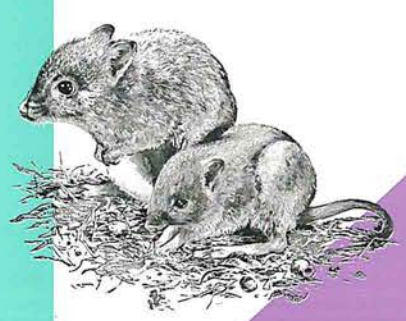
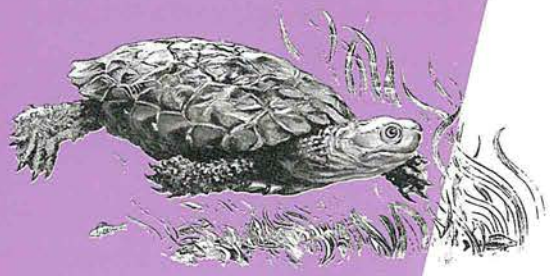
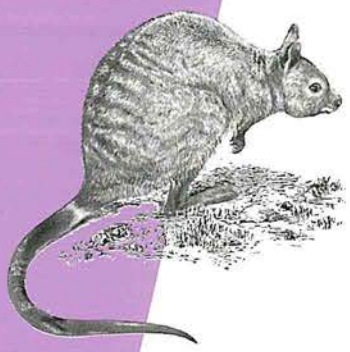
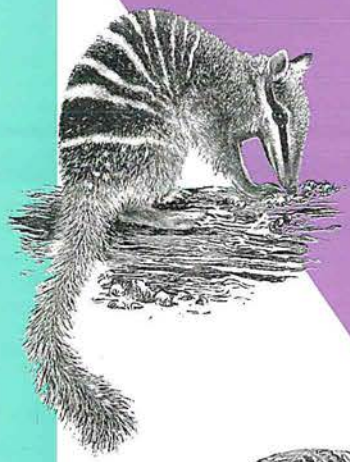
Western Shield Action Pack

western shield

Activities on Threatened Species for Upper Primary School



Department of Conservation and Land Management

Contents

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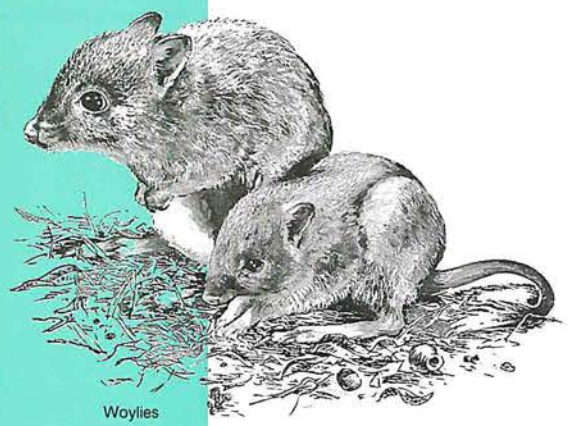


Woylies

Teachers' Notes

Overview of Action Pack

The objectives are:

- to increase awareness of Western Australia's threatened species,
- to familiarise students with current CALM projects aimed at preventing further extinctions ie Operation Foxglove and Project Eden that come under the umbrella of Operation Western Shield,
- to improve understanding and recognition of Western Australia's unique fauna,
- encourage positive community action to contribute to the protection and conservation of native wildlife.

The outcomes:

Students are encouraged to:

- find out information to increase their knowledge of threatened species,
- take positive action to conserve plants, animals and the environment.

Values:

- students will recognise the importance of maintaining the natural balance of species within an ecosystem and the devastating impact of introduced species on Western Australia's unique fauna.

Planning your lessons

Work in this pack could be covered during four or more lessons, with a class divided into small groups of students. Three students per group would be ideal.

Materials

All materials other than everyday items of use in the classroom are provided in this pack. Photocopying of Resource Sheets and Activity Sheets will be required.

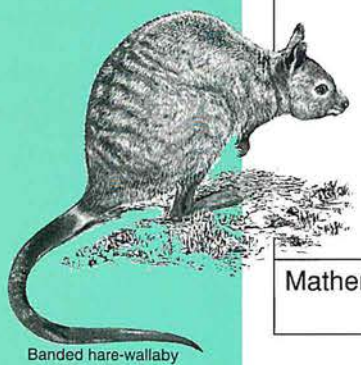
Banded hare-wallaby

Curriculum Links

Curriculum Areas	Stage/Year	Number/Strand	Understanding/Topics/Activities
Science	6	Animals	Investigating responses of animals to their environment.
	7	Plants/Animals	Investigating animal/plant interdependence.
Language	5/6/7	2.1	Differing demands on the natural environment may lead to conflict.
		3.2.2.B	Descriptions. Presents descriptions in oral and written forms.
		3.2 Informational	Some factual texts are characterised by technical vocabulary. It is necessary to understand that vocabulary before fully comprehending the text.
Mathematics	5/6/7	N:P4:1	Construct and read graphs, and interpret graphical information.
Social Studies	6/7	Environment, Society and Culture	Sharing the environment.
			Cooperation and conflict.

Student Outcome Statements

Profile	Strand	Level
Studies of Society and Environment	Natural and Social Systems	3.16 Describes an example of a cycle within natural systems and the place of people in it.
	Investigation, Communication and Participation	4.2 Translates information from one form to another.
Science	Life and Living	3.13 Maps relationships between living things in a habitat.
		3.15 Explains why some living things have become extinct and identifies current endangered species.
		4.13 Identifies events that effect balance in the ecosystem.
	Working Scientifically	3.6 Identifies ways science is used responsibly in the community.
English	Reading and Viewing	3.1 Interprets and discusses some relationships between ideas, information and events.
	Writing	4.4 Uses writing to develop familiar ideas, events and information.
	Speaking and Listening	3.7a Interacts for specific purposes in the classroom.
		5.7a Interacts with peers in structured situations to discuss familiar or accessible subjects involving challenging ideas and issues.
Mathematics	Chance and data	3.20 Reads and describes information in simple tables, diagrams, pictographs and bar graphs.



Banded hare-wallaby

Teachers' Notes 1

Poster Pictures

This activity introduces Operation Western Shield and the main concepts associated with it. The poster pictures help to focus attention on threatened species which will benefit from the campaign.

Background information (also read *LANDSCOPE* reprints from pack)

Species extinction is a process that is not new. In the past the most dramatic wave of extinctions that we know of happened with the disappearance of the dinosaurs from Earth. What is of concern today is that the rate of extinctions is at least one hundred times above the natural extinction rate and happening on a massive scale. Human activities are directly responsible.

Worldwide there are many reasons for extinctions: including habitat destruction, hunting and poaching, pollution, disease and introduced species. In Australia one of the main causes of extinctions is the introduction of predators and competitors from overseas.

Western Shield is CALM's project in WA to expand feral predator control and then reintroduce native animals to former habitats (see map in *LANDSCOPE* reprint).

Definitions:

Presumed extinct - species not definitely located in the wild for the past 50 yrs.

Endangered - in danger of extinction; survival is unlikely if the causal factors continue operating.

Threatened - a general term covering all categories of animals under threat.

Concepts

- Extinction rates today are much higher than natural rates because of human activities.
- In Australia a main cause of extinctions is the introduction of species.
- A variety of native animals are threatened by foxes and cats; medium sized mammals, reptiles and ground-nesting birds.

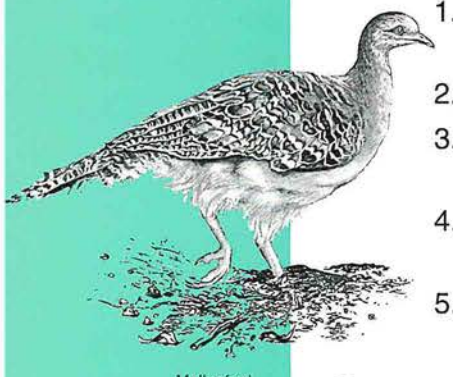
Materials

6 Posters (1/group), Activity Sheet 1 (1/student)

Teacher directions

Teachers could start this unit of work with Extension Activity 1 - glossary of terms.

1. Assign students to small groups. Each group needs to have access to a poster.
2. Ask students to study the poster and feed back their discoveries.
3. Class discussion to include the map showing the extent of Operation Western Shield, the bar graph and threatened species.
4. Hand out Activity Sheet 1. Working in groups, students answer questions on sheet.
5. Collect posters; ask students to write in the names of the animals on Activity Sheet 1.



Malleefowl

Activity Sheet 1

Name: _____

Poster Pictures

1. Study the colour poster. Read and discuss with your group.
2. How many of these animals have you seen in the wild? Tick the boxes.
3. What does the bar graph tell you about the effects of fox baiting?

_____

_____

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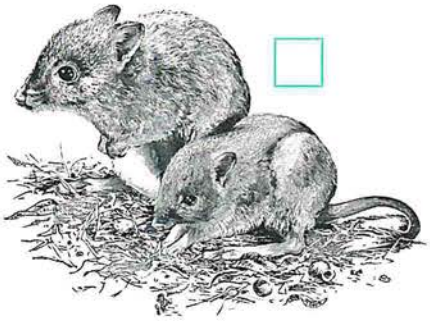
4. Look at the map and then circle on this sheet the area Western Shield operates closest to you.

5. Look closely. Find the hidden animal. What is it? _____



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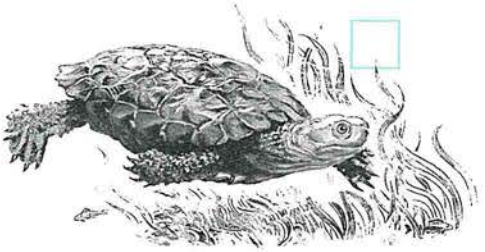

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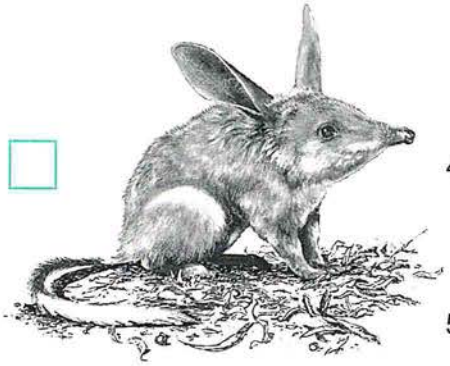

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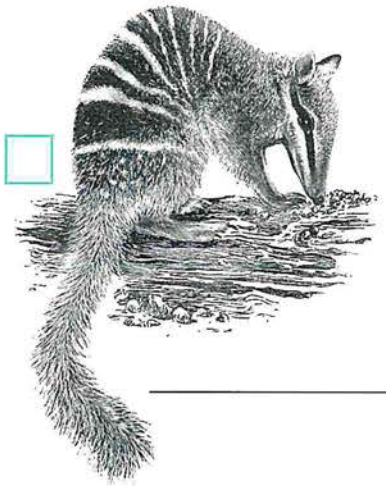

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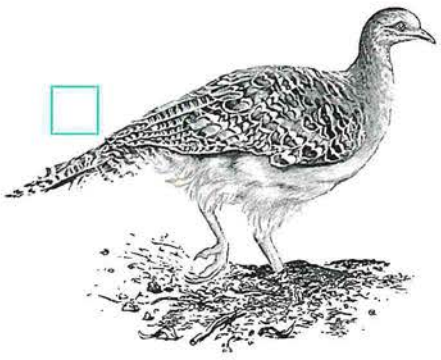

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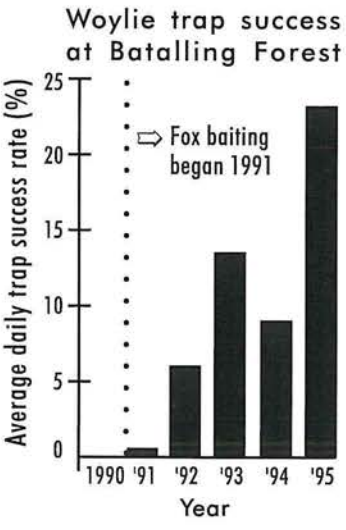

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Teachers' Notes 2

Puzzle Page

This activity should be inviting to the students and will consolidate their knowledge of Western Shield and associated terminology.

Background information for students to complete the activity is given on Resource Sheet 2.

Concepts

- The control of introduced species is a community concern requiring a statewide operation.
- Success can be achieved only after years of careful research and pioneer programs to test methods.
- We can all help in bringing wildlife back from the brink of extinction.

Materials

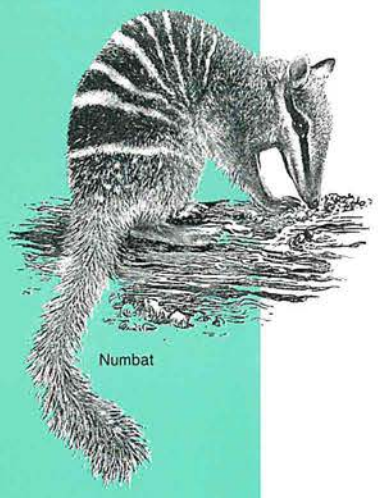
Resource Sheet 2 (1/group), Activity Sheet 2 (1/student)

Teacher directions

1. Speakers from selected groups read aloud paragraphs of Resource Sheet 2. Follow with a class discussion on key words: baiting, brink, endangered, extinct, feral, native, pioneer, threatened.

   Focus questions:

   - What does 'extinction' mean?
   - Why do species become extinct?
   - What does 'endangered' mean?
   - What does CALM stand for?
   - What can you do to help save animals and plants from becoming extinct?
   - What is Operation Western Shield?
   - Which species has CALM brought back from the brink of extinction? (refer to *LANDSCOPE* reprints in pack)
2. Students complete the Puzzle Page, working in groups but completing own sheet.
3. Early finishers answer the puzzle below.



Numbat

A numbat eats 20,000 termites a day. Four numbats live in an area of wandoo woodland. A fox catches and kills one of these numbats. This fox then eats a poison bait put out during Operation Western Shield and dies. Three more numbats then enter the area.

How many termites will be required in the area per week to feed all the resident numbats?

Resource Sheet 2

Puzzle Page

Operation Western Shield
Bringing wildlife back from the brink of extinction

What's all the fuss about?

In Western Australia over the past 100 years 10 native mammals have become extinct. Thirty one more species are threatened and only survive in low numbers. Why? Hungry foxes and cats, introduced from overseas, are a main cause of our wildlife's decline.

There is hope!

Pioneer programs that control fox numbers, such as Operation Foxglove in the northern jarrah forest, show an increase in numbers of native animals. Take a look at the poster and see how woylie (a small relative of the kangaroo) numbers have increased in the Batalling Forest after fox baiting began in 1991. Woylies are now no longer threatened.

Using nature to conserve nature

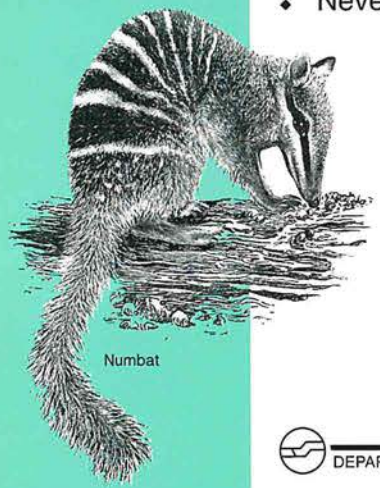
So, how are fox numbers controlled? Western Australia has a natural advantage - a group of plants called poison peas. These plants contain a poison which is made synthetically under the name 1080 (pronounced ten-eighty). Native animals have developed a high tolerance to this poison over hundreds of years, but introduced animals, such as the European fox and feral cat, die quickly after eating tiny amounts.

Western Shield - a statewide operation

Western Shield is the name given to CALM's expanded operation to remove foxes and cats from nearly five million hectares of the State by regular baiting with 1080 poison. Many native animals will be saved from extinction and you will be able to find them in bushland once again.

Can you help? Yes!

- Contact your local CALM office to find out more. They may need volunteers. Read CALM's *LANDSCOPE* magazine and spread its conservation message.
- Control your pet cat; have it desexed, keep it in at night (daytime pets can become night-time killers) and attach bells to its collar to warn prey.
- Never dump your unwanted pets in the bush.



Numbat

Activity Sheet 2

Name: _____

Puzzle Page

1. Giant Western Shield Sleuth

As you find the words in the sleuth, colour them in and cross them off on the list.

The letters that are left uncoloured spell out the beginning of a phrase.

Can you solve the sleuth?

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

List

Bait,	Brink,	Cat,	CALM,	Conserve,	Chuditch,
Die,	Eat,	Endangered,	Extinct,	Feral,	Fox,
Foxglove,	Hare wallaby,	Malleefowl,	Mammals,	Native,	Nature,
Numbat,	Lethal,	Prey,	Poison pea,	Python,	Ringtail possum,
Saved,	Ten eighty,	Tortoise,	Woylies.		

Which animal pictured on the poster is not listed above? _____

Complete the phrase: W_ _ _ _ _ _ _ _ _ _ _ _ _ _

B_ _ _ _ _ _ _ W_ _ _ _ _ _ _ _ _ _ _ F_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ E_ _ _ _ _ _ _ _ _

Numbat

2. How many words....

can you make in 10 minutes from the letters in: **WESTERN SHIELD ?**

15 - good; 25 - very good; 35 - excellent!

3. Unscramble these words - who will benefit from Western Shield?

abednd raeh aabwlyl rewenst pwsam ortiseo acrept tyohpn

_____ _____ _____

Teachers' Notes 3

Which threatened species am I?

This activity will help students to identify and learn about some of Western Australia's threatened and unique species.

Background information

The importance of species conservation

Many people now see the environment and conservation of species as the most important issue today and in the history of humankind. Why is this so? The ultimate cost of not conserving wildlife and biological diversity is the ecological collapse of the planet and our own survival being threatened. There are, however, many other reasons in the interim for conserving species diversity:

- The aesthetic beauty of a natural environment,
- The economic benefits in areas such as medicine, agriculture (food, clothing and energy production) and industry, and
- The moral obligation we have of passing on a rich environment to future generations.

We do not know what effect the loss of a particular species will have on our environment, on the natural processes on which plants, animals and humans depend. Any extinction or decline of species is of great concern for a whole range of environmental, moral and aesthetic reasons.

This is why CALM places so much importance on Operation Western Shield which will have an annual budget of $1.4 million and cover an area of nearly 5 million hectares.

Concepts

- Western Australia has a unique and diverse fauna. Some species are threatened with extinction.
- Identification of an animal is the first step on the road to understanding and ultimately being able to conserve a species.

Materials

Resource Sheet 3 (1/group), Activity Sheet 3 (1/student)

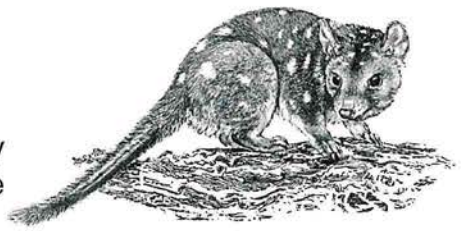
Teacher directions

1. Prior to the lesson collect information from the library and from CALM (see reference list) about Western Australia's threatened species.
2. Using this background information and Resource Sheet 3 discuss the importance of conserving species and the unique variety of Western Australia's fauna.
3. Go through Activity Sheet 3 and then allow the students to complete it.
4. Early finishers could create their own summary and clues for other poster species.

Carpet python

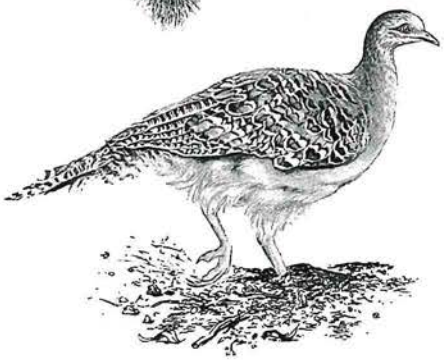
Resource Sheet 3

Which threatened species am I?

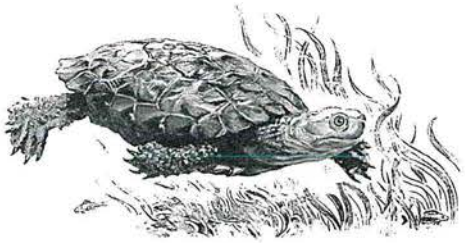


Chuditch: Also known as a quoll. A small carnivorous marsupial about the size of a small cat. Its fur is mainly brown with white spots. It has a long tail and a brush of long black hairs. Although it mainly forages for food on the ground it will climb trees while hunting at night for animals such as insects, birds, frogs and lizards.

Numbat: A small reddish-brown marsupial, with a long bushy tail, pointed snout and white stripes across the back. Feeds on termites using its long sticky tongue. Active in the early morning and early evening. Nests in and under fallen logs in forest and woodland. Western Australia's animal emblem.



Malleefowl: A greyish-brown, spotted bird found mainly in dry inland scrub areas. It builds a large mound of soil and litter into which the eggs are laid and incubated by the heat generated by the composting process. The male bird builds and looks after the mound, keeping it at the correct temperature by opening or closing the centre.



Western swamp tortoise: A short-necked tortoise with a dark yellow and brown to black shell. Lives in swamps that fill with water only during the winter and spring and are dry during summer and autumn. When the swamps are dry it aestivates (sleeps deeply) in holes in the ground or under leaf litter. Feeds on insects, tadpoles, small crustaceans.

Western ringtail possum: This grey possum lives in and moves between trees. It has a long, white-tipped tail which it wraps around branches as an aid in climbing. Ringtails are active at night and feed mainly on leaves, fruit and flowers. Daytime is spent in the hollows of trees.

Carpet python

Activity Sheet 3

Name: _____

Which threatened species am I?

What to do

1. Read Resource Sheet 3. This gives information to help you identify some of the threatened species shown on the poster. Does the poster hint at their habitat? Discuss with your group.
2. Fill in the answers on this sheet.

- I am a small Australian mammal. I have a long tail. Fallen logs, are important to me not only as a food source but also as a home. With my sticky tongue I catch termites.

  I am a _____

- I help to keep a natural balance in the forest by eating other animals. I am nocturnal and well camouflaged by my dappled appearance.

  I am a _____

Complete clues for the other three animals:

- _____
  _____
  _____
  _____

  I am a _____

- _____
  _____
  _____
  _____

  I am a _____

- _____
  _____
  _____
  _____

  I am a _____

Carpet python

Teachers' Notes 4

Foxed Food Chains

This activity illustrates the impact an introduced species can have on a food chain and ultimately on an ecosystem. An excursion to the jarrah forest prior to this activity would be of considerable value in understanding the interacting elements of the ecosystem. See Extension Activity 5.

Concepts

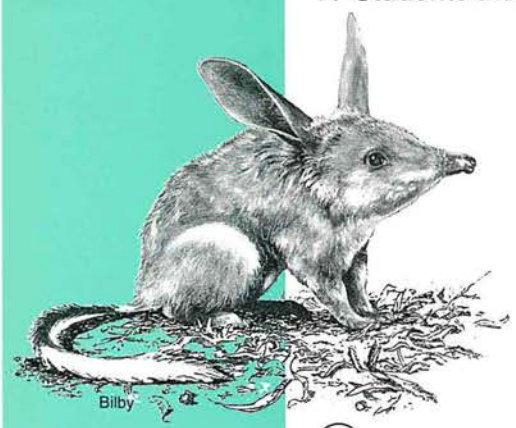
- Food chains and food webs are diagrams which represent the feeding relationships between living organisms within an ecosystem.
- A stable ecosystem is one in which relationships between organisms and the non-living components have evolved to an equalibrium over long periods of time.
- The introduction of a species with no predators can imbalance the ecosystem and threaten many species.

Materials

Resource Sheet 4 (1/group), Activity Sheet 4 (1/student), blank sheet of paper, scissors and glue (1/group).

Teacher directions

1. Brainstorm with students the concepts of food chains, food webs and ecosystems.
2. Ask students in their groups to read Resource Sheet 4.
3. Discuss the links between the elements of the jarrah forest, both living and non-living. Add to the list in Resource Sheet 4 and examine the source of food (nutrients) for each element. Discuss the feeding habits of the fox. Students can also refer to information gathered for previous activities in this pack.
4. Students each construct a food chain in pictures in the circles provided (Activity Sheet 4). Members of each group must have different food chains, but can assist each other in the process.
5. On completion students cut out the box (along dotted line) containing their food chain. The group's food chains are then glued onto a blank piece of paper. Groups discuss and insert lines and arrows to show links between elements of the chains thus creating a food web.
6. With reference to Resource Sheet 4 students write an **F** in the boxes against each element on which the fox will have an impact.
7. Students then answer questions posed on Activity Sheet 4.


Bilby

Resource Sheet 4

Foxed Food Chains

An ecosystem can be defined as a balanced community of living plants and animals interacting with each other and with their non-living surroundings (air, water, soil, sunlight) in a defined space (eg. in a forest).

The interaction between different organisms within a community of different plants and animals is quite varied. An example is the feeding relationship.

In a jarrah forest there are the plants that produce their own food through photosynthesis. These are called the 'primary producers' which include the **trees**, **understorey plants** and **herbaceous ground cover plants** eg **grasses.**

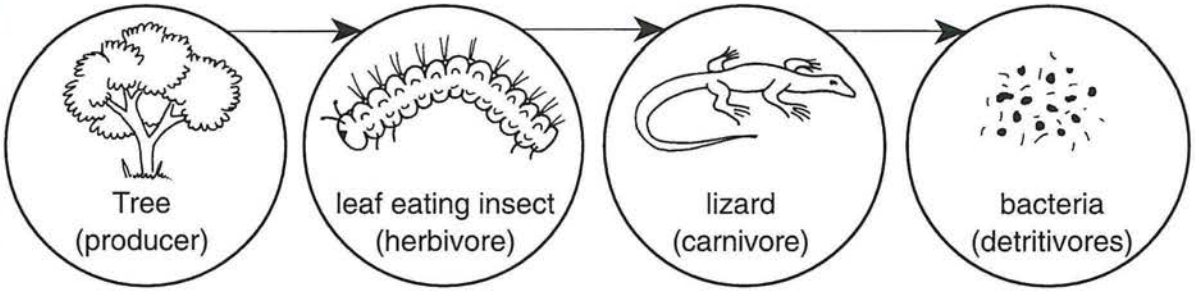
Other living organisms feed on plants. They are called 'herbivores' or 'primary consumers' such as **insects, possums**, **wallabies** and **woylies**.

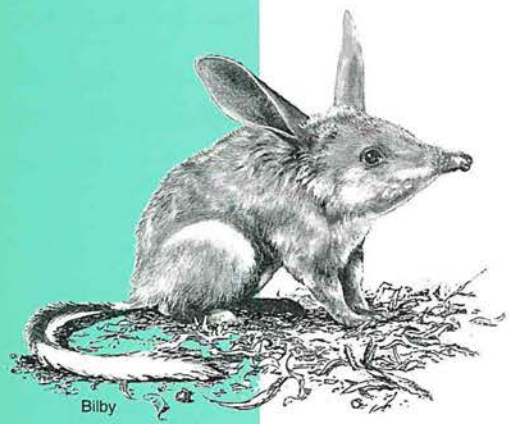
Animals that feed on other animals are called 'carnivores' or 'secondary consumers'. Examples are **chuditch**, **numbats** and **reptiles** eg **snakes, lizards** and **skinks**. Some animals feed on both plants and animals and are referred to as 'omnivores'.

Finally there is a whole range of other organisms, both plant and animal, which break down dead organic matter. These are called 'detritivores' or 'decomposers' and 'recyclers' of food (nutrients) including **bacteria**, **fungi** and **insects** such as **termites**.

A single chain of organisms feeding one on another is called a **food chain.**

Here is an example of a **forest food chain:**




Bilby

In reality consumer organisms (herbivores, carnivores and detritivores) feed on several different food sources. A network diagram showing feeding relationships in an ecosystem is called a **food web**.

Entering this relatively stable forest ecosystem came the fox, a very adaptable animal, capable of living in many different conditions. Foxes were deliberately released near Melbourne in the 1860s so that people could hunt them for sport and they soon spread to the south-west of Western Australia.

The fox in a forest ecosystem is not a fussy eater. It will take live mammals, reptiles, birds, reptile and bird eggs, lizards, frogs, and plants. It will scavenge dead, decaying animals and when hungry will feed on insects and other invertebrates. The fox is a skilful killer, hunting at night, relying on sound and smell more than sight to find its prey.

This cunning killer, however, has no real predators to keep its numbers down.

Consider the impact of foxes on the food chain above. They could affect, or even destroy, at least one level of the chain, the lizards. Scientists are not always sure what will happen when an entire level of a food chain is destroyed. In the longer term species can become endangered or even extinct.

Some living elements of the jarrah forest ecosystem

Primary producers

marri tree, jarrah tree, banksia, wattle, balga, zamia, bracken, poison pea

Primary consumers

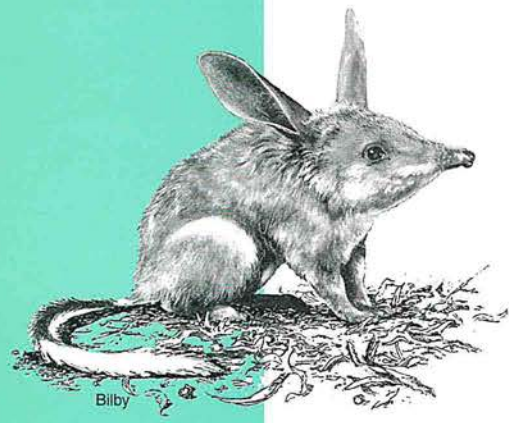
parrot, possum, wallaby, woylie, kangaroo, leaf-eating insect eg caterpillar

Secondary consumers

insect-eating bird, numbat, echidna, frog, dugite, death adder, skink, goanna, wedge-tailed eagle

Decomposers and recyclers

bacteria, earthworm, fungus, millepede, mite, springtail and other tiny insect species, termite.


Bilby

Activity Sheet 4

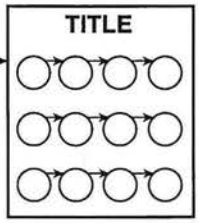
Name: _____

Foxed Food Chains

What to do

1. Using the information on Resource Sheet 4 and the list produced by the class, each person in your group draws pictures of species (in the circles below) to make a simple food chain in the jarrah forest. Each member of your group should have different elements in their chain.

2. Cut out your food chain and paste it onto the blank piece of paper together with the food chains of your group. eg →



3. Insert lines and arrows to create a jarrah forest food web.

4. Write an **F** in each box where foxes could have an impact.

5. Discuss and write in a title at the top of your group's foodweb.

- What other animals would be likely to die in the forest if foxes ate all the small ground dwelling herbivores?

_____

_____

_____

- If all ground dwelling herbivores were killed by foxes in an area of forest how would the plant life be affected?

_____

_____

_____

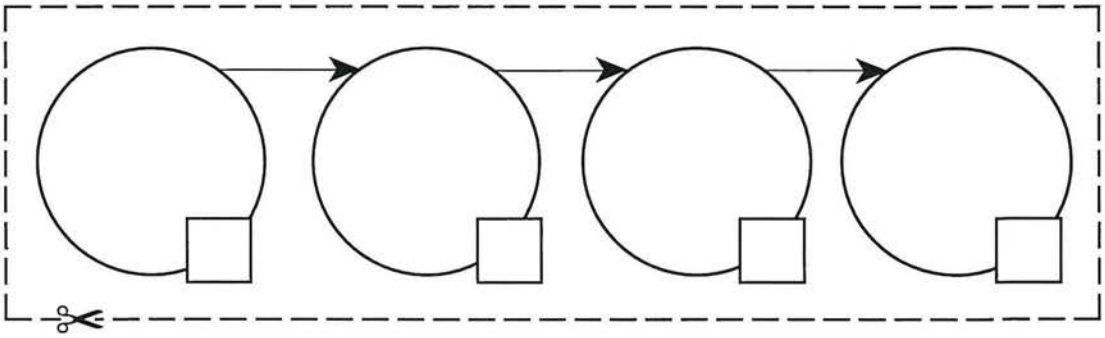
- What procedure could we follow to restore that area of jarrah forest back to its natural balance of species?

_____

_____

_____

Draw a food chain




Bilby

Teachers' Notes

Extension Activities

1. Prepare a glossary of terms

Students prepare a glossary, using dictionaries and the library, to define the following terms: aestivate, bait, biological control, conserve, diversity, ecosystem, endangered, extinction, feral, habitat, mammal, marsupial, native, predators, unique, threatened.

2. Research a threatened animal

Ask your students in groups to research a threatened species. Choose from species pictured on the poster or in the *LANDSCOPE* article, Western Shield, in this pack.

Students research the animal and then write a Report with pictures and diagrams using the First Steps headings:

- Introduction;
- Description;
- Distribution;
- Habitat;
- Feeding Habits;
- Reproduction;
- Other Interesting Points;
- Ending.

The section on 'Other Interesting Points' should consider:

- why the species is threatened,
- how have humans contributed to making them threatened,
- how can humans turn this around and assist the species,
- what is CALM doing to protect the species.

3. Make a class book about threatened species

Combine the work of the students' investigations into a book for display in the classroom.

4. Pet Cat Debate

Students research and write a Persuasive Exposition on the topic "Do introduced animals destroy our native wildlife?". Follow this with a class debate 'for' or 'against' pet cats. Refer to p142 of Exploring Wheatbelt Woodlands (See Reference List).

5. Visit The Hills Forest Activity Centre

CALM runs environmental education programs and excursions for schools. Find out about camping over night in the jarrah forest at Mundaring. Phone (09) 295 2244.

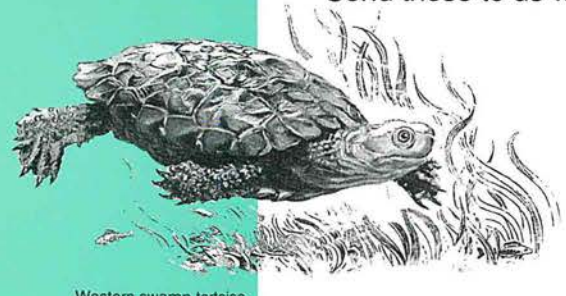
6. Visit the Perth Zoo

Find out what Perth Zoo is doing for endangered species. Are there breeding programs for endangered species? Start a fund-raising drive to sponsor a WA endangered species.

7. Design a poster for protecting a WA endangered species

Students could include a new slogan to help CALM's conservation programs.

Send these to us with your registration for CALM's *"Win a night out with the woylies".*



Western swamp tortoise

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Videos

Australian National Parks and Wildlife Service (1992). *Australia's Endangered Wildlife.*†

* Can be obtained from CALM's Enquiries Office, 50 Hayman Rd, Como 6152 or phone (09) 334 0437.

† Can be found at Perth Zoo Library.

Western ringtail possum