MAGICAL LAND OF OZ

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AUSTRALIAN TEACHERS OF MEDIA

A STUDY GUIDE BY
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CONTENT HYPERLINKS

SYNOPSIS

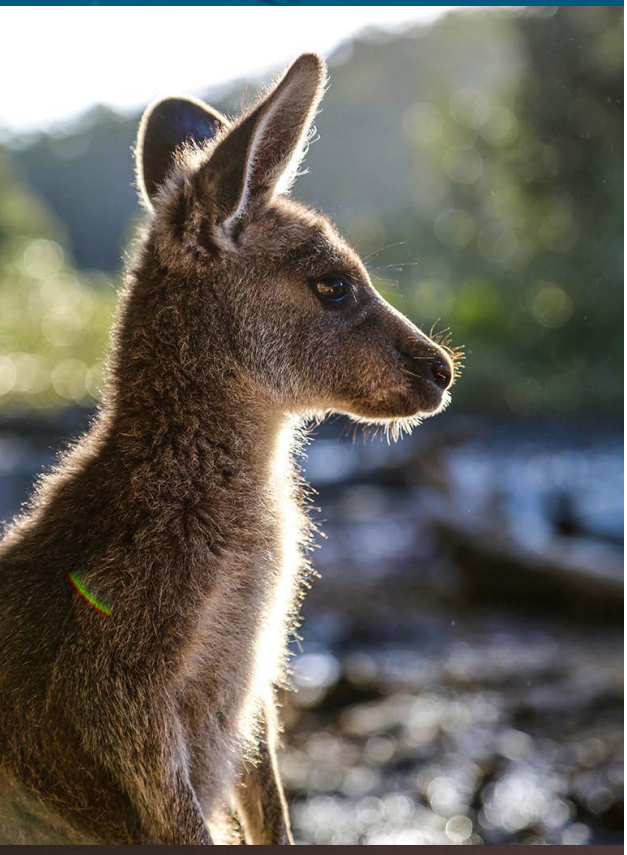
Across Australia, as the dawn rises the marsupials go to bed – except for the ones that don't. In this land of ancient wonders, big skies and jewelled seas, rules can be broken as the country boasts of splendid dragons, saltwater monsters and dancing spiders.

Magical Land of Oz offers a blue-chip, continent-wide series ranging from the land's highest snow peaks to the depths of the frigid and wild southern seas; from its last populations of wild numbats to its largest diorama of giant cuttlefish. It's a land of diverse beauty that delights and surprises. The series both entertains and deepens our understanding of how the natural world is made up of not just unique species, but distinct individuals, whose lives are far from predictable.

Using the latest camera technology we capture animal populations only recently discovered and unfamiliar behaviours of species we thought we knew well. We meet animal characters so enigmatic, most Australians are unaware they share not just their island continent but also their own suburban backyards.

We reveal the challenges these animals must navigate in a land of extremes and the intense human-induced change they must cope with in order to survive. *Magical Land of Oz* fills the screen with colour, dance, acrobatics, music, mating and murder as we witness animals in their natural habitat, making Australia a truly spellbinding place.

The stage is set for the story to begin…



Episode 1: Oceans

Most of Australia lies underwater. Its marine wilderness is double that of its landmass. Journeying in this episode through Australia's three surrounding oceans and their islands, we discover an explosion of life in the cold, spectacular southern sea, the sanctuary of the Pacific and the Indian Ocean with its awe-inspiring predators.

- Shark swarm – Red Bluff, WA
- Australian sea lion – Pearson Island, SA
- Cuttlefish – Spencer Gulf, SA
- Southern right whale – Head of the Bight, SA
- Bottlenose dolphin – Esperance, WA
- Spider crab – Port Phillip Bay, VIC
- Humpback whale and Migaloo – East Coast
- Gould's petrel – Cabbage Tree Island, NSW
- Green sea turtle – Great Barrier Reef, QLD
- Brown boobies and frigate birds – Lacepedes, WA
- Whale shark – Ningaloo, WA
- Tiger shark - Coral Bay, WA

Episode 2: Land

Australia is one of the most biodiverse of all landmasses – its landscapes spectacularly varied. The Australian 'bush' is a generic term but its landscape is anything but. In equal amounts it is lush and wet, arid and sharp, a perfumed expanse of dappled light. We move from the continent's snow-covered peaks to its ancient rainforests and tropical savannahs, discovering how animals have learned to thrive across the continent's harsh and beautiful extremes.

- Monotremes (echidna/platypus) – Snowy Mountains, NSW
- Eastern grey kangaroo – Tidbinbilla, ACT
- Wedge-tailed eagle – Cooma, NSW
- Numbat – Dryandra Woodland, WA
- Rainforest – Wet Tropics of Queensland
- Tree kangaroo – Daintree, QLD
- Parrots – Cape York, QLD
- Saltwater crocodile – Adelaide River, NT
- Diving tarantula – Maningrada in Arnhem Land, NT
- Black kite – Weemol, NT

Episode 3: Human Shift

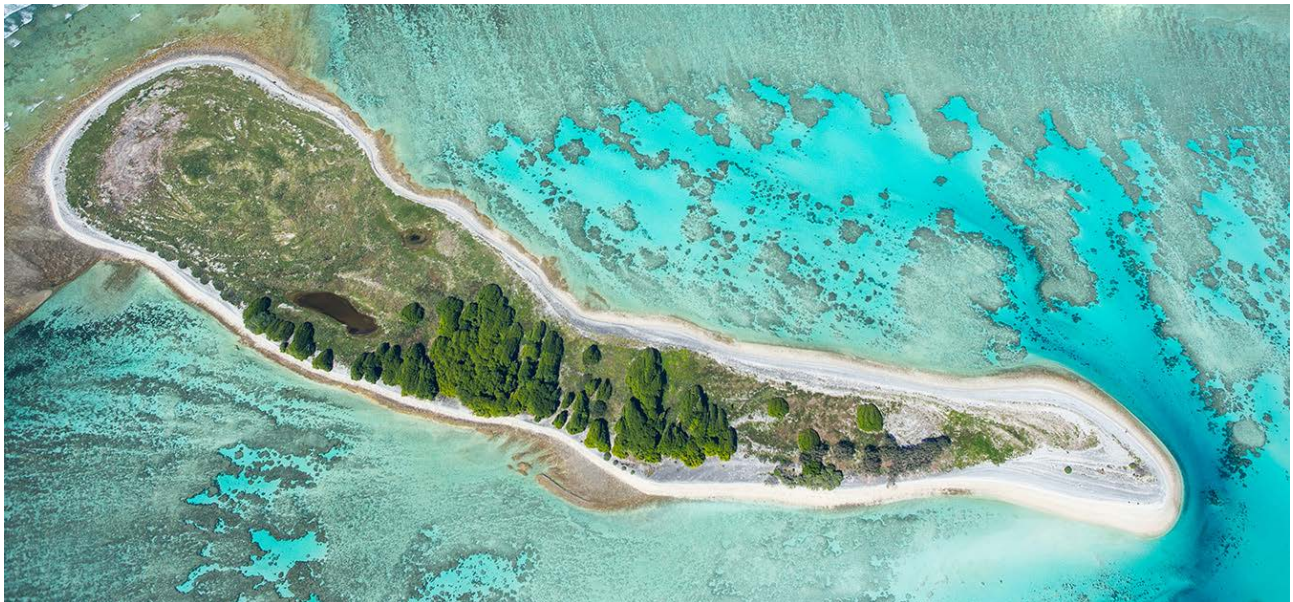
Despite Australia's relatively small population, the force of human-induced change has been rapid and remarkable. And so, animal populations have reacted in quick and dramatic ways. Researchers have found hectare for hectare, urban areas contain more threatened species than non-urban areas. It appears cities are in fact the hotspots for Australia's unique fauna and wild lives intersect with human lives in surprising ways. We meet Australia's contemporary natural history success stories, and those being left behind as the continent rushes through the twenty-first century.

- Brushtail possums – Melbourne, VIC
- Peacock spiders – general suburbs
- Eastern water dragons – Brisbane, QLD
- Red fox – Sydney beaches, NSW
- Dingoes –Great Sandy Desert, WA
- Inland fish – Great Northern Highway, WA
- Koalas – Gunnedah, NSW
- Little penguins – Phillip Island, VIC

WHY AUSTRALIA IS SPECIAL

Magical Land of Oz is a series about the only country in the world spanning an entire continent. Here are some of the key facts about Australia:

- Australia has a land area of 2.97 million square miles (almost as large as that of the United States of America and thirty-two times larger than the United Kingdom).
- It is one of the most biologically diverse countries on the planet: home to more than 1 million species of plants and animals with 80 per cent of its animals found nowhere else in the world.
- It is also home to over 24 million people. The country's vast openness means it has the lowest population density in the world – only two people per square kilometre.
- Aboriginal people have lived here for more than 60,000 years. In fact, Australia's Indigenous people have the longest continuous cultural history of any group of people on Earth.
- The mammals come from the oldest known groups alive today; platypus, echidnas, kangaroos and koalas all occur nowhere else.
- The majority of the world's birds have Australian ancestors. No other continent has been as important for bird evolution. In fact, Australia is where bird song began.
- Australia's marine territory is double that of its landmass. It is the only country in the world surrounded by three different oceans: the Pacific, the Indian and the Southern.
- Thirty native mammals have become extinct since European settlement just over 200 years ago. To put this in a global context, one out of three mammal extinctions in the last 400 years have occurred in Australia.



CHALLENGES FACING AUSTRALIA'S NATURAL WORLD

CLIMATE

Australian average temperatures have increased by 1°C since 1910.

In the past decade, record high water temperatures in our oceans have caused widespread coral bleaching, habitat destruction and species mortality.

EXTINCTION RATES

For all its natural beauty, the sad reality is that Australia leads the world on extinction – it has the worst mammal extinction rate in the world.

The primary factors causing this loss of wildlife include:

- Feral cats and foxes – for example, feral cats kill an estimated 75 million native animals every night across Australia
- Feral herbivores – including pigs, goats, rabbits, donkeys, horses, camels, buffalo and feral cattle
- Changes in fire regimes – especially an increase in the extent and severity of wildfires
- Clearing native vegetation
- Weeds

DEFORESTATION

Australia has one of the highest rates of land clearing in the world.

More than 40 per cent of the country's forests and woodlands are estimated to have been cleared since European colonisation.

There is so much forest and bushland destruction happening that Eastern Australia is now in the top ten 'deforestation fronts' in the world.

In recent years, land has been cleared at a rate equivalent to 1000 rugby fields a day in the state of Queensland.

More than 1 million hectares of native bush and forest has been cleared in Queensland over the last four years. More than a third of that land had never been cleared before.

THE CONSERVATION IMPERATIVE

Australia is one of just five countries that hold 70 per cent of the world's remaining untouched wilderness areas. United States, Brazil, Russia, Canada and Australia hold the vast majority of the world's remaining wilderness.

Australia is the only megadiverse nation that is a developed nation with a low population density – this translates to a high level of economic ability for biodiversity protection, without the population pressures that could compete with biodiversity protection for land use.

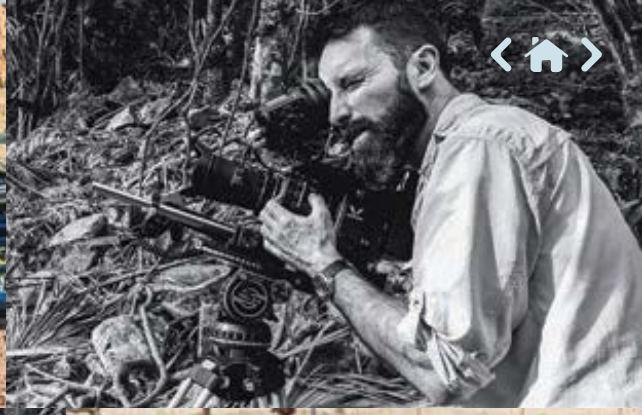
Australia provides our best chance of maintaining wilderness on Earth, and with the face of the great changes sweeping the world, now is the time to make this commitment.

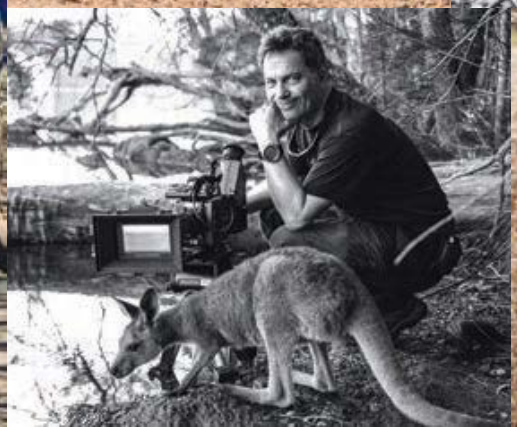
MAKING MAGIC

Barry Humphries, Narrator Barry Humphries hasn't had much experience with wildlife in his illustrious career apart from working with a cinematographer whose nipple was bitten off by a koala that mistook it for a gumnut. However, he has had more experience than anyone else on the planet as Australia's most celebrated satirist. As our most ubiquitous commentator of the Australian character, he's used his wit and observation of detail to create a troupe of internationally recognised voices from the acerbic Dame Edna to the shameless Les Patterson. In adding his voice to the *Magical Land of Oz*, Barry Humphries brings humour, poignancy and awe to his own magical land.

Tosca Looby, Series Director Tosca Looby has had a long and glamorous career as creator of natural history and factual television for over two decades. Having gained her Masters in Journalism in London, she gave up her desk job for a more fragrant office in her Australian homeland. She has trained flies to juggle, crawled through dingo dens, been defecated on by eagles and made a time lapse of rotting corpses. As series director of Magical Land of Oz she has returned to the mud, the waiting, the failed attempts and even occasional successes that come with creating blue-chip natural history television in some of Australia's remotest and most beautiful locations. It's been a challenging but magical ride.








CURRICULUM LINKS

Magical Land of Oz is suitable for students undertaking:

- Science (Years 1–10)
- Humanities and Social Sciences (Years 1–7)
- Geography (Year 10)
- Mathematics (Years 7 and 8)

The cross-curricular priorities related to the series are:

- Sustainability
- Aboriginal and Torres Strait Islander Histories and Cultures

As a curriculum resource in Science, *Magical Land of Oz* is primarily relevant to the Biological Sciences strand of 'Science Understanding'. Investigations and observations suggested by the program allow students to develop 'Science Inquiry Skills', while connections to questions of sustainability and conservation ensures that this resource is also applicable to the 'Science as a Human Endeavour' criterion.

As a curriculum resource in Humanities and Social Science, *Magical Land of Oz* is primarily relevant to the Geography strand of 'Knowledge and Understanding'. The questions of habitats, conservation and human intervention also presents students with the opportunity for students to demonstrate the qualities described in the 'Inquiry and Skills' descriptor of this subject.

Teachers are advised to consult the Australian Curriculum online at <https://www.australiancurriculum.edu.au> and curriculum outlines relevant to their state or territory for further information.

Science

Years 1 and 2

Science Understanding:

- Living things have a variety of external features (ACSSU017)
- Living things live in different places where their needs are met (ACSSU211)
- Living things grow, change and have offspring similar to themselves (ACSSU030)

Science Inquiry Skills:

- Pose and respond to questions, and make predictions about familiar objects and events (ACSIS024/ACSIS037)
- Compare observations with those of others (ACSIS213/ACSIS041)
- Represent and communicate observations and ideas in a variety of ways (ACSIS029/ACSIS042)

Years 3 and 4

Science Understanding:

- Living things can be grouped on the basis of observable features and can be distinguished from non-living things (ACSSU044)
- Living things have life cycles (ACSSU072)
- Living things depend on each other and the environment to survive (ACSSU073)

Science as a Human Endeavour:

- Science knowledge helps people to understand the effect of their actions (ACSHE051/ACSHE062)

Science Inquiry Skills:

- With guidance, identify questions in familiar contexts that can be investigated scientifically and make predictions based on prior knowledge (ACSIS053/ACSIS064)
- Use a range of methods including tables and simple column graphs to represent data and to identify patterns and trends (ACSIS057/ACSIS068)
- Represent and communicate observations, ideas and findings using formal and informal representations (ACSIS060/ACSIS071)

Years 5 and 6

Science Understanding:

- Living things have structural features and adaptations that help them to survive in their environment (ACSSU043)
- The growth and survival of living things are affected by physical conditions of their environment (ACSSU094)

Science as a Human Endeavour:

- Scientific knowledge is used to solve problems and inform personal and community decisions (ACSHE083/ACSHE100)

Science Inquiry Skills:

- With guidance, pose clarifying questions and make predictions about scientific investigations (ACSIS231/ACSIS232)
- Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate (ACSIS090/ACSIS107)
- Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts (ACSIS093/ACSIS110)

Year 7

Science Understanding:

- Classification helps organise the diverse group of organisms (ACSSU111)

Science as a Human Endeavour:

- 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:

- Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (ACSIS124)
- Use scientific knowledge and findings from investigations to evaluate claims based on evidence (ACSIS132)
- Communicate ideas, findings and evidence based solutions to problems using scientific language, and representations, using digital technologies as appropriate (ACSIS133)

Years 9 and 10

Science Understanding:

- Multi-cellular organisms rely on coordinated and interdependent internal systems to respond to changes to their environment (ACSSU175)
- Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems (ACSSU176)
- The theory of evolution by natural selection explains the diversity of living things and is supported by a range of scientific evidence (ACSSU185)

Science as a Human Endeavour:

- Values and needs of contemporary society can influence the focus of scientific research (ACSHE228/ACSHE230)

Science Inquiry Skills:

- Formulate questions or hypotheses that can be investigated scientifically (ACSIS164/ACSIS198)
- Critically analyse the validity of information in primary and secondary sources and evaluate the approaches used to solve problems (ACSIS172/ACSIS206)
- Communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations (ACSIS174/ACSIS208)

Humanities and Social Sciences

Years 1 and 2

Inquiry and Skills:

- Pose questions about past and present objects, people, places and events (ACHASSI018/ACHASSI034)
- Explore a point of view (ACHASSI022/ACHASSI038)
- Draw simple conclusions based on discussions, observations and information displayed in pictures and texts and on maps (ACHASSI025/ACHASSI041)
- Present narratives, information and findings in oral, graphic and written forms using simple terms to denote

the passing of time and to describe direction and location (ACHASSI027/ACHASSI043)

Knowledge and Understanding (Geography):

- The weather and seasons of places and the ways in which different cultural groups, including Aboriginal and Torres Strait Islander Peoples, describe them (ACHASSK032)
- The ways in which Aboriginal and Torres Strait Islander Peoples maintain special connections to particular Country/Place (ACHASSK049)

Years 3 and 4

Inquiry and Skills:

- Pose questions to investigate people, events, places and issues (ACHASSI052/ACHASSI073)
- Interpret data and information displayed in different formats, to identify and describe distributions and simple patterns (ACHASSI057/ACHASSI078)
- Draw simple conclusions based on analysis of information and data (ACHASSI058/ACHASSI079)
- Interact with others with respect to share points of view (ACHASSI059/ACHASSI080)
- Present ideas, findings and conclusions in texts and modes that incorporate digital and non-digital representations and discipline-specific terms (ACHASSI061/ACHASSI082)

Knowledge and Understanding (Geography):

- The main climate types of the world and the similarities and differences between the climates of different places (ACHASSK068)
- The importance of environments, including natural vegetation, to animals and people (ACHASSK088)
- The custodial responsibility Aboriginal and Torres Strait Islander Peoples have for Country/Place, and how this influences views about sustainability (ACHASSK089)

Years 5 and 6

Inquiry and Skills:

- Develop appropriate questions to guide an inquiry about people, events, developments, places, systems and challenges (ACHASSI094/ACHASSI122)
- Examine primary sources and secondary sources to determine their origin and purpose (ACHASSI098/ACHASSI126)
- Examine different viewpoints on actions, events, issues and phenomena in the past and present (ACHASSI099/ACHASSI127)
- Evaluate evidence to draw conclusions (ACHASSI101/ACHASSI129)
- Work in groups to generate responses to issues and challenges (ACHASSI102/ACHASSI130)
- Reflect on learning to propose personal and/or collective action in response to an issue or challenge, and predict the probable effects (ACHASSI104/ACHASSI132)
- Present ideas, findings, viewpoints and conclusions in a range of texts and modes that incorporate source materials, digital and non-digital representations and discipline-specific terms and conventions (ACHASSI105/ACHASSI133)

Knowledge and Understanding (Geography):

- The influence of people, including Aboriginal and Torres Strait Islander Peoples, on the environmental characteristics of Australian places (ACHASSK112)
- The environmental and human influences on the location and characteristics of a place and the management of spaces within them (ACHASSK113)
- The impact of bushfires or floods on environments and communities, and how people can respond (ACHASSK114)
- The world's cultural diversity, including that of its indigenous peoples (ACHASSK140)

Year 7

Inquiry and Skills:

- Construct significant questions and propositions to guide investigations about people, events, developments, places, systems and challenges (ACHASSI152)
- Analyse primary sources and secondary sources to identify values and perspectives on people, actions, events, issues and phenomena, past and present (ACHASSI157)
- Interpret and analyse data and information displayed in a range of formats to identify and propose explanations for distributions, patterns, trends and relationships (ACHASSI158)
- Evaluate and synthesise evidence to draw conclusions (ACHASSI159)
- Collaborate to generate alternatives in response to an issue or challenge, and compare the potential costs and benefits of each (ACHASSI160)
- Develop and use criteria to make informed decisions and judgements (ACHASSI161)
- Reflect on learning to propose personal and/or collective action in response to an issue or challenge, taking into account different perspectives, and describe the expected effects (ACHASSI162)
- Present ideas, findings, viewpoints, explanations and conclusions in a range of texts and modes that incorporate source materials, citations, graphic representations and discipline-specific terms, conventions and concepts (ACHASSI163)

Knowledge and Understanding (Geography):

- Causes, impacts and responses to an atmospheric or hydrological hazard (ACHASSK187)
- The influence of environmental quality on the liveability of places (ACHASSK190)

Geography

Year 10

Geographical Knowledge and Understanding (Unit 1: 'Environmental change and management'):

- Human-induced environmental changes that challenge sustainability (ACHGK070)
- Environmental world views of people and their implications for environmental management (ACHGK071)
- The Aboriginal and Torres Strait Islander Peoples' approaches to custodial responsibility and environmental management in different regions of Australia (ACHGK072)
- The application of systems thinking to understanding the causes and likely consequences of the environmental change being investigated (ACHGK073)
- The application of geographical concepts and methods to the management of the environmental change being investigated (ACHGK074)
- The application of environmental economic and social criteria in evaluating management responses to the change (ACHGK075)

Geographical Inquiry and Skills

- Develop geographically significant questions and plan an inquiry that identifies and applies appropriate geographical methodologies and concepts (ACHGS072)
- Apply geographical concepts to synthesise information from various sources and draw conclusions based on the analysis of data and information, taking into account alternative points of view (ACHGS077)
- Present findings, arguments and explanations in a range of appropriate communication forms, selected for their effectiveness and to suit audience and purpose; using relevant geographical terminology, and digital technologies as appropriate (ACHGS079)
- Reflect on and evaluate findings of an inquiry to propose individual and collective action in response to a contemporary geographical challenge, taking account of environmental, economic, political and social considerations; and explain the predicted outcomes and consequences of their proposal (ACHGS080)

Mathematics

Year 7

Number and Algebra:

- Given coordinates, plot points on the Cartesian plane, and find coordinates for a given point (ACMNA178)
- Solve simple linear equations (ACMNA179)
- Investigate, interpret and analyse graphs from authentic data (ACMNA180)

Year 8

Number and Algebra:

- Plot linear relationships on the Cartesian plane with and without the use of digital technologies (ACMNA193)

Statistics and Probability

- Investigate techniques for collecting data, including census, sampling and observation (ACMSP284)

Cross-curricular Priorities

Aboriginal and Torres Strait Islander Histories and Cultures

- Aboriginal and Torres Strait Islander communities maintain a special connection to and responsibility for Country/Place.
- Aboriginal and Torres Strait Islander Peoples have holistic belief systems and are spiritually and intellectually connected to the land, sea, sky and waterways.
- The significant contributions of Aboriginal Peoples and Torres Strait Islander Peoples in the present and past are acknowledged locally, nationally and globally.

Sustainability

- The biosphere is a dynamic system providing conditions that sustain life on Earth.
- All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing and survival.
- Sustainable patterns of living rely on the interdependence of healthy social, economic and ecological systems.
- World views that recognise the dependence of living things on healthy ecosystems, and value diversity and social justice, are essential for achieving sustainability.
- World views are formed by experiences at personal, local, national and global levels, and are linked to individual and community actions for sustainability.
- The sustainability of ecological, social and economic systems is achieved through informed individual and community action that values local and global equity and fairness across generations into the future.
- Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments.
- Designing action for sustainability requires an evaluation of past practices, the assessment of scientific and technological developments, and balanced judgements based on projected future economic, social and environmental impacts.
- Sustainable futures result from actions designed to preserve and/or restore the quality and uniqueness of environments.

EDUCATIONAL CONTEXT

The activities in this study guide are largely intended for students who have watched all three episodes of *Magical Land of Oz.* Some activities – 'Exploring the Magical Land of Oz', 'Hidey Holes' and 'Gettin' Around' – are best introduced or partially completed over the course of watching the program.

Most activities in this study guide are pitched at a secondary audience; however, the majority of these activities can be adjusted, scaffolded or simplified to suit younger students as identified in the preceding 'Curriculum Links' section.

VIEWING ACTIVITIES

* Exploring the Magical Land of Oz

While watching *Magical Land of Oz,* complete the table on the following page.

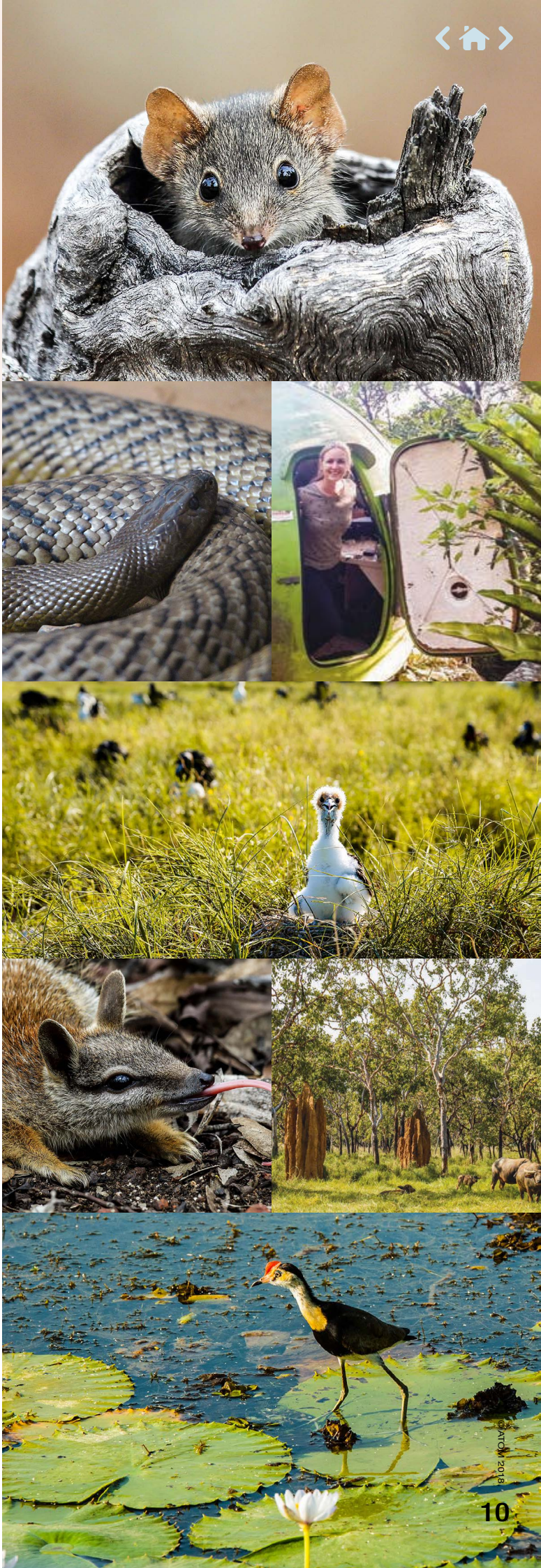
jump to Table

Under the heading '**MAGICAL FACTS**', identify the information about the animal shown in the episode: its features, its habitat, its behaviour – and anything else of interest. Highlight a single 'fantastic fact' of these observations.

Under the heading '**HUMAN IMPACT**', identify the impact humans have had – or continue to have – on this animal's lifestyle. This may be based on information shown in the program, your own knowledge or a suggestion based on your knowledge of the animal's behaviour and habitat.

Under the heading '**FURTHER EXPLORATION**', write down a question you have about this animal that is not addressed or answered in the episode.

After completing this table, pick two animals (from two different episodes) and research the answer to the question(s) that you have about this animal. Share your discoveries with your peers.



	Animal	Magical Facts	Human Impact	Further Exploration
OCEANS	Dusky shark			
	Australian sea lion			
	Bottlenose dolphin			
	Gould's petrel			
	Green sea turtle			
LAND	Echidna/ platypus			
	Eastern grey kangaroo			
	Numbat			
	Electus parrot			
	Diving tarantula			
HUMAN IMPACT	Brushtail possum			
	Peacock spider			
	Red fox			
	Dingoes			
	Yellowtail grunters			

Magical Monsters

Shark Attack?

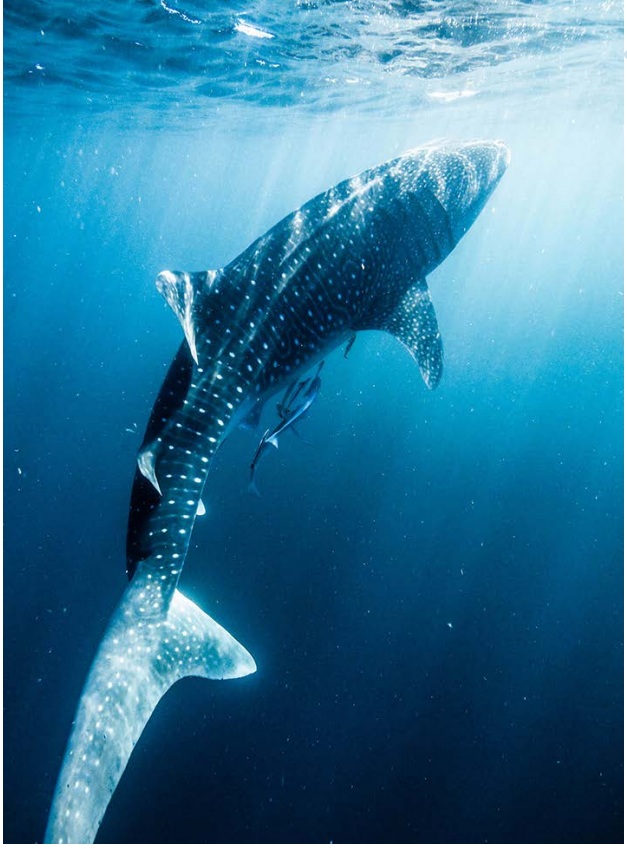
In the first episode, 'Oceans', Humphries explains that 'There are 375 shark species in the world, yet only three are responsible for most human attacks. Dusky sharks are not among them.' These three – 'the Big Three', according to a Florida Museum resource chronicling shark attacks on humans <https://www.floridamuseum.ufl.edu/shark-attacks/factors/species-implicated/> – are the white, tiger and bull sharks.

Yet, thanks to movies like *Jaws* and *47 Metres Down*, and alarmist media coverage of local shark attacks, most sharks are perceived with fear and trepidation by the general populace.

- Write an opinion piece that would be suitable for a blog or newspaper arguing that the threat of sharks is exaggerated. Compare statistics of shark attacks (such as those in the aforementioned Florida Museum resource) to day-to-day dangers faced in normal life to justify your argument.

Shark culls are a common, if controversial, reaction by Australian state governments to shark attacks. Example articles are the following:

- 'Qld govt stands by shark cull decision', *SBS News,* <https://www.sbs.com.au/news/qld-govt-stands-by-shark-cull-decision>, 24 September 2018
- 'Shark population 'explosion' needs culling 'just like pigs and kangaroos', says Rob Katter', *ABC News,* <https://www.abc.net.au/news/2018-11-08/just-like-pigs-and-roos-rob-katter-calls-for-shark-cull/10479232>, 8 November 2018



However, such culls have increasingly become the subject of heated debate, with public opinion appearing to turn against the practice, as evidenced by this 2017 article:

- Thomas Wynter, 'Tide turned: surveys show the public has lost its appetite for shark culls', *The Conversation,* <http://theconversation.com/tide-turned-surveys-show-the-public-has-lost-its-appetite-for-shark-culls-89163>, 18 December 2017

Construct an argument that shark culls are either necessary or unnecessary, supporting your viewpoint with appropriately referenced facts and a judicious use of emotive language. At your teacher's discretion, you may wish to frame this as a persuasive essay or conduct a formal debate in your class.

Useful resource: <https://www.abc.net.au/news/2019-01-23/how-shark-infested-is-brisbane-river/10731866

Creepy Crawlies

For most of us, spiders are, if not totally terrifying, then certainly more than a little creepy. However the *Magical Land of Oz* shows that these arcane arachnids have their own magical charms, whether the colourful mating rituals of the resplendent peacock spiders or the diving tarantula's fantastical ability to survive floodwaters.

- Produce a multimodal presentation to convince the sceptics that spiders are beautiful rather than fatal; terrific rather than terrible. Your presentation should incorporate as many visual elements as possible to emphasise the aesthetic appeal of the humble spider, but you may also want to explain the important role spiders play in their ecosystems.

One of the more fascinating creatures showcased in *Magical Land of Oz* is the diving tarantula. As Humphries intones, 'their discovery is so recent they are yet to be officially named by science.' The tarantula was in fact discovered by students at the Maningrida Community College working with local Djelk rangers, as detailed in this article:

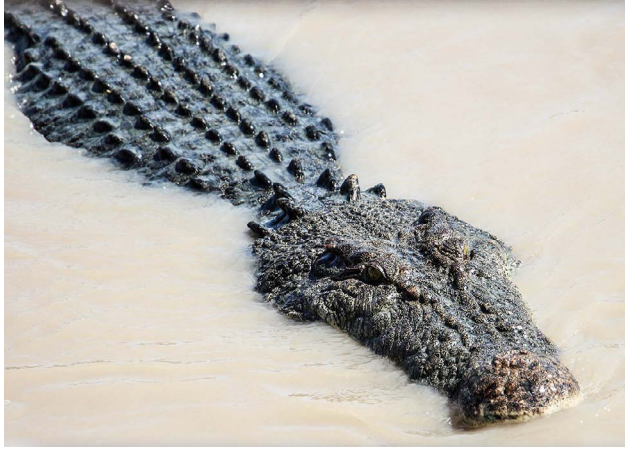
- 'What is hairy, has eight legs, and breathes underwater?', *Northern Territory Department of Education,* <https://education.nt.gov.au/news/2018/what-is-hairy,-has-eight-legs,-and-breathes-underwater/>, 8 March 2018
- What role do the Djelk rangers play in the Maningrida region? Research if there is a similar Indigenous land management program operating in or around your area.

In the 'Land' episode, it is briefly explained that the diving tarantulas are able to survive up to four months of flood conditions underwater by using their 'hairy coat [to trap] air bubbles.'

- Explain how the surface tension of water would allow this phenomenon to occur.
- *Magical Land of Oz* states that 'it's assumed [that diving tarantulas will] remain submerged for the next four months.' Is this a realistic supposition, or would the tarantulas need to resurface more often? Support your conclusion with scientific reasoning and research.

Useful resources:

- https://www.bawinanga.com/what-we-do/djelk-rangers/
- http://www.abc.net.au/news/2015-06-21/spider-expert-hails-medicinal-possibilities-from-nt-tarantulas/6560978/
- https://www.livescience.com/14517-diving-bell-spiders-underwater-bubbles.html
- https://www.adelaide.edu.au/news/news46181.html



Saltwater Monsters

The crocodiles showcased in *Magical Land of Oz* are as much prey as fearsome predator. Fed upon by march flies, they are unable to fully shake them off because of a 'a distinct design fault': short legs that can't reach to defend themselves from the incessant insects.

- What advantage is offered to the crocodiles by their short legs that would allow them to develop with this apparent evolutionary disadvantage?
- Research an apparent 'design fault' in the human body, like those detailed at <https://www.gizmodo.com.au/2016/04/the-most-unfortunate-design-flaws-in-the-human-body/>, and discuss why it might have developed and how to mitigate the drawbacks of this anatomical feature.

Like sharks and spiders, crocodiles are regarded as fierce and fearsome (particularly by the likes of Bob Katter). In the 'Land' episode, the threat presented by crocs is underlined by the river guide's ominous monologue:

Life Jackets. They're situated up there. I'm not going to show you how to put one on. Does anyone know why? Crocodiles are attracted to bright colours, ok. And splashing. So, there's about 5000 crocodiles in this river so you won't have time to drown anyway.

For all the danger associated with crocodiles, this segment reminds us of their contribution to the Australian tourism industry, as evidenced by their pride of place on the Australian tourism website: <https://www.australia.com/en/places/darwin-and-surrounds/where-to-see-crocodiles.html>

- Write a fully referenced report comparing the benefits of crocodiles to the Australian economy versus the dangers they present to local communities, drawing a conclusion about whether they have an overall positive or negative impact on the nation.

Cannibalistic Crabs

One of the more gruesome images in *Magical Land of Oz* is found in its first episode, where hungry spider crabs tear the limbs from a moulting member of their species.

- What other animals demonstrate cannibalistic behaviour in the wild?
- What are the benefits of cannibalism for these species?
- Why is it surprising that some animals would eat their own kind?

Useful resource: <https://www.wired.com/2015/01/animal-cannibalism/>

* Animal House: Hidey Holes

Throughout the *Magical Land of Oz,* a number of animals are seen searching for safe homes, scurrying in burrows or carving out nests for their offspring. Complete this table for the four nominated animals and two others seen in the program of your choice.

Animal	Location of their 'home'	Features of their 'home'	Sketch of their 'home'
Cuttlefish			
Numbat			
Brushtail possum			
Gould's petrel			
Choose your own			
Choose your own			

into a makeshift den, and water dragons 'have become "metropolitan" dragons – not just with a lifestyle change, but genetically distinct from their wild cousins.'

- Choose one of these animals or another Australian animal thriving in human environments, and explore how they have adapted to succeed under these conditions.

Magical Land of Oz explains that the eastern water dragons 'are Australia's most surprising example of rapid evolution, driven almost entirely by the changing environment.'

Read the following article, then answer the questions below:

- 'These water dragons are 'evolving at a pace we can witness", *ABC News,* <https://www.abc.net.au/news/2018-02-10/water-dragons-are-evolving-at-a-pace-we-can-witness/9415990/>, 13 February 2018.
- Why is the complex social behaviour of the water dragons surprising to scientists?
- Water dragons are described in the article as 'polyandrous'. What does this mean?

Animal Homes: Adapting to New Roommates

'Large kangaroos are among the very few native animals to benefit from land clearing and the decline of Australia's apex predators,' explains Humphries in the 'Land' episode.

Indeed, the kangaroo population has been thriving in recent years; at the time of writing there are roughly twice as many kangaroos in Australia as people.

- Why do large kangaroos like the eastern grey kangaroo benefit from land clearing across Australia?
- What impact has the increase in the kangaroo population had on the wider Australian ecosystem and the human population?
- Currently Australia has a range of systems in place to control the kangaroo population. Research the details of these interventions, listing their positive and negative impacts on the environment.

Kangaroos are not the only animals seen in *Magical Land of Oz* to thrive – or, at least, survive – in the new frontiers carved out across a post-colonised Australia. As seen in the 'Human Shift' episode, urban brushtail possums 'enjoy an all-you-can-eat smorgasbord courtesy of Melbourne's tourists', dingoes turn a shale heap above a mining site

- What do water dragons eat?
- Dr Frere describes city environments as 'the archipelagos of the Anthropocene.' What does this phrase mean? (You may need to do further research.)
- What are the morphological differences found between water dragons in different parks in Brisbane?
- What does it mean when the article states that 'They are starting to move away from being water dragons, and starting to be something else.'
- What are the behavioural differences between urban and non-urban dragons?

After reading this article, you may wish to view the linked videos at <https://www.abc.net.au/news/wildoz/>, which include archived footage of cameras that were fixed around Brisbane in 2018 to livestream animal behaviour in the city.

Useful resources:

- http://www.abc.net.au/news/rural/2017-09-29/kangaroo-management-fails-farmers-inrecord-roo-numbers/8993148/
- https://theconversation.com/new-evidence-culling-kangaroos-could-help-the-environment-30795/
- http://www.abc.net.au/news/2018-08-28/dingoes-will-no-longer-be-native-animals-in-western-australia/10172448/
- https://www.brisbanetimes.com.au/national/queensland/some-brisbane-reptiles-double-in-size-because-of-which-park-they-live-in-study-20170427-gvtnev.html

Introduced Species

Before rabbits were introduced to Australia, and so much native bushland was removed, it was small native animals which had the run of the land.
Where Australia's ecosystems are left intact, animals thrive. Simple as that.

Magical Land of Oz mentions a couple of introduced species prominently: rabbits – primarily as a food source for the wedge-tailed eagle – and foxes, which 'shoulder the blame for Australia's appalling record of mammal extinctions.'

- What are the impacts of foxes and rabbits on Australia's ecosystem?
- What systems have Australian governments and organisations used to manage or control the populations of these animals?
- Choose another introduced species in Australia, research its history and impact on the ecosystems in which it is found, and write a proposal for an intervention to manage the risk to Australian native species.

Floods and Fires

The 'Land' episode of *Magical Land of Oz* takes its viewers to Australia's monsoon regions, an environment that, according to the narration, 'see-saws between two extremes: the floods of the summer's wet season and raging fires which can take hold – burning for months – through the region's parched winters.'

Humphries also notes that 'these extremes […] have helped sculpt' the landscape of the tropical savannah, a region that stretches across the north coast of Australia.

- Identify three ways in which the ecosystem of this region is influenced by these extreme conditions, with a particular focus on the fauna found within its bounds.

Fires are a feature found all across Australia – not always accidentally. This is seen later in the same episode, as Indigenous rangers in Central Arnhem Land – the north-eastern corner of the Northern Territory – light fires to 'prevent uncontrollable wildfires later in the season.'

Watch the 5.31 video, 'Fighting carbon with fire, Arnhem Land, Australia', from UN University <https://www.youtube.com/watch?v=Qfjw5Vts8hQ/> then read this Creative Spirits page on fire management: <https://www.creativespirits.info/aboriginalculture/land/aboriginal-fire-management/>.

Answer the following questions individually, sharing your responses with your class afterwards:

- In the UN University video, Aboriginal fire ecologist Dean Yibarbuk argues that 'We haven't been here managing fire, so destructive fires have come.' How does the practice of Aboriginal fire management reduce the risk and frequency of the 'uncontrollable wildfires' alluded to in *Magical Land of Oz*?
- Yibarbuk explains that 'hot fires' have killed trees in the region. This is in comparison to the cool fires set in traditional fire management. Explain the difference between a 'hot fire' and a 'cool fire' and the necessary conditions for a cool fire.
- 'Working with scientists,' says Yibarbuk, 'we can bring what they know, together with the knowledge of our older people who remember how it was before.' Research two other examples where modern science has been enriched by the traditional knowledge of Australian Aboriginal culture.
- The video concludes with an intertitle explaining that Aboriginal fire management can reduce carbon emissions by hundreds of thousands of tonnes. How can this practice reduce greenhouse gas emissions?

Useful resource: <https://coolaustralia.org/wp-content/uploads/2014/01/Australiantropicalsavannafactsheet.pdf>

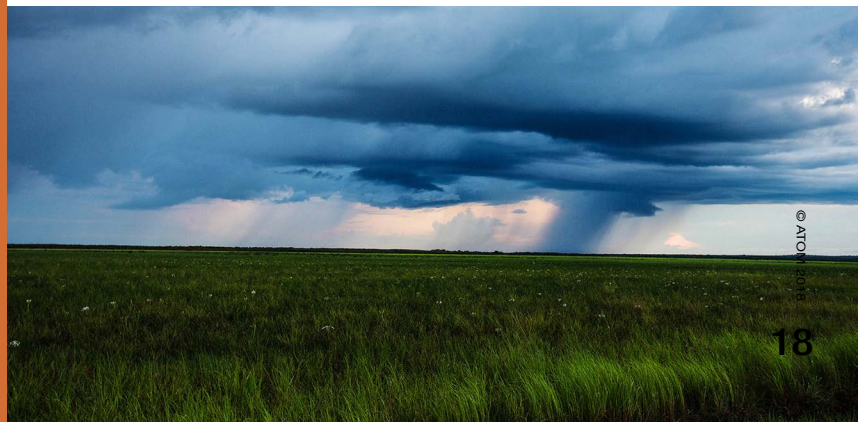
Curiouser and Curiouser

White Whales

In the 'Oceans' episode of *Magical Land of Oz,* we are introduced to the famous Migaloo: a pale humpback whale whose colour 'is most likely due to rare genetic mutation'. That supposition is borne out from the white whale calves found in the years since Migaloo's discovery (in 1991), which the narration suggests are perhaps the white whale's offspring.

- What is the rare genetic disorder being referred to in the *Magical Land of Oz*? (Research your answer rather than jumping to conclusions.)
- If Migaloo does, in fact, have this disorder, is it reasonable to conclude that he fathered the newborn white whales found in Pacific around Australia and New Zealand? What is the likelihood that the offspring of Migaloo and another whale would have this condition?
- Migaloo is described as being 'in his prime' at thirty-two years old. How old do humpback whales usually live? Is it reasonable to describe him being in his prime at this age?
- Migaloo's name is taken from an Aboriginal dialect. What other Australian animals' names are taken from Australian Indigenous languages?
- Migaloo has been given special protection under Australian legislation due to his uniqueness. Any vessel coming within 500 metres of Migaloo is subject to a significant fine of A$16,500. What are the protections, if any, offered to normal whales in Australian waters?

Useful resource: <https://www.australiangeographic.com.au/topics/wildlife/2017/07/20-facts-about-migaloo-the-white-whale/>



The Ultimate Mashup

The platypus has long been one of Australia's most fascinating creatures. Humphries compares the monotreme to lizards, otters and ducks, noting that 'the combination works – the platypus has remained unchanged for in Australia for 25 million years.'

- Create an educational poster aimed at a primary student audience identifying the unique features of the platypus and how they aid in its survival.

Gettin' Around

'Birds migrate to cope with the dramatic pulses of the wet and dry,' explains Humphries. 'Other creatures do not have this luxury, unable to move with the seasons… they must stay and face the elements.'

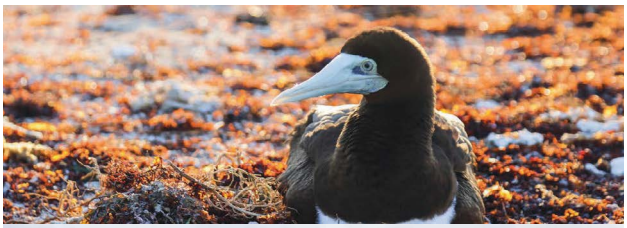
But contrary to this narration, animal migration is not the exclusive domain of birds. That's seen most memorably in 'Human Shift', the third episode of *Magical Land of Oz,* where yellowtail grunters seize upon flash flooding in the Great Sandy Desert to carve out new territory – by literally swimming across a waterlogged road!

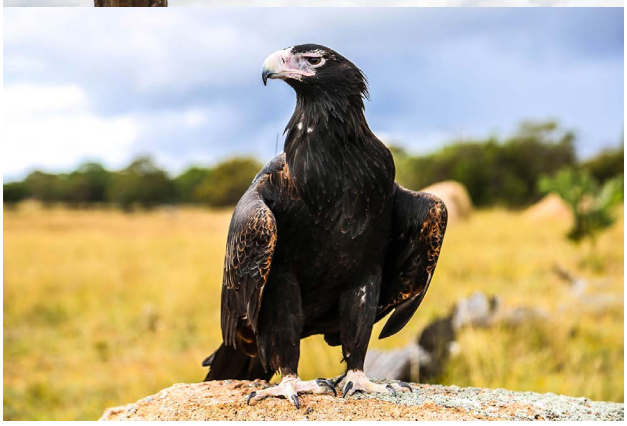
- Identify three other examples of migration witnessed in the *Magical Land of Oz.*

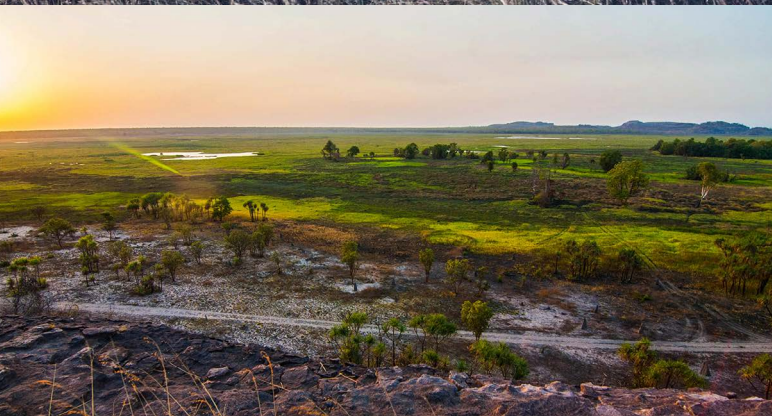
Marine migration is not restricted to fish fearlessly flinging themselves across an inundated highway; as seen in the 'Oceans' episode of this program, many oceanic animals adopt a nomadic lifestyle of sorts. Spider crabs 'migrate to the shallows each winter – not to mate, but to moult' while humpback whales traverse the so-called Humpback Highway between Antarctica and the Great Barrier Reef. The green sea turtles have their own highway, 'a passageway for tropical water to flow' between Asia and Australia (a version of which was memorably featured in *Finding Nemo*).

- Choose a marine animal – whether spider crabs, humpback whales, sea turtles or another animal of your choice – and explore its migration patterns, including the geological conditions underwater (e.g. the Humpback Highway) that allow this migration to occur.

Present your findings in a presentation that includes a map plotting a representative migration pattern for the chosen animal.







Birds' Brains

Us humans tend to position ourselves atop the pyramid of Earth's animals. After all, aren't we smarter, fitter, generally better looking than our less primitive peers in the animal kingdom? And the one attribute that we lord over our fellow species is our tools.

Yet humans aren't the only species to craft and use tools. A Live Science article <https://www.livescience.com/9761-10-animals-tools.html> lists ten animals also known to use tools – among them chimpanzees, elephants, dolphins and octopuses – and it's hardly an exhaustive list.

- Choose one of the animals from the Live Science list and research what tools they use and how they are used. Try to find a video of these tools in use.
- What other animals are known to use tools? Is it reasonable to conclude that the animals who use tools are more intelligent than those that don't?

'Birdbrain' might be an antiquated insult for someone of below-average intelligence, but *Magical Land of Oz* showcases a pair of bird species with some real ingenuity.

The first is the palm cockatoo, affectionately nicknamed 'Palmy'. Not only does this bird use tools, it uses them to make music, tapping out 'regular beats to [their] own particular rhythm' with a makeshift drumstick in what is thought to be a mating ritual. The narration posits that it's the 'most intelligent' bird in Australia, as evidenced by its brain to body ratio.

But is this a reliable measure of intelligence?

- Research the average body and brain mass of a selection of animals, and plot these values on a scatterplot. Note any observations and plot a line of best fit. What do you notice about the anomalies: do these animals appear to be more or less intelligent than the others chosen? Draw a conclusion about the effectiveness of the brain to body ratio in approximating a species' intelligence.
- **Extension activity:** A more effective measurement used to understand animal intelligence based on their anatomy is the 'encephalisation quotient'. Research this measure and apply it, where possible, to the data collected above.

Another bird observed using tools is the 'firebird' or 'karrkkanj', which spreads fire by carrying burning branches to new areas.

- Why does the firebird spread fires? Suggest how this behaviour might have evolved.
- What is the history and cultural importance of the karrkkanj in Aboriginal culture?

Useful resources:

- https://theconversation.com/what-makes-an-animal-clever-research-shows-intelligence-is-not-just-about-using-tools-76531/
- https://www.australiangeographic.com.au/news/2009/12/palm-cockatoos-drum-to-their-own-beat/
- https://www.sciencedirect.com/topics/neuroscience/encephalization-quotient/
- https://news.nationalgeographic.com/2018/01/wildfires-birds-animals-australia/
- https://www.australiangeographic.com.au/news/2018/01/this-is-why-aussie-firehawk-raptors-are-spreading-bushfires/

The Conservation Imperative

March of the Penguins

In the final minutes of 'Human Shift', we visit Phillip Island, a popular tourist destination near Melbourne. After learning of the perilous conditions facing local penguins, there's a rare happy ending! We learn that the penguins are thriving 'after pioneering conservation efforts [are] put in place to keep the nesting birds safe from harm's way.'

Magical Land of Oz goes on to detail how 180 holiday homes were removed from the area, tripling the penguin population since the 1980s and ultimately accommodating a successful tourism industry built around the adorable monochrome birds.

- Write two letters to the local Phillip Island newspaper's editor, each with a different perspective. In the first, argue for the continuation of the penguin conservation efforts, detailing their benefits to the economy and the environment. In the second, argue against these efforts, from the perspective of an aggrieved resident.

Useful resource: <https://www.penguins.org.au/conservation/>

Cuddly Koalas

After observing farmer Rob Frend's attempts to assist his local wildlife population, the challenges facing koalas – brought on by land clearing, climate change and various man-made impacts on their environment – are made starkly clear.

In New South Wales, koalas are on track for extinction by 2050. […] To turn the koala story around will require a national recovery plan; one that recognises the value of a single, incomparable species.

- Write a detailed proposal for such a national recovery plan. This plan should be well-researched, appropriately referenced and written in the appropriate genre. This report should include:
- an introduction clarifying the importance of koalas to Australia;
- identification of the risks facing the koala population and their causes;
- a specific, step-by-step strategy to address the most significant of these risks; and
- identification of the challenges and costs associated with this strategy, taking into account different perspectives and describing the expected effects.

The Heat Is On

The dangers facing Australia's wildlife – from koalas to penguins – have many causes, but one of the key culprits is undeniably climate change. *Magical Land of Oz* suggests that Australia's climate is particularly susceptible, 'changing more dramatically here than in many other parts of the world.'

That claim is supported by figures from the CSIRO and the Australian Bureau of Meteorology that suggest Australia could be on track for a temperature rise of more than 5°C by the end of the century, outstripping the rate of warming experienced by the rest of the world.

- Research the temperature for Australia (or your local region) over recent history and compare it to global temperatures. Do you notice any significant differences between the trends observed locally and globally?
- What are the effects of climate change on Australian wildlife?





AUSTRALIAN TEACHERS OF MEDIA

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