

Teachers' notes

Tree kangaroos and home movies

- how letting rare tree kangaroos film themselves might help protect their species

Lesson Overview

This lesson introduces students to some innovative methods of wildlife conservation currently being employed in the study of Matschie's (pronounced mat-ski-z), or Huon, tree kangaroo, in Papua New Guinea. In particular, this lesson looks at the use of tiny video cameras that have been fitted to the collars of a number of tree kangaroos allowing researchers to view their behaviours at all times of the day, capturing information that would be otherwise impossible to obtain.

The lesson is largely classroom-based; however, one of the optional 'Further Activities' included involves going outdoors either into the school grounds, or to a nearby park. Whether you include this activity or not, the lesson is ideally suited for an urban school.

Lesson Duration

Approximately 40 minutes without incorporating any of the 'Further Activities'.

Lesson Aim

- To show students how zoos are finding new ways to study and preserve endangered species.
- To help students understand the necessity of working with indigenous people in the attempts to preserve wild animals.
- To help students appreciate the preciousness of nature.

Lesson Outcomes

Students will learn about:

- current attempts to study Matschie's tree kangaroo through the use of small video cameras
- threats to Matschie's tree kangaroos through habitat loss and hunting

Students will learn to:

- think in new ways about how we might better protect endangered animals and how the technology used in this instance might be more widely applied
- consider how the actions of humans impact the environment

Lesson Background

(Some additional information about tree kangaroos that may prove helpful in your preparation)

- Tree kangaroos are marsupials, which means the young are born under-developed and are carried by the mother in a pouch until they are able to fend for themselves. Children may be aware that Australia is home to many of the world's marsupials; however, there are also large numbers of marsupials endemic to the island of New Guinea immediately north of Australia, such as echidnas, possums and tree kangaroos. There are no 'normal' terrestrial kangaroos endemic to New Guinea.

- While tree kangaroos do hop along the ground from time to time, they are different from terrestrial kangaroos in that their hind legs move independently. Hence they can climb trees. Terrestrial kangaroos' hind legs always move together (except, interestingly, when swimming which suggests the limitation on movement is cognitive rather than physical). A tree kangaroo's front legs are also much longer proportionately than a normal kangaroo's which also helps as it climbs trees.
- There are 14 commonly recognised species of tree kangaroos spread across Far North Queensland and the island of New Guinea (half of which forms the nation of Papua New Guinea and half of which is the eastern most part of Indonesia and referred to as Irian Jaya).
- The 14 species of tree kangaroo are:
 1. Lumholtz's tree kangaroo (Far North Queensland)
 2. Bennett's tree kangaroo (Far North Queensland)
 3. Goodfellow's tree kangaroo (New Guinea)
 4. Grizzled tree kangaroo (New Guinea)
 5. Vogelkop tree kangaroo (New Guinea)
 6. Wondiwoi tree kangaroo - presumed extinct (New Guinea)
 7. Matschie's, or Huon, tree kangaroo (New Guinea)
 8. Doria's tree kangaroo (New Guinea)
 9. Seri's tree kangaroo (New Guinea)
 10. Golden-mantled tree kangaroo (New Guinea)
 11. Lowlands tree kangaroo (New Guinea)
 12. Tenkile tree kangaroo (New Guinea)
 13. Dingsio (New Guinea)
 14. Dendrolagus notatus - nb: no common name as yet (New Guinea)
- An interactive slideshow of the distribution for each species is available at www.KentonWebb.com, in the 'Conservation' section. If you right-click on each image, you can save them to your desktop.
- A number of tree kangaroo species are endangered. This is due to habitat loss caused by land clearing for farms and mines, as well as hunting.
- Matschie's tree kangaroo (the one shown in this clip) is one of the most popular species held in US zoos. The international conservation effort for Matschie's tree kangaroo is coordinated by Woodland Park Zoo, in Seattle. (www.zoo.org)
- Matschie's tree kangaroo was named after German zoologist Paul Matschie who was curator of the Berlin zoological museum when the species was discovered.
- Other popular species of tree kangaroo in captivity are, Goodfellow's Tree Kangaroo (held in Taronga, Perth, Canberra and Melbourne zoos in Australia, and Belfast zoo in the UK) and Lumholtz's tree kangaroo (held in the David Fleay Wildlife Park on the Gold Coast and the Wildlife Habitat in Port Douglas, both in Australia).
- More information can be obtained at www.papuaweb.org/gb/ref/flannery-1996 including some nice sketches of each species. Bear in mind that in this article Dr Flannery recognises 17 (rather than 12) species of tree kangaroo in New Guinea alone which is not the current scientific position. As the book is on New Guinea tree kangaroos, he doesn't mention the two Australian ones.

Before you begin

Watch the video: '[Tree kangaroo home movies](http://www.KentonWebb.com)' on www.KentonWebb.com in the same area as this lesson.

Read over the questions below and decide which you will ask and whether you want to show the video straight through, or break it up into two or three sections asking your questions in between.

For example, you may choose to pause the video at 3:57, and ask the following questions:

'Is the tree kangaroo they caught a male or female?' (*It is a male*).

'It would be nice if they found a female too. Hands up who thinks they will find a female?' (*Acknowledge hands*).

'If they found a female what might she have with her?' (*A baby – technically, a joey, as a tree kangaroo is a marsupial*).

'Let's see if they find a female too.' (*Play the next section of the video*)

This line of questioning will build anticipation among the students. (You could adopt a look of wonder when they find the little joey inside the mother's pouch.) Once you have watched the video and asked your questions, hand out one or more of the activity exercises.

The questions below are intended for classroom discussion either for the class as a whole, or small group work. However, you may prefer to use worksheets. If so, the questions are available to download at www.KentonWebb.com where you downloaded these teacher's notes. They are available in both Word format and Pdf. Use Word if there are some questions you don't wish to include (or you want to add your own). Use the Pdf if you're happy with the questioning as is. (The questions are numbered on the Pdf so that if short of time, you can simply print it off and tell the class which questions to answer.)

Lesson Outline

Crittercams give us the first tree kangaroo home movies

Introductory questions before you show the video

If you wanted to study your pet dog or cat, what are some of the ways you would go about it?
(*Sit and watch it; ask questions of people who know about your pet; take photographs or video of it*)

If you wanted to set up some cameras to video your pet, where would be good places to do so?
(*The places it frequents, for example its feeding bowl, where it sleeps, the paths it walks along*)

Now imagine you're wanting to study a wild animal. How might this be more difficult than studying your pet?
(*You don't know exactly where they are; they might be rare and therefore very hard to find; they may be hard to get close to when you do find them; they might be dangerous*)

Today's lesson is on some innovative ways people are studying Matschie's tree kangaroo which is both rare and very hard to get close to.
(*Now play the video clip*)

Questions once the video has been shown

Why are tree kangaroos hard to find?
(*They live very high up in their trees; they are very hard to see as they look like the moss they live amongst; there are not many of them*)

What things have humans done to reduce the numbers of tree kangaroos?
(*Cut down their forest; eaten them*)

What did the researcher put on the tree kangaroo?

(A small video camera 'crittercam')

Why did the researcher do that?

(In order to see how the tree kangaroo lived)

Why didn't they just climb up the tree with the tree kangaroo and film them there?

(It is too high and even if they did, a person would have to be filming the tree kangaroos all day in order to get the same behaviours on film)

What did the crittercam show?

(The tree kangaroo eating, grooming; the female was seen cleaning its pouch)

What did the researcher discover the female tree kangaroo was carrying?

(A baby joey)

Why was everyone excited by this?

(Accept responses. Something appropriate might be: It means the animals are happy and breeding)

If they found a female and it didn't have a baby joey inside, what might that mean?

(A range of answers are possible, including, the female can't find a mate; the female isn't old enough to have a joey – tree kangaroos mature at around two years of age; the female is currently pregnant and will soon have a baby joey)

Did the scientists think the Crittercam was a success? Why?

(Yes, because tree kangaroos live so high in the trees, the scientists could only guess as to what they did while now they can watch their behaviours in their natural habitat throughout the day)

Final questions (to encourage thinking regarding a broader application of this technology and its appropriateness across different species)

What other animals do you think it would be good to put a Crittercam on? Why?

(Animals that live in places where it is very hard to observe them or is inhospitable to humans; animals that are very rare and hence it is hard to film them. Try to get the students to think of 3 animals that fit this category. Some might be snow leopard, aye-aye, dwarf blue sheef, red wolf, northern hairy nosed wombat, hispid hare, Siberian tiger)

Which animals would you not put a Crittercam on? Why not?

(Students might have their own opinions here, but you might like to suggest perhaps it might not be wise to put a Crittercam on a migratory animal that you might never see again, like a sea turtle or a whale. Or an animal that is too small to carry one, or for whom the camera would interfere with their behaviours. You could make a joke out of this by asking rhetorically, 'Would you put a Crittercam on a fly?' 'How about a goldfish?' Try to think of 3 animals where utilising this technology might not be such a good idea.)

What other methods could zoologists and scientists use to study endangered animals?

(Sitting in a hidden location and watching them, eg a bird hide; driving after them in a 4WD; flying above them in a helicopter or aeroplane; capturing them and bringing them to a zoo or aquarium; setting up automatically triggered cameras in locations where the animals are known to walk or fly)

Further activities

Here are a number of activities for you to choose from to further the learning of this lesson. You might like to adapt any of these depending on the nature and age of your class.

1/ Research Report Writing

Download these questions from www.KentonWebb.com in the same section where you downloaded this lesson.

You are a researcher studying tree kangaroos in a previously unstudied area of New Guinea. Last year you fitted a Crittercam to a mother and father tree kangaroo. Today you are watching the video footage for the first time. Write about what you see and learn.

Some things to include might be:

- Which species of tree kangaroo you have decided to study and why
- How many hours of footage you have captured and how much of it is useful for your research (you might like to explain why the other footage is not useful to your research)
- What the tree kangaroos eat and when they eat
- What other animals you can see on the video (You can find a list of animals found in New Guinea by typing 'Fauna of New Guinea' into Wikipedia) Describe what these animals are doing and how they react when they see your tree kangaroo. Are they frightened? Not bothered? Chase your tree kangaroo? What time of day do these animals appear?
- Any concerns you have regarding threats to tree kangaroos and what those threats are
- Anything unexpected your tree kangaroos did (You might start this sentence with, 'I didn't know that ...')
- Whether your tree kangaroos had any joeys (babies)
- How much you love working with tree kangaroos
- How excited you are by the video you have captured
- What you hope your work studying tree kangaroos will achieve
- Why you think your work helping tree kangaroos is important

2/ Handouts

(Suitable for younger students, kindergarten to year 2)

These can be downloaded from www.KentonWebb.com in the same section where you downloaded this lesson

- Find-a-word – where the leftover letters form a sentence about tree kangaroos
- Environmental 'Spot the difference' – where there are 10 things different between two pictures, half of which are harmful to tree kangaroos
- Drawing exercise – where students copy a line drawing of a tree kangaroo

3/ Craft

(Suitable for years kindergarten to year 2 or 3)

- Tree kangaroo mask - colour in and make a tree kangaroo mask (download the mask from www.KentonWebb.com)
- Photograph things an animal would find interesting around your school as well as things it would find threatening or harmful. Print off the photos – or make a PowerPoint presentation – explaining each thing you've photographed.
- Make a map of Papua New Guinea and attach photos of at least 4 different species of tree kangaroo to it linking with string to the area in which they live. List some of the threats to each species. This can also be done as an engaging PowerPoint Presentation where each new slide reveals the new species and the information associated with it.