Threatened Animals in Queensland

BIOLOGICAL SCIENCES

QGC | FUTUREMAKERS | QUEENSLAND MUSEUM | Queensland Government

Introduction

The Biodiversity Collection at the Queensland Museum contains over 2.5 million specimens. Most specimens are from Queensland's terrestrial and marine provinces. There is also substantial comparative material from the adjacent Indo-Pacific region, and a smaller number of exotic species acquired for comparative purposes.

In addition, the Queensland Museum Network has an irreplaceable collection of more than 34,000 animal type specimens used to identify and name species. These types are a vital national and international resource for scientific research and identification verification. Researchers at the Queensland Museum have played a role in discovering over 4000 new species since 1862!

Our Biodiversity Collections:

— Represent a pivotal resource for the study of tropical Australasian biodiversity.

— Provide verifiable tools to gain new knowledge of Queensland's unique animals and those that are also common elsewhere in the Asia-Pacific region.

— Provide an insight into the evolution, connectivity and dispersal of life throughout this region.

The Biodiversity Collection steadily grows as we increase our inventory and understanding of Queensland's natural resources.

This resource complements the Wild State Exhibition at the Queensland Museum, and may be used in conjuction with the Wild State Teacher Resource from _Queensland Museum online learning resources_.

Cover Image: The Cassowary is one of the many threatened animals on display at the Queensland Museum, Brisbane. Due to its size, the Cassowary is the only animal that can swallow and disperse some large rainforest fruits over long distances. As a result of this important role, the Cassowary is known as a keystone species. If the Cassowary were to become extinct it could disrupt the entire rainforest ecosystem. Image: QM

Future Makers is an innovative partnership between Queensland Museum Network and Shell's QGC project aiming to increase awareness and understanding of the value of science, technology, engineering and maths (STEM) education and skills in Queensland.

This partnership aims to engage and inspire people with the wonder of science, and increase the participation and performance of students in STEM-related subjects and careers — creating a highly capable workforce for the future.

Australian Curriculum Links

YEAR 4

Science Understanding (SU)

Biological Sciences
Living things depend on each other and the environment to survive *(ASSU073)*
Living things have life cycles *(ACSSU072)*

Science as a Human Endeavour (SHE)

Science knowledge helps people to understand the effect of their actions *(ACSHE062)*
Science involves making predictions and describing patterns and relationships *(ACSHE061)*

Science Inquiry Skills (SIS)

Represent and communicate observations, ideas and findings using formal and informal representations *(ACSIS071)*

YEAR 5

Science Understanding (SU)

Biological Sciences
Living things have structural features and adaptations that help them to survive in their environment *(ACSSU043)*

Science as a Human Endeavour (SHE)

Scientific knowledge is used to solve problems and inform personal and community decisions *(ACSHE083)*

Science Inquiry Skills (SIS)

Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts *(ACSIS093)*

YEAR 6

Science Understanding (SU)

Biological Sciences
The growth and survival of living things are affected by physical conditions of their environment *(ACSSU094)*

Science as a Human Endeavour (SHE)

Scientific knowledge is used to solve problems and inform personal and community decisions *(ACSHE100)*

Science Inquiry Skills (SIS)

Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts *(ACSIS110)*

Science Understanding (SU)

Biological Sciences
Classification helps organise the diverse group of organisms *(ACSSU111)*

Interactions between organisms, including the effects of human activities can be represented by food chains and food webs *(ACSSU112)*

Science as a Human Endeavour (SHE)

Solutions to contemporary issues that are found using science and technology,
may impact on other areas of society and may involve ethical considerations *(ACSHE120)*

Science Inquiry Skills (SIS)

Communicate ideas, findings and evidence based solutions to problems using scientific language, and representations, using digital technologies as appropriate *(ACSIS133)*

Activity Overview
Threatened Animals in Queensland

Examine a threatened Queensland animal and create an exhibit for the Queensland Museum. This exhibit should explain to your audience why the species is threatened, and what they can do to help protect it.

TEACHER TIPS

- You can tailor the questions for your students depending on year level. Scaffolded questions linked to the Australian Science Curriculum for Years 5, 6, and 7 can be found at the back of this booklet.

- Scientists work collaboratively. You may wish to arrange students into groups of 3 – 4 to promote collaborative learning and communication. Answers can also be shared in discussion groups with the class.

- Students may type and print their information cards, or print them and write on them by hand.

- Sometimes short films are played at the museum. You could let students choose whether they want to make an exhibit or a multimedia production.

- Your class may want to host a threatened species exhibition for other classes, or parents.

- You may wish to assign students to a threatened species, or reduce the number of threatened animals students may choose, to minimise indecision and initial research time.

Threatened Animals in Queensland

Plants and animals depend on each other, and the environment, to survive. With the human population in Queensland increasing, much of the natural environment has been cleared for development and agriculture. Non-native plants and animals, including predatory species like cats, dogs, and foxes, have also been introduced. Many introduced species compete with native animals for habitat and food. These actions have resulted in the decline of many native animals, and even the extinction of some populations.

Living things are classified as 'threatened' if they are at risk of extinction. Depending on the severity of the risk, threatened species are categorised under Australian and Queensland legislation as vulnerable, endangered, or extinct in the wild. In Queensland there are currently 224 animal species and 731 plant species listed as threatened, however more species are regularly added to this list. Of the threatened animals in Queensland, 137 are vulnerable, 76 are endangered and 11 are extinct in the wild.

Threatened Animals in the Queensland Museum

You will be required to choose a threatened animal from Table 1 on page 6, or from the up-to-date list of threatened species on the Queensland Government website. Animals in Table 1 can be seen at the Queensland Museum, Brisbane.

Figure 1: An adult, male Gouldian Finch. The Gouldian Finch is endangered, predominantly due to habitat loss. It can be seen in the Wild State *exhibition at the Queensland Museum, Brisbane. Image: Martin Pot, cc.*

Table 1: Threatened animals displayed in the Queensland Museum, Brisbane

Common Name	Scientific Name
Mammals	
Koala	*Phascolarctos cinereus*
Yellow-bellied Glider	*Petaurus australis*
Mahogany Glider	*Petaurus gracilis*
Greater Glider	*Petauroides volans*
Northern Hairy-nosed Wombat	*Lasiorhinus krefftii*
Bridled Nailtail Wallaby	*Onychogalea fraenata*
Yellow-footed Rock-wallaby	*Petrogale xanthopus*
Bilby	*Macrotis lagotis*
Water Mouse	*Xeromys myoides*
Ghost Bat	*Macroderma gigas*
Spectacled Flying-fox	*Pteropus conspicillatus*
Spotted-tailed Quoll	*Dasyurus maculatus*
Dusky Flying-fox	*Pteropus brunneus*
Humpback Whale	*Megaptera novaeangliae*
Dugong	*Dugong dugon*
Birds	
Gouldian Finch (Figure 1)	*Erythrura gouldiae*
Southern Cassowary (cover)	*Casuarius casuarius*
Golden-shouldered Parrot	*Psephotus chrysopterygius*
Eastern Curlew	*Numenius madagascariensis*
Great Knot	*Calidris tenuirostris*
Glossy Black-cockatoo	*Calyptorhynchus lathami*
Black-breasted Button-quail	*Turnix melanogaster*
Grey-headed Albatross	*Thalassarche chrysostoma*
Southern Giant Petrel	*Macronectes giganteus*
Powerful Owl	*Ninox strenua*
Reptiles	
Loggerhead Turtle	*Caretta caretta*
Hawksbill Turtle	*Eretmochelys imbricata*
Yakka Skink	*Egernia rugosa*
Saltwater/Estuarine Crocodile	*Crocodylus porosus*
Amphibians	
Beautiful Nursery-frog	*Cophixalus concinnus*
Mountain-top Nursery-frog	*Cophixalus monticola*
Australian Lacelid	*Litoria dayi*
Waterfall Frog	*Litoria nannotis*
Fish	
Grey Nurse Shark	*Carcharias taurus*
Insects	
Illidge's Ant-blue Butterfly	*Acrodipsas illidgei*

*Note:
These animals can either be seen in [*Wild State*]**, the** *Discovery Centre,* **or the** *Whale Mall* **at the Queensland Museum, Brisbane.**

Activity 1
Creating a Museum Exhibit

In this activity, you are working for the Queensland Museum and are required to create an exhibit about a threatened Queensland animal.

Follow the steps below to complete your exhibit:

1. **Choose a threatened species from page 6,** or the Queensland Government website.

2. **Research and answer the questions on pages 8 – 9.**
   (Use the Richmond Birdwing Butterfly example on pages 10 – 11 for help.)

3. **Take photo, do a scientific illustration, or create a model of your specimen.**

4. **Complete the specimen tag below, and fasten it your specimen.**

Queensland Museum   ID#..............................
Scientific Name: ....
Common Name:..
Sex of Specimen:...
Location: ....
Collector: ....
Date: ....

Figure 2: A specimen tag to attach to your animal.
(Please note: insects are pinned to a display with a small tag.)

5. **Create an exhibit for your animal.** This display should highlight the habitat your animal is found in, and any other relevant information about your animal e.g. does it swim, fly or climb trees? You might like to view existing exhibitions including the *Wild State* exhibition at the Queensland Museum, Brisbane to gain some ideas.

6. **Display your exhibit, including your animal (picture or model) and information, in a class exhibition to help everyone learn about threatened animals in Queensland!**
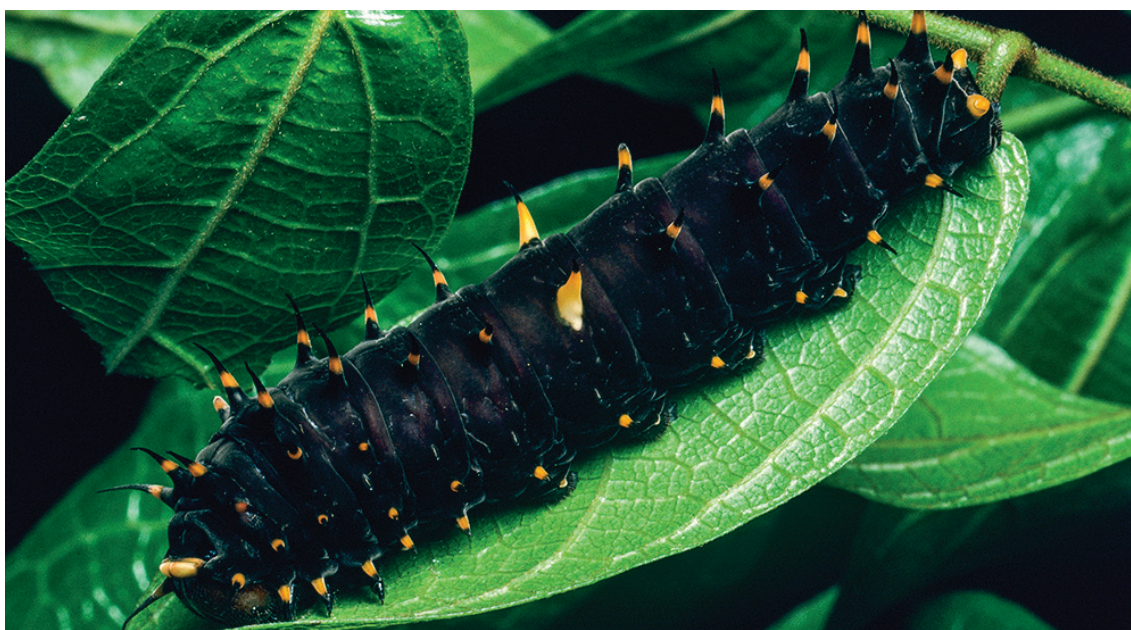

Figure 3: Larvae of the endangered Richmond Birdwing Butterfly. More information about this threatened species can be seen on pages 10–11.
Image: QM, Jeff Wright

Name: ....

Scientific Name: ....

Distribution
(Where do I live?)

1000km

Habitat
(What type of environment do I live in?)

Description
(What do I look like?)

Diet
(What do I eat?)

Life cycle
(How do I change as I grow?)

Predators
(Who eats me?)

Competition
(What other animals compete with me for food and shelter?)

Cool facts!

Needs
(What do I need from my environment to survive, e.g. food, shelter?)

Importance
(What would happen to the environment if I became extinct?)

Threats
(Why am I threatened?)

Solutions
(What can people do to help me survive?)

Name: Richmond Birdwing Butterfly

Scientific Name: *Ornithoptera richmondia*

Distribution
(Where do I live?)

N

I live in these areas

BRISBANE ●

1000km

Habitat
(What type of environment do I live in?)

Subtropical rainforest that contains the Birdwing Butterfly Vines *(Pararistolochia sp.)*.

Richmond Birdwing Butterflies live along the coast and nearby ranges.

Description
(What do I look like?)

Females are mostly brown and with cream and yellow markings (Figure 5), while the males are black and vivid green (Figure 6).

The Richmond Birdwing Butterfly is one of the largest butterflies in Australia with a wingspan of up to 16 cm in females and 13 cm in males!
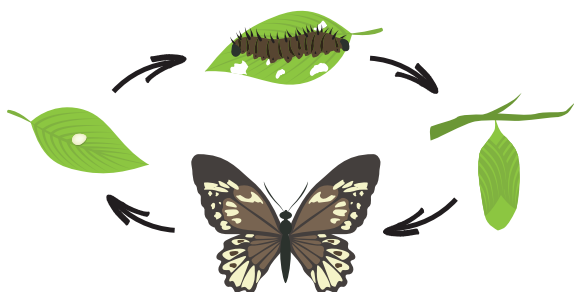
Diet
(What do I eat?)

Larvae eat leaves of the native *Pararistolochia* vines – both the Lowland Richmond Birdwing Vine, and the Mountain Butterfly Vine.

Butterflies eat nectar from flowers, including lantana.

Life cycle
(How do I change as I grow?)

Predators
(Who eats me?)

Larvae and adults are toxic, so no active predators; they are unlikely to be consumed by birds or mammals. The Richmond Birdwing Butterfly may be eaten passively by spiders and predatory insects.

Competition
(What other animals compete with me for food and shelter?)

The Birdwing Butterfly Vine, which the Richmond Birdwing Butterfly larvae/caterpillars need for food, competes with invasive weeds like the Dutchman's Pipe Vine, which is toxic to the larvae.

Cool facts!

The Richmond Birdwing Butterfly is one of the biggest butterflies in Australia (north Queensland birdwing species are larger). The larva / caterpillar can grow up to 7 cm long!

The adult butterfly only lives 4 to 6 weeks.

Needs
(What do I need from my environment to survive, e.g. food, shelter?)

Larvae/caterpillars need tender young leaves on the Birdwing Butterfly Vine to eat. Older leaves are too tough for the larvae to eat. Large numbers of this vine are required to produce enough young leaves to feed the larvae of the Richmond Birdwing Butterfly.

This vine lives in subtropical rainforest which is rapidly being cleared.

Importance
(What would happen to the environment if I became extinct?)

Based on our current understanding, the Richmond Birdwing Butterfly has few predators and they are not the main pollinators of plants so the ecosystem may survive without the butterfly.

However, there may be parasitic flies and wasps that rely on this butterfly for survival. Due to the connectedness in the environment, small changes can have huge unforeseen consequences.

Threats
(Why am I threatened?)

Most of the subtropical rainforest habitat of this butterfly has been cleared for human development.

An introduced vine from South America, the toxic Dutchman's Pipe Vine, looks like the Birdwing Butterfly Vine. Richmond Birdwing Butterflies sometimes lay their eggs on this vine, and when the larvae hatch and eat it they die due to the toxins.

Drought stops the Birdwing Butterfly Vine from growing fresh new leaves, which the Birdwing Butterfly larvae need to eat to survive. Older, tougher leaves are not edible to newly hatched larva, leading to starvation.

Solutions
(What can people do to help me survive?)

Protect coastal subtropical rainforest from being cleared and designate zones that cannot be cleared. Regenerate coastal subtropical rainforest.

Remove Dutchman's Pipe Vines from gardens and the environment. Plant more Birdwing Butterfly Vines. You could also support conservation groups such as the Richmond Birdwing Recovery Network.

Reduce the use of fossil fuels to mitigate climate change. This will prevent the increase in the frequency and severity of drought.

Educate others about endangered species, and what individuals, the community and organisations can do to protect them (for example, this exhibit).

Figure 5: Female Richmond Birdwing Butterfly (actual size). Image: QM, Bjorn Fjellstad

Queensland Museum **ID#** QM123456

Scientific Name: *Ornithoptera richmondia*

Common Name: Richmond Birdwing Butterfly

Sex of Specimen: Male

Location: Mt Nadi, NSW

Collector: Al Knight

Date: 06/12/1969

Figure 6: Male Richmond Birdwing Butterfly (actual size). Why do you think the male is different in appearance to the female? Image: QM, Jeff Wright

Year 5 Scaffold

Adaptations
(What adaptations help me survive in my environment?)

Debate — Choose a role from the list below:

☐ Scientist at the Queensland Museum   ☐ Miner
☐ Politician   ☐ Local resident
☐ Developer   ☐ Choose your own:
☐ Environmentalist

Debate the following questions with your group from the perspective of your chosen role:

1. **Is it important to protect this animal?**

2. **What should we do to protect it?**

Year 6 Scaffold

Environment
(How have environmental changes affected my survival?)

Future
(How might my habitat change in the future? How may this affect my survival?)

Debate — Choose a role from the list below:

☐ Scientist at the Queensland Museum

☐ Politician

☐ Developer

☐ Environmentalist

☐ Miner

☐ Local resident

☐ Choose your own:

Debate the following questions with your group from the perspective of your chosen role:

1. **Is it important to protect this animal?**

2. **What should we do to protect it?**

Year 7 Scaffold

Classification
(How am I classified?)

Kingdom: ....

Phylum: ....

Class: ....

Order: ....

Family: ....

Genus: ....

Species: ....

Science and technology in practice
(How are science and technology used to improve my survival? This could include control of introduced species, breeding programs, developmental solutions.)

Food Chain

Create a food chain from my ecosystem:

Food Web

Create a food web including:

— Producers, consumers, decomposers, trophic levels
— Human impact on this ecosystem