Wilderness Society
Life. Support.

Environment Award for Children's Literature

Wildlife Warriors
Grade 4 to Grade 6

Sustainability Focus

This lesson explores the interdependence of systems that support life on Earth, as well as social values and ecological patterns of living that promote the sustainability of our local environments.

Education for sustainability leads students to develop an overall capacity to contribute to a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations.

Students gain an understanding that human activity impacts on ecosystems and therefore on biosphere processes and biosphere sustainability. Students can focus on the causes and consequences of change in systems and how this affects sustainability.

Relevant Links to the National Science Curriculum

Year 4

Science Understanding
— Biological Sciences

- Living things, including plants and animals, depend on each other and the environment to survive

Science as a Human Endeavour

- Use and influence of science — science knowledge helps people to understand the effect of their actions

Science Inquiry Skills

- Communicating — represent and communicate ideas and findings in a variety of ways, such as diagrams, physical representations, simple explanations and arguments, and simple reports

Year 5

Science Understanding
— Biological Sciences

- Living things have structural features and adaptations that help them to survive in their environment

Science as a Human Endeavour

- Use and influence of science — scientific knowledge is used to inform personal and community decisions

Science Inquiry Skills

- Planning and conducting — with guidance, select appropriate investigation methods to answer questions or solve problems including internet research
- Communicating — communicate ideas, explanations and processes in a variety of ways, including multi-modal texts

Year 6

Science Understanding
— Biological Sciences

- The growth and survival of living things are affected by the physical conditions of their environment

Science as a Human Endeavour

- Use and influence of science — scientific knowledge is used to inform personal and community decisions

Science Inquiry Skills

- Planning and conducting — with guidance, select appropriate investigation methods to answer questions or solve problems including internet research
- Communicating — communicate ideas, explanations and processes in a variety of ways, including multi-modal texts

Engage

Teacher and student class discussion (suggested answers are given to assist teachers):

1. What do the following animals need to survive? Leadbeater's Possum/Fairy Possum, southern right whale, cassowary? (Teachers can have images of these animals on a data projector. Possible responses: food; water; clean air; shelter for protection from predators and extremes of weather; mates so that reproduction can occur, and for protection in colonies)

Explore

1. Choose one of the animals from the list and research their specific needs and how these needs are met by the animal's environment. Combine your findings with others in the class.

basic needs	Fairy Possum	Southern right whale	Cassowary
food	Wattle sap; arthropods which they find under the loose bark of Eucalypts e.g spiders, crickets, termites and beetles; water	Mainly small crustaceans like copepods and krill, as well as plankton. They are baleen whales which means they don't have any teeth, and feed by filtering food through 220-260 baleen plates which hang from each side of their upper jaws. The baleen is up to 2.8m long, and is fringed by long, fine, greyish bristles. Southern rights hunt their prey by swimming with their mouth open and trapping their prey in their baleen bristles, while also filtering water out of their mouth	Fruit; seeds; berries from the rainforest; small invertebrates and vertebrates; water from local streams as well as from their food
Habitat	Lives an arboreal life (within the treetops or canopy of the forests), and makes nests in old growth trees. This helps the possum hide from predators during the day	Aquatic/marine habitat — water supports the whale through buoyancy, and provides food and a suitable temperature range	As a ground-dweller, cassowaries rely on their bright plumage to blend in with rainforest plants — an example of camouflage. The tropical climate means the temperature is fairly stable and the range suitable for the cassowary

Explain

1. Living things have features that help them to survive in their environment. They may be:

   - physical or structural
   - physiological or functional
   - behavioural

   Features that increase an organism's growth and survival are called adaptations. Research some specific adaptations of your chosen organism (suggested answers are given below).

Adaptation	Fairy Possum	Southern right whale	Cassowary
Structural	Fur acts as insulation to keep body temperature stable. Claws on hands and feet are used for gripping tree branches (no gliding membrane). Large eyes are so they can see better at night. Their pouch is used to shelter and nourish offspring	Whales are typically black in colour with some irregular white patches to blend in with the waters of the deep. They have a baleen plate to sieve the water for prey. Their streamlined body reduces friction as the whale moves through water. Their flippers are broad and short for powering through the water	Cassowaries have feathers which are thick and bristly for protection from thorns and other rainforest vegetation. They have casques — a horny structure on top of their head — which acts as a protective shield when moving through forest. Their claws are sharp, to dig for food and protect from predators. The colour of their feathers camouflages with tropical plants
Functional	The Fairy Possum has many breeding cycles throughout the year — so if one litter is lost, another can be produced to replace it. Females secrete milk for their young	The southern right whale possesses two separate blowholes close together forming a v-shape — air can easily and quickly be inhaled and exhaled. The southern rights can hold their breath for up to 30mins. The whales have blubber, which keeps them warm and is so effective that they cannot survive in tropical waters. They can increase blood circulation to get rid of some excess heat	Long-range hearing helps the cassowary detect predators before they get too close. They have a digestive system that can cope with the toxins in some fruits and fungi. Cassowaries have gentle digestion and weak digestive acids so seeds pass through the stomach unharmed. (Seeds pass out in the bird's faeces and can grow even after being swallowed, so cassowaries disperse rainforest plants)

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Adaptation	Fairy Possum	Southern right whale	Cassowary
Behavioural	The Fairy Possum is nocturnal, meaning they are active at night. During the heat of the day, the possums sleep in tree hollows and hides from predators	The southern right whales produces short, low frequency moans and pulses for communication with other whales. They practisebreaching — turning in mid-air and falling back into the water — to dislodge parasites and as a courtship display	Cassowaries make a rumbling noise to warn others of danger. If approached, they will stretch tall, ruffle their feathers and hiss to frighten predators away

Elaborate

1. The survival of some of the animals is under threat because of changes to their environments. Work individually or in pairs and choose ONE of the suggested three animals to research. What are some changes to the organism's physical environment that are affecting their survival?

Threat	Fairy Possum	Southern right whale	Cassowary
Loss of habitat	Logging is removing the trees/habitat that the possum calls home. Food and shelter are removed, making them more vulnerable to predation. The demand for timber (for paper and housing) is causing this deforestation problem	Vessel traffic, coastal development, oil exploration (BP is looking to drill for oil in the Great Australian Bight), and marine mining pose a risk to the whale's habitat	Removal of native habitat/ rainforest for farming, housing, and tourism is having an effect, as food and shelter are removed
Climate change	Increased severity and frequency of drought (brought about by climate change), disease, and bushfires are also having an impact	It is generally recognised that this will substantially alter ocean conditions, thus affecting the whale's habitat	More frequent and severe cyclones possibly linked to more rapid climate change are destroying large sections of rainforest
Rubbish	With foreign human rubbish littering their habitat, the possums risk accidentally eating bits of plastic, getting caught in nets or rope (constricting movement or ability to breathe), or having the rubbish leach or contaminate their food and water	With foreign human rubbish littering their habitat, the whales risk accidentally eating bits of plastic, getting caught in nets or rope (constricting movement or ability to breathe), or having the rubbish leach or contaminate their food and water	With foreign human rubbish littering their habitat, the cassowaries risk accidentally eating bits of plastic, getting caught in nets or rope (constricting movement or ability to breathe), or having the rubbish leach or contaminate their food and water

Threat	Fairy Possum	Southern right whale	Cassowary
Other	Feral cats are predators of the possum	Until 1935, whaling was the primary threat for this species, but they've been protected since then. General whaling stopped in 1978 in Australia. The southern rights (Eubalaena glacialis) got their common name from the fact that they were "the right whale" to hunt. Whales also risk collisions with vessels and entanglements in fishing gear	Large feral cats and dogs increase predation levels

2. What sorts of things can people do to try to lessen these threats?

   a Only buy paper from sustainable sources, both for office use (products marked 100% post-consumer recycled) and in other paper products such as toilet paper

   b Recycle as much paper as possible so the demand will decrease

   c Buy less packaged goods to reduce the demand for paper and cardboard

   d Always put rubbish in the bin (and recycle where possible)

   e Write to the Reflex paper company and ask them to buy their timber from sources that don't impact on the Fairy Possum's habitat

   f Keep all cats in at night

   g Write to local companies that release pollutants into our local systems to clean up their act

   h Ask our politicians to set aside areas of tropical rainforest or mountain forest as nature parks so that the cassowary and Fairy Possum are protected

   i Control numbers of feral dogs and pigs

   j Sign petitions to keep our marine parks free from commercial fishing

   k Protest against drilling for oil in the Great Australian Bight

   l Restrict traffic in known whale habitats

   m Patrol Australian waters to enforce the ban on whaling

3. Predict what will happen to your animal if we don't do anything to reduce these threats?
   (Students can discuss the concept of extinction. Older students could research the stages to extinction such as vulnerable, endangered, critically endangered, and extinct in the wild, etcetera.)

4. Head to eacl.org.au/learn to read three short stories about a Fairy Possum, southern right whale and cassowary by authors Narelle Oliver, Michael Gerard Bauer and Samantha Wheeler. Ask your students to choose their favourite story, then either write or illustrate a response. We'd love to see them! Email us at eacl@wilderness.org.au and let us know your name, age, and where you're from!

5. Showcase to other students what you have discovered. Some suggestions include:

   - A show and tell to other classes in the school
   - Lunchtime display
   - Display in the library
   - Talk on assembly

Evaluate

1. List some effects of human actions on environments that you have discovered today?

2. What are some personal and community decisions that can be undertaken to increase the chance of survival of the animals discussed in today's lesson?

Using what you've learned from this lesson plan or one of the three short stories by authors Narelle Oliver, Michael Gerard Bauer and Samantha Wheeler (eacl.org.au/learn) write or illustrate a nature scene. We'd love to see them! Email us at eacl@wilderness.org.au and let us know your name, age, and where you're from!

