey sac can expand considerably, enabling her to carry her own weight in nectar.

She regurgitates this nectar when she returns to the hive, feeding it directly to other bees or depositing it in a storage cell.

It is quite warm in the hive and so the water in the nectar soon starts to evaporate. (Honey has a moisture content of around 20 %, compared to about 80 % for nectar.)

Reduction of the water content, however, is only half of the story of the transformation of nectar into honey. A chemical change also takes place. An enzyme in the bees' saliva splits sucrose into the simpler sugars: glucose and fructose.

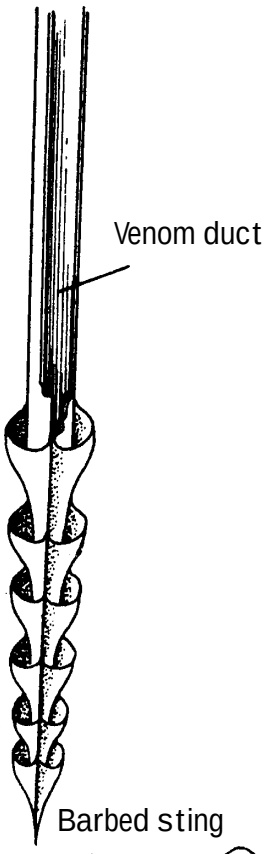
Did you know?

Honey bees have a communication system more highly developed than that of any animal except humans.

Honey bees can tell the time. They do this by noting the position of the Sun at different times of the day.

Honey bees have a top speed of 25 kph and are more fuel efficient than any machine. They get about 1 500 000 km to the litre (of nectar).

A honey bee has a barbed sting which remains firmly anchored in the flesh of her victim. When she tries to withdraw the sting, the entire venom apparatus and part of her abdomen get torn off. The wound kills her within a day or two.



True Blue Aussie Bees

When the Darwin Stringybark *Eucalyptus tetrodonta* flowers in the dry season, Aboriginal people in the north know that it is time to go searching the tree trunks for sugarbag.

Australia has a number of species of native bees. They belong to the same family as the European honey bees (Family Apidae) but are small, black and stingless.

They are sometimes called *sweat bees* because of their peculiar habit of collecting human sweat (presumably to get the minerals it contains). However, insect experts prefer that we call them *stingless bees.*

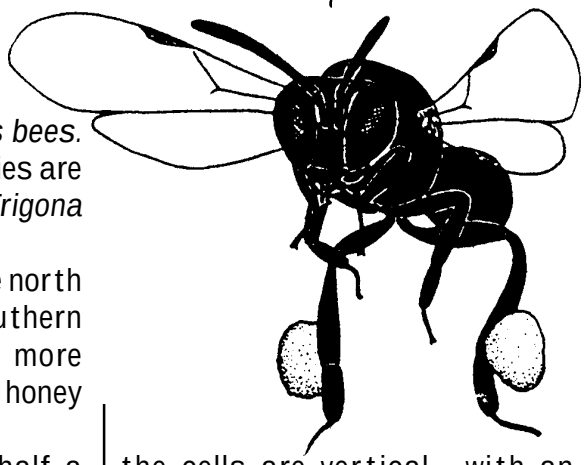
Technically, the various species are classified into two genera, *Trigona* and *Austrophlebeia.*

They are more common in the north of the country than in southern Australia. Their honey is more watery and acidic than the honey of European bees.

The native bees are only half a centimetre long, black and stingless.

Like the European bees, they have pollen baskets on their back legs. They fly back to the nest with their pollen-laden legs spread apart and hanging low.

Also their nest is built differently. It has a central brood chamber but the cells are vertical, with an opening at the top, sealed with wax. (European bees build honeycombs with horizontal cells.) Surrounding the brood chamber are egg-shaped wax pots containing honey and pollen. (European bees store their honey and pollen in cells like the ones in which they put their babies.)



PUZZLE ANSWERS

Brain Teaser (page 3)

The following route will get the Field-rat to clearing W with 30 seeds left in her tummy:

C, B, A, F, G, H, I, D, E, J, O, N, S, T, Y, X, W

Great Desert Survivors (page 6)

People need a minimum of FOUR LITRES per day.

Urban Encounters (page 8)

EARLY DRY

Nature Quiz (page 9)

The Wildlife Olympics

1. The cheetah, representing Africa, would win. It reaches speeds of 110 kph, over short distances, compared to only 36.5 kph for the fastest humans.
2. Australia's kangaroo would be tops in the long jump with a leap of 12 metres. However, in the jump-for-size division, a grasshopper would beat this. Its jump of 2 metres is equivalent to a roo jumping 200 metres.
3. Emus are great long distance runners. An Emu from Western Australia is known to have covered 990 kms once.
4. Sailfish have been clocked at 110 kph. The second fastest fish on Earth is the Marlin. It reaches 80 kph.
5. The Chimpanzee would win silver, with the Gorilla pipping the Orang-utan for bronze.

National Emblems

1. Hockeyroos
2. Boomers
3. Dolphins

Around the Traps

Darwin

The 12-14 Year Old Junior Rangers in the Darwin region recently had a camp at Litchfield National Park to conclude the Program for 2000.

Junior Rangers bid a sad farewell to their fearless leader Belinda Ainley who left the Community Education Unit this year. Over the last six months Belinda organised a range of exciting activities where the group were able to help Parks and Wildlife Commission staff with a number of projects and activities.

Projects included, monitoring, a flora survey, collecting plant specimens to test for medicinal uses, learning how to care for injured and orphaned native wildlife and making nest-boxes and pouches for them, hearing about careers in the Parks and Wildlife Commission and building a walking track at the Special Interest campground at Litchfield National Park.

The Program is designed specifically for children between the ages of 12 and 14 and the group meets fortnightly at parks and reserves in the Darwin region.

Belinda Ainley and the 12 - 14 year old group having just completed a walking trail at Litchfield National Park.

The 9 - 11 year old Junior Rangers also celebrated the end of another busy year which saw them designing animal exhibits, making animal tracks, navigating their way through Charles Darwin, designing marine T-shirts, making bush jam, building bird nest boxes and more.....! But the finale was yet to come...

The 9 - 11 year old Junior Rangers were involved in a play called 'A Bush Adventure". The play focused on 3 Junior Rangers who become lost in the bush. They are able to survive the night alone by drawing on the skills and knowledge they have learnt on the Junior Ranger Program throughout the year.

Some of the cast included feral pigs, snakes, a butterfly and a black footed tree rat.

The Junior Rangers survive crocodiles, snake bites, are able to find bush tucker (with one of the "newest" Junior Rangers nearly mistaking some wallaby scats for burnt bush nuts!), obtain water from plants, use triangulation to locate a calling cane toad and remove it from the bush before they are finally rescued.

To present the Certificates of Participation to the Junior Rangers on the day after a hearty lunch was our very own Bill Binns. Bill also came to the kids' aid by playing the part of the helicopter pilot in the play who assists in the rescue of the lost Junior Rangers. Complete with headphones and holding a cardboard helicopter Bill played the part fantastically and our thanks go to him for helping us out with the play.

The end of year celebrations were also a time to say farewell to Louise Kean and Belinda Ainley and welcome Dianne Martin and Dean McAdam into the Community Education Unit.

G'day from Ranger Bill

As you can see from this issue's articles it's been a jam packed year of activities for Junior Rangers in the Top End to Katherine right down to Alice Springs. It has been encouraging to see so many young people commit themselves to an environmental program and thanks must go to the many parents and guardians who have played such a large role in supporting their children's involvement in this program. Thanks also to the Community Education staff for their great work they have done on the Program and their efforts in bringing you an informative and exciting Program.

Planning is already underway for the 2001 program so let us know your thoughts on what you would like to learn about from our natural and cultural environment.

Remember if you have an encounter of the environmental kind during your holidays write in and let us know so we can share it through the Junior Ranger Review.

I wish you all a very merry Christmas and a fantastic New Year, keep safe and we look forward to bringing you more environmental stories from around the Territory in 2001.

Katherine

The first rains are early again this year in Katherine, and the bush environment has been quick to respond. A pleasant velvet of green has covered the darkened scenes that the dry season fires have left, with the first grasses feeding off the fertile ash left by the bush fires.

In our November 'Coming Events' Program the Katherine Junior Rangers are going to have a close examination of the greening up of the bush after the effects of 'bush-fires' and find out how important bush fires are in our bush environment.

The study will reveal how incredibly tough our bush can be when exposed to the harshness of fire. We will find out who the key players are that assist in the recovery of the bush after the late season hot fires have occurred, and which plants benefit from the effects of being burnt.

Insects are one of the quickest animal families to benefit from the first rains. Junior Rangers are going to tempt insects to a bright light and a sheet, so that we can see what types of species are present at the start of the wet season. The insects we collect will be given their correct names by an entomologist (researcher that studies insects and small organisms), who will also be able to describe the ecological niches that the insects fit into in their own amazing food chain.

After we have had great fun doing all this work Junior Rangers will celebrate the end of the year 2000 Junior Ranger Program with an end of year party. It is the time of year when Junior Rangers receive their participation certificates and we farewell the members that will finish their time as Junior Rangers after four whole years of experiencing the program. We wish them well in their future, and invite them to keep in contact and hope they keep the Junior Ranger conservation message going.

With the big monsoon rains not too far away our native frog population will be making the most of it. The croaking does not go undetected for too long before the Junior Ranger frog watch program gets under way and the unsuspecting male frogs are pounced on. So, look out in your mailing for the Junior Ranger frog watch program (there will also be posters around town and advertisements in the papers). The program is not only fun but will also help to collect information about the distribution of the introduced cane toad. Hopefully I'll see you all there.

Alice Springs

Junior Rangers may have come to an end for the year but this does not mean there is nothing for you to do!

For all you budding entomologists (insect watchers) out there, summer is the time for great insect activity, just keep an eye out around your lights at night.

During the day butterflies are around in abundance, such as the Common Eggfly, Lemon Migrant, Dangy Swallow Tail, Checkered Swallow Tail and the Caper White just to name a few.

Bird watchers will not be disappointed either, keep an eye open for the Black-shouldered Kites which are currently around the Alice area. If you go to the sewerage ponds you may even see the Sharp-tailed Snipe which migrates all the way from Siberia to spend the summer in Australia, an amazing 11,000km trip! So there is no excuse to be bored over the holidays. Get outside and discover what is around you.

To all the Junior Rangers thanks for a great year, have a Merry Christmas and hope to see you all in 2001. Cheers Ranger Kym.

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