SOUTHERN QUEENSLAND

# FLYING-FOX EDUCATION KIT

## Year 6: The flying-fox habitat

www.allaboutbats.org.au

SEQ Catchments
Healthy Land – Healthy Water

Burnett Mary Regional Group
Practical Solutions for Natural Resource Management

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SOUTHERN QUEENSLAND

# Flying-fox education kit

## About the education kit

The *Southern Queensland Flying-fox Education Kit* was developed as part of the ***Improving Landscape Resilience to Climate Change in SEQ: the flying-fox roost & forage conservation pilot project***. This two-year project, coordinated by SEQ Catchments, aimed to improve the long-term sustainability of flying-fox camp sites in the southern Queensland region and increasing community awareness of the intrinsic value of flying-foxes and the critical ecosystem services they provide.

The project was funded through the Australian Government's Caring for our Country program and supported by Brisbane, Logan and Redland City Councils, Moreton Bay Regional Council, Noah's Ark Wildlife Coalition, Bat Conservation and Rescue Queensland, The Hut Environment and Community Association, the Queensland Department of Environment and Resource Management and Burnett Mary Regional Group.

The education kit introduces teachers and students to Gracie the grey-headed flying-fox. Gracie's mission is to help save my flying-foxes and get the message out about how important they are in pollinating native trees and dispersing native seed - essential things in keeping our environment healthy!

The All About Bats website is a key component to this education kit - www.allaboutbats.org.au.

## Year 6: The flying-fox habitat

The *Southern Queensland Flying-fox Education Kit* provides schools of southern Queensland with an opportunity to study flying-foxes in the classroom while achieving outcomes (particularly Biological Sciences) under the Australian Curriculum.

The year 6 unit consists of three lessons that contain a variety of activities. Teachers may choose to complete more than the suggested lessons e.g. a teacher may choose to recap some of the year 5 activities or proceed to year 7.

These activities use a range of different learning media to provide an all-round learning experience for their students. This includes printed materials, PowerPoint presentations, YouTube videos and sound files that are all found on the All About Bats website.

The year 6 unit "The flying-fox habitat", introduces students to how the flying-fox habitat has been destroyed and how that has led to some flying-foxes being listed as threatened species. They will also explore how scientists are helping people to come up with solutions to help both flying-foxes and man.

UNIT OVERVIEW

# Year 6 The flying-fox habitat

## Rationale

This unit has been designed for year 6 students to increase their understanding of the habitat of flying-foxes. Students will look at how the flying-fox habitat has been destroyed and how that has led to some flying-foxes being listed as threatened species. They will also explore how scientists are helping people to come up with solutions to help both flying-foxes and man.

This unit is divided into three lessons. The aim is that each lesson will take between one and two hours.

### Lesson 6.1 Where do flying-foxes live?

This unit starts with a close look at the habitat of a flying fox through discussion, observation and reading. Students learn about flying-fox camps and find out where the known camp sites are in southern Queensland. They study local maps to see if there is a roost located near them.

### Lesson 6.2 Flying-foxes are losing their habitat

Students will look at what has happened to the flying-fox's habitat since the arrival of European settlers and how this has affected population numbers. They will analyse distribution maps of native vegetation and note how much it has decreased. A role play will allow students to see how crucial native vegetation is to the survival of the flying-fox and other native wildlife.

### Lesson 6.3 Threatened flying-foxes

Students are made aware of facts about threatened species and that some species of flying-fox are under threat. Students look at positive solutions that have been arrived at to allow humans and people to live together. The unit will finish with the same quiz to see allow students to reflect on how much they have learnt.

# Year 6 The flying-fox habitat

## National Curriculum

| Lesson | 6.1 | 6.2 | 6.3 | Statements |
|---|---|---|---|---|
| Science understanding (Biological sciences) | ✓ | ✓ | ✓ | The growth and survival of living things are affected by the physical conditions of their environment. (ACSSU094) |
| Science as a human endeavour | ✓ | ✓ | ✓ | Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples' lives. (ACSHE100)<br>Scientific knowledge is used to inform personal and community decisions. (ACSHE220) |
| Science inquiry skills | ✓ | ✓ | ✓ | Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate. (ACSIS107)<br>Compare data with predictions and use as evidence in developing explanations. (ACSIS221)<br>Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts. (ACSIS110) |
| General Capabilities: Literacy | ✓ | ✓ | ✓ | As they become literate students learn to:<br>• Interpret, analyse, evaluate, respond to and construct increasingly complex texts. (Comprehension and composition)<br>• Understand, use, write and produce different types of text. (Texts)<br>• Make appropriate word selections and decode and comprehend new (basic, specialised and technical) vocabulary. (Vocabulary) |
| General capabilities: Critical and creative thinking | ✓ | ✓ | ✓ | As they develop critical and creative thinking students learn to:<br>• Pose insightful and purposeful questions.<br>• Apply logic and strategies to uncover meaning and make reasoned judgments.<br>• Think beyond the immediate situation to consider the 'big picture' before focussing on the detail.<br>• Reflect on thinking, actions and processes.<br>• Analyse information logically and make reasoned judgments.<br>• Evaluate ideas and create solutions and draw conclusions.<br>• Assess the feasibility, possible risks and benefits in the implementation of their ideas.<br>• Transfer their knowledge to new situations. |
| Cross-curriculum priority: Sustainability | ✓ | ✓ | ✓ | All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing. (OI.2)<br>Sustainability action is designed to intervene in ecological, social and economic systems in order to develop more sustainable patterns of living. (OI.7)<br>Sustainable futures are shaped by our behaviours and by the products, systems and environments we design today. (OI.8) |

LESSON 6.1

# Where do flying-foxes live?

## Objectives

Students will look at what habitat means and the habitat of a flying-fox. They will consider how and which of the Australian flying-foxes live in their local area. A map of camp sites will allow students to identify whether flying-foxes live in their area.

## National Curriculum

| Activity | 6.1A | 6.1B | 6.1C | 6.1D |
|---|---|---|---|---|
| Science understanding (Biological sciences) | ✓ | ✓ | ✓ | ✓ |
| Science as a human endeavour | | ✓ | ✓ | ✓ |
| Science inquiry skills | | ✓ | ✓ | ✓ |
| General capabilities: Literacy | ✓ | ✓ | ✓ | ✓ |
| General capabilities: Critical and creative thinking | ✓ | ✓ | ✓ | ✓ |
| Cross-curriculum priority: Sustainability | | ✓ | ✓ | ✓ |

*For outcome codes and descriptions of outcomes, see unit overview.*

## Background information

Flying-foxes hang out, or roost, in large groups referred to as camps. These camps can range in size from a few hundred to hundreds of thousands, depending on the availability of food in the surrounding area. Flying-foxes prefer native fruit and blossom, but will feed on exotic species, like fruit trees, when native sources are low.

Flying-foxes in coastal lowlands of southern Queensland prefer to roost in vegetation with the following general characteristics:

- a closed canopy at least 5 m high
- dense vegetation within 500 m of fresh water
- within 50 km of the coastline or at an elevation less than 65 m above sea level
- large enough to accommodate and sustain large numbers of flying-foxes (one hectare)
- generally within 20 km of food.

## Activity sequence

### 6.1A What do you know about flying-fox habitat?

Students undertake a Think, Pair, Share activity to see what they already know about the flying-foxes and their habitat. Sheets are collected.

### 6.1B What is the habitat of a flying-fox?

Students learn about flying-fox habitat requirements by watching video footage, reading Gracie's notes, using the internet and reviewing images provided. They create their own summary sheet of a flying-fox's habitat.

### 6.1C Where do flying-foxes live in Australia?

The distribution maps of all Australian flying-foxes are compared. Students find out the habitat requirement of these species.

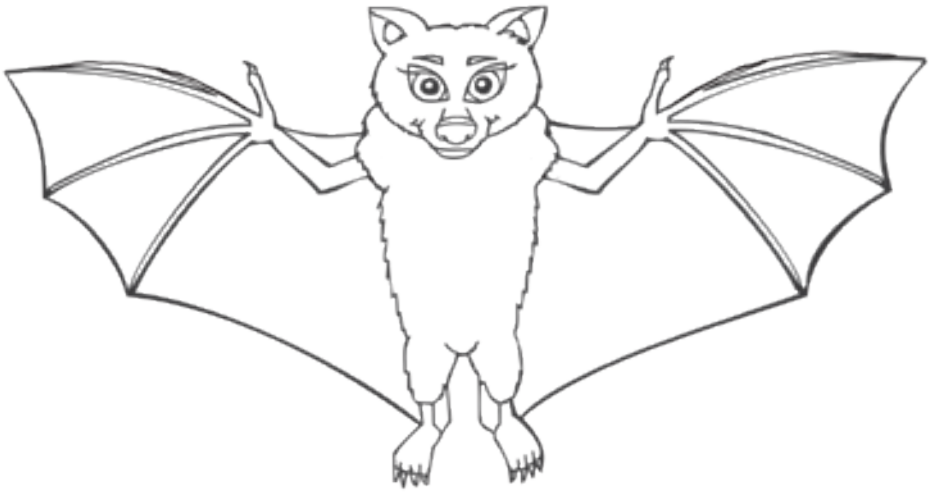
### 6.1D Is there a camp near you?

Students locate and analyse maps of roost sites to work out whether there is a roost near them. They find out whether flying-foxes can travel to their garden or not.

ACTIVITY 6.1A

# What do you know about flying-fox habitat?

What do you know about flying-foxes, where they live and what they eat? Write down your **thoughts** in the space below. **Discuss** your thoughts with a partner. Once completed, **share** one of your thoughts with the whole class.

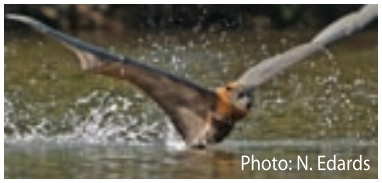


ACTIVITY 6.1B

# What is the habitat of a flying-fox?

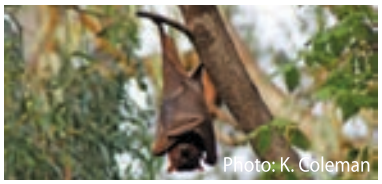
The term **habitat** describes the environment in which an organism lives. When we look at an organism's habitat we look at shelter, food and water.

The habitat of a flying-fox needs to include those camps it roosts in during the day (there can be many different sites every year), as well as all the locations where it finds food and water at night.




Flying-foxes like to be near fresh water.

Flying-foxes eat blossom and fruit from native trees (e.g. Eucalypt).




Flying-foxes use trees for shelter.


Flying-foxes will eat orchard fruit when native food is limited.

## Hanging out with my friends

I'm Gracie, the grey-headed flying-fox, and I hang out, or roost, with my friends in large groups called a camp. I've been in camps that only had a few hundred flying-foxes, to camps around 200,000. That was a good year because there was lots of food around the place.

Our camps are social places where I can rest after a long night out feeding, groom myself (I always want to keep clean and look my best) and chat with my friends during the day. When night falls we head on out to find the best food. I always remember the best trees, year after year.

My favourite food is native fruit and blossom, but I will feed on exotic species, like fruit trees, when my favourite food isn't there. With the weather getting hotter each year, it makes it more difficult for me to find the best native food sources as the flowering times often change. When there isn't many native sources I sometimes go to the local orchards to feed. This is a bit frightening because the humans are not very happy and try to scare me away.

## Love is in the air

When it comes time for mating, all the boys in the camp start claiming their branch of the tree. They have a really strong smell, I like it. The fittest males are at the top of the tree and I usually go there.

All of us females give birth around spring time and when our babies are old enough, we leave them in the camp crèche. The trees need to provide enough cover to shelter the young ones from the weather and predators. My friend Ruby is a little red flying-fox, she has her babies in autumn. She will migrate to the best feeding grounds at this time.

## Picking the best camp

I prefer to live on the coast of eastern Queensland and here are some tips for what my friends and I look for in a camp site:

- a closed canopy at least 5 m high with different layers
- close to fresh water
- close to the coast and not too high up in the hills
- large enough to house lots of us
- generally within 20 km of food.

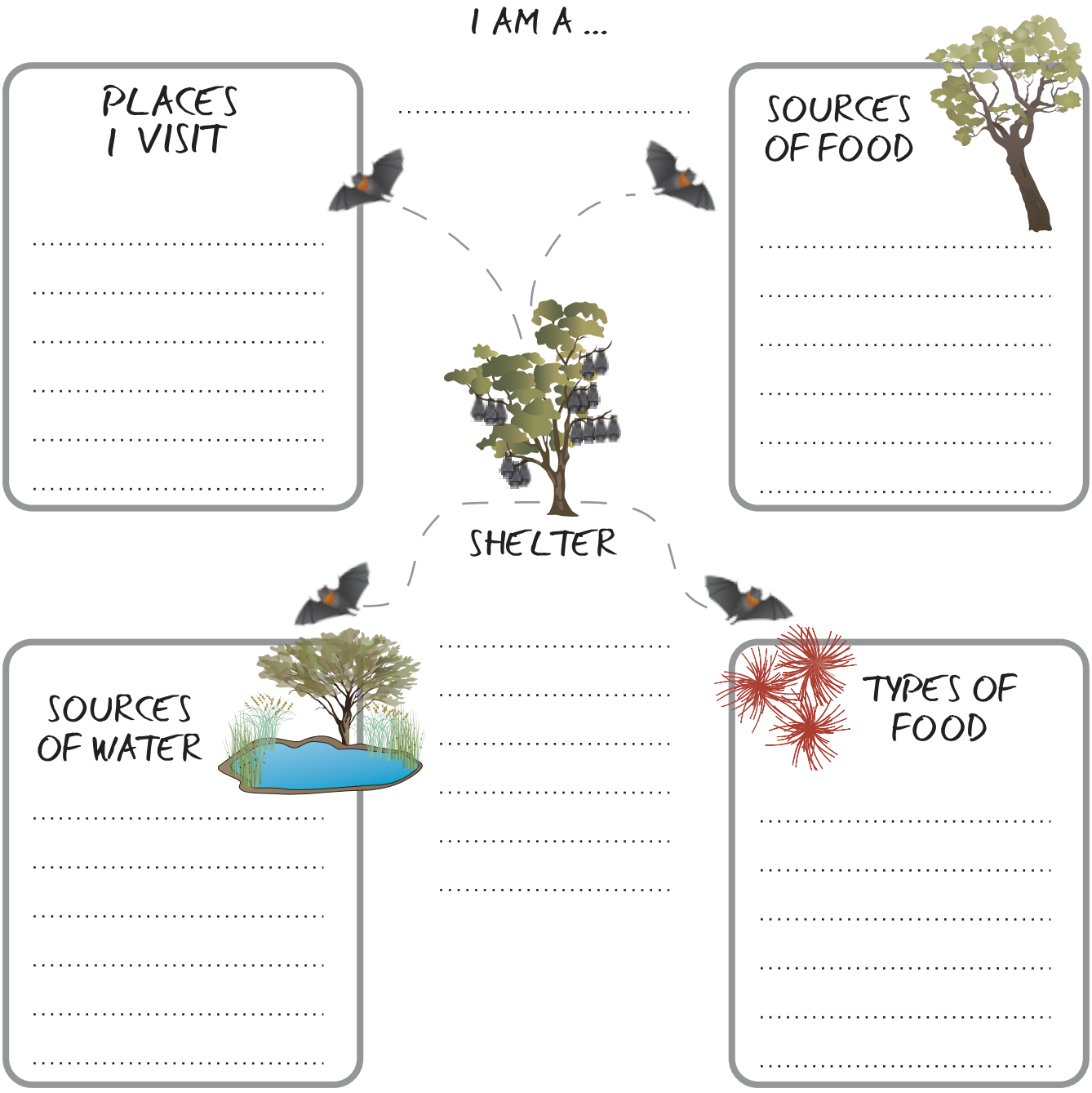
ACTIVITY 6.1B

# What is a habitat?

Rsearch the habitat of a flying-fox by doing the following:

- Watch the video 'Hervey Bay Fruit Bats' on the All About Bats Year 6 web page.
- Read how Gracie, the grey-headed flying-fox, describes her habitat.
- Investigate flying-foxes on the All About Bats website www.allaboutbats.org.au.

Complete the following diagram.



ACTIVITY 6.1C

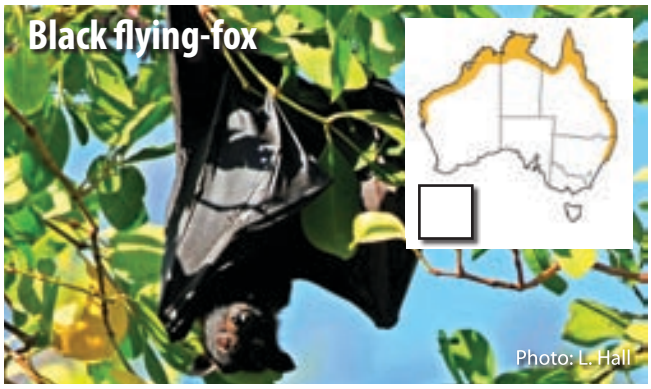
# Where do flying-foxes live in Australia?

Australia is home to eight different species of flying-foxes. Four of these are only found on small islands off the Australian mainland coast. The other four mainland species are pictured below.

Look at the distribution maps of each flying-fox and mark those flying-foxes that can be found in southern Queensland.

Under each picture write a description of what type of habitat the flying-fox prefers. Use the websites below to help you out. Habitat characteristics can include:

- Climate (e.g. temperate, tropical, arid)
- Vegetation (e.g. rainforest, grasslands, woodlands)
- Coastal or inland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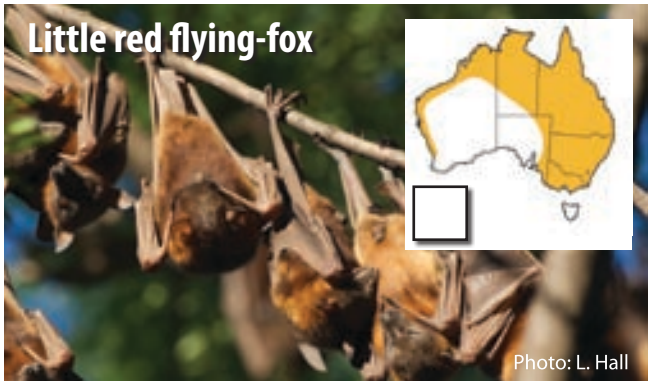



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*All About Bats > Flying-foxes*
*www.allaboutbats.org.au/11/Mega-Bats/11/Flying-foxes*

*Australian Museum*
*www.australianmuseum.net.au/Australian-bats*

ACTIVITY 6.1D

# Is there a camp near you?

Flying-foxes roost in large groups called camps. They often travel quite far between the camp site and their food sources. This is important as tree seeds and pollen are dispersed over a wide area.

Use the map of known camps of South East Queensland provided. Camp site maps for other parts of Queensland and smaller scale maps showing parts of South East Queensland can be found at:: derm.qld.gov.au/wildlife-ecosystems/wildlife/living_with_wildlife/flyingfoxes/seq-roost-locations.html

1. Do you know of any camp sites near your house? Do you ever see flying foxes in your garden?

   .....

   .....

2. Do you think your neighbourhood provides food for flying-foxes? Explain.

   .....

   .....

   .....

3. Make your own ruler with a piece of paper that is exactly equivalent of 20 km long on the map. Use the map scale to help you work out how long 20 km is.

4. Find where you live on the map and put a dot there.

5. Using your home-made ruler, draw a circle that has a 20 km radius (make sure your dot is in the centre).

6. Are there any roost sites within 20 km of your house? If so, how many?

   .....

7. According to the map, about how far is the nearest roost site from where you live?

   .....

8. Do you know of any other roost sites that are not on the map? If so, please let the Department of Environment and Resource Management know by calling 13 74 68.


Flying-fox roost at Woodend, Ipswich

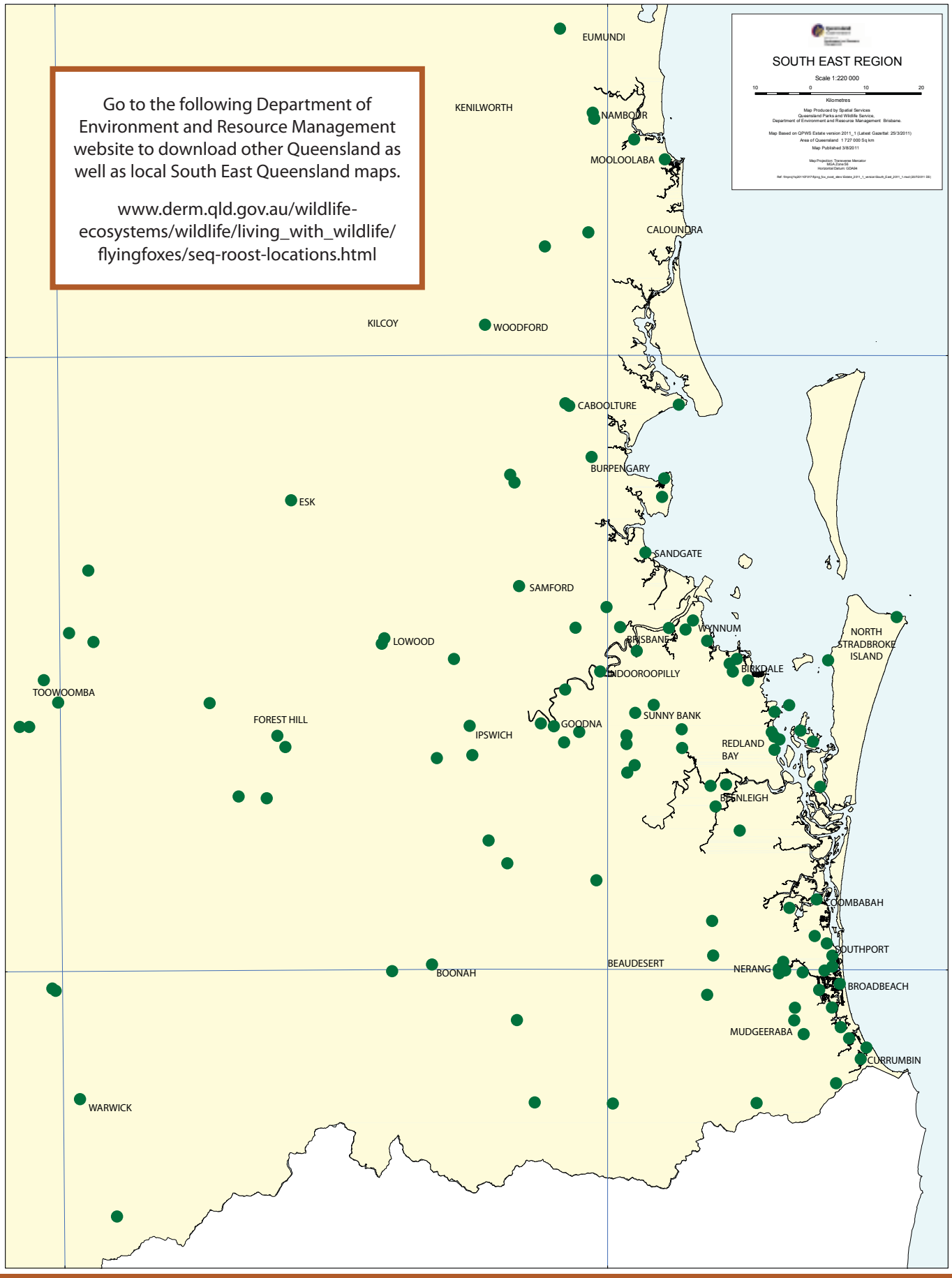

Flying-fox roost at Cascade Gardens, Gold Coast

ACTIVITY 6.1D

# Is there a camp near you?

Go to the following Department of Environment and Resource Management website to download other Queensland as well as local South East Queensland maps.

www.derm.qld.gov.au/wildlife-ecosystems/wildlife/living_with_wildlife/flyingfoxes/seq-roost-locations.html



LESSON 6.2

# Flying-foxes are losing their habitat

## Objectives

Students will look at how human settlement in Australia has decreased the habitat for the flying-fox.

## National Curriculum

| Activity | 6.2A | 6.2B | 6.2C |
|---|---|---|---|
| Science understanding (Biological sciences) | ✓ | ✓ | ✓ |
| Science as a human endeavour | ✓ | ✓ | ✓ |
| Science inquiry skills | ✓ | ✓ | |
| General capabilities: Literacy | ✓ | ✓ | |
| General capabilities: Critical and creative thinking | ✓ | ✓ | ✓ |
| Cross-curriculum priority: Sustainability | ✓ | ✓ | ✓ |

*For outcome codes and descriptions of outcomes, see unit overview.*

## Background information

Flying-fox camps are a gathering of many individuals doing there own thing. Some flying-foxes stay in a camp almost permanently, while other are just passing through.

Every night flying-foxes fly from their roost in the search of food. Flying-foxes can travel hundreds of kilometres to find food, but they usually stay within 20 km of their current roost.

As humans are encroaching on their habitat through urbanisation and farming, native food sources and roosting sites are diminishing and flying-foxes are having to fly further and further in the search of food and roosts. As a result, many are undernourished, fatigued and stressed.

Although flying-foxes prefer to eat native food they sometimes have to resort to orchard fruit. They become unhealthy and are more likely to come into conflict with humans. The flying-foxes that are most likely to be affected are breeding females as they are the least capable of flying long distances and are more desperate for food. The native trees also miss out as they are not having their pollen and seeds dispersed.

The best solution is to regenerate native forests.

## Activity sequence

### 6.2A The changing habitat

In pairs or small groups, students discuss the similarities and differences between the habitat diagrams. They complete the worksheet that looks at human impact on flying-fox habitat.

### 6.2B The diminishing trees

By comparing the forest cover before European settlement and in the 1990's, students can see for themselves how much vegetation has been cleared. Students reflect on how much more difficult it is for the flying-foxes to travel from place to place.

### 6.2C Habitat islands

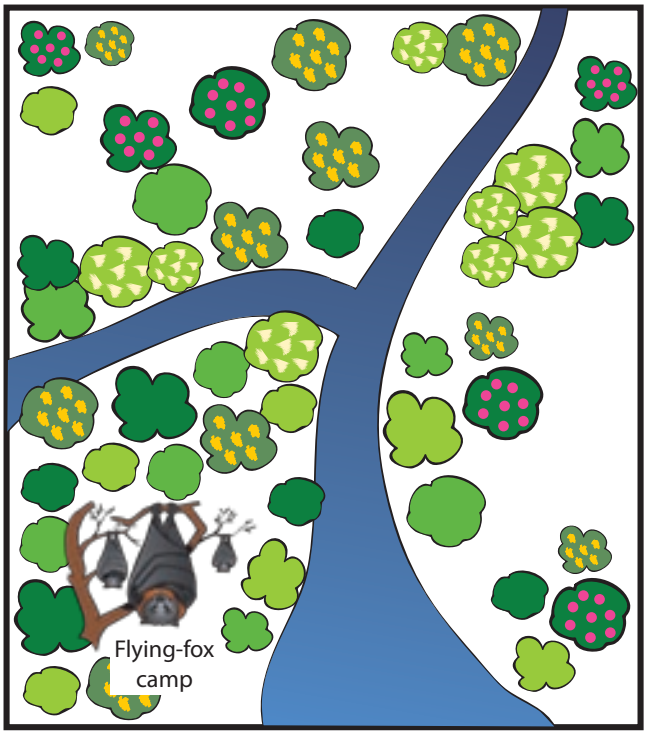
In this role play game, students will have the opportunity to pretend they are small native animals who are at risk of being eaten by predators. Trees provide them with food and safety. Student will witness for themselves the effect that removing trees has on their survival.

ACTIVITY 6.2A

# The changing habitat

Flying-foxes rely on native forests for food and roost sites. Humans have impacted on the supply of food and the availability of suitable roost sites through development and changes in land use. This has caused the loss of natural food sources, increased availability of exotic food sources and loss of roost sites or reduction in roost site size.

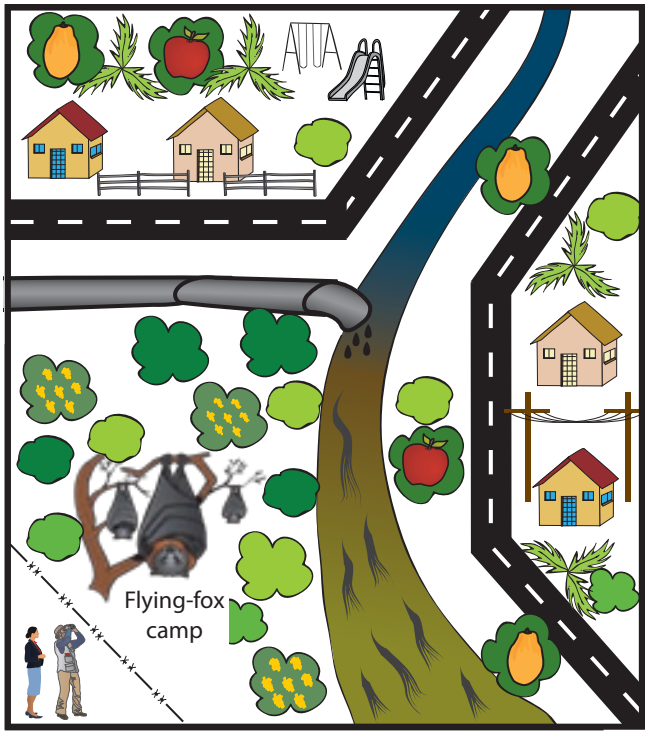
## Pre-European settlement




- Eucalypt trees
- Lilly pilly trees
- Melaleuca trees

Enough native forest exists that flying-foxes can roost in different parts of a camp site at different times of the year and between years. This relieves the stress on individual trees.

## Today




- Eucalypt trees
- Mango trees
- Apple trees
- Cocos/queen palms

Flying-foxes can only roost in 'islands' of vegetation amongst urban development or agricultural landscapes. This can lead to great stress on individual roost trees in the camp site. Flying-foxes spill over into backyards and other neighbouring areas when flying-fox numbers increase due to local food availability.

ACTIVITY 6.2A

# The changing habitat

In pairs or small groups, discuss what is happening in the habitat diagrams of pre-European settlement and today. Fill in the table and answer the questions below.

| | Differences | Similarities |
|---|---|---|
| Food | | |
| Water | | |
| Roosting trees | | |

1. What other threats have humans introduced for the flying-foxes?

   .....

   .....

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   .....

2. How can we help flying-foxes survive alongside humans?

   .....

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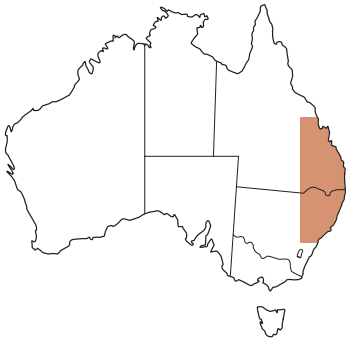
ACTIVITY 6.2B

# The diminishing trees

These maps show the change in forest cover of eastern Australia since European settlement.

**Forest cover before 1788**

**Forest cover early 1990s**


1. What differences can you see between the two maps of forest cover?

   .....

   .....

2. Estimate the percentage of forest cover:

   before 1788 .....

   early 1990s .....

3. What do you think happened?

   .....

   .....

4. Flying-foxes move throughout the year in search of flowering trees. How is the change in forest cover going to affect them?

   .....

   .....

   .....

ACTIVITY 6.2C

# Habitat islands

## *Teacher's notes*

Discuss with the class the concepts of habitat, loss of habitat, remnant native vegetation[1], predation, feral animals, urban development and conservation. Animals that get 'trapped' in isolated patches of native vegetation (habitat islands) will often die out because they can't send their young off to find new homes, they can't get new sources of food and predators become cunning and know how to catch them.

### Materials

- hula hoops (approximately 10)
- enough native animal name tags for all students in the class

### Setting up the game

Place two hoops (or something similar) on the ground, approximately 20-30 metres apart - they are your "habitat islands" of native vegetation. Set side boundaries using structures or features in the school (e.g. a tree or building) - otherwise students will run everywhere.

Explain to the students that these habitat islands contain many native animals but they can't move between them without help from other vegetation.

Place some more hoops between the two habitat islands - they are big old native trees that provide shelter and habitat for small species. When a student (small animal) enters a hoop, then they are safe from the predator(s).

### Playing the first game

One person is designated as a sea eagle, or some other predator (i.e. owl). It is their job to tag the other students as they make their way across the field.

The native animals then have to try and get from one hoop to the other without getting caught by the predator. Once the first animal is safe the next animal can take their move (like baseball).

If a native animal gets caught, it is out of the game. This continues until the rest of the class has gone through. To add a degree of difficulty, students must move the way the animal would move.

Once you have completed one round, ask students to predict what would happen if some of these trees were removed.

### Subsequent games

At the end of each game, change conditions of the game to simulate more urbanisation. Choose something the students will relate to your local area. Each condition removes one or more of the remaining trees. Repeat until there are no more trees. Examples can include:

- A fence line with firebreak
- A powerline with firebreak
- A new road or highway widening
- A new house development
- Clear vegetation for agriculture
- Introduce a new predator like a cat or fox

### Reflection

Students should individually reflect on this activity with a short report or diary entry. These reflections can be shared with the class once completed. Prompting questions can include:

*What happened to the animals when the habitat trees were removed?*

*What would happen to the small animals if they could no longer move?*

*How could we help the animals move between habitat islands again?*

1 Remnant native vegetation is vegetation that is considered representative in height, structure and species of the original vegetation prior to European settlement.

ACTIVITY 6.2C

# Habitat islands

## *Game play*

### Habitat Islands are important

Since European settlement we have chopped up the landscape for our own purposes - housing, roads, mining, agriculture etc. This has been for our survival, however this has left a landscape dotted with habitat islands in a sea of concrete, fences and vast open spaces.

Animals that get 'trapped' in isolated patches of native vegetation (or habitat islands) will often die out because they can't send their young off to find new homes, they can't get new sources of food and predators become cunning and know how to catch them.

We need to keep or create connections between these islands so that our native species can survive.

### Small native animals

Your mission is to move from one habitat island to another without getting tagged by the roaming predator. When you reach an old tree, you are safe from the predator. Make your next move while another person starts their journey.

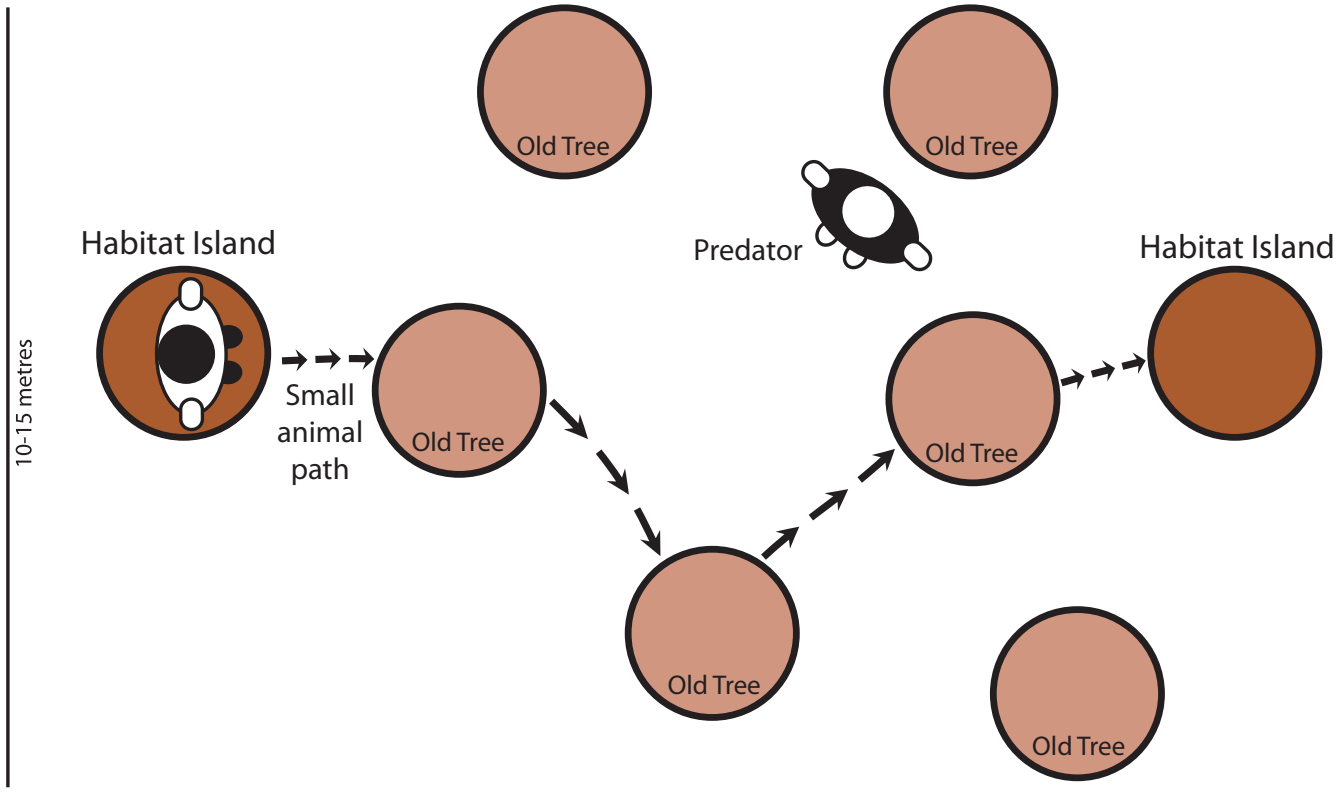
Only one animal can leave the starting habitat island at a time. If you get tagged by the predator then your turn is over.

***Challenge yourself***

Try to move like the creature on your name tag. How mush easier is it for the predator to catch you?

### Predators

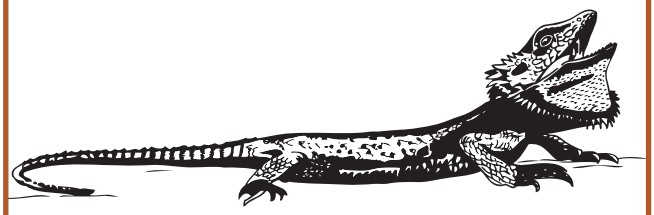
You mission is to tag the small native animals. You can't tag them when they are at a tree or in their habitat island.



# Habitat islands

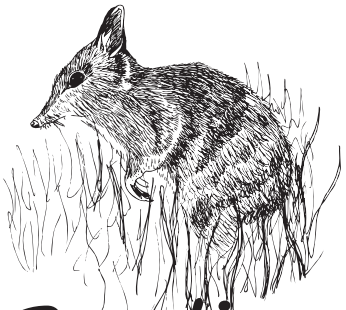
## *Name tags*

Flying-fox



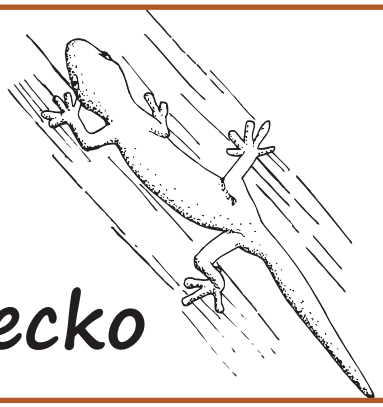
Bearded Dragon

Koala



Bandicoot

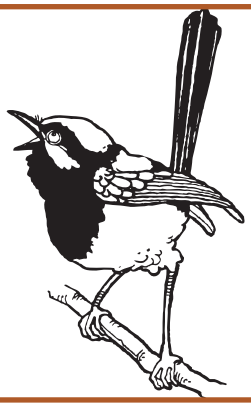
Ringtail Possum



Gecko

Frog

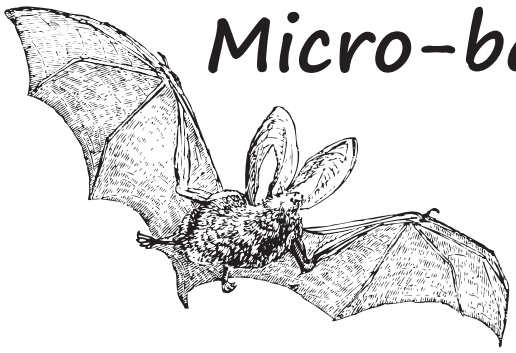
Fairy Wren



# Habitat islands

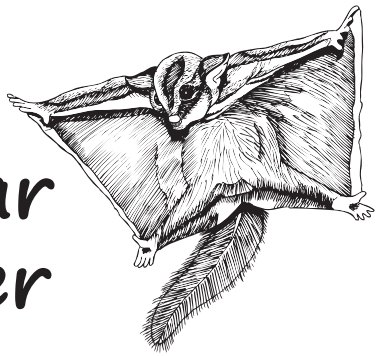
## *Name tags*

Micro-bat



Wedge-tailed eagle

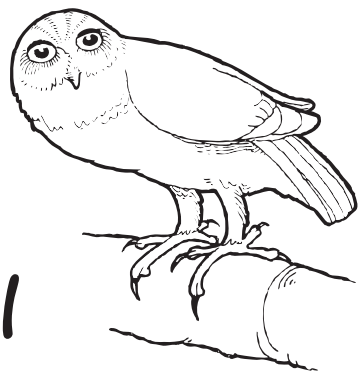
Sugar glider



Carpet python

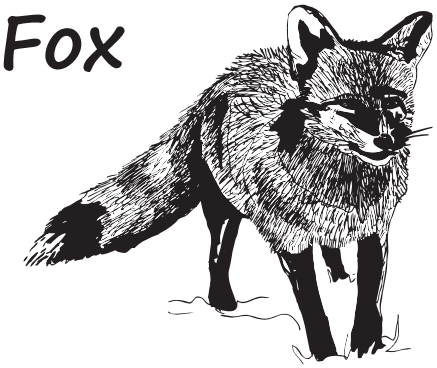
Sea Eagle

Cat



Owl

Fox



LESSON 6.3

# Threatened flying-foxes

## Objectives

Students are made aware of facts about threatened species and that some species of flying-fox are under threat.

Students look at positive solutions that have been arrived at to allow humans and people to live together.

## National Curriculum

| Activity | 6.3A | 6.3B | 6.3C |
|---|---|---|---|
| Science understanding (Biological sciences) | ✓ | ✓ | ✓ |
| Science as a human endeavour | ✓ | ✓ | ✓ |
| Science inquiry skills | | ✓ | |
| General capabilities: Literacy | ✓ | ✓ | ✓ |
| General capabilities: Critical and creative thinking | ✓ | ✓ | ✓ |
| Cross-curriculum priority: Sustainability | ✓ | ✓ | ✓ |

*For outcome codes and descriptions of outcomes, see unit overview.*

## Background information

Australia has many species that cannot be found anywhere else in the world. Unfortunately, the number of some of these species have dropped to a point where they are struggling to survive. These are called "threatened species".

Not all flying-foxes are threatened species. On mainland Australia this extends only to the grey-headed and the spectacled flying-foxes which are both classified as Vulnerable under Australian Government law. The Christmas Island flying-fox is a critically endangered species. It is only found on Christmas Island, and its isolation possibly hinders this species' survival. Other species like the little red and black flying-foxes are relatively common, although their numbers are being monitored as their habitat diminishes.

When trying to protect threatened species, or any wildlife, experts will try to achieve a win/win solution. This means that they find solutions that are both beneficial to the wildlife and the human population.

## Activity sequence

### 6.3A A threatened species fact sheet

Students read and discuss the two page fact sheet on threatened species. Answer the questions on the worksheet.

### 6.3B Finding solutions

Students are divided into small groups. Each group is given an article to read about how people have come up with solutions to problems. After reading the article, each group completes their portion of the table. They then report back to the class so that they can complete a table.

### 6.3C What do you know about flying-fox habitat?

Students complete a quiz about flying-fox habitat to see how much they have learned.

ACTIVITY 6.3A

# A threatened species

*Fact sheet*

## The variety of life

Biodiversity (**bio**logical **diversity**) is a term that describes the variety of living things on Earth. The biodiversity of our planet encompasses all life from the smallest microorganism to the largest mammal. It includes:

- The number and kinds of species.
- The ecosystems (habitats) they form (e.g. rainforests, woodlands, deserts).
- The genetic differences between species.

A highly diverse ecosystem is a sign of a healthy system. Biodiversity is important because it provides us with everything we need to survive, water, air, food and land.

Unfortunately, humans have caused the destruction and alteration of many natural ecosystems and creatures we share the planet with. We have a responsibility to try and protect and preserve these environments for future generations to enjoy.

## What is a threatened species?

Australia has many species that cannot be found anywhere else in the world. Unfortunately, the number of some of these species have dropped to a point where they are struggling to survive. These are called "threatened species".

Some reasons that plant and animal species become threatened are:

- Loss or destruction of habitat
- Alteration of habitat (natural or man-made)
- Fragmentation of habitat
- Predation and competition from invasive plants and animals (e.g. cats)
- Disease
- Food shortage
- Pollution
- Competition from human processes
- Competition from other species
- Climate change

## Levels of threat

When we talk about threatened species they can be put into a range of different categories depending on the severity of their situation. Under national legislation there are five categories.

***Vulnerable Species:*** A species' numbers have dropped significantly but it is not yet classed as endangered.

***Endangered Species:*** A species' numbers are so low that it is severely threatened.

***Critically Endangered Species:*** A species' numbers are so low that it is very close to becoming extinct.

***Extinct in the wild:*** There are no more of a species left in their native habitats but there are some in captivity.

***Extinct:*** There are no more of a species left anywhere in the world.

ACTIVITY 6.3A

# A threatened species

*Fact sheet*

## Threatened flying-foxes

Flying-foxes play an important role in the pollination and dispersal of seed for many native trees. Their nightly feeding ensures diversity of life in our forests and woodlands.

The grey-headed flying-fox is one of Australia's most recognised threatened flying-foxes. Nationally it is classified as a "Vulnerable Species" under the *Environment Protection and Biodiversity Conservation Act 1999*. This means that population numbers across Australia are diminishing, and the Australian Government is committed to ensuring their protection.

The other threatened species is the spectacled flying-fox found in northern Queensland. It too is classified as a "Vulnerable Species" under the *Environment Protection and Biodiversity Conservation Act 1999*.

Both the black and little red flying-foxes have sufficient population numbers to be kept off the threatened species list. As they share the same habitat as the grey-headed and spectacled flying-foxes, they will also benefit from the conservation efforts.

## Threats to survival

Threats, both natural and human, to flying-foxes include:

- habitat loss from tree clearing;
- wildfire;
- barbed wire fences;
- powerlines;
- cyclones; and
- prolonged drought.

## Species recovery

Under the *Environment Protection and Biodiversity Conservation Act 1999*, and the "Action Plan for Australian Bats", there are listed a set of recovery objectives for the grey-headed flying-fox. To help this species recover, there is a national requirement to do the following:

- Stabilise the population.
- Identify and protect essential habitat.
- Develop non-destructive methods for crop protection.
- Manage camps in problem areas without causing harm to the population.

We can all do our own little bit to help the grey-headed flying-fox and all other bats in our environment. Actions include:

- Understanding them better and letting others know about the beneficial role all bats play.
- Increase their habitat by planting roosting and food trees in suitable locations.
- Protect backyard fruit trees from all fruit eating wildlife by correctly netting them.
- Protect and manage camp sites.

ACTIVITY 6.3A

# A threatened species

After reading the "A threatened species" fact sheet, answer the following questions.

1. What is biodiversity?

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2. Why is biodiversity important?

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3. What is a threatened species?

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4. What are the five levels of threat?

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5. Why is the flying-fox important for biodiversity?

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6. What level of threat applies to the grey-headed flying-fox?

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7. List three things that are threatening the survival of the grey-headed flying-fox?

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8. What is the name of another threatened flying-fox in Queensland?

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9. What can we do to help threatened species?

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ACTIVITY 6.3B

# Finding solutions

When there is conflict, it is good to try to find a solution that everybody is happy with. For flying-foxes, we need to try to come up with win/win solutions so that both flying-foxes and humans can live together in harmony. Science can often help people come up with solutions.

Each group will be given an article to read and discuss. When you have finished, complete the table for your article. Each group will be asked to share their information to the class so that the table will be completed.

| Article | What is the problem? | Who is affected by the flying-foxes? | Have they found a solution? | How has science helped? |
|---|---|---|---|---|
| **Cairns airport** | | | | |
| **Hendra virus** | | | | |
| **Barbed wire** | | | | |
| **Crop netting** | | | | |
| **Electrocution** | | | | |

ACTIVITY 6.3B

# Finding solutions

*Answers*

| Article | What is the problem? | Who is affected by the flying-foxes? | Have they found a solution? | How has science helped? |
|---|---|---|---|---|
| **Cairns airport** | Flying-foxes flying in the way of airplanes. | Planes are damaged which costs the airlines a lot of money. Costs are passed on to the passengers. | Predict when bats are likely to pass over and don't land / take off any planes during that time. | Investigating the flying-fox flight paths and timing of when melaleucas are blooming. |
| **Hendra virus** | Flying-foxes contaminating food / drinking water of the horses with the Hendra virus. | Horses and humans can be infected by Hendra virus and this might lead to death. | Protect the horse's food and water source. Scientists are developing a vaccine for the Hendra virus. | Finding a vaccine.<br><br>Understand how the virus is transmitted from flying-foxes to horses and from horses to humans so that we can protect horses and humans. |
| **Barbed wire** | Flying-foxes are getting stuck in the barbed wire. | People have to remove injured flying-foxes from the wire. | Change the barbed wire fence to a wildlife friendly fence. | Working out how wildlife friendly fences can work. |
| **Crop netting** | Flying-foxes are feeding on orchard crops in the Sydney Basin and Central Coast. | Farmers lose crops and productivity. | NSW Government is providing funding to help farmers put exclusion netting over their crops.<br><br>Culling permits being phased out. | Identified decrease in grey-headed flying-fox numbers.<br><br>Need to conserve the current populations. |
| **Electrocution** | Flying-foxes with a wingspan of 1.2 m get electrocuted when they touch two different electrical wires.<br><br>Flying-foxes die. | Power cuts for residents.<br><br>Damage to wires.<br><br>Energex has to restore wires and remove dead animals. | Change the wiring so that flying-foxes don't get electrocuted. | An understanding of how electricity works and what can be done to make it so that flying-foxes do not die. |

ACTIVITY 6.3B

# Finding solutions

## *Cairns airport*

*Read this article and complete the table for your article. Be ready to present your answers to the class.*

### *"Cairns Airport reveals how it deals with birds, bats and planes"*

Brad Ryan, The Cairns Post
Wednesday, September 22, 2010

www.cairns.com.au/article/2010/09/22/127931_local-news.html

CAIRNS Airport's strategies to stop flying-foxes hitting aeroplanes will be presented to industry delegates from around the world at a bird strike conference in Cairns this week.

The biennial International Bird Strike Committee Conference started in Cairns yesterday, with the local airport's strategies to combat flying-fox issues featuring on the agenda today.

Although it is hard to pinpoint an exact figure, industry experts estimate bird strike costs the worldwide aviation industry $US1.2 billion a year.

Cairns airport faces distinct challenges – particularly from flying-foxes.

Airport operations manager Paul Lamont said the airport's strategy was based on an 18-month study, conducted by the CSIRO and consulting firm Avisure, that found mass flying-fox fly-outs across the airport were related to the blooming of melaleuca plants in northern beach suburbs.

"We are able to predict when they are likely to occur by monitoring the flora," Mr Lamont said.

He said alerts were issued to notify airlines when large numbers of flying-foxes were likely to be near the airport, based on the melaleuca blooms.

"When we are issuing those alerts Jetstar, for example, will carry more holding fuel.

"When (flying-foxes) are flying along the runway what we are basically saying to them is delay your departures and slow down your arrivals."

There are still at least two or three bird strike incidents that damage aircraft at Cairns airport every year.

"That $US1.2 billion figure is an educated guess – it could be anything up to five times that because we don't get any data out of China and Russia and almost all of Africa," International Bird Strike Committee chair John Allan said.

"We've lost over 250 lives and over 100 aircraft to bird strike in the history of civil aviation.

"The conference is essentially about spreading best practice around the globe and keeping people safe."

This year is the first time the conference has been held in Australia.

ACTIVITY 6.3B

# Finding solutions

## *Hendra virus*

*Read this article and complete the table for your article. Be ready to present your answers to the class.*

### *"Culling flying-foxes won't fix Hendra"*

Australian Veterinary Association Media Release
Thursday, 14 July 2011

www.ava.com.au/sites/default/files/mediareleases/Bat_cull_release.pdf

Culling flying-foxes to prevent Hendra virus outbreaks will only make things worse, says the Australian Veterinary Association (AVA).

"Calls to eradicate flying-foxes in an attempt to control Hendra virus are ignoring the facts," says Dr Barry Smyth, President of the AVA.

"They fly and travel long distances, and would be very difficult if not possible to eradicate. In trying to kill them they would become very stressed, and that would increase their chances of spreading Hendra virus.

"Instead, everyone who works with or cares for horses needs to know their risks, and take appropriate measures to protect themselves and their horses from Hendra.

"We understand people's anxiety about this virus. Vets who see sick horses every day are really in the firing line of the disease and the number and range of cases this year is certainly alarming. There are also several months to go before Hendra season finishes for the year.

"Our best option for dealing with this deadly disease is the Hendra horse vaccine currently in development. We're looking forward to the vaccine being available as soon as humanly possible.

"With the unprecedented number of cases across a vast area this year, it's clearly a national and urgent problem. Both flying-foxes and horses travel large distances in Australia, and we believe all horses will need to be vaccinated to adequately protect against the disease. We think that vaccination should be a condition of entry into events, races and shows.

"An identification system through micro-chipping and keeping accurate records in a good database will be needed for us to be sure our patients have been vaccinated," said Dr Smyth.

Horse owners can reduce the risks of Hendra virus in their horses by fencing off trees attractive to flying-foxes, covering horse feed and water containers, and not feeding horses with food that could appeal to flying-foxes such as fruit and vegetables. They should wash their hands when dealing with horses, and contact a vet quickly if a horse is unwell.

For further information and requests for interviews contact the AVA media office on (02) 9431 5062, 0439 628 898 or media@ava.com.au.

Photo: Darren England, The Courier Mail

www.couriermail.com.au/news/queensland/hmm-to-cull-or-not-to-cull/story-e6freoof-1226100078379

ACTIVITY 6.3B

# Finding solutions

## *Barbed wire*

*Read this article and complete the table for your article. Be ready to present your answers to the class.*

### *"Barbed Wire Reduction"*

More than 60 wildlife species have been identified in Australia as occasional or regular victims of barbed wire fences. Each year thousands of these animals face a cruel death or permanent disability from entanglement on wires that are invisible to them at night. Many of the survivors are euthanased as they are unreleasable. Nocturnal animals such as bats, gliders and raptors are especially at risk.

Barbed wire is an icon in the Australian landscape that has remained unchallenged for too long. Fencing is integral to good land management, but it needs to be done in a way that is wildlife-friendly. There are non-harmful fencing alternatives available that minimise the likelihood of harm to wildlife.

In September 2006 Bat Rescue's FNQ counterparts, Tolga Bat Hospital, received a grant from the Threatened Species Network of the World Wide Fund for Nature (WWF) to commence the Wildlife Friendly Fencing Project. The long process of raising public awareness of the impact of barbed wire on all wildlife, especially those under serious threat of extinction, has already begun.

Funding from WWF targeted Queensland, in particular the Atherton Tablelands and south-east Queensland. The flagship species for the project were the Spectacled Flying-fox (*Pteropus conspicillatus*), Grey-Headed Flying-fox (*Pteropus poliocephalus*) and Mahogany Glider (*Petaurus gracilis*).

Bat Rescue Inc. administered the Wildlife Friendly Fencing Project activities in south-east Queensland, and is proud to be in partnership with Tolga Bat Hospital and Bat Conservation & Rescue (Brisbane) for this worthwhile initiative.

Please visit www.wildlifefriendlyfencing.com for detailed information on the project and how you can help.

***Below photos are from www.wildlifefriendlyfencing.com***

This spectacled flying-fox got caught in a barbed wire fence. Fortunately it was released 2 weeks after being rescued.

This bat looks like she is just resting, but the damage is evident in the photo above.

Photos: Steve Amesbury

ACTIVITY 6.3B

# Finding solutions

## *Crop netting*

*Read this article and complete the table for your article. Be ready to present your answers to the class.*

### *"$5 million to protect crops in Sydney Basin and Central Coast from flying-foxes"*

The Hon Robyn Parker MP Minister for the Environment, Media Release

25 June 2011

www.environment.nsw.gov.au/resources/MinMedia/MinMedia11062501.pdf

Minister for the Environment, Robyn Parker joined Central Coast orchardist, and Treasurer of the NSW Farmers Association, Peter Comensoli to announce $5 million in funding to assist orchardists install exclusion netting in the Sydney Basin and on the Central Coast to protect their crops from flying-foxes.

"The humane conservation of flying-foxes and the need to protect fruit crops has been a challenge for governments, farmers and conservationists for many years so I am very pleased to be delivering a solution here today as we promised we would," Ms Parker said.

"We have not only delivered for the Sydney basin's orchardists but extended it to the Central Coast - an area generally considered part of the Sydney Basin agriculture hub that regularly suffers similar flying-fox damage.

"Today's announcement has been made possible through the collaborative efforts of the NSW Farmers Association and conservation groups working together with the NSW Government.

"This announcement is yet another example of what this Government stands for – working together to provide wins for the environment and wins for farmers and the economy."

Eligible farmers will be able to apply for a subsidy of up to 50% of the cost of installing netting – capped at $20,000 per hectare and thanks to my colleague, Minister for Primary Industries, Katrina Hodgkinson MP the funds will be delivered through the Rural Assistance Authority.

Minister Parker said that the grey-headed flying-fox was listed as vulnerable in NSW and under Commonwealth legislation.

"The scientific evidence indicates that population of the grey-headed flying-fox underwent a 30% decline in just ten years and as female flying-foxes take three years to mature and produce only one baby per year, it's unlikely that there's been a population spike in recent years."

Minister Parker said that in conjunction with the netting arrangements, licences to shoot flying-foxes would be phased out, apart from special circumstances.

"The phasing out will apply across NSW – but where fruit growers experience an unusual arrival of flying-foxes they will be able to apply for a license as a last resort," she said.

ACTIVITY 6.3B

# Finding solutions

## *Electrocution*

*Read this article and complete the table for your article. Be ready to present your answers to the class.*

### *"Electrocution Reduction"*

Flying-foxes have a wingspan up to 1.2m and can easily be electrocuted on powerlines, interrupting services to residents and causing horrific death to the animal.

Since 2004, Bat Rescue has collaborated with Energex to compile a database of trouble spots for rectification in the Gold Coast and Sunshine Coast Regions to reduce these incidences. Information provided to Energex by Bat Rescue has also prompted a number of bundling and rectification works to be undertaken in both areas. This not only reduces the hazard for bats but also the inconvenience and disruption to the community when power outages occur as a result of a powerline strike. Energex have also expressed an interest in trialling and manufacturing devices that could deter Flying-foxes from landing on powerlines.

In March 2007 Bat Rescue's Gold Coast branch and Energex were joint recipients of a Wildlife Preservation Society Award for their collaboration to reduce bat electrocution fatalities.

Major works undertaken on the Gold Coast involved replacing low voltage 3-phase cables and re-wiring all roadside 3-phase-and-neutral spans across a busy road in Broadbeach. The trial of this particular cable is an Australia-first and Energex will be closely monitoring the performance to evaluate the cost and effectiveness of this solution.

Four wire-servicing hydraulic platform trucks were used in this operation with a total team of approximately sixteen staff.

Article and photo from:
www.batrescue.org.au/website/index.php?option=com_content&view=article&id=62&Itemid=68

ACTIVITY 6.3C

# What do you know about flying-fox habitat? *Quiz*

1. What is a flying-fox?

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2. What foods do flying-foxes eat?

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3. Where do flying-foxes live?

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4. Why are flying-foxes considered mammals, not birds?

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Photo: N. Edards

5. What is habitat?

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6. What is a threatened species?

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7. Are flying-foxes threatened species?

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8. What is the main threat to flying-fox survival?

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9. Are people allowed to hurt or disturb flying-foxes?

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10. What can we do to help flying-foxes?

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My quiz score is: 10

ACTIVITY 6.3C

# What do you know about flying-fox habitat? *Answers*

1. What is a flying-fox?

   A flying-fox is a type of bat, or specifically, a type of mega-bat. They are also known as fruit bats.

2. What foods do flying-foxes eat?

   Flying-foxes eat blossoms, nectar and fruit.

3. Where do flying-foxes live?

   Flying-foxes live in trees. Flying-foxes roost

   in large groups called a camp.

4. Why are flying-foxes considered mammals, not birds?

   Flying-foxes are considered mammals because they give birth to live young, suckle their young and have fur.

5. What is habitat?

   Habitat is the area in which you live. The habitat of a flying-fox includes the trees it roosts in and the trees it feeds from.

6. What is a threatened species?

   A threatened species is a species who is struggling to flourish or survive. For a species to be threatened, it has to be classified by scientists under state or commonwealth legislation.

7. Are flying-foxes threatened species?

   Not all flying-foxes are under threat, only the grey-headed and the spectacled flying-foxes. Their numbers are in serious decline across Australia.

8. What is the main threat to flying-fox survival?

   Loss of habitat is causing the biggest problem for the flying-fox. Other threats include:

   - wildfire;
   - barbed wire fences;
   - powerlines;
   - cyclones; and
   - prolonged drought.

9. Are people allowed to hurt or disturb flying foxes?

   No, flying-foxes are protected by law and they must not be hurt or moved on without permission.

10. What can we do to help flying-foxes?

    Flying-foxes can be helped in the long term by revegetating native forests. In the short term, we can learn more about them so that we can live peacefully with them.

## For more information

All About Bats. . . . . www.allaboutbats.org.au
SEQ Catchments . . . . . www.seqcatchments.com.au
Burnett Mary Regional Group . . . . . www.bmrg.org.au
Department of Environment and Resource Management. . . . . www.derm.qld.gov.au

## Working with bats

The following organisations can be contacted for more information about bats, or individuals may be willing to speak to your class about what they are doing to help conserve our wildlife.

**Bat Conservation & Rescue Inc.**
www.bats.org.au
P: 07 0488 228 134
E: info@bats.org.au

**The Hut Environmental and Community Association Inc. (THECA)**
www.theca.asn.au
P: 07 3878 5088
E: theca@hotkey.net.au

**Wildlife Presentation Society Queensland**
www.wildlife.org.au
P: 07 3221 0194
E: wpsq@wildlife.org.au

**Your local council.**

**Queensland Parks and Wildlife Services**
www.derm.qld.gov.au
South East P: 07 3512 2300
Sunshine Coast and Burnett P: 07 5459 6110

**SEQ Catchments**
www.seqcatchments.com.au
T: 07 3211 4404
E: admin@seqcatchments.com.au

**Burnett Mary Regional Group**
www.bmrg.org.au
P: 07 4181 2999
E: admin@bmrg.org.au

## Excursion ideas

The following locations can be used to viist a flying-fox camp where there is interpretive information to learn more about the local camp. There are many more sites out there that have not been represented here. To find your nearest camp site go to:

www.derm.qld.gov.au/wildlife-ecosystems/wildlife/living_with_wildlife/flyingfoxes/seq-roost-locations.html

**Cascade Gardens**
Gold Coast Highway, Broadbeach

**Woodend Nature Centre**
35 Williams Street, Coalfalls
www.discover-our-ipswich.com/woodendnaturecentre.html

**Black Swamp Wetland**
Access via Queen Street, Cleveland
www.more2redlands.com.au/Explore/Leisure_Attractions/Nature%20-%20Wildlife/Mainland/Pages/Black%20Swamp%20Wetlands.aspx

**Tooan Tooan Creek**
Cnr Taylor Street and The Esplanade, Hervey Bay

**Batty Boat Cruise (Brisbane River)**
www.wildlife.org.au/news/2011/batty.html
P: 07 3221 0194
Although this Batty Boat Cruise is an evening activity with a per person cost, It is recommended for teachers who may like to broaden their knowledge about flying-foxes.

**www.allaboutbats.org.au**

SEQ Catchments
Healthy Land – Healthy Water

Burnett Mary Regional Group
Practical Solutions for Natural Resource Management