TEACHER RESOURCE BOOK

Mitch

the rainforest snail

Prepared under the Recovery Plan for
Mitchell's Rainforest Snail (*Thersites mitchellae*)

NSW
NATIONAL
PARKS AND
WILDLIFE
SERVICE

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For further information contact:

Threatened Species Unit
Conservation Programs and Planning Division
Northern Directorate
NSW National Parks and Wildlife Service
Locked Bag 914
Coffs Harbour NSW 2450
Ph: (02) 6651 5946

For general enquiries contact:

Ph: 1300 361967
www.nationalparks.nsw.gov.au

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Produced by: NSW National Parks and Wildlife Service, Northern Directorate, Coffs Harbour.
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Research, development and compilation: Michael Murphy, Kerry Cooper and Katrina McKay.
Illustrations: Kerry Cooper, Lyn Skillings (pages 16, 17, CD), Ann Sheppard (CD).
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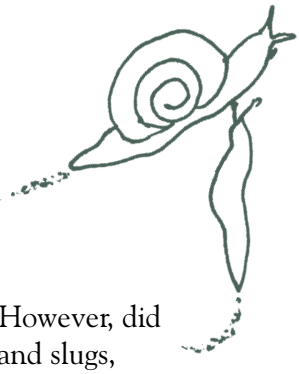
Introduction



Think of a species of Australian native animal.... Got one?

Chances are the animal you thought of was a vertebrate, an animal with a backbone. However, did you know that 99% of our native animals are invertebrates, little creatures like snails and slugs, butterflies and beetles, millipedes and worms. These animals, usually small enough to hold in your hand, are often ignored, but together they are responsible for making our natural ecosystems work.

They may be small but many of our native invertebrates are in big trouble. Land snails have been around since the days of the dinosaurs, but today in Australia and all around the world they are disappearing. Did you know that more snails have become extinct in modern times than any other type of animal?

This booklet focuses on a character called Mitch, a Mitchell's Rainforest Snail. Like so many of Australia's unique and fascinating native invertebrates, little is known about Mitchell's Rainforest Snail and other native land snails. What is known is that their habitat is disappearing due to land clearing for farms and towns. Mitchell's Rainforest Snail is being pushed to the limit and it is now threatened with extinction. Through learning about these animals it is hoped that students will appreciate the need for protecting our smaller native animals.

Why teach students about threatened species?

Along with many other threatened species, little detail is currently known about Mitchell's Rainforest Snail. It is hoped that the information in this booklet will stimulate a desire to learn, the motivation to investigate and an understanding about the need to conserve this and other lesser known native animals. Armed with this, it is hoped that students will make informed and responsible choices about the conservation of our natural heritage, now and in the future.

How to use this booklet

This activity-based booklet is a teacher resource for Stage 2 and Stage 3 students. It may be used in a number of key learning areas. The pages may be photocopied at the discretion of the class teacher for class use, homework, or as a basis for a project or extension material. Enlargement of pages to A3 size is suggested for pages such as '*Mollusc Mix Up*' and '*Rapping in Riddles*' which can be the basis of a class activity or discussion, or the pictures in '*Who eats Who?*' which may be used in the construction of a mobile or static display.

Information for teachers

Pages 21-22 include the answers to the questions in this book and a *Mollusc Ready Reckoner,* while suggestions for further reading can be found inside the back cover.

The National Parks and Wildlife Service welcomes feedback from teachers concerning this resource book. Contact details are provided on the inside of the front cover.

Contents

Mitch the rainforest snail – NSW National Parks and Wildlife Service, 2003

Mollusc mix up

Mitch reads about molluscs:

"A mollusc is a soft-bodied animal with a muscular foot or tentacles. A mollusc may have a hard shell for protection. There are many different types of mollusc, which scientists put into four main groups."

Mitch thinks that he is a type of mollusc!

1. Help Mitch work out which mollusc group he belongs to.

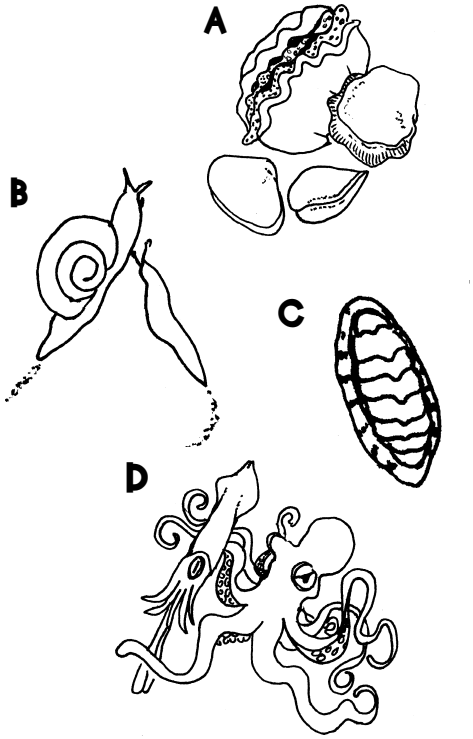
Read the information below, then draw a line to join the picture to the correct group.

GROUP 1 '**Cephalopods**' have a head with many tentacles extending from it. They live in the sea. They may have their shell inside their body.

GROUP 2 '**Bivalves**' have two shells that can close. They have a body but no head. Some types live in the sea, and other types in fresh water.

GROUP 3 '**Chitons**' have a head and body protected by eight overlapping shells on their back. They live in the sea, especially on rocks at the seashore.

GROUP 4 '**Gastropods**' have a head with eye stalks. Some types have a shell on their back, other types have no shell at all. Different types live in different places, such as in the sea, rock-pools, creeks and forests.



2. Mitch thinks he is a _ _ _ _ _ _ _ _ _ _

NEXT TIME YOU VISIT THE BEACH

Look for shells in the sand. See how many empty ones you can you find. Sort them to count the number of different bivalves and gastropods there are.

You might also find some cuttlebone. A cuttlebone is a shell that was once inside the body of a type of mollusc called a Cuttlefish. Look at the descriptions above to work out which group of mollusc the Cuttlefish belongs to.

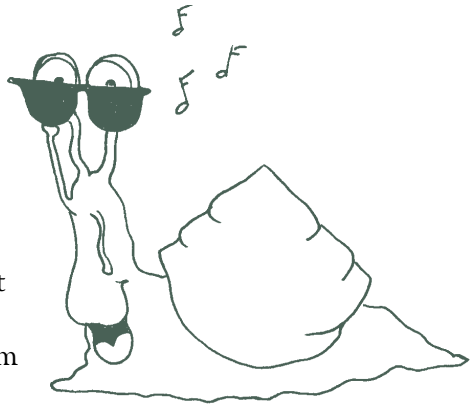
Bring your empty shells to school to make a mollusc display.

DID YOU KNOW?

There are about 80,000 different types of mollusc in the world? That's twice as many as all the birds, mammals, reptiles, amphibians and fish combined!

The Giant Squid, up to 18 metres long, is the world's biggest mollusc and the biggest invertebrate ever!

Rapping in Riddles



Mitch the rainforest snail is surprised at the many different features that molluscs have. He has written a riddle in rap to describe himself, and eight others about his distant mollusc relatives. See if you can work them out from the family portraits, then try to write your own rap for each.

A

I have a shell inside my head,
My mouth looks like a beak,
I move by jet propulsion,
And have more than eight feet.

I am a...

_____

B

I have a matching pair of shells,
I live at the bottom of the sea,
I do not swim around,
My food comes straight to me!

I am a...

_____

C

I leave slime,
In my track.
I have eye stalks
And a home on my back.

I am a...

_____

D

A mollusc,a mollusc,
You often see me?
I have one shell,
And live by the sea.

I am a...

_____

E

On the rocky shore,
It's speed I lack,
I have eight plates
Upon my back.

I am a...

_____

F

I have no shell,
On land I'm found,
I make slime,
To move around.

I am a...

_____

G

With gills on my back,
I'm found in the sea,
With lots of bright colours,
I'm a sight to see.

I am a...

_____

H

I have 8 legs,
And swim with ease,
I can hide in rockpools,
In small spaces I squeeze.

I am a...

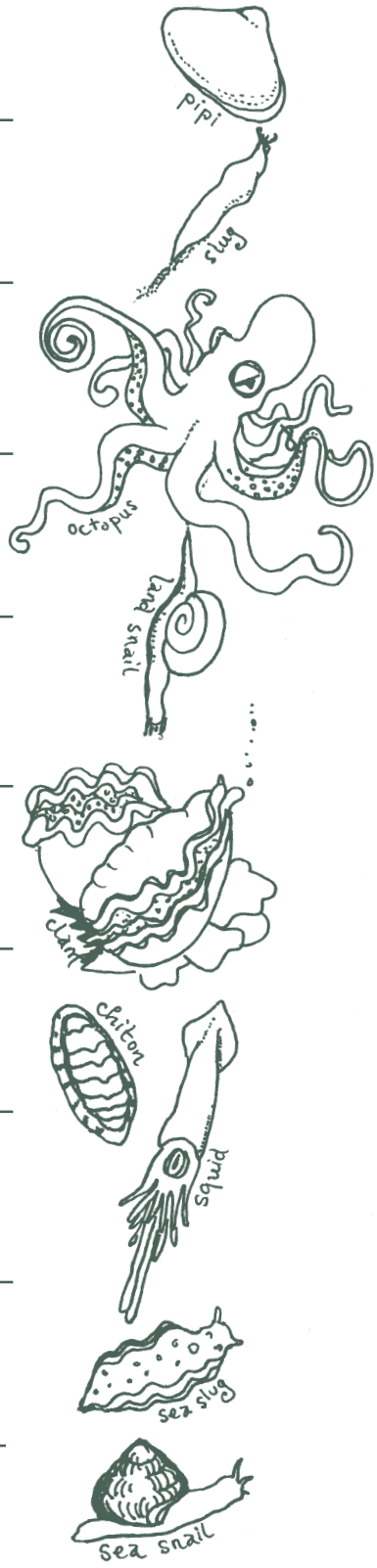
_____

I

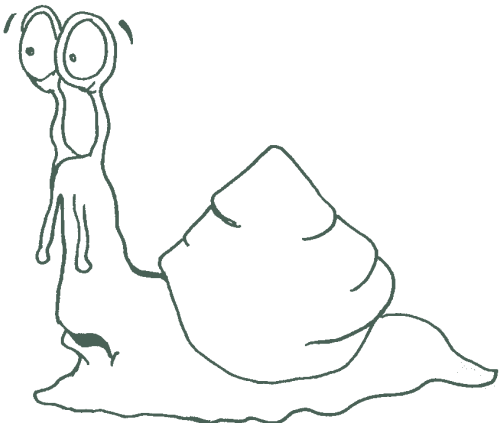
I have two matching shells,
I can be found in the sea,
If you dig in the sand,
You may even find me!

I am a...

_____

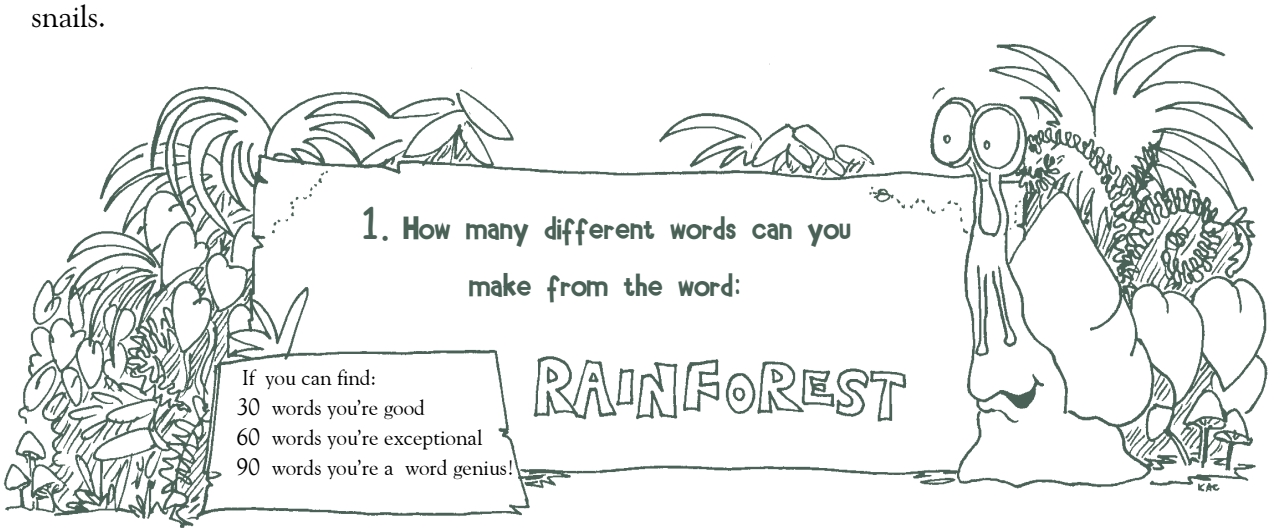


Friend or Feral?



Native land snails are an important part of our natural environment. There are over 2000 different types of native land snail in Australia, with over 90% of these living in rainforests. Others live in bushland and woodlands, and a few are even found in deserts.

A rainforest has many different types of soft-leaved trees that grow closely together, allowing only a small amount of sunlight to filter through to the forest floor. A rainforest is shady and damp with plenty of food. Most native land snails only feast on fungus and decaying plants, while some eat other snails.



2. Research rainforests and write a report on what you have found out. Find out about the different types of rainforest in Australia.

   On the internet go to www.bigvolcano.com.au/natural/rftypes.htm to read more about the different types of rainforest.

The most widespread type of snail in Australia is the feral European Snail, whose relatives first arrived in Australia around 200 years ago. It is usually these snails who are found in large numbers in gardens, eating vegetables and other plants. European snails like to eat leaves of introduced plants.

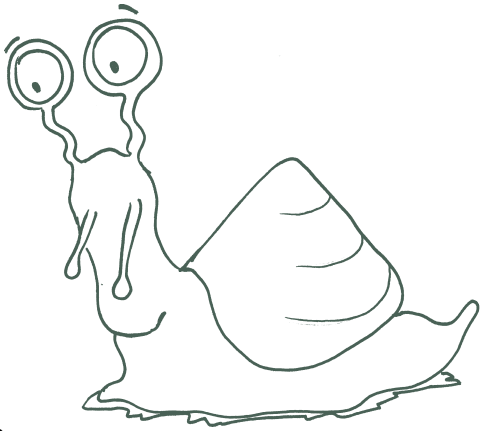
Some native snails look a bit like the European Snail, but others come in lots of different shapes and sizes. If you find a funny looking snail, it's probably a local! Native snails are usually found in the bush. Natives can also be found visiting gardens, especially if there are small areas of bushland nearby.

3. What is a feral animal?

4. List 3 feral animals that are a threat to the Australian environment. Why are they a threat? Give one reason for each.

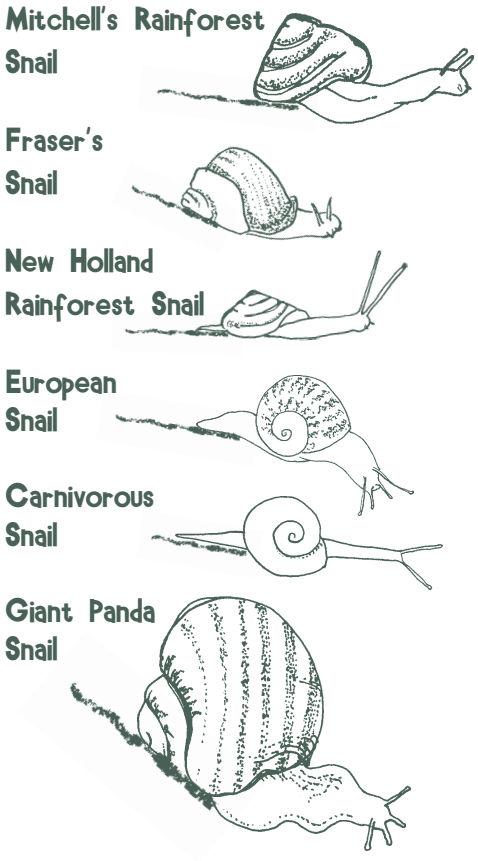
5. Where do you think you are most likely to find a European Snail?

Spot the Snails



1. **Look** at the snails below. Compare the shape of the shells and the length of their bodies and feelers.

2. **Colour** each of the native snails green and any feral European snails red as you find them in the puzzle.



3. **Write** an acrostic poem about a snail.

S _ _ _ _ _ _ _ _ _ _ _ _ _

N _ _ _ _ _ _ _ _ _ _ _ _ _

A _ _ _ _ _ _ _ _ _ _ _ _ _

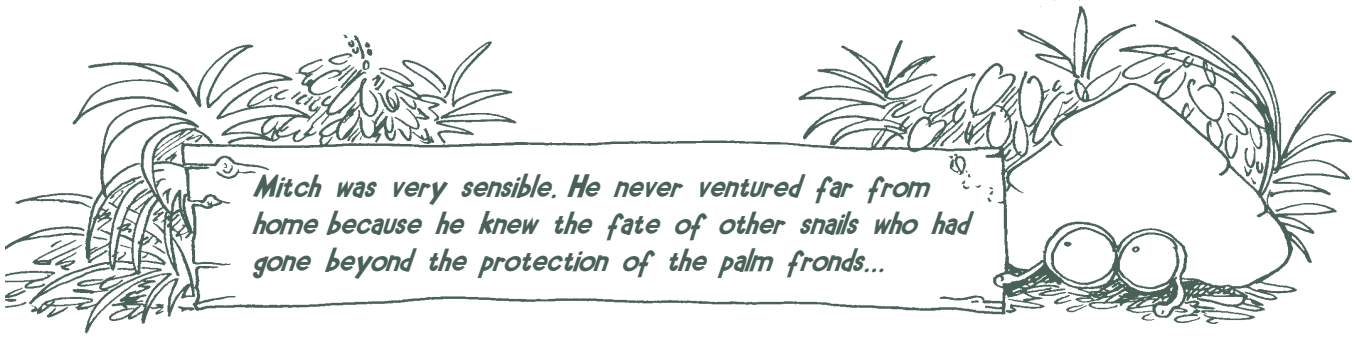
I _ _ _ _ _ _ _ _ _ _ _ _ _

L _ _ _ _ _ _ _ _ _ _ _ _ _

4. **Cut out** a snail-shaped piece of paper and write on it about what it would be like to be a native snail living in a rainforest. It may be a short story or a list of words describing how you feel.

Display your snails on the classroom wall using a trail of plastic lunch wrap as the snail slime.

Sensible Snails



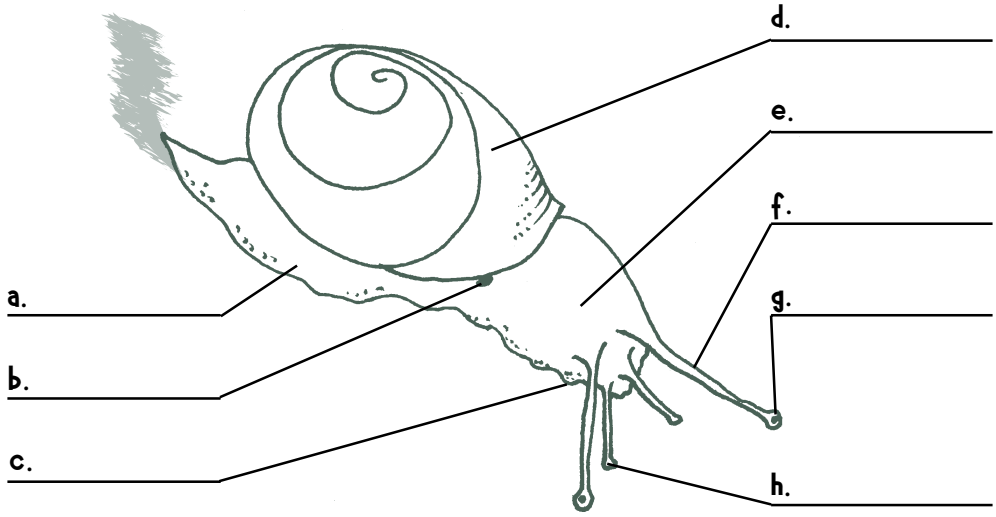
Snails like moist areas and mostly come out on rainy nights. If it is too dry they hide inside their shell.

1. Read the description below:

Land snails are soft-bodied animals with a hard spiral **shell** on top. A strong muscular **foot** pulls the body along. They have two pairs of **tentacles** on the **head**. Each of the taller back tentacles has an **eyespot** on top, while the shorter front tentacles have **smelling organs** that act like a nose. The **mouth** is under the head and contains a toothy tongue called a radula for grinding up food. Land snails breathe through a **breathing hole** under the edge of the shell.

2. Label the diagram using these words:

head
eyespot
smelling organ
tentacle
mouth
breathing hole
shell
foot



3. Circle true or false to make the statement correct:

a. A snail has a soft body true / false

b. Snails have two feet true / false

c. A snail is a type of mollusc true / false

d. Snails and slugs both have a shell true / false

e. Many snails are native animals true / false

f. Snails breathe through their mouth true / false

DID YOU KNOW?

In France snails are called escargot. May 24th is National Escargot Day!

It might be a . . .

1. **Colour** each word as you find it. Hint: some letters may be used more than once. When you have found them all, circle the remaining letters. What have you found?

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

shell soft sensitive rainforest foot antennae palm
glide feelers leaf litter slime tentacles roam use
eyestalk mucous mouth nocturnal rasp moist

2. **Use** at least four words from the list above to write one or more sentences about snails.

3. **Look up** the words antennae, feelers, and tentacles in the dictionary. These words are all used to mean the same part on a snail.

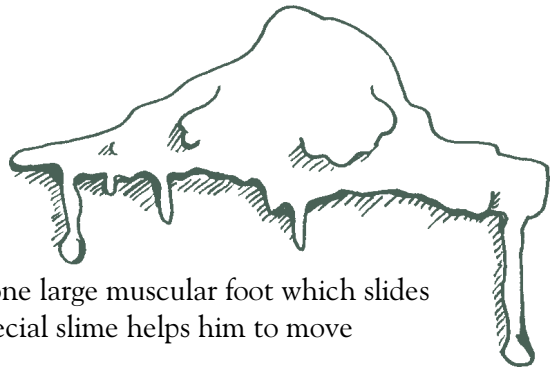
   a) List the things that these parts do?

   b) List which parts of your body do these same jobs?

DID YOU KNOW?

There are about three times more species of native land snail in Australia than species of birds? There are more than 2000 different species of land snail in Australia compared to about 780 species of bird. We know a lot about our birds but almost nothing about most of our snails except their scientific names, and a lot of them don't even have names yet!

Slimy Solutions



Mitch the rainforest snail moves like other snails. He has one large muscular foot which slides over a trail of slime that he makes as he goes along. This special slime helps him to move forward but stops him from slipping backwards.

How does snail slime work?

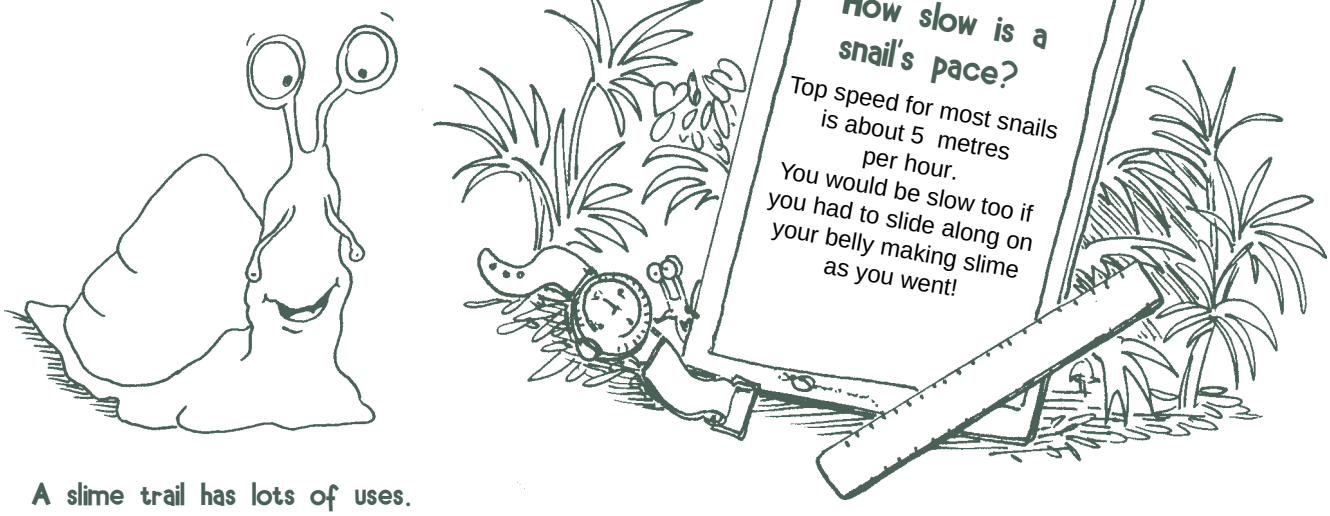
Pushing or squeezing the slime makes it become soft and runny. When the pushing stops it becomes firm again.

How do snails move?

Snails push themselves along with waves of movement that ripple along their muscular foot. Each wave starts at the tail and travels to the head, pushing it forwards. This pushing makes the slime underneath soft and runny, allowing the snail to slide forward.

As the snail moves forwards the slime left behind becomes firm again and stops the snail from sliding backwards.

Place a snail shell on a wet window or clear perspex and see if you can see the ripples moving forward on its foot. Can you see the slime?



A slime trail has lots of uses.

A slime trail is sticky and helps snails climb.
A snail can follow its trail to find its way home.
A snail can use a trail to find and follow other snails.
Slime trails grow food. Tiny microscopic algae likes to grow on slime trails,
(...and after a big night out, many snails like to snack on this algae on the way home).

Snails are not silly, they can reuse old slime trails to save on slime!

Imagine if you could make snail slime! What would you use it for?

Mitch's Magic Slime

Mitch the rainforest snail is sharing his secret recipe so that you too can make slime. This is not exactly the same as snail slime, but it still feels great!

You will need:

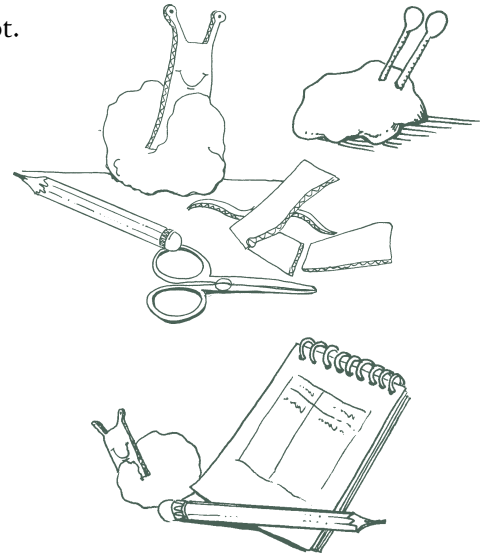
- 5 teaspoons of borax
- 1 cup of water
- ½ cup of white PVA glue
- running water for washing
- container for mixing

What to do:

i. Dissolve the borax in the water to make a borax solution.
ii. Put 2 teaspoons of borax solution in the mixing container
iii. Add the PVA glue and stir constantly
iv. It will begin to thicken
v. Add more borax solution a spoon at a time and stir after each one (about 6 or 7 altogether)
vi. Use your hands to mix and squeeze the slime together
vii. Wash the slime under running water until any excess glue is gone

Have a play!

1. **Make** a shape out of your slime that is like a snail's moist foot. If you want you can make a head for your snail out of stiff cardboard or plastic, or eyestalks out of cottonbuds.
2. **Describe** what your slime feels like.
3. **Test** your slime by pushing it along different surfaces. Investigate the difference between dry smooth, wet smooth, dry rough and wet rough surfaces.
4. **List** what your slime can do.
5. **Investigate** what type of surface your snail moves easier on.
6. **Discuss** what type of weather you think snails prefer.



Imagine spreading that under your feet everywhere you step

Sticky Signposts

Mitch the rainforest snail knows what it is like to be tiny, with poor eyesight and living amongst towering rocks, logs and plants. Like other snails he uses signposts to find his way to food, to find his way home, or find other snails.

Fish tank experiments

Feral snails are best used for this. Leave native snails where they belong.

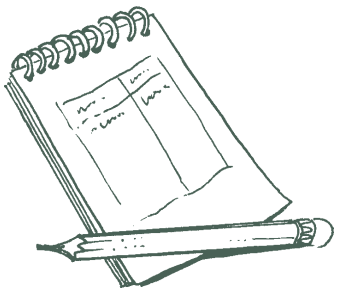
i. Set up a fish tank with moist soil on the bottom and a few broken pieces of brick or roofing tile in one corner.

ii. Collect some European Snails from the garden.

iii. Mark each one with a different number on the shell using liquid paper, and put them in the tank. Put some vegetable peels in the opposite corner as snail food. Make sure the tank has a lid or your snails will escape. Spray inside the tank with a water spray every day because snails like to keep moist.

DID YOU KNOW?
Snails use their tentacles to tell which way a slime trail is going. Scientists are still baffled as to exactly how they do it!

Things to do:



1. **Trace** the snails' movement paths on the glass with a marker pen. Use a different colour for each snail.
   Do snails re-use their own or another's trails?

2. **Record** where the snails rest each day.
   Do they return to the same spot each time?
   What happens if you change where their food is or give them different food?

3. **Watch** a snail moving along the glass or put one on a sheet of clear Perspex so you can hold it up and look at the underneath.
   Can you see the waves of movement along its foot? Can you see its mouth?

4. **Measure** how far a snail moves in 1 minute by marking its starting and finishing spot with a pen on the glass and using a watch.
   How many metres per hour is this?
   Have a snail race to see who has the speediest snail.

5. **Write** a report on what you have seen.

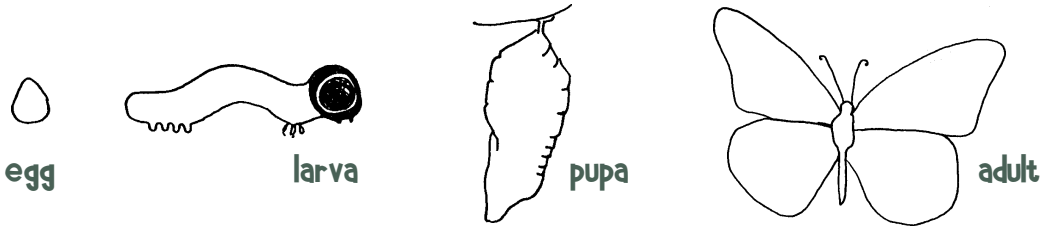
DID YOU KNOW?
Scientists who study native snails in rainforests sometimes track them by attaching a tiny spool of cotton to their shell which winds out as they move leaving a fine cotton trail. This is clever as the snails usually move at night when no-one is watching.

Becoming Bigger

Mitch lives in the rainforest with lots of other animals, including many different types of invertebrates. These invertebrates, or animals without bony skeletons, include molluscs, insects, spiders, centipedes, millipedes, leeches and worms.

Different invertebrates have different types of lifecycles.

1. **Butterflies**, **moths** and **beetles** have a lifecycle with very different looking stages



2. **Grasshoppers** and **cockroaches** grow through a series of moults, shedding their old exoskeleton (their hard skin) and growing a new bigger one.

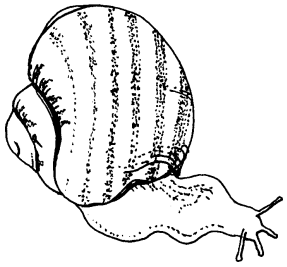
3. **Land snails** lay eggs that hatch into tiny shelled snails. As the baby snail grows bigger its shell gets bigger too. If you look at a snail shell closely you can see the growth rings which are continually being added to as the snail grows.

Fully grown land snails come in many different sizes.

The smallest are less than 1 millimetre long. Australia's biggest land snail is the Giant Panda Snail which has a shell 10 centimetres long, about the size of an apple.

The biggest land snail in the world is the Giant African Snail, whose shell is up to 40 centimetres long.

That's a big snail!



DID YOU KNOW that a snail has both male and female parts to its body?

When two snails come together to mate they each shoot a 'love dart' into the other snail. They can then both go away to lay eggs.

The round, rubbery eggs come out of the side of the snail's head! They are laid in a moist safe place such as under leaf litter or under a log or a rock. The eggs are then left to hatch by themselves.

Tucker Time

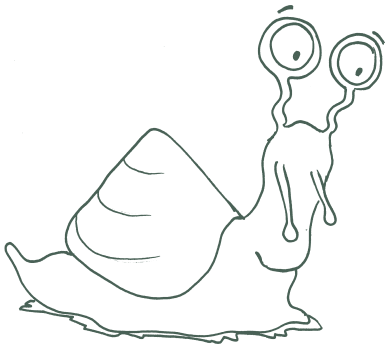
Like other snails, Mitch the rainforest snail chews his food with his tongue. His toothy or scaly tongue is called a radula, which moves like a chainsaw to break up food.

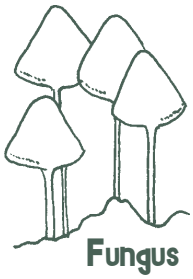
1. Here are four things that different **native snails** like to eat, and one that they don't. Work out which things native snails do eat and draw a slime trail from each of them to the snail so he can find them.

Which one would native snails not eat? _____

Bird

Native plants





Fungus

Other snails

Leaf litter

2. **Unscramble** the words to find out some of the garden plants that **feral snails** love to eat.

E T U L C E T _____

A C B A B G E _____

C H A N I P S _____

C B R O O L I C _____

Slow Speed Chase!

The native Carnivorous Snail follows the slime trails of other snail species to hunt them down and eat them!

Where am I?

Mitchell's Rainforest Snail used to be common in rainforests and swampy areas on the coastal lowlands between Tweed Heads and Ballina in northern New South Wales.

Use the scale on the map to help you estimate the size of the area where it used to occur.

1. **How many** square kilometres make up the coastal lowlands? (Hint: use the grid to estimate the area. Each grid square is 25 square kilometres)

This part of New South Wales is a very popular place for people to live. Over the last 100 years over 90% of the coastal lowlands been cleared for farms or towns. Now there are only scattered pockets of habitat left for Mitchell's Rainforest Snail, totalling about 5 square kilometres in area.

Today it has only been found in eight locations.

Find these locations on the map.

2. **List the eight locations** shown on the map.
3. **Which location** is the furthest south?
4. **Which location** is the furthest west?

Stotts Island is the largest patch of remaining habitat for Mitchell's Rainforest Snail and is very important for its survival. The National Parks and Wildlife Service protects and manages Stotts Island.

5. **Look at the map** and estimate how close Stotts Island is to Murwillumbah.
6. **What is** the closest place where Mitchell's Rainforest Snail survives near your home?

Scientists hope that Mitchell's Rainforest Snail still survives in other locations.

7. **Look at the map** and list some other locations where you think it might be worth looking for Mitchell's Rainforest Snail.

Map Legend

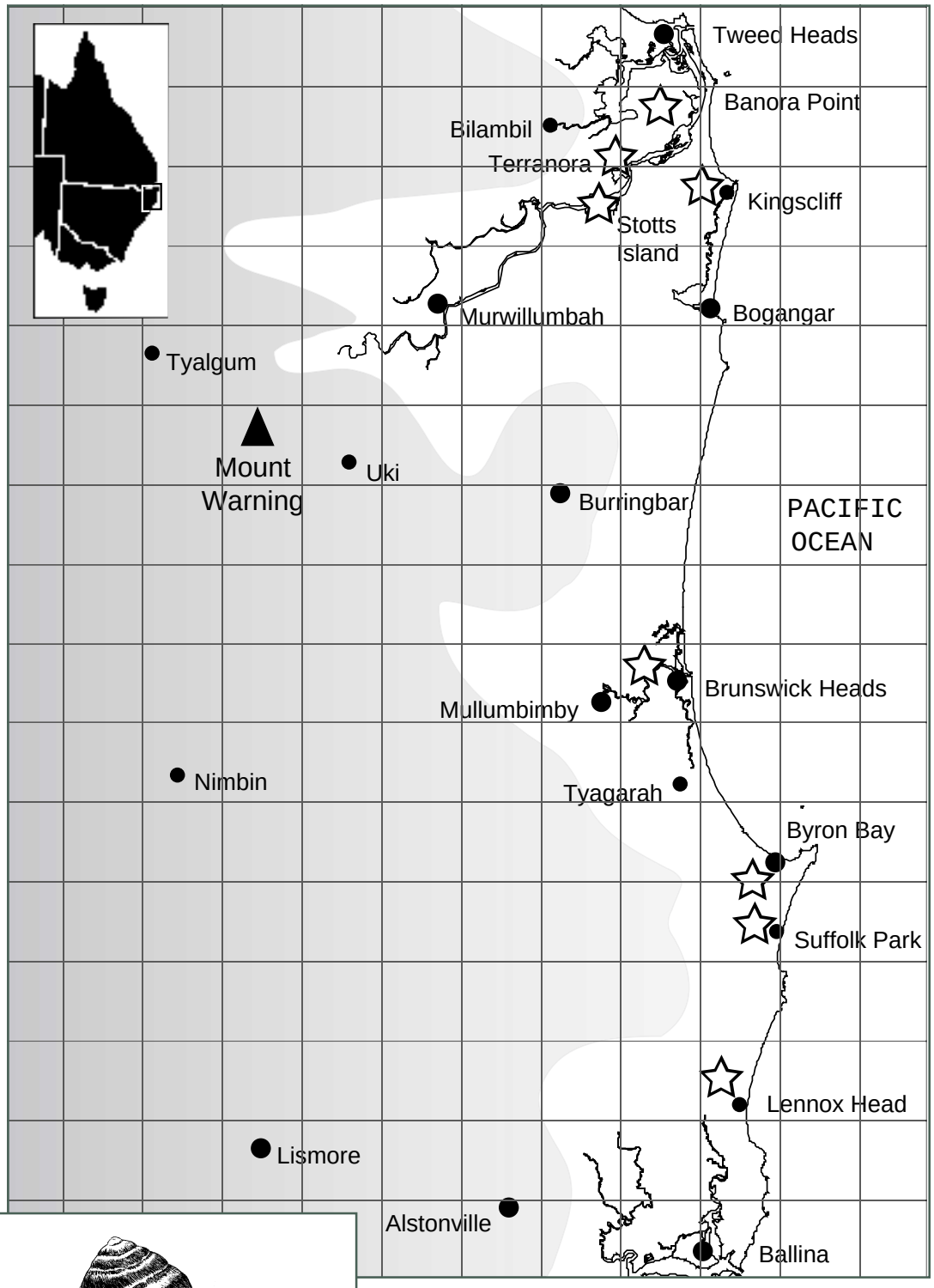
A location where Mitchell's Rainforest Snail has been found.

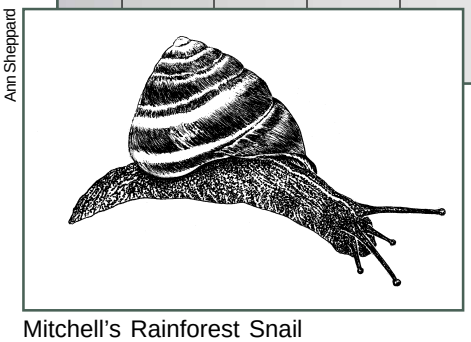
The north arrow points up to where north is on the map.

The scale bar shows the distance in kilometres.

Land 100 metres or more above sea level is shaded (below 100 metres is called the coastal lowlands).

The location of places where Mitchell's Rainforest Snail has been recently found.

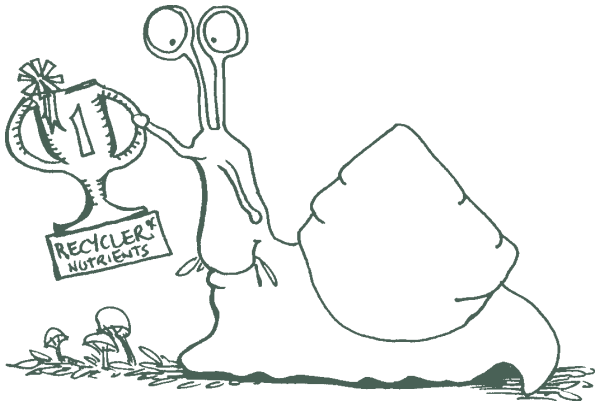




Ann Sheppard

Mitchell's Rainforest Snail

Who Eats Who?



An ecological community is a group of species living together in an area. Different species in an ecological community rely on each other for the energy they need to live.

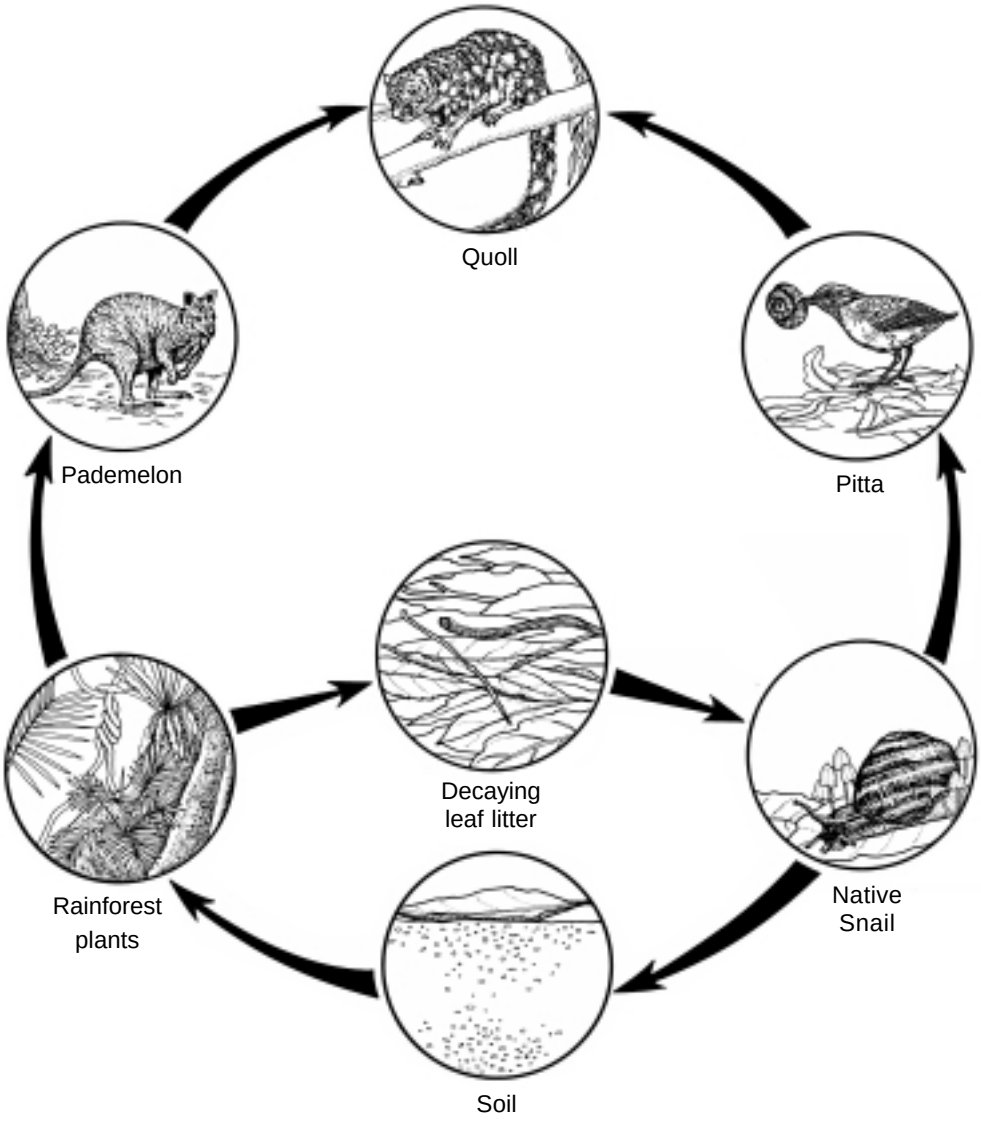
What do you think a fungivore is?

Plants get their energy from sunshine. Animals that get their energy by eating plants are called herbivores, while those that eat other animals are called carnivores. Fungi get their energy by breaking down dead plants.

A food web is a way of showing the different relationships between species in an ecological community. An arrow from one species to another means that the first one provides energy to the second (usually by being eaten). Studying food webs helps scientists work out what might happen to other species if one goes extinct.

Native snails are an important part of the food web in rainforest communities. They help break down leaf litter, returning nutrients to the soil, and provide food for birds such as pittas, lyrebirds and brush turkeys.

1. **Discuss** which animals in the food web below are a **carnivore** or **herbivore** or **fungivore**.

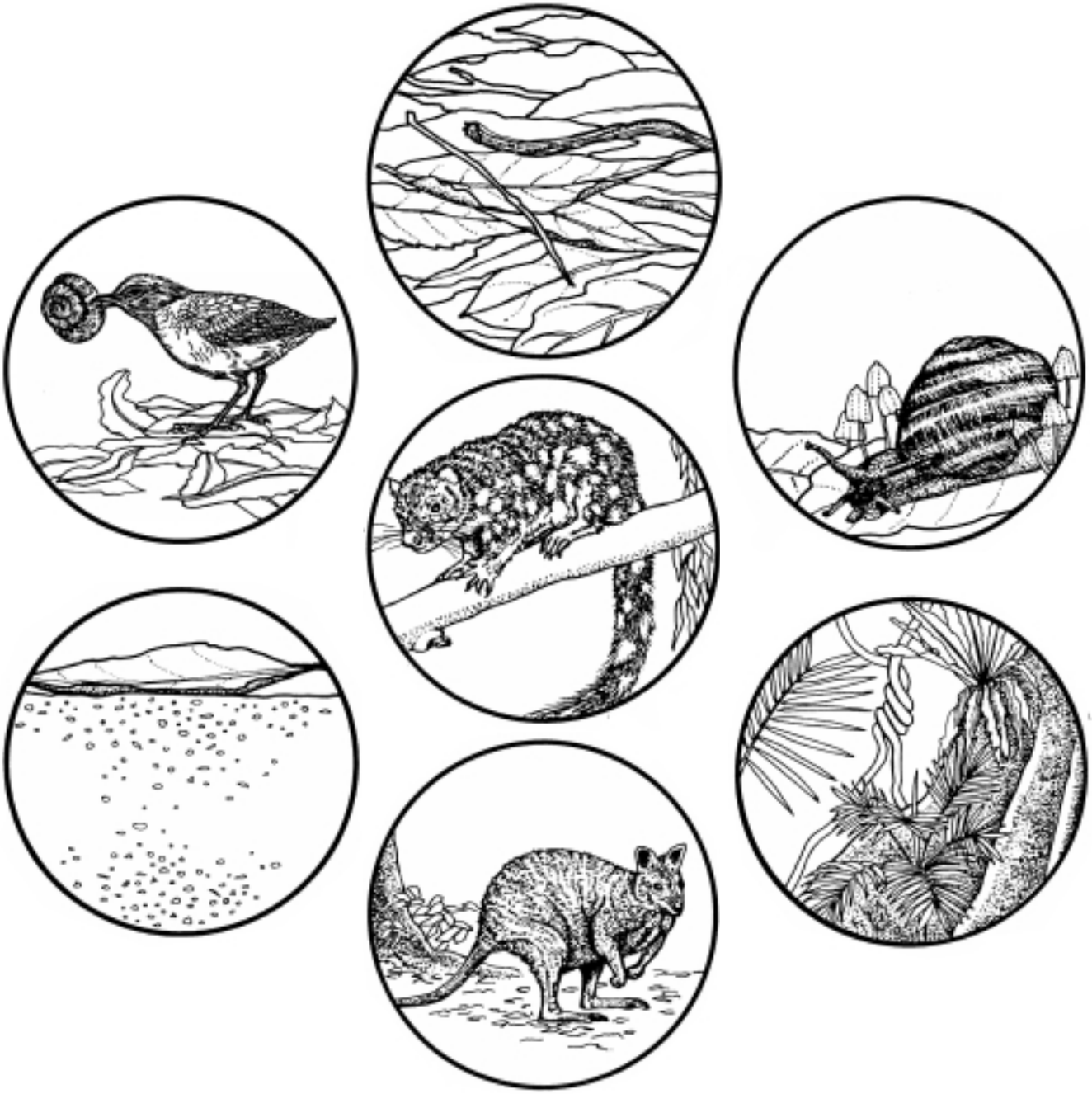


2. **Research** one of the animals pictured in this rainforest food web and write a report on:
   - what it looks like; where it lives; what it eats;
   - what other species might be affected if it went extinct.

   Prepare a one minute speech on your animal to present to the class.

3. **Colour** in and cut out the pictures below. You can use them to:
   - make a food web on the wall of your classroom;
   - make a mobile; or
   - paste them onto cards and attach them to paddlepop sticks to make puppets

4. **Write** a play using these rainforest creatures as the characters and perform it for your class.



Mitch's maths

Mitch likes a challenge! He is always trying to solve problems. See if you can solve these.

Level 1

a. 24 snails + 13 snails = _____ snails

b. 18 slugs + 13 slugs = _____ slugs

c. 17 snails – 3 snails = _____ snails

d. 112 slugs – 44 slugs = _____ slugs

e. 115 snails – _____ snails = 90 snails

f. 87 slugs + _____ slugs = 113 slugs

g. 119 snails + 23 snails = _____ snails

h. 123 slugs – 15 slugs = _____ slugs

Level 2

Question A

Mitch invites 13 snails, 8 slugs and 5 clams to go to a mollusc party.

- How many **shells** will be there all together?

Question B

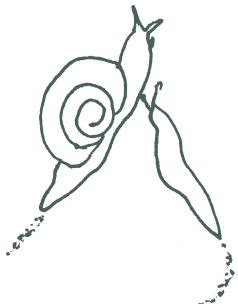
Snails have 4 feelers on their head. Red Triangle Slugs have only 2 feelers.

- If there are 14 snails and 12 slugs in a garden, how many **feelers** would there be altogether?

Question C

An octopus is a mollusc with eight arms. A group of octopuses at a rock pool concert were all waving their arms around.

- If there were 128 arms altogether, how many octopuses were there?



Question D

3 snails lay 25 eggs each and 2 snails lay 30 eggs each.

- How many eggs did the five snails lay altogether?
  (Hint: write this as a sum and then work out the answer.)

(___ x ___) + (___ x ___) = ____

Question E

25 snails are living in a rainforest. On the first day one fifth of them are eaten by a Pitta. On the second day one quarter of the snails that are left are eaten by a Lyrebird.

- How many snails are left?

Level 3

Question A

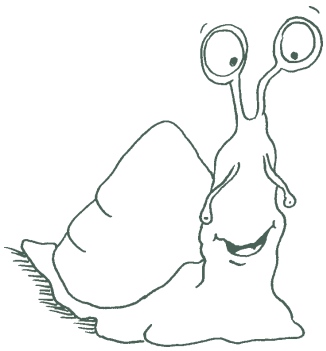
Mitch goes out on a rainy night. He moves 6 metres each hour for 3 hours, stays still for an hour to eat some fungus, and then moves 7 $^{1}/_{2}$ metres per hour for 2 hours.

- What is the total distance he travels in the 6 hours?
- What is his average speed over the 6 hours?

Question B

A Giant Panda Snail weighs 120 grams and Mitch only weighs 20 grams. 3 Giant Panda Snails sit on one end of a see-saw.

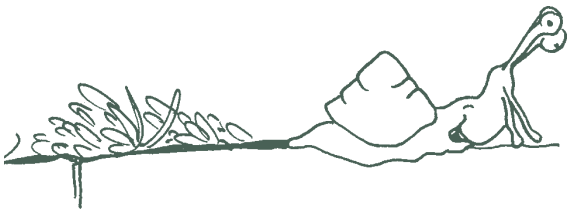
- How many snails the same weight as Mitch do you need on the other end to balance them?



Question C

A European Snail is moving around in a garden. It moves 35 centimetres in a straight line, then turns to the right and moves 20 centimetres in a straight line, then turns right again and moves 70 centimetres in a straight line, then turns right again and moves 10 centimetres in a straight line, then turns left and moves 5 centimetres in a straight line, and then turns right and moves 10 centimetres in a straight line.

- Draw a diagram showing where the snail has moved.
- How close to its starting point is it at the finish?



Question D

Mitch keeps a record of how far he moves each night for a week, and what the weather is like each night. The chart below shows what he recorded.

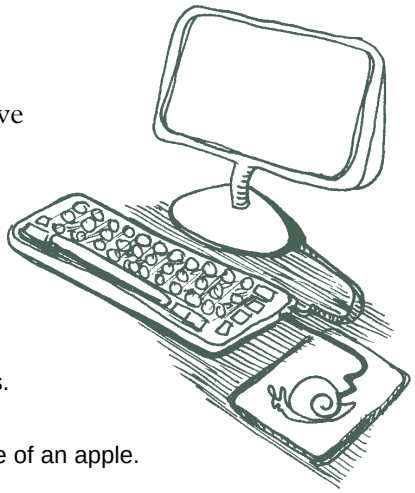
- What is the total distance Mitch travels over the week?
- What is the average distance moved by Mitch on dry nights?
- What is the average distance moved by Mitch on wet nights?
- What is Mitch's favourite weather for moving around?

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Weather	dry	rainy	rainy	dry	rainy	rainy	dry
Number of metres moved	2	10	13	4	6	13	0

Mitch in the computer class

Activity

Write a story, poem or a report about snails on the computer. Use your computer to design a layout for your document which you think looks good. Choose pictures from the CD provided with this book to illustrate your story, poem or report, and cut and paste them into your document.



Images on CD

The enclosed CD contains a series of colour images of Australian native land snails, which can be used in classroom activities.

1. **Mitchell's Rainforest Snail.**
   An endangered species that lives in rainforest areas in northern NSW.
2. **Mitchell's Rainforest Snail laying eggs beneath leaf litter.**
   Snails lay eggs from an opening in the side of their head!
3. **New Holland Snail.**
   This snail lives in rainforests and sometimes climbs high up on tree trunks.
4. **Giant Panda Snail.**
   This is the biggest native land snail in Australia, with a shell about the size of an apple.
5. **Eggs of Giant Panda Snail.**
   The eggs of the Giant Panda Snail are about the size of marbles and are laid under leaf litter on the rainforest floor. The snail takes two or three days to lay its eggs, remaining in the same spot for the entire time!
6. **Giant Panda Snail with cotton spool attached by a scientist.**
   The cotton unravels as the snail moves along, leaving a trail of cotton that can be followed later to see how far the snail has moved and where it has gone.
7. **Giant Panda Snail (bottom) with European Snail (top).**
   Showing the large size of the Giant Panda Snail compared to the feral European Snail.
8. **Brazier's Snail.**
   This pretty snail lives in rainforest areas on the NSW north coast.
9. **Lord Howe Placostylus.**
   An endangered snail only found on Lord Howe Island.
10. **Unnamed snail (Coffs Harbour NSW).**
    This species was only recently discovered and does not even have a name yet. Scientists estimate that only about a half of Australia's native snails have yet been discovered!
11. **Carnivorous Snail.**
    This snail eats other snails and hunts them down by following their slime trails.
12. **The Red Triangle Slug**
    This is a large, colourful native slug which feeds at night on microscopic algae growing on tree trunks. On rainy mornings they can sometimes be seen climbing back down tree trunks.
13. **Semi-slug.**
    The semi-slug is partway between a snail and a slug, having only a small shell on its back that is too small for it to hide in. This species of semi-slug produces a purple dye when disturbed.
14. **Pitta anvil with snail shells.**
    Pittas are rainforest birds that eat snails after cracking them open against favourite stones called anvils.
15. **Illustration of the shells of four native snails.**
18. 15: Mitchell's Rainforest Snail, 16: Giant Panda Snail, 17: New Holland Rainforest Snail, 18: Fraser's Snail.
19. **Food Web**

Celebrity Profile:
Mitch the rainforest snail

Hello Mitch, thanks for agreeing to this interview for *Snail Weekly*.

"That's OK. I like to be there for my snail fans."

Where do you like to hang out?

"Well, I live on the far north coast of New South Wales, which is a pretty cool place to live. I'm usually found in rainforests and around wetlands, but sometimes I like to visit people's gardens. I think its very important to always stay moist."

How can people recognize you?

"I've got a triangular-shaped shell about 5 cm wide that is a dark brown colour with two yellow stripes. Pretty funky hey?"

What do you like to eat?

"Microscopic algae and fungi growing on decaying leaf litter and palm fronds. My doctor says its good for me!"

What sort of things don't you like?

"I don't like seeing native trees being chopped down or removed. I've already lost 90% of my habitat and I really need what's left. I don't like introduced weeds spreading into bushland, or fires in rainforests and swampy areas. I also don't like introduced rats because they try to eat me."

What are some of your favourite things?

"I love patches of local rainforest with lots of palm fronds and leaf litter on the ground, and I like the bushy edges of swampy areas too. On dry days I usually stay at home under a fallen palm frond and read a book or just watch TV, but on wet nights I like to get around and see what's happening."

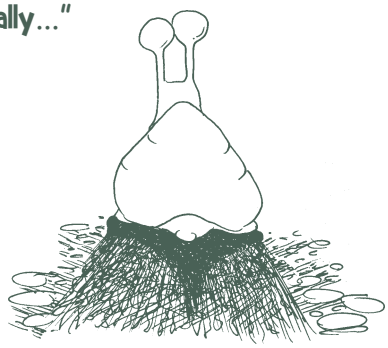
Do you know any snail jokes?

"A snail went to a house one night and knocked on the door. A man answered the door, looked down and saw the snail, and picked him up and threw him into the garden. Six months later the man heard knocking on the door again, and opening it saw the snail on the doorstep. "Hey, what did you do that for?" said the snail."

"A snail was mugged by a tortoise. When the police asked him if he could identify who attacked him, the snail said "No, it all happened too fast."

Do you know any **good** snail jokes?

"No, not really..."



Write a celebrity interview with another type of native invertebrate. You could choose a butterfly, a rhinoceros beetle, a leech, or anything you like. Include a picture of your celebrity.

What can you do?

Save Our Snails!

Mitch knows that land snails have been around since the days of the dinosaurs, and that more snails have become extinct in modern times than any other type of animal.

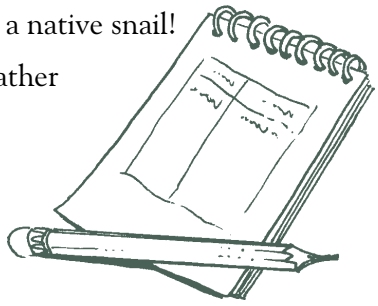
Mitch is also aware that loss of habitat is the main problem, as well as the introduction of feral animals such as rats that eat native snails.

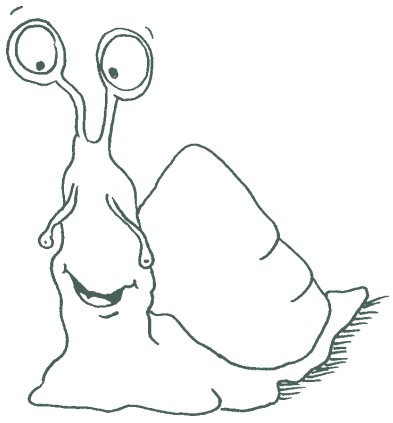
He understands the importance of looking after patches of native vegetation called remnants. Even very small patches can support native land snails and other native invertebrates. Invertebrates are only small but together they make natural ecosystems work, so they are very important. Have a class discussion to talk about ways to help save Mitch and other native invertebrates.

How can you help?

Listed below are things that people can do to help native invertebrates. Choose one and plan how you would carry it out.

- **Protect** patches of rainforest, bushland and wetlands in your local area. Let people know how important they are. Even small patches are worth looking after, and can be expanded by planting local native seedlings.
- **Help** keep local rainforest and bushland areas free of weeds and rubbish.
- **Plant** a garden with local native plants at home or at school. Use mulch to reduce the need for watering and to provide extra habitat for native invertebrates. Keep a list of the different invertebrates that visit your native garden.
- **Research** a patch of local bushland and write a report on what you find. Keep an eye out for native snails in your local area. Let the National Parks and Wildlife Service know if you think you have found Mitchell's Rainforest Snail.
- **Have a closer look** at the snails in your garden. One of them might be a native snail!
- **Investigate** environmentally friendly ways to control weeds and pests, rather than using chemical sprays and powders.
- **Imagine** you are the Science reporter for a newspaper. Write a report telling people about Mitch, including where he lives, why he is in danger and why we need to save him and other small native animals. You can even send your story to a local newspaper!





Now get out there and Save Our Snails! Good luck!

Teacher information:

Answers

Page 1 Mollusc Mix Up:

group 1 = D, group 2 = A, group 3 = C, group 4 = B.
Mitch thinks he is a gastropod.

Page 2 Rapping in Riddles:

A = squid, B = clam, C = land snail, D = sea snail, E = chiton, F = slug,
G = sea slug (nudibranch), H =octopus, I = pipi.

Page 3 Friend or Feral:

1. Words to be found in the word 'rainforest' include the following:
a, an, ant, are, arrest, art, ate, ear, east, eat, err, errant, faint, fainter, fair, fan, far, fare, fast, faster, fat, fate, fear, feat, feint, fin, fine, fir, fist, fit, first, foe, for, fore, forest, fort, fret, fries, frost, I, ion, infer, in ,if, is, it, nit, no, nor, not, note, near, neat, nest, net, oaf, oar, of, often, on, or, ore, raft, rafter, rain, ran, rant, rare, rat, rate, refrain, rein, rent, rest, restrain, retrain, rife, rift, riot, rise, risen, roan, roast, roar, roe, rose, roster, sane, sat, satin, seat, sent, serf, sift, sifter, sin, sir, sire, siren, snare, snore, snort, so, soft, soften, softer, son, sore, sort, stain, stair, star, stare, stern, stir, stone, store, strain, tan, tar, tea, tear, tern, terrain, tin, tine, to, toe, ton, tone, toner, train, trainer.

3. A feral animal is an animal out of place. It has been brought to an area by people and has escaped into the natural environment and become a pest.

4. Some other feral animals found in Australia are cats, foxes, dogs, rabbits, camels, horses, pigs, starlings, sparrows, cane toads, carp, honey bees, cabbage butterflies and red fire ants.

5. In a vegetable patch.

Page 5 Sensible Snails:

2. a= foot, b= breathing hole, c= mouth, d= shell, e= head, f= tentacles g= eye spot, h= smelling organ.

3. a= true, b= false, c= true, d= false, e= true, f= false.

Page 6 It might be a...

1. The letters remaining spell 'snail'.
3. a) Sense the snail's surroundings.
   b) Sensory areas of the body, like our hands, eyes, and nose.

Page 8 Mitch's Magic Slime:

5 & 6. The slime will move most easily on a smooth wet surface, and can be used to demonstrate why snails prefer to move around in wet weather.

Page 11 Tucker Time:

1. Snails don't eat birds. In fact this bird (a Pitta) eats snails!
2. Lettuce, cabbage, spinach, broccoli.

Page 12 Where Am I?:

1. Approximately 800 square kilometres.
2. Locations are Banora Point, Terranora, Stotts Island, Kingscliff, Brunswick Heads, Byron Bay, Suffolk Park and Lennox Head.
3. Lennox Head.
4. Stotts Island.
5. Between 10 and 15 kilometres.

7. Anywhere on the coastal lowlands eg. Ballina, Bogangar or Murwillumbah. Not Mt Warning, Alstonville or Nimbin.

Page 14 Who eats Who:

A fungivore eats fungi. Many snails are fungivores.

1. Quoll and Pitta are carnivores. Pademelon is a herbivore. Snail is a fungivore or herbivore.

Page 16-17 Mitch's Maths:

Level 1: a.= 37, b.= 31, c.= 14, d.= 68, e.= 25, f.= 26, g.= 142, h. = 108.

Level 2: a.= 23, b.= 80, c.= 16, d.= (3 x 25) + (2 x 30)= 135, e.= 15.

Level 3: a.= 33 metres total. 5.5 metres/hour. b.= 18, c.= 40 cm, d.= 48 metres, 2 metres/night (dry), 10.5 metres/night (wet), Mitch prefers wet nights.

Mollusc Ready Reckoner:

These questions and answers can be used together with the pictures on page 2 to play a guessing game of "What am I?"

	Land snail	Land slug	Sea snail	Sea slug	Pipi	Clam	Chiton	Octopus	Squid
Has a shell?	✓		✓		✓	✓	✓		✓
Has more than 1 shell?					✓	✓	✓		
Has 8 shells?							✓		
Lives in the sea?			✓	✓	✓	✓	✓	✓	✓
Lives on land?	✓	✓							
Able to swim?				✓				✓	✓
Moves by jet power?								✓	✓
Has 8 tentacles?								✓	
Has more than 8 tentacles?									✓
Moves from place to place?	✓	✓	✓	✓	✓		✓	✓	✓
Stays in one place?						✓			
Has a head?	✓	✓	✓	✓			✓	✓	✓
Has a toothy tongue (radula)?	✓	✓	✓	✓			✓	✓	✓
Digs in the sand at the beach?			✓		✓				
Lives on rocks at the sea shore?			✓	✓			✓		
Has a beak-like mouth?								✓	✓
Type of mollusc:	Gastropod	Gastropod	Gastropod	Gastropod	Bivalve	Bivalve	Chiton	Cephalopod	Cephalopod

For further reading:

NPWS publications:

The Recovery Plan for the Mitchell's Rainforest Snail and Critical Habitat Declaration for Stotts Island are available on the NSW National Parks and Wildlife Service website at www.nationalparks.nsw.gov.au

Book:

Threats to Plants and Animals: Habitat Fragmentation by Kimberley Jane Pryor (Macmillan Library, 2003) includes information on Mitchell's Rainforest Snail. ISBN 0 7329 8100 X.

Articles:

A paper by Michael Murphy on the plight of Mitchell's Rainforest Snail and the efforts being made to save it can be found in the journal Australian Zoologist Volume 32(1) pp. 1-11 (April 2002), published by the Royal Zoological Society of NSW. ISSN 0067-2238.

A paper by Adrienne Kinnear on the use of invertebrates in primary science classroom activities can be found in the publication The Other 99%: The Conservation and Biodiversity of Invertebrates (June 1999; pp. 426-31), published by the Royal Zoological Society of NSW. ISBN 0 9586085 1 2. This publication also includes other articles which may be of interest.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