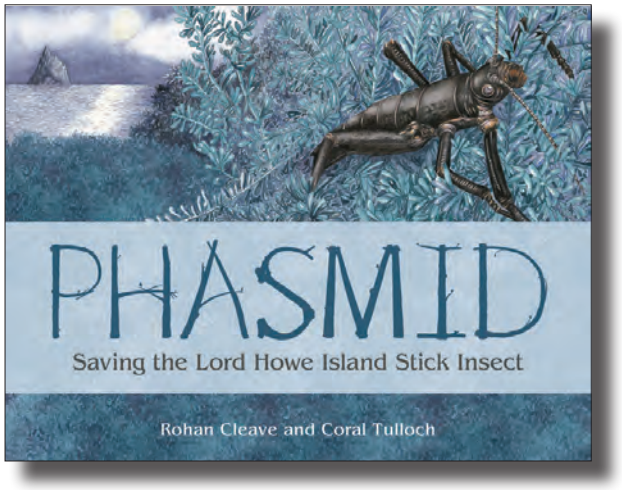
Teachers' Notes



Phasmid

Saving the Lord Howe Island Stick Insect

Rohan Cleave and Coral Tulloch (Illustrator)

In this true story there are treacherous seas, a shipwreck, ravenous rats, shy insects, adventurous scientists rock climbing in the middle of the night, extraordinary discoveries and the effort of bringing a species back from the edge of extinction: enough to ignite anyone's imagination!

Filled with the rich themes of habitat, life cycles, endangered species, conservation and our role in protecting future biodiversity, the story provides a wonderful resource to refer to within broad inquiry units of work such as Caring for the World, the Future of Wildlife, Connections, and Living Communities.

These notes offer some background content for teachers as well as four generative questions for inquiry based learning. They can be used to prompt further inquiry in discussions and, in conjunction with student questions, to frame research.

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www.publish.csiro.au

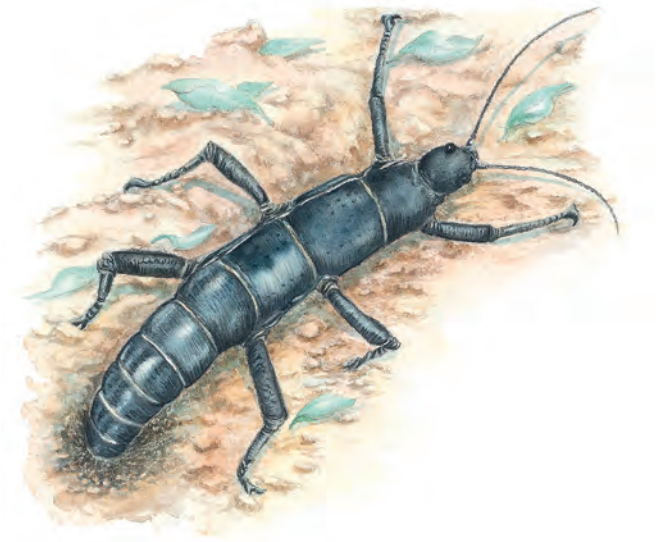
Locked Bag 10, Clayton South, VIC 3169, Australia
Tel: 1300 788 000 (local call in Australia)
Fax: +61 (0)3 9545 8550
Email: publishing.sales@csiro.au

Habitat: Do animals need their habitat to survive?

- What does 'habitat' mean?
- Are all habitats the same?
- What needs to be in an animal's habitat so it can survive?
- In what ways can a habitat be harmed?
- What will happen to an animal if its habitat is harmed?

Going further

- How was the Lord Howe Island Phasmid's habitat changed after the shipwreck?
- How can the habitat be restored on Lord Howe Island so the phasmids can be returned?
- Imagine being a Lord Howe Island Phasmid after the shipwreck. How could you escape from Lord Howe Island and make it to safety on Ball's Pyramid?



Concluding and acting

- Find a habitat at school or at home.
- Which plants live there? Which animals live there? What do they eat and drink? Where do they shelter?
- How can you look after the habitat at school or at home?

Life cycles: Why does the Lord Howe Island Phasmid's body change as it grows?

- Does the Lord Howe Island Phasmid's body change as it grows?
- How can a 20 mm phasmid fit inside a 6 mm long egg?
- If a phasmid has a tough exoskeleton that cannot stretch, how can a phasmid grow and get bigger?
- What do Lord Howe Island Phasmids eat?
- When the phasmids are young, when are they most active? How does the colour of their body help them survive?
- When they are adults, when are they most active? How does the colour of their body help them survive now?
- Most other phasmids lay their eggs as they climb trees. How is the Lord Howe Island Phasmid different?
- Most other phasmids sleep in trees. Where does the Lord Howe Island Phasmid sleep?

Going further

- Why can't the Lord Howe Island Phasmids' camouflage help them when there are rats around?
- When the Lord Howe Island Phasmids first arrived at Melbourne Zoo, no one really knew what they needed to survive, or what their life cycle was. How would you find out if you were the person looking after them? What would you give them to make sure they survived in your care?

Concluding and acting:

- To further student interest in stick insect life cycles, compare the life cycle of the Lord Howe Island Phasmid to that of a common Spiny Leaf Insect (*Extatosoma tiaratum*) by observation! Purchase an adult female and male Spiny Leaf Insect. You will also need to have access to fresh eucalypt leaves. Set up an enclosure and follow the care instructions outlined here: http://australianmuseum.net.au/care-of-stick-insects.
- An excellent handbook on rearing invertebrates is: Henderson A, Henderson D and Sinclair J (2008). *Bugs Alive: A Guide to Keeping Australian Invertebrates.* Museum Victoria, Melbourne.

Endangered Species: How do animals become endangered?

- What does 'endangered' mean?
- What does 'extinction' mean?
- What situations could endanger animals?
- Brainstorm and research the major threatening processes such as:
  - habitat loss and fragmentation;
  - introduced species disrupting the interactions in the ecology (for example, the Lord Howe Island Phasmid);
  - disease;
  - poaching (hunting and/or collecting for the illegal wildlife trade);
  - litter, chemical and air pollution;
  - climate change;
  - natural disasters such as fire and flood.

Going further

- When white people first came to Australia from England, they brought all sorts of animals with them. Some were for food (cows, sheep, chickens, goats, rabbits); some were for work (horses); some were to make the new settlers feel at home (blackbirds for their songs, foxes for sport hunting, cats and dogs); some were stowaways on the ships (rats, mice). Have any of these animals been problems for Australia?

Concluding and acting

- If you own a pet, what could you do to make sure they do not harm wildlife?

Conservation: How can people help animals?

- Research the following conservation actions on the internet:
  - habitat conservation (including the eradication of pest species, revegetation and allowing time for habitat regeneration);
  - captive breeding programs which can support species' genetics and numbers and provide viable populations of animals for release into suitable habitat;
  - management of these species once released;
  - community education and opportunities for real conservation action.

Going further

- How have people helped the Lord Howe Island Phasmid to survive so far?

Concluding and acting

- Many conservation organisations suggest hands-on activities for students. Here are a few:
  - http://www.zoo.org.au/get-involved/act-for-wildlife
  - https://taronga.org.au/education/sydney/workshops
  - http://perthzoo.wa.gov.au/learn/loveyourlocalwildlife
  - http://museum.wa.gov.au/explore/frog-watch-schools/frog-watch-schools-kit

Australian Curriculum Content Descriptions for Science

Year 1	Year 2	Year 3	Year 4
Living things have a variety of external features (ACSSU017) Living things live in different places where their needs are met (ACSSU211) Science involves asking questions about, and describing changes in, objects and events (ACSHE021)	Living things grow, change and have offspring similar to themselves (ACSSU030) Science involves asking questions about, and describing changes in, objects and events (ACSHE034)	Living things can be grouped on the basis of observable features and can be distinguished from non-living things (ACSSU044) Science involves making predictions and describing patterns and relationships (ACSHE050) Science knowledge helps people to understand the effect of their actions (ACSHE051)	Living things have life cycles (ACSSU072) Living things, including plants and animals, depend on each other and the environment to survive (ACSSU073) Science knowledge helps people to understand the effect of their actions (ACSHE062)

Resources

- Film: award winning animated short film 'Sticky' https://vimeo.com/76647062
- Video: real life video of a Lord Howe Island Phasmid emerging from its egg https://vimeo.com/14413689
- Book: Wilkinson R (2014) *Return of the Phasmid*. Media Dynamics, Australia.
- Live animals and display: Lord Howe Island Phasmid display at Melbourne Zoo http://www.zoo.org.au/melbourne/animals/lord-howe-island-stick-insect