



Food and energy 3: Fauna surveys

Components

	NAME	DESCRIPTION	AUDIENCE
	<i>Fauna surveys</i> teachers guide	This guide describes use of a presentation and worksheet to investigate fauna surveys. Suitable questions for group discussion are included.	teachers
	<i>Fauna surveys</i> presentation	This presentation describes aspects of trapping native animals for research purposes.	students
	<i>Pitfall trapping</i> fact sheet	This fact sheet describes a method used to monitor honey possum populations. It includes basic data for a study area in southwest Western Australia.	students
	<i>An ecological problem</i> worksheet	Students calculate, analyse and present data regarding honey possum population estimates over time, using information from the fact sheet, <i>Pitfall trapping</i> .	students

Purpose

To **Explore** methods used by research scientists to determine the relative population abundance of organisms, and their distribution and occupation of particular habitats.

Outcomes

Students:

- identify an appropriate fauna survey technique to conduct an effective field sampling survey for specific species;
- calculate trap success rate (TSR), of faunal species from survey areas, as an estimate of their relative abundance; and
- explain that all components of an ecosystem (biotic and abiotic) are interrelated, and any changes within a system can impact population abundance and distribution of flora and fauna.

Activity summary

ACTIVITY	POSSIBLE STRATEGY
Students watch the presentation, <i>Fauna surveys</i> .	whole class See Notes for teachers below for questions to stimulate discussion during or after the presentation.
Students read fact sheet, <i>Pitfall trapping</i> , and answer questions one to four from the worksheet, <i>An ecological problem</i> .	individual or teacher-directed, whole class discussion.
Students complete the worksheet, <i>An ecological problem</i> , using data from the fact sheet, <i>Pitfall trapping</i> . Students may wish to use a spreadsheet to enter data, perform calculations and create graphs.	Introduce the activity with whole class discussion, brainstorming ideas regarding data analysis. Organise students into groups of two or three to complete the activity.

Notes for teachers

The presentation, *Fauna surveys*, provides students with information that will help them complete the worksheet, *An ecological problem*.

Suggested discussion points and questions to use with the presentation are listed in the table below.

To complete the main worksheet activity, encourage students to use a spreadsheet to enter data from Table 3 for grids A, B and C. This may be used to perform calculations and construct graphs. Two different data tables need to be constructed: one for raw data to calculate TSR; and one for TSR % values to construct graphs.

Students may access information about plant species through the *Florabase* website, florabase.calm.wa.gov.au. This contains photos of each plant, its flowers, flowering schedule and distribution. Using this information, students may gather information about food availability and determine species importance.

Technical requirements

The presentation is provided in Microsoft PowerPoint and Adobe PDF format. The teachers guide, fact sheet and worksheet require Adobe Reader (version 5 or later), which is a free download from www.adobe.com. The worksheet is also provided in Microsoft Word format.

SLIDE	NOTES
2	What sorts of ecosystem disturbances are occurring in WA at the moment? Suggest examples.
3	The Department of Environment and Conservation (DEC) is an example of a large government agency in WA. Go to their website (http://www.dec.wa.gov.au) and search for examples where this type of survey work could be happening at the moment. Teachers could view this site during the presentation or set this as a separate activity to follow the presentation.
4	Give examples of new urban developments, ie suburbs being built around wetlands or coastal areas. Why would this type of survey be necessary? Suggest another areas of WA where mining operations are proposed. How would surveys differ to those done in urban regions?
5	Suggest examples of natural events (disasters) in WA or Australia that have caused major ecosystem disturbances over recent times, eg Roleystone fire, Queensland floods ...
6	Suggest why legal requirements have to be met for these types of surveys.
7–11	Suggest species that might be used with each type of trap.
12	What are advantages and disadvantages of using radio tracking with native fauna?
13	What data would be most useful to collect for a researcher investigating the recovery rate of a population of honey possums after a major fire in their habitat?
14	What sorts of information can be gained from collection of urine and faeces?
15	Possible assignment/assessment task Search through some scientific journals (eg <i>Nature</i> , <i>Wildlife Research</i>) to research an example of an investigation carried out by a scientist in Australia that included the use of a fauna survey. In a one page summary, give details of why the investigation was required and a detailed summary of methods used to conduct the fauna survey. Suggest organisations that may find this particular investigation useful.

Reference

Bradshaw, S. D., Phillips, R. et al. (2007). Ecology of the honey possum, *Tarsipes rostratus*, in Scott National Park, Western Australia. *Australian Mammalogy* 29, pp 25–38.

Associated SPICE resources

Food and energy 3: Fauna surveys may be used in conjunction with related SPICE resources to address the broader topic of how scientists determine energy requirements of a species.

DESCRIPTION	LEARNING PURPOSE
<p><i>Food and energy (overview)</i></p> <p>This learning pathway shows how a number of SPICE resources may be combined to teach the topic of food and energy.</p>	
<p><i>Food and energy 1: The honey possum</i></p> <p>In a video interview, zoologist Professor Don Bradshaw tells how he became interested in the honey possum, a rare and unusual Australian marsupial, and describes some of their unique adaptations.</p>	Engage
<p><i>Food and energy 2: Pollen</i></p> <p>Students use a virtual microscope to examine pollen from a range of plants, measure the size of pollen grains, and learn about features such as pore width and cell wall width.</p>	Explore
<p><i>Food and energy 3: Fauna surveys</i></p> <p>Students explore factors controlling abundance and distribution of organisms, and occupation of particular habitats.</p>	Explore
<p><i>Food and energy 4: Honey possum respiration</i></p> <p>Students use a worksheet to explore the process of respiration in heterotrophic organisms.</p>	Explain
<p><i>Food and energy 5: Animal release</i></p> <p>Students answer questions to identify an environment that will effectively sustain a released population of honey possums.</p>	Elaborate

Image credits

Presentation, *Fauna surveys*

'Pilbara drill rig' by Calistemon, CC-BY-SA-3.0, commons.wikimedia.org/wiki/File:Drill_rig.jpg

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Fact sheet, *Pitfall trapping*

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additional photography by Miriam Sullivan, Don Bradshaw and Paul Ricketts.

Acknowledgements

Thanks to Emeritus Professor Don Bradshaw, School of Animal Biology, The University of Western Australia.

Designed and developed by the Centre for Learning Technology, The University of Western Australia.
Production team: Leanne Bartoll, Kim Braimbridge, Roger Dickinson, Jan Dook, Alwyn Evans, Sam Gallagher, Trevor Hutchison, Paul Ricketts and Michael Wheatley, with thanks to Fred Deshon, Bob Fitzpatrick, Jenny Gull and Wendy Sanderson.

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