

# Sharing Noongar Knowledge

Education resource for schools

May 2018



This resource has been developed for the Northern Agricultural Catchments Council (NACC) by Kate Naughtin with editing support by Patrick Witton.

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# ACKNOWLEDGEMENTS

## THE NOONGAR PEOPLE

This project acknowledges the Noongar people and recognises Aboriginal people as Australia's first natural resource managers.

The Noongar people have developed, refined and employed knowledge of the natural environment for tens of thousands of years, and this knowledge has been passed down from generation to generation. This traditional ecological knowledge is extremely valuable in enhancing the ways we care for our environment.

Noongar community members have generously shared their knowledge in the development of this resource, so that school-aged students will better understand Aboriginal culture, the environment and the importance of caring for it. Without the valuable contribution of the Noongar community, this project would not have been possible. We thank them for sharing their time and expertise for this project.

## PROJECT SUPPORT

This project has been supported by funding from the Western Australian Government's State National Resource Management Program, supported by Royalties for Regions.

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(Upper Primary and Lower Secondary only)

# ABOUT THIS RESOURCE

This resource has been designed for teachers and students in the Northern Agricultural Region (NAR) of Western Australia. The resource aims to: highlight the unique connection that Aboriginal people have to the land, sea, sky and waterways; impart traditional ecological knowledge; explore the ways Aboriginal people care for Country; and highlight changes to the environment that have occurred since colonisation. The resource draws on examples from the South West region and beyond.

This resource focuses on the Noongar people. A similar education resource has been developed based on Yamaji knowledge and culture which can be accessed at: <https://www.nacc.com.au/project/education>



## WESTERN AUSTRALIAN CURRICULUM LINKS

The resource aligns with the Western Australian curriculum: *Humanities and Social Studies*, and *Science* for students in Pre-primary to Year 9; and the cross-curriculum priorities: *Aboriginal and Torres Strait Islander Histories and Culture* and *Culture and Sustainability*. Curriculum links can be found at the beginning of each topic.

## TOPICS

1. The Noongar people
2. Connection to Country
3. Bush food
4. Traditional ecological knowledge
5. Caring for Country
6. Changes to the environment post-colonisation (Upper Primary and Lower Secondary only)

## HOW TO USE THIS RESOURCE

Topics in this resource are best taught in sequence, however they can also be taught as individual topics if time is limited.

## EACH TOPIC INCLUDES:

- **Western Australian curriculum connections** – for students in pre-primary to Year 9.
- **An introduction** – includes background information for each topic.
- **Activities** – developed for Lower Primary, Upper Primary and Lower Secondary students.
- **Going further** – provides optional activities for extension, excursions or incursions.
- **Reflect** – provides opportunities for students to consider what they have learned.
- **Additional resources** – includes a list of relevant resources. Local resources have been provided where possible.

## SOURCES

Noongar community members have generously shared their time, knowledge and feedback to help develop this resource. Other sources are listed in 'Additional resources' sections at the end of each topic.

## ENGAGING ABORIGINAL COMMUNITY MEMBERS

Local Aboriginal people hold a wealth of information about the land, sea, sky and waterways that has been passed down from generation to generation for thousands of years. When teaching with this resource, it is vital that Aboriginal community members are invited to share their knowledge, either on Country or in the classroom. Speak with your school managers to ensure that such participants are appropriately remunerated for their time. Schools can contact the Aboriginal Liaison Officer at the Northern Agricultural Catchments Council (NACC) for contact details of Traditional Owners in the NACC NRM Region.

## TEACHING ABORIGINAL STUDENTS

Aboriginal students may or may not want to share their knowledge of Country with the class. For this reason, all students should be given the opportunity to share what they know and what they would like to know throughout lessons, without a focus on Aboriginal students. This resource is for all students.

## PROMOTING RESPECTFUL DISCUSSIONS

Create a safe place for discussion in your classroom by setting some ground rules, or conducting an activity such as 'what respectful discussions look like, feel like and sound like'.

## SMALL GROUP DISCUSSION

Many of the activities in this resource use small group discussion as a tool for sharing and learning from each other. Three to four students in a group is ideal. It may be advantageous to stay with the same group for each topic or the entire resource.

## SUSTAINABILITY

This resource focuses on discussion, hands-on exercises and experiential activities. Efforts have been made to reduce paper. Please re-use paper where possible and limit the use of single-use plastics.

# THE NOONGAR PEOPLE

YEAR	WESTERN AUSTRALIAN CURRICULUM CONNECTIONS	
Pre-Primary	Humanities and Social Sciences The reasons some places are special to people and how they can be looked after, including Aboriginal and Torres Strait Islander Peoples' places of significance ( <a href="#">ACHASSK017</a> ) ( <a href="#">ACHASSK016</a> )	Humanities and Social Sciences How the stories of families and the past can be communicated and passed down from generation to generation (e.g. photographs, artefacts, books, oral histories, digital media, museums) and how the stories may differ, depending on who is telling them ( <a href="#">ACHASSK013</a> )
Year 2	Humanities and Social Sciences The importance today of an historical site (e.g. community building, landmark, war memorial, rock painting, engraving) and why it has heritage significance and cultural value for present generations (e.g. a record of a significant historical event, aesthetic value, reflects the community's identity) ( <a href="#">ACHASSK045</a> )	
Year 3	Humanities and Social Sciences Language groups of Australia's Aboriginal and Torres Strait Islander Peoples divides their Country/Place and differs from the surveyed boundaries of Australian states ( <a href="#">ACHASSK066</a> )	
Year 4	Humanities and Social Sciences The diversity and longevity of Australia's first peoples and the ways they are connected to Country/Place (e.g. land, sea, waterways, skies) and their pre-contact ways of life ( <a href="#">ACHASSK083</a> )	
Year 7	Humanities and Social Sciences How historians and archaeologists investigate history, including excavation and archival research ( <a href="#">ACDSEH001</a> )	
Year 8	Humanities and Social Sciences The spiritual, cultural and aesthetic value of landscapes and landforms for people, including Aboriginal and Torres Strait Islander Peoples ( <a href="#">ACHGK049</a> )	

## Introduction

Aboriginal people have been living in Australia for more than 65,000 years and have developed a rich knowledge of the land, sea, sky and waterways.

Before European colonisation, there were more than 250 Aboriginal language groups living in Australia. This includes Aboriginal groups from the South West who are called the Noongar people. Within the Noongar people, there are many smaller Aboriginal groups, each with their own culture, beliefs, lore and knowledge.

In Aboriginal culture everyone has a responsibility to care for the environment.

### KWL (Know, Want to Learn, Learned) Chart

As a class (Lower Primary), small group (Upper Primary) or individual (Lower Secondary) record:

- What do you **know** about the Noongar people, history and culture?
- What do you **want** to know about the Noongar people, history and culture?

At the end of each topic record: What did you **learn** about the Noongar people, history and culture?

### What is colonisation?

Colonisation in Australia occurred when English people invaded the country, took control by force and made Australia a colony of England.

### Talking about 'Country'

The word 'Country' when used in an Aboriginal context represents a specific part of the environment that a person is connected to, usually the land where their ancestors came from. Aboriginal people can be connected to more than one Country.

### Lore

A set of rules for Aboriginal people to follow that relate to interaction with their Country and its people.

# Activity 1

Students investigate the number of years that Aboriginal people have been living in Australia through grains of rice or a physical timeline.

## Lower Primary

### PREPARATION

- 1.2 kg rice (1 kg of rice contains approximately 50,000 grains).
- Small trays of rice for students to count.
- Transparent tub/large bowl (to hold 1.2 kg of rice).
- Students seated in view of a handful of rice.

### LESSON

I want you to imagine that one grain of rice is one year. How old are you? Take that many grains of rice and hold them in your hand. Let's count together. Can you count 20, 30 years in rice grains? Let's count together in years.

Now I want to show you how many years Aboriginal people have been living in Australia. How many years do you think this might be? *If students are able, play 'larger or smaller' until they reach 65,000.* Let's see what this looks like as rice. *Pour 1.2 kg of rice into the tub/bowl slowly.*

Think of all the things that the Aboriginal people would have learned about the land, sea, rivers and animals in this time.

## Upper Primary

## Lower Secondary

### PREPARATION

- A rope at least 10 metres in length (the longer the better).
- Tape on rope to demonstrate each significant date (below).
- A different coloured tape on end of rope to demonstrate time since European colonisation.

### LESSON

Aboriginal people have been living in Australia for more than 65,000 years. One end of this rope represents 65,000 years ago and the other end of the rope represents today.

*Using tape, show dates below on rope. Dates are rounded to the nearest 10 years. Some dates are approximate.*

- Archaeologists found artefacts such as grinding stones, flints and ochre (a natural paint used for ceremonies) in Kakadu National Park, in the Northern Territory, that were between **65,000 and 80,000** years old.
- Archaeologists found artefacts in a cave on Barrow Island, near Karratha in Western Australia, that were more than **50,000** years old. The artefacts showed that hunters had used the cave as a shelter.
- **20,000** years ago, Australia experienced its most recent ice age. Aboriginal people, with their knowledge of the land, survived this harsh period.
- **2,000** years ago Christians believe that Jesus Christ was born.
- **350** years ago the *Vergulde Draeck* (or *Gilt Dragon*) was shipwrecked near Lancelin on its way to the 'Spice Islands', present day Indonesia.
- More than **300** years ago people from Indonesia began visiting the north of Australia to trade for sea cucumbers. Aboriginal Australians also visited Indonesia.

- 250 years ago Captain Cook first arrived in Australia.
- 180 years ago explorer George Grey was shipwrecked at Kalbarri and walked from Kalbarri to Perth recording his observations of Aboriginal people.
- 120 years ago Australia became a nation.
- When were your grandparents and parents born?
- When were you born?
- Throughout all this time Aboriginal people have been living in Australia.

### The Coast Tells an Ancient Story

Many ancient Aboriginal sites – many of which are called middens – are found on the coast. These middens are made of shells, stone flakes, bones and more. Aboriginal people left them next to places where they gathered food. The middens tell the story of what Aboriginal people ate, their activities and the animals that were plentiful at the time.

In the past few years archaeologists investigated a midden site located at North Head near Jurien Bay. Radiocarbon dating found this site was 5,600 years old.

## Activity 2

Students compare map of Australia to map of Aboriginal Australia and share their knowledge about local Aboriginal groups and languages.

### PREPARATION

- Display a map of Australia and the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) map of Aboriginal Australia.  
<https://aiatsis.gov.au/explore/articles/aiatsis-map-indigenous-australia>

Please note: This map does not necessarily provide accurate information about Aboriginal groups and boundaries.

### LESSON

Lower Primary

Upper Primary

Lower Secondary

Discuss:

- What are the differences between these two maps?

The Aboriginal map of Australia shows that prior to European colonisation Aboriginal people lived all over Australia and there were many Aboriginal language groups with their own Countries.

Discuss:

- On whose Country is your school located?
- Do you know the names of any of the other Aboriginal groups around your region?
- Do you know any words in any local Aboriginal languages?
- Many places in the Mid and South West regions of WA have Aboriginal names. Find out the origin of the name of your town using the link below:

<https://www0.landgate.wa.gov.au/maps-and-imagery/wa-geographic-names/name-history/historical-town-names#G>

# Activity 3

Learn about Noongar family and kinship networks, and create your own family tree.

## PREPARATION

- Interactive whiteboard or personal computers to show Noongar culture (family) website. <https://www.noongarculture.org.au/family/>
- Resources for creating a family tree.

## LESSON

Read about family in Noongar culture from the website:

<https://www.noongarculture.org.au/family/>

### Lower Primary

Draw pictures of your family members and write their names.  
Can you include the Noongar names of family members too?

### Upper Primary

### Lower Secondary


Create a family tree and include Noongar names of family members.

## REFLECT

- Review your KWL chart. What did you learn? What do you want to know more about? How might you find out more?
- Discussion or journal writing: Why is it important to know about the past?

## ADDITIONAL RESOURCES

- Article: *Indigenous rock shelter in Top End pushes Australia's human history back to 65,000 years.*  
<http://www.abc.net.au/news/science/2017-07-20/aboriginal-shelter-pushes-human-history-back-to-65,000-years/8719314>
- Article: *Earliest evidence of Aboriginal occupation of Australian coast discovered (in WA).*  
<https://www.theguardian.com/australia-news/2017/may/19/indigenous-australian-life-cave-wa-50000-years>
- Website: *Sharing our pride* – timeline of dates that relate to Aboriginal history since colonisation.  
<http://www.shareourpride.org.au/sections/our-shared-history/>
- Website: Historical town names in Western Australia.  
<https://www0.landgate.wa.gov.au/maps-and-imagery/wa-geographic-names/name-history/historical-town-names#G>
- Audio: *Why is a Welcome to Country important?*  
<http://education.abc.net.au/home#!/media/2342923/why-is-a-welcome-to-country-important->
- PDF: *Living Culture, Living Land and Its People.* Noongar Protocols and 'Welcome to Country' guide.  
<https://static1.squarespace.com/static/56cac409d51cd4381775480d/t/57f25defe6f2e11074e8c283/1475501609428/Noongar+Protocols.pdf>
- PDF: *Noongar dictionary* (1997) Noongar Language and Cultural Centre.  
<https://www.noongarculture.org.au/wp-content/uploads/2013/07/Noongar-Dictionary-Second-Edition.pdf>

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- PDF: *Nyungar Budjara Wangany – Nyungar NRM Wordlist & Language Collection Booklet of the Avon Catchment Region.*  
[https://www.wheatbeltnrm.org.au/sites/default/files/knowledge\\_hub/documents/nyungar-dictionary.pdf](https://www.wheatbeltnrm.org.au/sites/default/files/knowledge_hub/documents/nyungar-dictionary.pdf)
  - App: *Noongar Dictionary.*
  - Website: AIATSIS Map of Aboriginal Australia.  
<https://aiatsis.gov.au/explore/articles/aiatsis-map-indigenous-australia>

# CONNECTION TO COUNTRY

YEAR	WESTERN AUSTRALIAN CURRICULUM CONNECTIONS		
Pre-primary	Humanities and Social Sciences The reasons some places are special to people and how they can be looked after, including Aboriginal and Torres Strait Islander Peoples' places of significance (ACHASSK017)(ACHASSK016)		Humanities and Social Sciences How the stories of families and the past can be communicated and passed down from generation to generation (e.g. photographs, artefacts, books, oral histories, digital media, museums) and how the stories may differ, depending on who is telling them (ACHASSK013)
Year 2	Humanities and Social Sciences The ways in which Aboriginal and Torres Strait Islander Peoples maintain connections to their Country/Place (ACHASSK049)		
Year 3	Humanities and Social Sciences The similarities and differences between places in terms of their type of settlement, the diversity of people (e.g. age, birthplace, language, family composition), the lives of the people who live there, and feelings and perceptions about places (ACHASSK069)		
Year 4	Humanities and Social Sciences The importance of environments to animals and people, and different views on how they can be protected (ACHASSK088)	Humanities and Social Sciences The diversity and longevity of Australia's first peoples and the ways they are connected to Country/Place (e.g. land, sea, waterways, skies) and their pre-contact ways of life (ACHASSK083)	Science Living things depend on each other and the environment to survive (ACSSU073)
Year 8	Humanities and Social Sciences The spiritual, cultural and aesthetic value of landscapes and landforms for people, including Aboriginal and Torres Strait Islander Peoples (ACHGK049)		
Year 9	Humanities and Social Sciences The perceptions people have of place, and how this influences their connections to different places (ACHGK065)		

## Introduction

Aboriginal people have a special connection to their Country. They believe that everything on Country is connected: the people, the land, the sea, and all its animals and plants. This connection is both spiritual and physical.

Aboriginal people believe in the Dreaming (sometimes called 'the dreamtime') and have stories that explain how the Earth and its animals were created. Aboriginal people believe that the spirits of their old people (their ancestors) exist within the landscape and its animals and plants. For example, a mountain or a river may not just be a landform, it may also be a place of spiritual importance and power. Aboriginal people have rights in their Country, for example to make decisions about (speak for) their Country, as well as a responsibility to make sure their Country is looked after.

Country is a place where Aboriginal people feel they belong.

### The Dreaming

The Dreaming is a spiritual connection to country and ancestors. Dreaming is a term used by Aboriginal people to describe the relations and balance between the spiritual, natural and moral elements of the world.

# Activity 1

Students watch a video and discuss the Dreaming.

## PREPARATION

- Video player.
- Dreaming stories from your library (or online – see ‘Additional resources’ below).

## LESSON

Lower Primary

Upper Primary



Watch *The Platypus Story*.

<https://www.youtube.com/watch?v=2bPbEJaUzdA>

Before watching:

*The Platypus Story* is a Dreaming story. Aboriginal people tell Dreaming stories to explain how the Earth and its animals were created. These stories often contain moral teachings (or special messages).

- What was the message (or moral) of this story?
- All animals belong to groups. What group does the platypus belong to?

Lower Secondary



Watch the *Introduction from the First Australians* TV series.

<https://aso.gov.au/titles/documentaries/first-australians-episode-1/clip1/>

- What happened in the Dreaming?
- What role did the giant beings (spirits) play?
- The historians in the video shared several facts. Share and discuss one fact with a partner.

# Activity 2

Students complete a guided meditation and discuss Aboriginal connection to Country.

## PREPARATION

- Optional: Soothing background music.
- Ask students to find a place, at a distance from other students, outside or on the floor.
- Students are to be silent and there should be little distraction around them.

## LESSON

Lower Primary

Upper Primary

Lower Secondary

Guided meditation:

I'll give you a minute to think of a place that you love. I will ask you questions and I want you to keep the answer to yourself.

Allow time between each question. Remind students that they are to remain silent.

- What does this place look like?
- What sounds can you hear there?
- What does it smell like?
- What does it feel like?
- If you had to describe this place to a friend, what would you say about it?
- How do you care for it?
- How would you feel if it were damaged or destroyed?

Think-pair-share:

- How do you think Aboriginal people feel when they are on their Country, the Country that their ancestors lived on for thousands of years?

## Activity 3

Students watch and discuss a video about Noongar spirituality.

### PREPARATION

- Video player.

Upper Primary

Lower Secondary



Watch *Dr Noel Nannup Noel Nannup – A Nyoongar perspective on spirituality*.  
[https://www.youtube.com/watch?v=2-k3WGOar\\_4](https://www.youtube.com/watch?v=2-k3WGOar_4)

- Dr Noel Nannup believes that everything, the land, animals and people, are all connected. Can you provide an example of how things in nature are connected?
- Dr Noel Nannup says 'you cannot keep taking, you have to give something back'. What do you think he means?

Lower Primary

Upper Primary

Lower Secondary

Read about Noongar spirituality.

<https://www.noongarculture.org.au/spirituality/>

Break into seven small groups and read a section of the website on Noongar spirituality. Sections include: *The Noongar creation period, the Nyitting (Dreaming), The Waugal or Great Serpent-Like Dreamtime Spirit, Jirda – Birds, Spirituality and Sense of Place, Baronga – Totems and Traditional Practices*.

- What did you learn? Share this with other groups.
- How would you describe Noongar spirituality?



## REFLECTION

- Review your KWL chart. What did you learn? What do you want to know more about? How might you find out more?
- In your own words, how would you describe the way that Aboriginal people are connected to their Country? Share this with a friend or write it in your journal.

## ADDITIONAL RESOURCES

- Website: *Aboriginal spirituality*.  
<https://www.australiantogether.org.au/discover/indigenous-culture/aboriginal-spirituality>
- Website: Australian Museum on Aboriginal spirituality.  
<https://australianmuseum.net.au/indigenous-australia-spirituality>
- Website: Noongar Spirituality.  
<https://www.noongarculture.org.au/spirituality/>
- Video: *What makes your story?* The importance of Aboriginal people nurturing their spiritual self.  
<http://education.abc.net.au/home#!/media/103044/>
- Website: Bangarra Dance Theatre features education resources exploring spirituality through dance.  
<https://www.bangarra.com.au/youth-outreach/education/resources/>

## DREAMTIME STORIES

- Video: 12 animated Dreamtime stories from Dust Echoes (ABC).  
<http://education.abc.net.au/home#!/digibook/2570774/dust-echoes>
- Video: Monash University animated Dreamtime stories.  
<http://artsonline.monash.edu.au/countrylines-archive/category/animations/>
- Videos: 18 popular Dreamtime stories.  
<https://www.welcometocountry.org/aboriginal-dreamtime-stories/>

# BUSH FOOD

YEAR	WESTERN AUSTRALIAN CURRICULUM CONNECTIONS		
Pre-primary	Humanities and Social Sciences The reasons some places are special to people and how they can be looked after, including Aboriginal and Torres Strait Islander Peoples' places of significance (ACHASSK017)(ACHASSK016)		Humanities and Social Sciences How the stories of families and the past can be communicated and passed down from generation to generation (e.g. photographs, artefacts, books, oral histories, digital media, museums) and how the stories may differ, depending on who is telling them (ACHASSK013)
Year 1	Humanities and Social Sciences Living things live in different places where their needs are met (ACSSU211)		
Year 2	Humanities and Social Sciences The history of a significant person, building, site or part of the natural environment in the local community and what it reveals about the past (ACHASSK044)	Humanities and Social Sciences The ways in which Aboriginal and Torres Strait Islander Peoples maintain connections to their Country/Place (ACHASSK049)	
Year 3	Science Living things can be grouped on the basis of observable features and can be distinguished from non-living things (ACSSU044)		
Year 4	Humanities and Social Sciences Aboriginal and Torres Strait Islander Peoples' ways of living were adapted to available resources and their connection to Country/Place has influenced their views on the sustainable use of these resources, before and after colonisation (ACHASSK089)	Humanities and Social Sciences The diversity and longevity of Australia's first peoples and the ways they are connected to Country/Place (e.g. land, sea, waterways, skies) and their pre-contact ways of life (ACHASSK083)	Science Living things depend on each other and the environment to survive (ACSSU073)
Year 5	Humanities and Social Sciences The patterns of colonial development and settlement (e.g. geographical features, climate, water resources, transport, discovery of gold) and how this impacted upon the environment (e.g. introduced species) and the daily lives of the different inhabitants (e.g. convicts, free settlers, Aboriginal and Torres Strait Islander Peoples) (ACHASSK107)		
Year 6	Science The growth and survival of living things are affected by physical conditions of their environment (ACSSU094)		
Year 7	Science Classification helps organise the diverse group of organisms (ACSSU111)		
Year 8	Humanities and Social Sciences The spiritual, cultural and aesthetic value of landscapes and landforms for people, including Aboriginal and Torres Strait Islander Peoples (ACHGK049)		
Year 9	Humanities and Social Sciences The perceptions people have of place, and how this influences their connections to different places (ACHGK065)		

## Introduction

Before European colonisation, the Noongar region was abundant with plants and animals. Aboriginal people had developed and refined their knowledge and skills in sourcing food in a sustainable manner over tens of thousands of years. Aboriginal people knew the best time of the year to pick fruits, gather seeds and roots, and hunt particular animals. They were able to identify hundreds of plants and animals, knowing which ones were edible and which were poisonous. They used every part of the plant or animal – for eating, medicine or other purposes – and collected resources responsibly to ensure that there would be enough for the next season.

Today, many Aboriginal people use this knowledge to hunt, fish and collect native plants sustainably. Hunting and gathering food is a way for Aboriginal people to supplement their diet, and continues to be an activity that is enjoyed as a family and where food is shared among the community.

# Activity 1

Students watch and discuss a video about bush food.

## PREPARATION

- Video player.

## LESSON

Lower Primary

Upper Primary

Lower Secondary

Before watching:

- What does 'native' mean when we talk about plants and animals?
- How many native plants and animals can you list?
- Have you heard of eating the gum or sap from a tree? What do you think it might taste like?



Watch *Collecting Jam Tree Gum*.

<https://www.youtube.com/watch?v=ISEL-EFT-1M>

- How did the people in the video describe the gum from the Jam Tree?
- What are the different ways that gum can be used?
- How did the child and his grandmother learn about the gum from the Jam Tree?
- Why do you think it is important that this knowledge is passed on?

### Losing language

There were more than 250 Aboriginal languages in Australia prior to European colonisation. Today only 120 languages are still spoken and many of these are in danger of being lost or forgotten. In the past, governments did not allow Aboriginal people to speak in their language or teach it to their children. Today there are organisations that are trying to record and revive Aboriginal languages.

# Activity 2

Students learn about a range of bush foods from the Noongar region.

## PREPARATION

- Display Noongar bush foods on page 19.

Lower Primary

- Have a look at the bush foods display.
- Do you recognise any of these foods? Have you tried any?

Aboriginal people have been eating these native foods for thousands of years.

- Can you practise learning the common and Aboriginal names of some of these bush foods? If there are no Aboriginal names listed for your area read 'Losing language' on above to find out why.

- Play a memory game. Take turns describing the plant or animal to your partner and see if they can guess what it is.

## Upper Primary

## Lower Secondary

### PREPARATION

- Collect books on bush foods from your school or local library.
- Check the 'Additional resources' section at the end of this topic for online resources.
- Contact a member of your local Aboriginal community to share their knowledge of bush foods with students, and consider holding an excursion on Country. Read the section on 'Engaging Aboriginal community members' on page 6 in 'About this resource' for helpful information.

### LESSON

- Have a look at the bush foods display.
- Do you recognise any foods? Have you tried any of these foods?
- How can these foods be categorised?

Research task: Choose a few foods from the list below. Find out about Aboriginal use, distribution, habitat, diet (animals), and identify any potential threats. Look at the bush food resources section on page 23 for help with your research. Use technology such as a PowerPoint to present your knowledge.

Whale	Shellfish (not mollusc)	Wallaby	Young birds
Seal	Bulrush	Quokka	Bird eggs
Crayfish	Lizards	Bandicoot	Gilgies
Waterfowl	Frogs	Swan	Native yam
Mullet	Snakes	Acacia seeds	Buff bream

# NOONGAR BUSH FOODS

Warning: Many plants and animals are poisonous. It is important that a plant is correctly identified before eating. Some plants require special treatment before they can be safely eaten.

In Western Australia, native plants and animals are protected by law. You need permission and permits before you can pick fruit, or remove native plants and animals. This is one way that the government is working to protect native plants and animals from over-exploitation.

For more information, visit the Department of Biodiversity, Conservation and Attractions website: <https://www.dbca.wa.gov.au/>

## NOONGAR BUSH FOODS - PLANTS

Common name	Quandong
Scientific name	<i>Santalum acuminatum</i>
Noongar name	Dumbari (Yued)



Image courtesy of Donna Ronan



Image courtesy of Donna Ronan



- The quandong fruit appears in spring.
- It is red or yellow when ripe.
- It is about the size of a 20-cent piece.
- The flesh of the fruit can be eaten fresh, dried or stewed.
- The fruit has a tangy, sweet flavour and is high in vitamin C.
- The stewed fruit can be turned into jam, savoury sauces, and filling for a pie.
- The kernel inside the nut can be eaten raw or roasted.
- Traditionally, the kernel was ground to make flour, which was used to make damper.
- The kernel can also be cooked on the coals, and then ground and mixed with water or animal fat to treat sores or inflammation.



Image courtesy of Donna Ronan

Common name	Zamia nut
Scientific name	<i>Macrozamia fraseri</i>
Noongar name	By-yu (Yued)

- The nuts can be ground to make flour.
- The Noongar people used this flour to make a kind of pancake, which was cooked on a rock in a camp fire.
- The nut is poisonous and needs to be soaked in water for at least a week prior to cooking.



Image courtesy of Barb Dobson.

## NOONGAR BUSH FOODS - PLANTS

Common name	Acacia seeds
Scientific name	There are many type of acacia trees where the seed can be used for flour. One common type is the jam wattle ( <i>Acacia acuminata</i> ).
Noongar name	Mungart (Yued) - jam wattle

- Seeds from many types of acacia trees can be ground up to make a flour, which is used for damper.
- The gum from this tree can also be eaten and mixed with water to make a sweet drink.
- Eating the gum can be used to treat diarrhoea.
- Infusions of the flowers can be used for blisters and burns.



Common name	Pigface
Scientific name	<i>Carpobortus virescens</i>
Noongar name	Bain (Yued)



Image courtesy of Donna Ronan



Image courtesy of Donna Ronan

- Pigface is a ground creeping plant.
- The fruit is eaten raw or dried.
- The juice found in the leaves can be used for aches, burns and bites.
- The crushed leaves can be infused in water and used to treat many digestive issues.

Common name	Bush potato/sweet potato
Scientific name	There are many types of bush potato. A common bush potato in Noongar Country is the <i>Platysace Cirrosa</i> .
Noongar name	Djubak (Yued)



- This root vegetable can be eaten raw, cooked or roasted.
- The root is usually found about 1.5 metres below the ground.
- Bush potatoes can be as large as a basketball.
- All small potatoes and roots were carefully replanted for future harvests.

## NOONGAR BUSH FOODS – ANIMALS

Common name	Goanna (gould's monitor)
Scientific name	<i>Varanus gouldii</i>
Noongar names	Bungarra, karda (Yued)



Image courtesy of Sue Norton



- Goannas can be difficult and dangerous to catch.
- They can often be found in their burrows.
- The goanna must be cleaned by removing its intestines before cooking.
- Goannas can be cooked on top of the campfire or in the ashes.
- Goanna oil can be used as a medicine to treat many skin ailments.

Common name	Echidna
Scientific name	<i>Tachyglossus aculeatus</i>
Noongar name	Nyingarn (Yued)

- Echidnas can be caught by hand.
- They can be cooked whole in ashes.
- The spikes fall out when cooked.
- Traditionally in Noongar culture, women and children would hunt for smaller animals such as the nyingarn (echidna).



Image courtesy of Lee Anne Carter

Common name	Common brushtail possum
Scientific name	<i>Trichosurus Vulpecula</i>
Noongar name	Goomal (Yued)

- One method of catching possums included the use of fire to smoke them out of trees.
- Possum fur was also used to make coats.



Image courtesy of Tanya Causer

## NOONGAR BUSH FOODS – ANIMALS

Common name	Emu
Scientific name	<i>Dromaius novaehollandiae</i>
Noongar name	Wetj (Yued)

- Aboriginal people look to the night sky as an indicator of when emus will lay their eggs.
- Emu eggs are collected and used in baking. Emu oil can be used as a substitute for butter.
- Emu eggs are also carved for art.
- Emu oil can be used for many ailments. For example, it can be mixed with hot water and drunk to treat colds, and as a rub for colds, aches and pains.



Common name	Turtle
Scientific name	<i>Chelodina colliei</i> (There are several different species of turtles found in Western Australia. This one is a freshwater turtle.)
Noongar name	Yarkan (Yued) - freshwater turtle

- Traditionally in Noongar culture, women would find and catch turtles.
- The women would walk slowly through dried up swamps, pools and other waterways using their toes to feel for breathing holes where turtles, frogs and gilgies (small freshwater crayfish) were found.
- Turtle eggs were also eaten.



Image courtesy of Julia Parsons

Common name	Western grey kangaroo
Scientific name	<i>Macropus fuliginosus</i>
Noongar name	Yonga (Yued)

- The kangaroo tail is considered a delicacy and was traditionally only eaten by Elders.
- Kangaroo skin was used as a coat or a blanket, as the underside of the fur was wind- and waterproof.
- The skin was made into a bag that was used to transport water, and it kept the water cool for several days.
- The fat from the kangaroo was used to waterproof canoes and other objects.
- Kangaroo tendons could be used as rope.



# Bush food resources

- The Northern Agricultural Catchments Council free app: *Coastal Plants*.
- Bush medicine book: Horsefall & Hansen (2016) *Noongar Bush Medicine*, University of Western Australia.
- Bush food book: Estelle Leyland (2002) *Wajarri Wisdom*. Yamaji Language Centre.
- PDF: *The food resources of the Aborigines of the South West of Western Australia*.  
<http://museum.wa.gov.au/research/records-supplements/records/food-resources-aborigines-south-west-western-australia/accessible-version>
- Website: *Florabase* (Western Australian Flora).  
<https://florabase.dpaw.wa.gov.au/>
- Website: Perth Zoo.  
<https://perthzoo.wa.gov.au/>
- Website: *The original fresh food people: Aboriginal bush meats*.  
<https://www.welcometocountry.org/the-original-fresh-food-people-aboriginal-bush-meats/>
- Website: *Atlas of Living Australia*.  
<https://www.ala.org.au/>
- PDF: *Noongar dictionary* (1997) Noongar Language and cultural centre.  
<https://www.noongarculture.org.au/wp-content/uploads/2013/07/Noongar-Dictionary-Second-Edition.pdf>
- App: *Noongar Dictionary*.
- Website: Noongar culture food.  
<https://www.noongarculture.org.au/food/>
- Video: Cooking quandongs  
<https://www.youtube.com/watch?v=35wdDxPz60g>
- Website: Noongar use of the zamia nut  
<http://anthropologyfromtheshed.com/project/the-traditional-sarcotesta-eaters-of-southwestern-australia/>
- Video: The zamia plant and Noongar seasons  
[https://www.youtube.com/watch?v=8pp1NhSoxA&feature=player\\_embedded](https://www.youtube.com/watch?v=8pp1NhSoxA&feature=player_embedded)
- Video: Noongar bush food and medicine at Forrestdale Lake (Perth)  
[https://www.youtube.com/watch?v=pvGRCOZnhyl&feature=player\\_embedded](https://www.youtube.com/watch?v=pvGRCOZnhyl&feature=player_embedded)

## Activity 3

Lower primary students familiarise themselves with native and introduced animals through a game. Upper primary and secondary students identify native trees in the schoolyard.

### Problematic Pests

Australia's isolation, as an island, has made it home to many unique plants, animals and environments found nowhere else in the world. These species have evolved over many thousands of years to thrive in the stable Australian environment but are not adapted to the threat posed by rapid changes. One of these changes is the introduction of plants and animals from elsewhere. For example, cats, foxes, rabbits and weeds threaten our native animals and plants. These have even caused the extinction of some native species. If we remove unwanted and harmful pests, and protect our native animals and plants, we can help make sure they will always be here.

## Lower Primary

### PREPARATION

- Outside area required.

### LESSON

Play *Predators and Prey* – a variation on the game ‘octopus’.

Line up students and give each one the name of a native animal such as **black cockatoo**, **malleefowl** and **turtle**, which are all endangered. Give three students the names of three introduced animals such as **fox**, **rabbit** and **cat**.

Tell students that the foxes must run or walk, rabbits must hop, and cats must pounce (or jump) to catch their prey. When you call the name of each native animal they must try to pass the predators. If a native animal (prey) is caught, they’re out – they must stand still and can only use their arms to tag. Explain to students that foxes, rabbits and cats threaten the lives of native animals and plants.

### Protect our plants and animals

The Northern Agricultural Region (which extends from Guilderton in the south to Kalbarri in the north) is home to approximately 7,620 native plants and animals. About 500 of these native plants and animals are endemic, which means they only exist in this region. This makes conservation a very important issue for everyone living and working in the region. It is important that we identify these endemic plants and animals so that we can protect them.

## Upper Primary

- Find out about the native plants in your school.
- Talk to your school gardener.

### LESSON

- Do you have native plants at your school? Help identify these plants to ensure they stay protected.

Identifying native plants can be difficult. To identify one you must look at where the plant is (location and habitat) as well as its size, leaves, flowers and fruit. Keep in mind that the leaves, flowers or fruit may not be seen all year round.

To help you identify native plants:

- Take a photo or sketch plants in your schoolyard and then use the ‘Tools for identifying plants’ below to help you work out if it is native.
- There are also lots of people who can help. These include: Aboriginal members of your community, your school gardener, and people who work as landscapers, in gardening stores, nurseries, environmental organisations, Regional Herbarium groups, the Parks and Wildlife Service, or just people with a green thumb.
- Once you have identified a few plants, pair up with students from another class and take them on a walking tour of your school to show them which plants are native. Explain the importance of protecting native plants on your journey.



## GOING FURTHER

Return to your native plants each season. Take a new photo or sketch, and record notes about the changes you've noticed.

### Lower Secondary

#### PREPARATION

- Find out about the native plants in your school.
- Talk to your school gardener.
- Give students a map of the school grounds.

#### LESSON

See Upper Primary activity

Identify native plants in your school. Map the locations of these plants and if possible record the common name, Aboriginal name (for your area), and scientific name of these plants. Can't find the Aboriginal name in your language dictionary? Read 'Losing language' on page 17 to find out why. Can you learn the names of surrounding Aboriginal groups?

Challenge: Can you find a way to tag these plants so that others know that they need to be protected?

#### GOING FURTHER

No native plants in your school or want to plant more?

Have a look at the guides below to work out the best plants for your area:

- Northern Agricultural Catchments Council's *Trees and Shrubs for the Midlands and Northern Wheatbelt* guide:  
<https://www.nacc.com.au/wp-content/uploads/2015/11/Trees-Shrubs-for-the-Midlands-and-Northern-Wheatbelt-2nd-edition.pdf>
- *Coastal Native Garden Guide* (includes inland guide):  
<https://www.nacc.com.au/project/coastal-native-garden-guides/>
- Northern Agricultural Catchments Council's *Coastal Plants* app  
<https://www.nacc.com.au/publications/#sc-tabs-15250766919371525148106777>

Experience bush foods in your classroom. While kangaroo and lemon myrtle can be found in your local supermarket, other native foods such as the quandong can only be purchased online:

- Website: Outback Pride  
<http://www.outbackpride.com.au/>
- Website: Bush Food Shop  
<http://www.bushfoodshop.com.au/>

Go out on Country with a member of your local Aboriginal community and learn more about bush foods.

#### REFLECT

- Review your KWL chart. What did you learn? What do you want to know more about? How might you find out?

# Tools for identifying plants

- The Northern Agricultural Catchment Council's *Coastal Plants* app lists many local native plants.  
<https://www.nacc.com.au/publications/#sc-tabs-1525148106777>
- *Florabase* is a catalogue of all Western Australian flora and includes information and photos for identification.  
<https://florabase.dpaw.wa.gov.au/search/advanced>
- *Atlas of Living Australia* allows users to search and upload images based on regions.  
<https://www.ala.org.au/>
- *Bowerbird* is a website where you can share your own sightings with images, videos or audio files and get help identifying unknown Australian species.  
<http://www.bowerbird.org.au/>
- *Flora of Australia online* includes a database of Australian flora.  
<http://www.environment.gov.au/biodiversity/abrs/online-resources/flora/main/index.html>
- The Western Australian Museum website includes an online identification resource.  
<https://naturemap.dpaw.wa.gov.au/Login.aspx?ReturnUrl=%2fdefault.aspx>

## Additional Resources

- Video: Commercial production of native foods.  
<https://www.youtube.com/watch?v=poA99DAPrZA&feature=youtu.be>
- Video: Chef Kylie Kwong cooks with native food.  
<http://www.abc.net.au/btn/story/s3527750.htm>
- Video: Growing and using native plants.  
<http://education.abc.net.au/home#!/media/2343020/recognising-the-potential-of-native-vegetables>
- Video: Bush food trip in Queensland.  
<http://education.abc.net.au/home#!/media/2100778/keeping-aboriginal-culture-alive>
- Video: Aboriginal rangers in Sydney explore the many uses of native plants.  
<http://education.abc.net.au/home#!/media/30780/the-many-uses-of-indigenous-plants>

# TRADITIONAL ECOLOGICAL KNOWLEDGE

YEAR	WESTERN AUSTRALIAN CURRICULUM CONNECTIONS		
Pre-primary	Humanities and Social Sciences How the stories of families and the past can be communicated and passed down from generation to generation (e.g. photographs, artefacts, books, oral histories, digital media, museums) and how the stories may differ, depending on who is telling them ( <a href="#">ACHASSK013</a> )		
Year 1	Science Observable changes occur in the sky and landscape ( <a href="#">ACSSU019</a> )		
Year 2	Humanities and Social Sciences The impact of changing technology on people's lives (e.g. at home, work, travel, communication, leisure, toys) and how the technology of the past differs from what is used today ( <a href="#">ACHASSK046</a> )	Humanities and Social Sciences The ways in which Aboriginal and Torres Strait Islander Peoples maintain connections to their Country/Place ( <a href="#">ACHASSK049</a> )	Science Earth's resources are used in a variety of ways ( <a href="#">ACSSU032</a> )
Year 4	Humanities and Social Sciences Aboriginal and Torres Strait Islander Peoples' ways of living were adapted to available resources and their connection to Country/Place has influenced their views on the sustainable use of these resources, before and after colonisation ( <a href="#">ACHASSK089</a> )	Humanities and Social Sciences The diversity and longevity of Australia's first peoples and the ways they are connected to Country/Place (e.g. land, sea, waterways, skies) and their pre-contact ways of life ( <a href="#">ACHASSK083</a> )	Science Living things depend on each other and the <b>environment</b> to survive ( <a href="#">ACSSU073</a> )
Year 5	Humanities and Social Sciences The way people alter the environmental characteristics of Australian places (e.g. vegetation clearance, fencing, urban development, drainage, irrigation, farming, forest plantations, mining) ( <a href="#">ACHASSK112</a> )	Science Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the sun, Earth and the moon ( <a href="#">ACSSU115</a> )	
Year 8	Humanities and Social Sciences The spiritual, cultural and aesthetic value of landscapes and landforms for people, including Aboriginal and Torres Strait Islander Peoples ( <a href="#">ACHGK049</a> )		
Year 9	Humanities and Social Sciences The ways that humans in the production of food and fibre have altered some biomes (e.g. through vegetation clearance, drainage, terracing, irrigation) ( <a href="#">ACHGK061</a> )		

## Introduction

Traditional ecological knowledge is the knowledge that Aboriginal and Torres Strait Islander people have of the land, sea, sky and waterways, and the relationships between them.

For thousands of years, the Noongar people used their knowledge of the environment to source and produce food in an effective and sustainable way. This knowledge allowed the Noongar people to live in environments that were often harsh. Their efficient practices left plenty of time for leisure activities and a rich cultural life.

Today, the Noongar people continue to use their knowledge of the environment to source and produce food sustainably. Traditional ecological knowledge is increasingly becoming recognised as an effective resource for better understanding nature, and for sustainable land management and biodiversity conservation.

# Activity 1

Students begin to consider the knowledge needed to survive in Australia before the 1800s.

## PREPARATION

- Materials to allow students to create a list (e.g. butcher's paper).

## LESSON

### Lower Primary

### Upper Primary

In the past there were no supermarkets, cars or mobile phones.

- Where do think you could find food and water?
- What skills or knowledge would you need to be able to survive?
- How would you make sure that it was available all year round?

Create a list in small groups or as a class.

### Lower Secondary

In a small group consider:

- What skills and knowledge would a community need to survive for over 65,000 years?
- How would you ensure that future generations would survive?

Create a list in small groups and then compare the results with other groups.

# Activity 2

Students work in small groups to respond to images relating to examples of traditional ecological knowledge. Examples have been taken from the Noongar region and beyond.

## PREPARATION

- Display large images (from page 29-38) on student devices or a large screen.
- Show images one at a time to allow for discussion time in between and then provide information about the image (on the page after the image).

### Lower Primary

### Upper Primary

### Lower Secondary

For each image discuss:

- What can you see in the image?
- What might this tell us about the knowledge and skills of Aboriginal people?
- What questions do you have about the image?

Then read the information about the area of traditional ecological knowledge.

# Water



# Water

The Noongar people sourced water from a range of locations such as creeks, rivers, pools and gnamma holes (rock holes). In the drier months, the Noongar people used other methods to find and conserve water.

George Grey, a European explorer who walked from Kalbarri to Perth in the late 1830s, recorded seeing weirs made from plants that had been built by Noongar people for accessing and retaining fresh water.

The Noongar people protected their water sources. For example, the Noongar people protected gnamma holes by covering holes, so animals would not get in and by regularly cleaning holes. This is still done today.

The Noongar people learned from watching animals. Signs such as ants building their nests and birds returning to their nests to protect their eggs or chicks, were indications that it was about to rain. This knowledge continues to be passed down.

Aboriginal people across Australia used animal skins as bags to transport water. The skin acted like a thermal layer, keeping the water cool for several days. Being able to transport water meant that Aboriginal people could travel long distances to trade, attend ceremonies and access different food resources.

Today, water continues to be a significant part of Aboriginal life and spirituality.

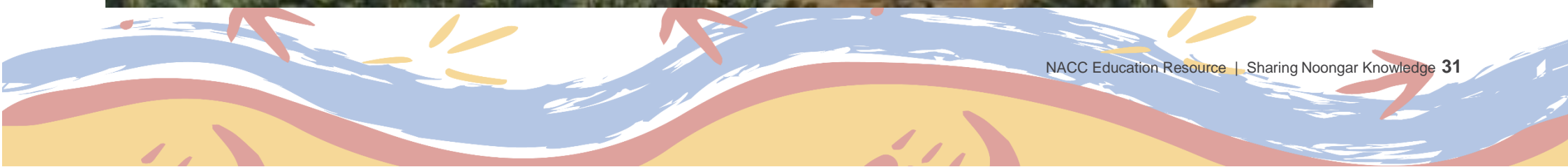


## Additional Resources

- Website: Wallaby skin water carrier.  
<https://australianmuseum.net.au/wallaby-skin-water-carrier-pre-1885>
- Video: Finding water underground and in the roots of the desert kurrajong.  
<https://www.youtube.com/watch?v=s5G9nQTLB0U>
- Journals of two expeditions of discovery by George Grey (Vol 1).  
<http://gutenberg.net.au/ebooks/e00054.html>
- Journals of two expeditions of discovery by George Grey (Vol 2).  
<http://gutenberg.net.au/ebooks/e00055.html>
- Video: Knowing when the rain will come (Lower Primary).  
<http://education.abc.net.au/home#!/media/30177/how-do-you-know-when-rain-is-coming->
- Video: The Ant Story (indicators of rain).  
[https://www.youtube.com/watch?v=lp\\_nKgAWLpY](https://www.youtube.com/watch?v=lp_nKgAWLpY)
- Website: Gnamma holes.  
<http://museum.wa.gov.au/explore/wa-goldfields/water-arid-land/gnamma-holes>



# Fire



# Fire

Aboriginal people used fire for many different purposes such as making paths, encouraging new vegetation growth, propagating (growing) seeds, hunting (as seen in the image), cooking, warmth, light, making tools, signalling, ceremonies and for managing the land.

For example, the Noongar people used fire for smoking out and trapping animals such as possums and to propagate seeds such as those from acacia trees.

The Noongar people also used fire to manage the environment through controlled burns. This is evident from markings on trees such as the jarrah tree indicating that Jarrah forests were burned every three to four years, while coastal grasslands were burned every two years. This strategy ensured that fuel that could create large uncontrollable fires did not build up. In parts of Australia, Aboriginal fire management practices are employed to reduce the severity and size of bushfires.



*Painting of Aboriginal people using fire to drive kangaroos into areas for hunting.*

Joseph Lycett, 1817.

Image courtesy of the National Library of Australia.

Image available from:

<https://www.nla.gov.au/digital-classroom/year-4/themes/first-peoples>

## ADDITIONAL RESOURCES

- Book: Gammage, B. (2012) *The Biggest Estate on Earth, how Aborigines made Australia*. Allen & Unwin. New South Wales.
- Video: Science and ancient fire knowledge – ABC education.  
<http://education.abc.net.au/home#!/media/29925/management-of-the-northern-savanna>
- Video: Fire's role in Australian environment – ABC education.  
<http://education.abc.net.au/home#!/media/525643/fire-s-role-in-the-australian-environment>
- Video: Aboriginal fire knowledge reduces greenhouse gases – ABC education.  
<http://education.abc.net.au/home#!/media/30042/aboriginal-fire-knowledge-reduces-greenhouse-gases>
- Paintings: Joseph Lycett paintings of Aboriginal use of fire.  
<https://www.nla.gov.au/digital-classroom/year-4/themes/first-peoples>
- Video: Traditional fire practices, monitoring threatened species and conducting baseline fauna surveys by the Martu people.  
<https://www.bushheritage.org.au/places-we-protect/western-australia/birriliburu>
- PDF: Wheatbelt NRM – Noongar traditional ecological knowledge (includes fire practices).  
[https://www.wheatbeltnrm.org.au/sites/default/files/knowledge\\_hub/documents/RTKlitweb.pdf](https://www.wheatbeltnrm.org.au/sites/default/files/knowledge_hub/documents/RTKlitweb.pdf)
- Website: Traditional ecological knowledge projects supported by the National Landcare Program (includes fire to manage the environment).  
<http://www.nrm.gov.au/indigenous-nrm/knowledge>



# Agriculture

Aboriginal people around Australia cultivated the soil, planted root vegetables, propagated and spread seeds, and harvested, stored and traded seeds and grains.

The Noongar people ground nuts from plants such as acacia seeds (as seen in the image) and the zamia palm to make flour, which was then baked into damper or cakes – an activity still enjoyed today. Archaeologists have dated grinding stones in Australia as being more than 30,000 years old. This makes Aboriginal people the world's first bakers.



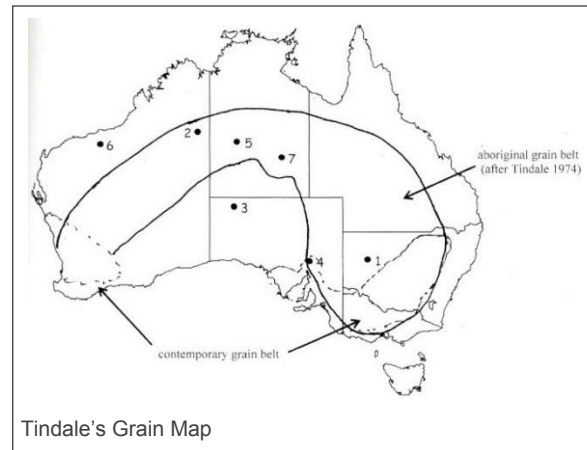
Acacia seeds on a grinding stone.  
Image courtesy of Tourism Australia.  
Image available from:  
<http://www.tourism.australia.com/en>

On his travels in Noongar Country, George Grey recorded seeing fields of yams. Yams and other tubers were a reliable food source for the Noongar people, who replanted smaller yams and roots for future harvests.

Around Australia, Aboriginal people harvested grains suited to the soil and water availability of the location, including in areas that non-Aboriginal people have deemed unsuitable for agriculture (see map).

## GOING FURTHER

Make your own damper. Many recipes are available online.



## ADDITIONAL RESOURCES

- Book: Bruce Pascoe (2014) *Dark Emu*. Magabala Books. Western Australia.  
<https://www.magabala.com/culture-and-history/dark-emu.html>
- Video: Using Aboriginal knowledge of spinifex grass for buildings – ABC education.  
<http://education.abc.net.au/home#!/media/103132/spinifex-research>
- Video: Learn how flour is made today – ABC education.  
<http://education.abc.net.au/home#!/media/30303/where-does-bread-come-from->
- Video: Bruce Pascoe cooks a pancake using native grass on television show.  
<https://www.youtube.com/watch?v=sRMNoWrrhb4>
- PDF: *Journals of Two Expeditions of discovery by George Grey (Vol 1)*.  
<http://gutenberg.net.au/ebooks/e00054.html>
- PDF: *Journals of Two Expeditions of discovery by George Grey (Vol 2)*.  
<http://gutenberg.net.au/ebooks/e00055.html>
- Website: *Noongar culture* (food).  
<https://www.noongarculture.org.au/food/>



# Fishing

Before European colonisation, the Noongar people used a range of fishing practices to catch and gather fish.

One method (as seen in the image) involved arranging stones to form a trap, sometimes several hundred metres in length, to catch fish that came in on the high tide and became trapped when the tide went out. Fish could then be easily caught by hand or with spears. The remains of a stone fish trap still exists on Yued Country at Wedge Island, near Cervantes. Another method involved catching fish using nets made of vines and other native plants.

Traditionally in Noongar culture, women would find and catch turtles. The women would walk slowly through dried up swamps, pools and other waterways, using their toes to feel for breathing holes where freshwater turtles, frogs and gilgies (small freshwater crayfish) were found. In Bunuru (late summer/early autumn) when the country lacked water, Noongar people fished in the oceans.

Fishing is still a popular activity enjoyed by many Noongar families. Fishing is a way to spend time together, supplement their diet, and pass on knowledge to younger generations.



500-metre long stone fish trap, Brewarrina, New South Wales, 1938.

Image courtesy of the State Library of Victoria, Picture Collection.

Image available from:

<http://ergo.slv.vic.gov.au/sites/default/files/imagecache/download/h2091850.jpg>

## ADDITIONAL RESOURCES

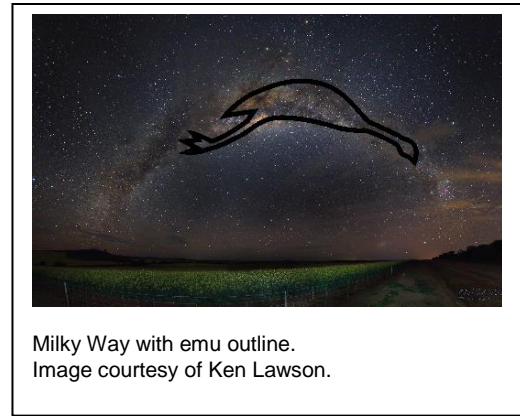
- Website info: Western Australian Museum information on stone fish traps (Noongar Country). <http://museum.wa.gov.au/wa-maritime-museum-audio-tour/welcome/mungahs>
- Video: Indigenous Eel Farming at Lake Condah – ABC education. <http://education.abc.net.au/home#!/media/29898/indigenous-eel-farming>
- Photos: AIATSIS collection of historical fishing images. <http://aiatsis.gov.au/exhibitions/historical-fishing-archival-photo-gallery>
- Photos: AIATSIS collection of contemporary fishing images. <http://aiatsis.gov.au/exhibitions/fishing-today-contemporary-photo-gallery?inline=true&transition=none&width=1000>
- Website: Catching and smoking fish in Arnhem Land ABC education. <http://education.abc.net.au/home#!/media/154244/archaeology-and-macassan-visitors-to-australia>



# Astronomy

The Noongar people looked to the night sky to predict when to hunt, harvest and come together. They looked at the stars, and the spaces between the stars, as a guide to important natural events such as the passing of the seasons.

For many Aboriginal groups around Australia, including the Noongar people, the appearance of an emu shape along the Milky Way (as seen in the image) signals the start of the emu mating season. As the shape gradually brightens over a few months, Aboriginal people know when the emu will lay its eggs and when to gather them.



Aboriginal people did not refer to a written calendar to work out the season. They were guided by the environment – the wind, the rain and the sky – to tell them when seasons were changing. Many Aboriginal groups observed different seasons to that of the European four-season year. For example, for the Noongar people the appearance of *Danacat* (the Seven Sisters) on the horizon at the break of dawn is a sign that *Cielba* (the “grass season”, which is similar to autumn) is near. *Cielba* is one of six Noongar seasons.

## GOING FURTHER

- Go along to an Aboriginal Astronomy night time viewing at the Gravity Discovery Centre and Observatory in Gingin.  
<https://gravitycentre.rezdy.com/165800/aboriginal-astronomy-night>
- Join your local amateur astronomy group or ask them to present at your school.  
<https://astronomy.org.au/amateur/amateur-societies/australia/>  
<https://www.facebook.com/geroastro/>

## ADDITIONAL RESOURCES

- PDF: *Indigenous astronomy* – ABC education.  
<http://education.abc.net.au/res/pdf/indigenous-astronomy-guide.pdf>
- Video: *Aboriginal Australians as the first astronomers* – ABC education.  
<http://education.abc.net.au/home#!/media/2615061/aboriginal-astronomy>

## Activity 3

Students discuss and then investigate traditional ecological knowledge topics using resources supplied at the end of each relevant section above. Upper Primary and Lower Secondary students use their research to perform an oral presentation.

Lower Primary

Upper Primary

Lower Secondary

Discuss:

- What image most interested you?
- How do you think traditional ecological knowledge can be useful to us today?
- Is there anyone in your community who can share their traditional ecological knowledge, either in the classroom or out on Country?

Use the websites in the 'Additional resources' section (at the end of each area of traditional ecological knowledge) to research an area of traditional ecological knowledge that interests you.

Upper Primary

Lower Secondary

- Make a list of key points from your research and then use these points to perform an oral presentation.

## Activity 4

Students develop skills in tracking animals by drawing animal footprints in sand.



### Tracking Techniques

Aboriginal people have a rich knowledge of the bush and how to find animals. One of the techniques that they use is called tracking. This involves looking, listening, smelling, hearing and thinking to locate animals. Good trackers notice the big and small details, such as a slightly nibbled leaf, a burrow, or animal droppings. Tracking also involves looking at animal footprints. These can tell you what animals have been in the area, when they were there, and where they may be headed. Don't be tricked! Animals such as the emu will rise on to its claws to cover its tracks.

Tracking Malleefowl – image courtesy of Bianca McNear.

Lower Primary

Upper Primary

### PREPARATION

- Fill trays with sand.
- Display animal footprints sheet on page 41 for students to copy. Footprints include: emu, kangaroo, echidna, goanna, fox, dog, cat, malleefowl and snake (tracks).

## LESSON

Practise your tracking skills by learning how to identify footprints. Drawing footprints in the sand is a method that many Aboriginal people use to teach younger people what to look for when hunting.

- Use trays of sand to draw footprints of local animals.
- Use your fingers and sticks to perfect the footprint and ask your partner to identify the animal.

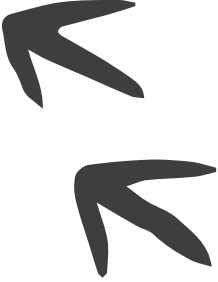
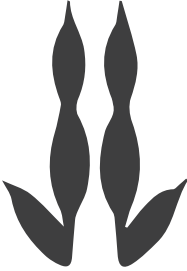

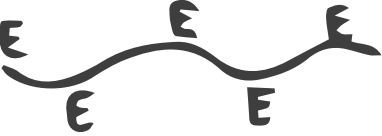




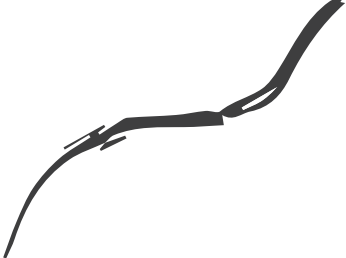
## REFLECT

- Review your KWL chart. What did you learn? What do you want to know more about? How might you find out more?
- What is traditional ecological knowledge?
- What most interested you about traditional ecological knowledge?

## ADDITIONAL RESOURCES

- Wikihow: *Tracking animals*.  
<https://www.wikihow.com/Track-Animals>
- Website: *Identifying tracks, scats, burrows and other signs* – Australian animals.  
<http://wildlife.lowecol.com.au/files/Identifying-Tracks-Scats-Burrows-and-other-signs.pdf>
- PDF and Video: Traditional ecological knowledge helps monitor threatened bilbies on Martu Country.  
<https://blog.nature.org/science/2017/07/17/traditional-knowledge-helps-monitor-threatened-bilbies-on-martu-country/>

# Tracking Activity Worksheet

<p>Emu</p> 	<p>Kangaroo</p> 	<p>Echidna</p> 
<p>Goanna</p> 	<p>Fox</p> 	<p>Dog</p> 
<p>Cat</p> 	<p>Malleefowl</p> 	<p>Snake</p> 

# CARING FOR COUNTRY

YEAR	WESTERN AUSTRALIAN CURRICULUM CONNECTIONS			
Pre-primary	Humanities and Social Sciences The reasons some places are special to people and how they can be looked after, including Aboriginal and Torres Strait Islander Peoples' places of significance (ACHASSK017)(ACHASSK016)		Humanities and Social Sciences How the stories of families and the past can be communicated and passed down from generation to generation (e.g. photographs, artefacts, books, oral histories, digital media, museums) and how the stories may differ, depending on who is telling them (ACHASSK013)	
Year 1	Humanities and Social Sciences The natural, managed and constructed features of places, their location on a pictorial map, how they may change over time (e.g. erosion, revegetated areas, planted crops, new buildings) and how they can be cared for (ACHASSK031)			
Year 2	Humanities and Social Sciences The ways in which Aboriginal and Torres Strait Islander Peoples maintain connections to their Country/Place (ACHASSK049)			
Year 4	Humanities and Social Sciences The importance of environments to animals and people, and different views on how they can be protected (ACHASSK088)	Humanities and Social Sciences The diversity and longevity of Australia's first peoples and the ways they are connected to Country/Place (e.g. land, sea, waterways, skies) and their pre-contact ways of life (ACHASSK083)	Humanities and Social Sciences Aboriginal and Torres Strait Islander Peoples' ways of living were adapted to available resources and their connection to Country/Place has influenced their views on the sustainable use of these resources, before and after colonisation (ACHASSK089)	Science Living things depend on each other and the environment to survive (ACSSU073)
Year 5	Humanities and Social Sciences The way people alter the environmental characteristics of Australian places (e.g. vegetation clearance, fencing, urban development, drainage, irrigation, farming, forest plantations, mining) (ACHASSK112)		Humanities and Social Sciences The patterns of colonial development and settlement (e.g. geographical features, climate, water resources, transport, discovery of gold) and how this impacted upon the environment (e.g. introduced species) and the daily lives of the different inhabitants (e.g. convicts, free settlers, Aboriginal and Torres Strait Islander Peoples) (ACHASSK107)	
Year 6	Science The growth and survival of living things are affected by physical conditions of their environment (ACSSU094)			
Year 7	Humanities and Social Sciences The importance of conserving the remains of the ancient past, including the heritage of Aboriginal and Torres Strait Islander Peoples (ACDSEH148)			
Year 8	Humanities and Social Sciences The spiritual, cultural and aesthetic value of landscapes and landforms for people, including Aboriginal and Torres Strait Islander Peoples (ACHGK049)			
Year 9	Humanities and Social Sciences The ways that humans in the production of food and fibre have altered some biomes (e.g. through vegetation clearance, drainage, terracing, irrigation) (ACHGK061)			

# Introduction

Aboriginal people had to live sustainably to ensure that there would be enough food from one year to the next, and into the future. Although Aboriginal people were spread out across Australia, they concentrated around areas abundant in resources such as the coast and river systems. Their sustainable approach to sourcing food nourished them for more than 65,000 years. Their care for the environment wasn't just practical but also spiritual. The land and sea and its creatures are the embodiment of ancestral spirits.

Today Aboriginal people still visit the places where the best food can be found. They collect a variety of foods from different areas, and always leave enough for the future. They also continue to care for Country by following lore. For example, when visiting a river they throw sand into the water so that the spirits know that they are there. They observe rules such as not going to places that their Elders have told them to avoid, and they care for significant sites by making sure that they are maintained and not disturbed.

## Activity 1

Students watch and discuss a video on caring for gnamma holes.

Lower Primary

Upper Primary

Lower Secondary



Watch *Gnamma Project*.

<https://www.youtube.com/watch?v=YunoUEZTbCk>

Lower Primary

- Why did the people in the video want to clean the gnamma hole?
- How did the people in the video clean the hole?
- What happened after the hole was cleaned?

Upper Primary

Lower Secondary

- How did the Noongar people care for the gnamma hole in the past and in this video?
- Why did they throw sand in the water?
- The plaque at the end says 'if you kill the water snake, the water dries up'. How does this relate to Noongar spirituality?
- Visit Noongar Spirituality for more information.  
<https://www.noongarculture.org.au/spirituality/>

### GOING FURTHER

- Learn more about Gnamma holes and their significance to the Noongar people from the Wheatbelt National Resource Management group.  
[https://www.wheatbeltnrm.org.au/sites/default/files/knowledge\\_hub/documents/The%20Derdibin%20Gnamma%20Storybook%20Final%20Web.pdf](https://www.wheatbeltnrm.org.au/sites/default/files/knowledge_hub/documents/The%20Derdibin%20Gnamma%20Storybook%20Final%20Web.pdf)

## Activity 2

Students create an advertisement to promote picking up rubbish from the beach.

### 'Take 3 for the Sea'

Much of the huge amounts of rubbish in the ocean is plastic – and it's a big problem. Every year eight million tonnes of plastic end up in the ocean. That's like dumping one truck of rubbish into the ocean every minute. And it never goes away. Instead it floats around, pollutes the environment, and harms sea life. Turtles swallow plastic bags thinking they're jellyfish. Dolphins, penguins and fish get tangled in fishing lines. Seabirds swallow drink-bottle caps and all other small bits of plastic. It's a mess! But you can help.

When you go to the beach or river 'Take 3 for the Sea' – take three pieces of rubbish with you when you leave. This way you'll help reduce the problem and protect our sea and river creatures.

Lower Primary

Upper Primary

Lower Secondary

### PREPARATION

- Ask students to bring a used plastic bag from home.

### LESSON

Read 'Take 3 for the Sea' and then brainstorm ways to get others to 'Take 3 for the Sea'. As a class, small group or individual, choose one way to promote 'Take 3 for the Sea'. Here are a few ideas to get you started:

- Create your own video or animation.
- Write and perform a song or a jingle.
- Create a 'Take 3 for the Sea' design for a t-shirt, or a post for your school's webpage.

Once you've finished, share your message with your family, another class or in your school newsletter.

### GOING FURTHER

Head down to your closest beach for a rubbish clean up. Fill your bag with as many pieces of rubbish as you can find. Remember to look along the foreshore too, as this rubbish will likely be blown onto the beach.

Lower Primary

Upper Primary

Lower Secondary

Once you've collected the rubbish, discuss:

- Where would this rubbish have ended up if you had not collected it?
- What problems might the rubbish have caused?

Organisations like Tangaroa Blue take rubbish very seriously, and for good reason too. They want you to log the rubbish that you've collected into their database so that they can find out more about people's rubbish habits and what they might be able to do about it. So far, more than 10 million pieces of rubbish have been logged (and collected). Can you help them too?

- Log your rubbish on the Tangaroa Blue website.  
<http://amdi.tangaroablue.org/>
- Select 'submit data'.
- You will need to register individually or as a class (an email address is required).
- Select the location of the clean up, the collection and item details.
- You can add photos and provide additional information about your collection.
- Check out the dashboard to find out what rubbish items are most prevalent, and the clean-ups section to see what others found in Geraldton.  
<http://amdi.tangaroablue.org/dashboard>
- You can also do this with your family, friends and by joining other local environmental organisations.
- What can you do with your rubbish now? Reuse – create an artwork or recycle.

If your school is not close to the beach, you can still collect and log rubbish on the Clean-up Australia website:

<https://www.cleanupaustaliaday.org.au/about/index.php?PAGE=/about-the-event/year-round-clean-up>

## Activity 3

Students create a poster to help them to learn about eating seasonal food.

### Eat it in season

Have you ever eaten a strawberry in June? It's likely it came from far away and had to be transported long distances to reach your local supermarket. Fruit and vegetables closer to home often use fewer resources for packaging, storage and transport than fruit and vegetables grown closer and in season. Choosing local and seasonal food is good for the environment and you too. If you eat fruit and vegetables when they are in season, you'll often be eating something that's cheaper, tastier and more nutritious.

### PREPARATION

- A3 paper (one per student).

### LESSON

Lower Primary

Upper Primary

Lower Secondary

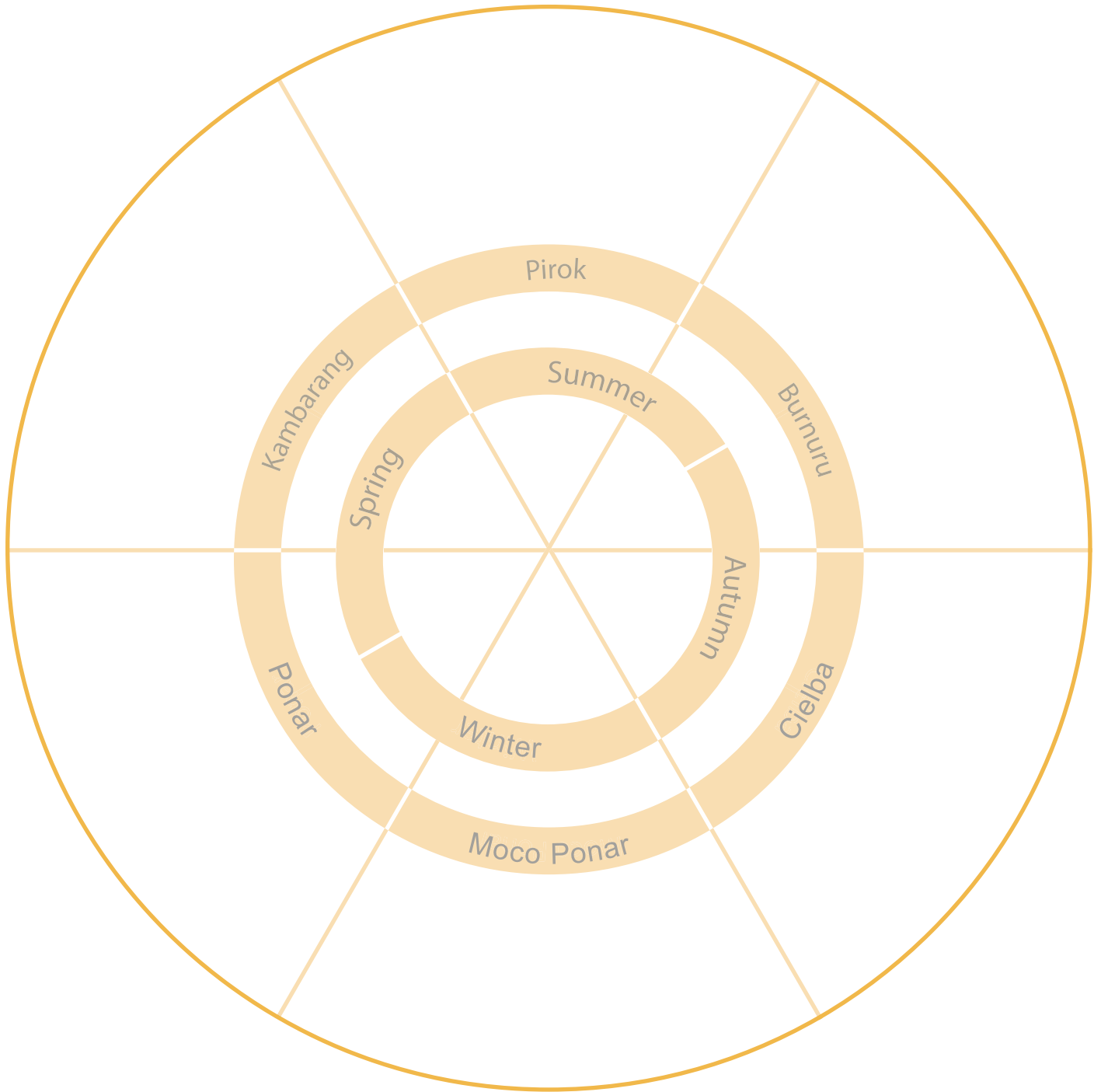
Create an A3 poster of foods matched with their seasons for your home. See page 46 for information about seasonal fruit and vegetables and a template on page 47. Choose foods that your family uses regularly to put on your poster. Take your poster home and put it on the fridge as a reminder to your household.

# Fruit and vegetables in season – Western Australia

Aboriginal people did not refer to a written calendar to work out the season. They were guided by the environment – the wind, the rain and the sky – to tell them when seasons were changing. Many Aboriginal groups observed different seasons to that of the European four-season year. The Noongar people observe six seasons: Pirok, burnuru, cielba, moco, ponar and kambarang.

SEASON	NOONGAR (YUED) SEASONS	FRUIT	VEGETABLES
Summer	Pirok	Avocado, Banana, Berries, Cherry, Fig, Grape, Honeydew, Mango, Nectarine, Passionfruit, Pineapple, Peaches, Rockmelon, Strawberry, Watermelon.	Asian greens, Beetroot, Beans, Broccoli / Broccolini, Capsicum, Carrot, Celery, Cucumber, Eggplant, Green Bean, Leek, Lettuce, Mushroom, Peas, Potato, Onion, Radishes, Snow Peas, Sweet Corn.
	burnuru		
Autumn	burnuru	Apple, Avocado, Banana, Fig, Grape, Guava, Honeydew, Kiwifruit, Lemon, Lime, Mandarin, Mango, Guava, Nectarine, Papaya, Passionfruit, Peach, Pear, Persimmon, Plum, Pomegranate, Rockmelon, Orange, Strawberry, Tomato.	Asian greens, Beetroot, Broccoli / Broccolini, Brussels sprouts, Cabbage, Capsicum, Carrot, Cauliflower, Celery, Eggplant, Green beans, Leek, Lettuce, Mushroom, Onion, Parsnip, Peas, Potato, Pumpkin, Radishes, Rhubarb, Spinach, Squash, Swede, Sweet Potato, Sweet Corn, Turnip.
	cielba		
Winter	moco	Apple, Avocado, Banana, Grapefruit, Guava, Kiwifruit, Lemon, Lime, Mandarin, Orange, Pear, Persimmon, Pineapple, Passionfruit, Quince, Tangelo, Strawberry.	Asian Greens, Beetroot, Broccoli / Broccolini, Brussels sprouts, Cabbage, Carrot, Cauliflower, Celeriac, Celery, Eggplant, Fennel, Kale, Lettuce, Mushroom, Parsnip, Persimmon, Peas, Potato, Rhubarb, Truffles, Turnip, Zucchini.
	ponar		
Spring	ponar	Apricot, Avocado, Banana, Cherry, Grapefruit, Guava, Honeydew, Lemon, Loquat, Mandarin, Mango, Nectarine, Orange, Passionfruit, Papaya, Pineapple, Rockmelon, Strawberry, Watermelon.	Asian Greens, Artichoke, Asparagus, Avocado, Beetroot, Broccoli, Cabbage, Carrot, Cauliflower, Cucumber, Capsicum, Eggplant, Garlic, Green Beans, Leek, Lettuce, Mushroom, Peas, Potato, Pumpkin, Radishes, Rhubarb, Silverbeet, Snow Peas, Spinach, Sweet Corn, Tomato, Zucchini.
	kambarang		

# Seasonal Foods Calendar



## REFLECT

- Review your KWL chart. What did you learn? What do you want to know more about? How might you find out more?
- What do you do to care for the environment? Discuss or write in your journal.

## Lower Primary

(This is the final topic in for Lower Primary students)

## REVIEW YOUR KWL CHART.

- What did you learn?
- What did you most enjoy learning about?
- What questions do you have now?
- How might you be able to find the answers?

## ADDITIONAL RESOURCES

- Video: Dr Noel Nannup's perspective on Aboriginal spirituality and sustainability.  
[https://www.youtube.com/watch?v=2-k3WGOar\\_4](https://www.youtube.com/watch?v=2-k3WGOar_4)
- Video: Learn about Aboriginal seasons across Australia – ABC education.  
<http://www.abc.net.au/btn/story/s4761972.htm>
- Video: Walga Rock – Wajarri sacred site and how it is cared for.  
<https://vimeo.com/182500708>

# CHANGES TO THE ENVIRONMENT POST-COLONISATION

YEAR	WESTERN AUSTRALIAN CURRICULUM CONNECTIONS			
Year 4	Humanities and Social Sciences The importance of environments to animals and people, and different views on how they can be protected ( <a href="#">ACHASSK088</a> )	Humanities and Social Sciences The diversity and longevity of Australia's first peoples and the ways they are connected to Country/Place (e.g. land, sea, waterways, skies) and their pre-contact ways of life ( <a href="#">ACHASSK083</a> )	Humanities and Social Sciences The nature of contact between Aboriginal and/or Torres Strait Islander Peoples and others (e.g. the Macassans, Europeans) and the impact that these interactions and colonisation had on the environment and people's lives (e.g. dispossession, dislocation, the loss of lives through conflict, disease, loss of food sources and medicines ( <a href="#">ACHASSK086</a> ))	Science Earth's surface changes over time as a result of natural processes and human activity ( <a href="#">ACSSU075</a> )
Year 5	Humanities and Social Sciences The way people alter the environmental characteristics of Australian places (e.g. vegetation clearance, fencing, urban development, drainage, irrigation, farming, forest plantations, mining) ( <a href="#">ACHASSK112</a> )	Humanities and Social Sciences The patterns of colonial development and settlement (e.g. geographical features, climate, water resources, transport, discovery of gold) and how this impacted upon the environment (e.g. introduced species) and the daily lives of the different inhabitants (e.g. convicts, free settlers, Aboriginal and Torres Strait Islander Peoples) ( <a href="#">ACHASSK107</a> )	Humanities and Social Sciences The economic, social and political impact of one significant development or event on a colony and the potential outcomes created by 'what if...?' scenarios (e.g. frontier conflict; the gold rushes; the Eureka Stockade; the Pinjarra Massacre; the advent of rail; the expansion of farming; drought) ( <a href="#">ACHASSK107</a> )	
Year 6	Humanities and Social Sciences Experiences of Australia's democracy and citizenship, including the status and rights of Aboriginal people and/or Torres Strait Islander Peoples, migrants, women and children ( <a href="#">ACHASSK135</a> )		Humanities and Social Sciences Interactions between organisms can be described in terms of food chains and food webs; human activity can affect these interactions ( <a href="#">ACSSU112</a> )	
Year 8	Humanities and Social Sciences The spiritual, cultural and aesthetic value of landscapes and landforms for people, including Aboriginal and Torres Strait Islander Peoples ( <a href="#">ACHGK049</a> )			
Year 9	Humanities and Social Sciences The challenges to food production, including land and water degradation, shortage of fresh water, competing land uses, and climate change for Australia and the world ( <a href="#">ACHGK063</a> )			

## Introduction

Since European colonisation, the Australian environment has changed dramatically. Introduced plants and animals and the use of land for agriculture have caused many of these changes, as has the disruption to Aboriginal fire management practices. These changes have resulted in biodiversity loss and damage to the landscape including soil health.

Many Aboriginal people were also forced off their lands, so were unable to care for their Country. Later, government policies (laws) such as assimilation and the forcible removal of Aboriginal

children resulted in the disruption of traditional ecological knowledge being passed down to younger generations.

Today, organisations such as the Northern Agricultural Catchments Council encourage the sharing and use of traditional ecological knowledge to better care for the environment.

### Terra Nullius

In 1770 Captain Cook claimed the east coast of what would become known as 'Australia' for the King of Great Britain. It was not acknowledged that Aboriginal people owned the land under their own system of lore. The land was deemed *terra nullius* (i.e. land belonging to no one).

In the 1992 Mabo decision, the High Court of Australia overturned the idea that the land of Australia was *terra nullius* when the British claimed sovereignty.



Watch *The Invasion Story* to learn more:  
<https://www.youtube.com/watch?v=Oj0TNPNpI1c>

## Activity 1

Students read about the experiences of a Noongar community member and then respond to questions.

Upper Primary

Lower Secondary

*In the 1970s and 1980s I grew up in Dandaragan, where my father (Colin Moore) was born and where his mother, my nan, was born (Edith Worrall, circa 1916), where her mother (Clara Worrall, circa 1899) and her father Billy Worrall (circa 1860s) all came from. When dad and I visited nan, sometimes the environment would be discussed – a topic I'd tune into. I remember how nan described the sound snakes would make at night in the bush and how the bush, in the new country (since colonisation), was being cleared for farming. Growing up we never heard these sounds. On the farm my brother and I would jump our motorbikes on the mounds made by what Dad said were 'boodie' (a small marsupial), now locally extinct. Much of the destruction to Yued boodja (Country) occurred before I was born, but the effects of colonisation on the environment are still very much an issue today. For example, trees have been removed for agriculture which has made the water table rise on the wetlands. Areas of significance such as Wedge Island are now threatened because of the infestation of introduced plants such as the spiny rush. There are no longer massive flocks of black tailed cockatoo, which once fed on the mari flowers.*

*My family, like many Aboriginal families, has been affected by the Stolen Generations. My nan and her sister Dori were raised by my great-great grandparents (Billy Worrall and Alice Nettle) because my nan's mother (my great-grandmother) died two weeks after giving birth to Dori. My nan was forcibly removed and taken to Mogumber Mission, which was devastating for everyone. Whilst my nan was at Mogumber her grandparents died so she never got to see them again. The only thing I think that may have helped was that Mogumber was still her Yued boodja (Country). – Brendan Moore, Yued man.*

- What changes to the environment did Brendan's family experience?
- How have their lives been affected by government policies (laws)?

## Activity 2

### European farms in Australia

When European settlers arrived in Australia they established farms for exporting products such as wool. The First Fleet brought sheep, cows and goats. Unlike Australian animals such as the kangaroo, these animals had hooves that compacted the soil. They trampled and overgrazed fragile native vegetation, which led to soil erosion and degradation.

Europeans cleared the land for farming and removed deep-rooted trees, which led to a change in the water table and climate. Later, artificial fertilisers and chemicals were added to soils to make them more hospitable to foreign crops and grasses. This practice continues today.

### Upper Primary

### Lower Secondary

Upper Primary students explore the importance of soil and how erosion impacts on soil. Lower Secondary students use data to examine the health of soil in the Mid and South West region.

Brainstorm:

- Why is healthy soil important?

Good soil health is crucial to grow plants for food. Soil also provides plants and other organisms with a home, helps to filter and clean water, and releases gases into the atmosphere to keep our air clean.

### Upper Primary

#### PREPARATION

- Ask students to bring in a large jar of soil from their backyard.
- Prepare soil on trays for students to examine.
- Provide magnifying glasses.
- Photos of erosion (see page 52-53).
- A tray of soil per group (combine soils that students have brought in).
- Students to collect grass, sticks and other natural materials to create their landscapes.

#### LESSON 1

- What can you see in the soil?

Soils are made up of minerals (from rocks), air, water and organic materials (living or dead animals and plants).

- What does the soil sound like when you rub it between your fingers?
- What does the soil smell like?
- What does the soil feel like?
- Have a look at the different soils in the room. Are they all the same?

Discussion points:

- Soil comes from the earth.
- Good quality soils have organic matter and water.
- Different plants grow in different types of soil.
- It is difficult to grow plants in poor quality soils.

## LESSON 2

### Discussion:

- Have a look at the different photos on pages 52-53. Can you identify the types of erosion as seen in the photos?

Fill a tray with soil. This is your landscape. Do not push down on the soil. Add small hills, grasses and other natural materials such as leaves. Using a paper straw (you can make your own) blow softly and watch what happens to the soil.

This is the same process that occurs with wind erosion, removing the topsoil. This creates problems because topsoil is where many of the nutrients are located and it is where plants grow best. Once topsoil is degraded or eroded away it is very time consuming and expensive to replace. Without good topsoil plants do not grow as well.

Rebuild your landscape, but this time create a barrier using sticks, small stones and other natural materials.

- Blow softly through the barrier. Was the effect different?
- Read 'Fighting erosion' to find out how farmers use this strategy.

### Fighting Erosion

Planting trees along the boundaries of a property is one technique that farmers use to reduce the effects of wind erosion. You may be keen to push down on your soil, compacting it so that it won't blow away. This is what hooved animals do when they walk on it repeatedly. Unfortunately, it's difficult for water to sink into compacted soil, which then makes the soil dry and difficult for plants to grow in.

## Erosion



Mid West erosion



Drummonds Cove, March 2013



Lancelin 2018

### PREPARATION

- Display information on local Soil Health on pages 55-59.

### LESSON

Discuss:

- How healthy is the soil where you live?
- What issues might be affecting the soil?

In 2013, the Western Australian Department of Primary Industries and Regional Development released a report card on soil in South West Australia: *Resource status and trend summary for the South West*. This includes information on local soil health. Analyse the information (available on pages 55-59) and then answer following questions.

- What are the issues affecting soil health in your region?
- Have a look at the tables on pages 59-60 *Resource status and trend summary for the South West* and find out more about these issues.
- Discuss the image on page 60: *The three primary factors that influence the environmental performance of the land*.
- What does this tell us about the factors that influence soil quality?

### GOING FURTHER

We know that different plants grow in a range of soil types, and one of the reasons is because all plants prefer a different level of acidity. One way to find out which plants grow best in your school or home soil is to test the acidity of your soil. There are several ways you can do this:

- Use a pH testing kit available from nurseries and gardening centres.
- Test using the *red cabbage method*, as described by Stephanie Alexander (page 5 in the PDF).

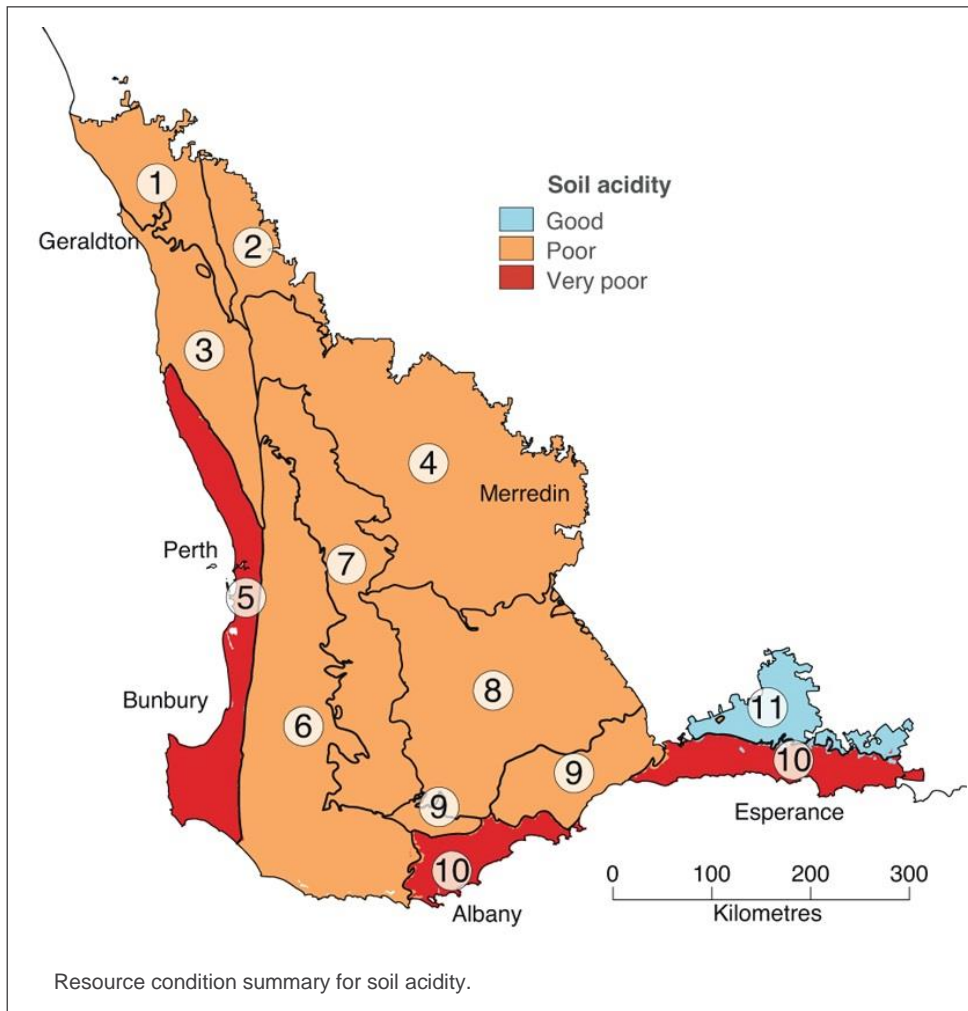
[https://www.kitchengardenfoundation.org.au/uploads/09\\_resources/whats\\_happening\\_in\\_the\\_classroom/Yrs56\\_AcidityInTheSoil\\_WEB.pdf](https://www.kitchengardenfoundation.org.au/uploads/09_resources/whats_happening_in_the_classroom/Yrs56_AcidityInTheSoil_WEB.pdf)

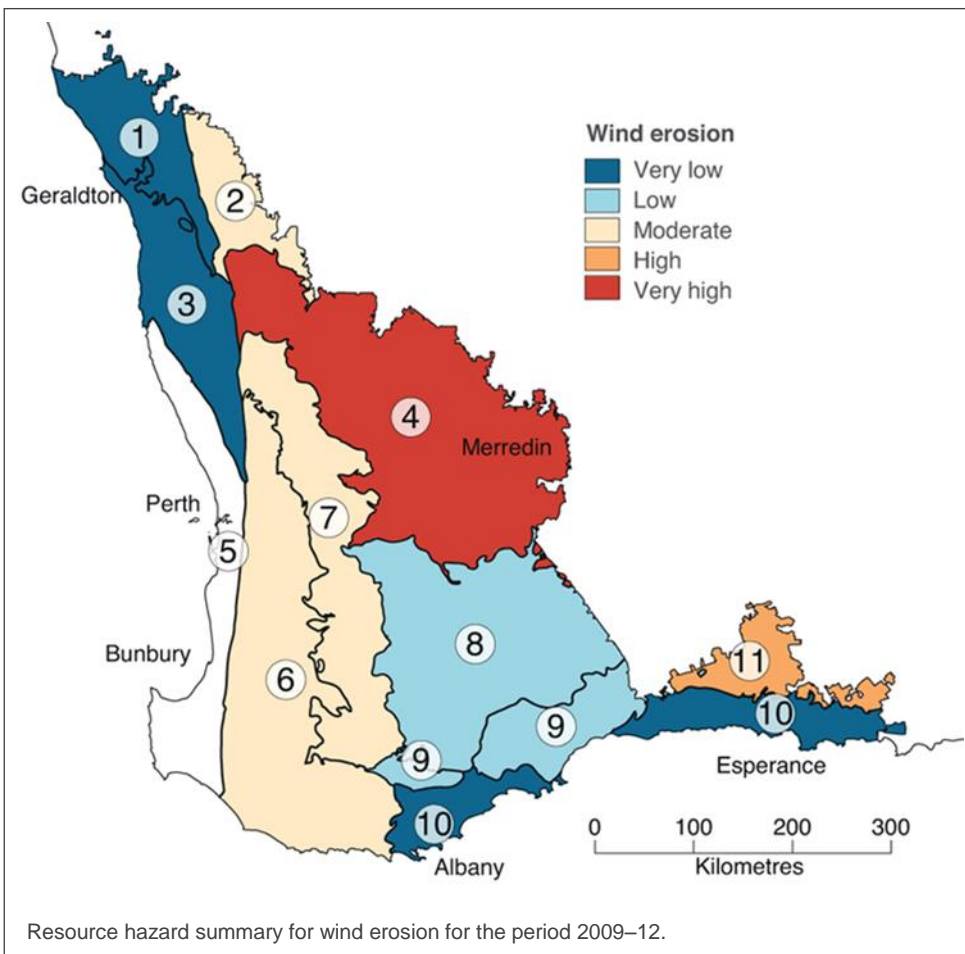
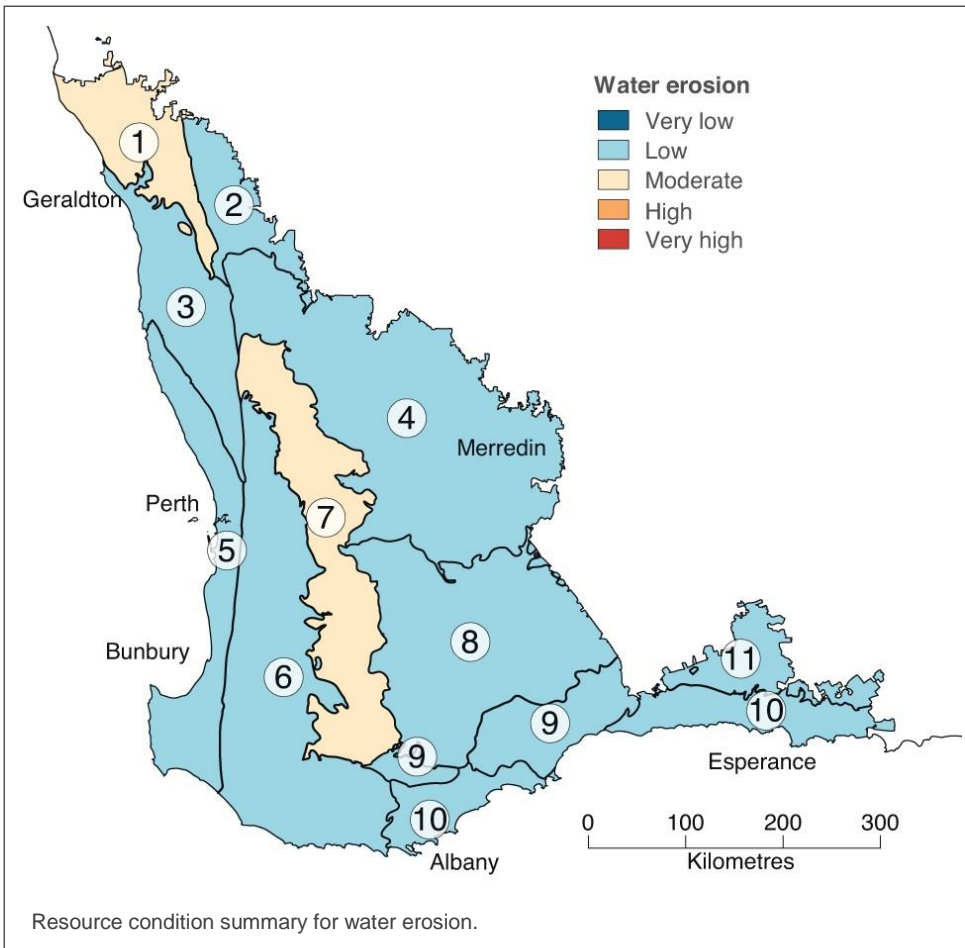
Once you know how acidic your soil is you can work out which plants are best to plant. You can also change the acidity of your soil by adding compost to decrease the acidity. Adding lime to your soil is a technique used by farmers in the Northern Agricultural Region to increase soil acidity.

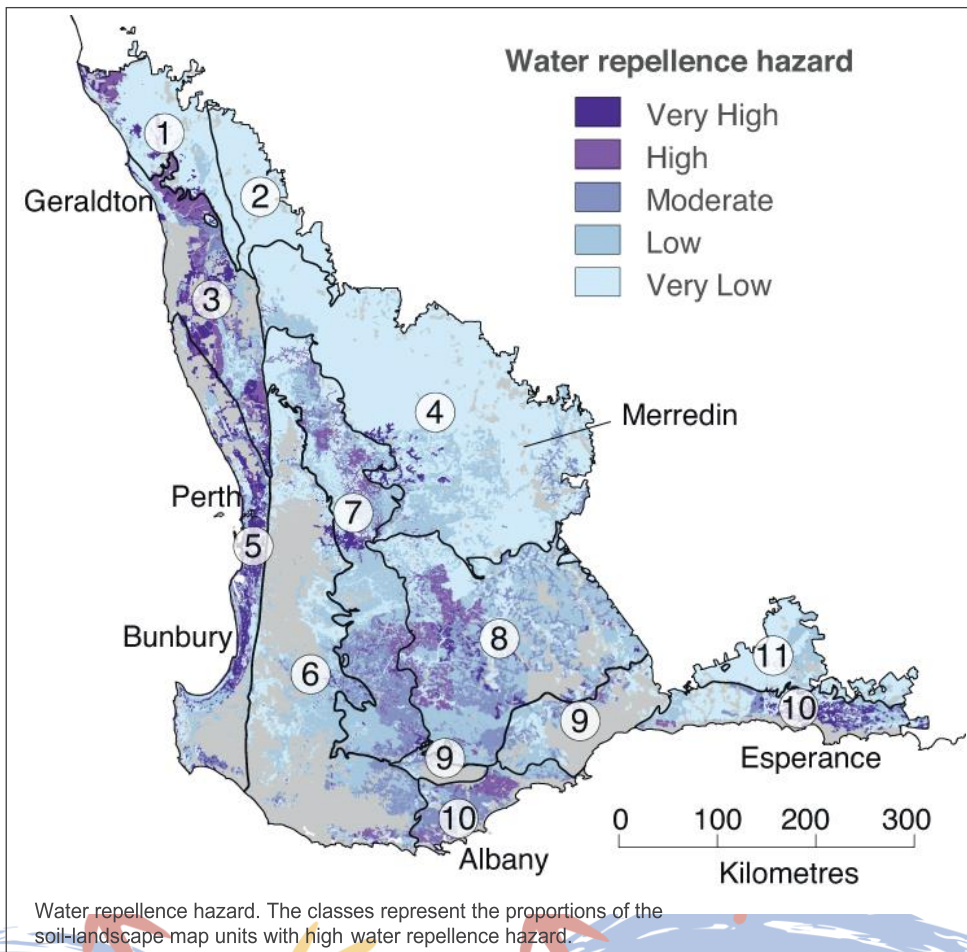
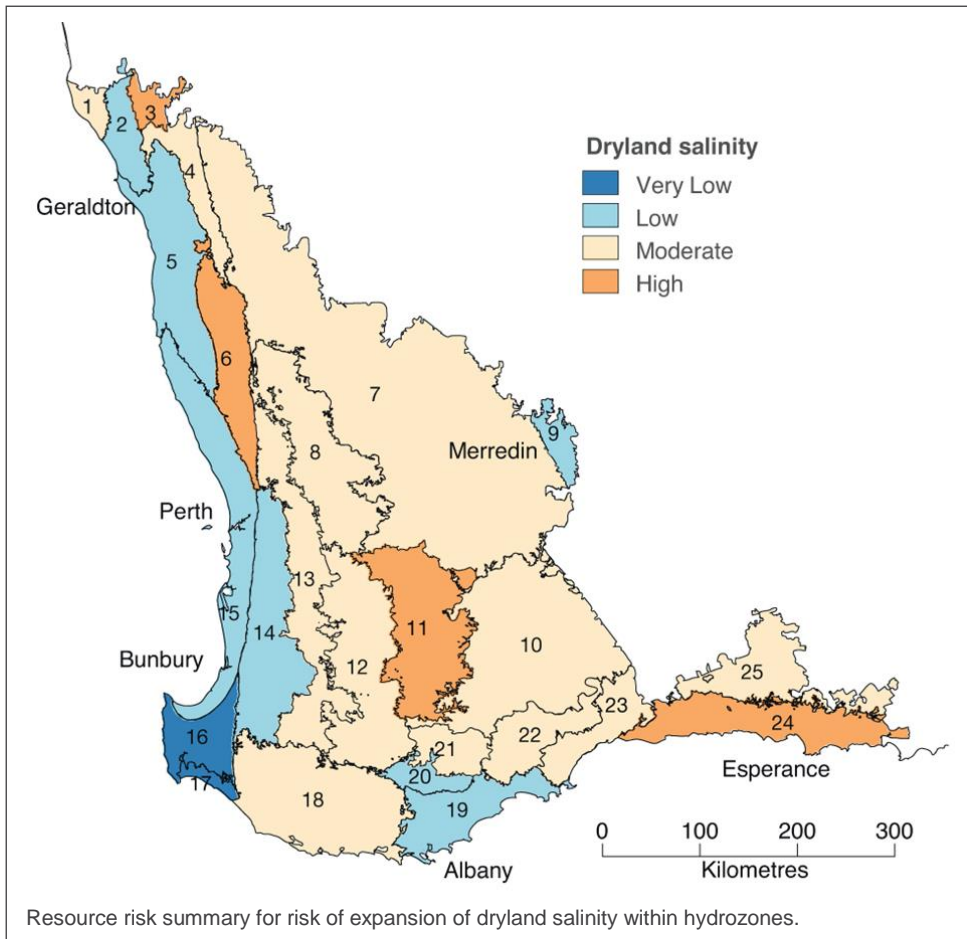
# Local soil health

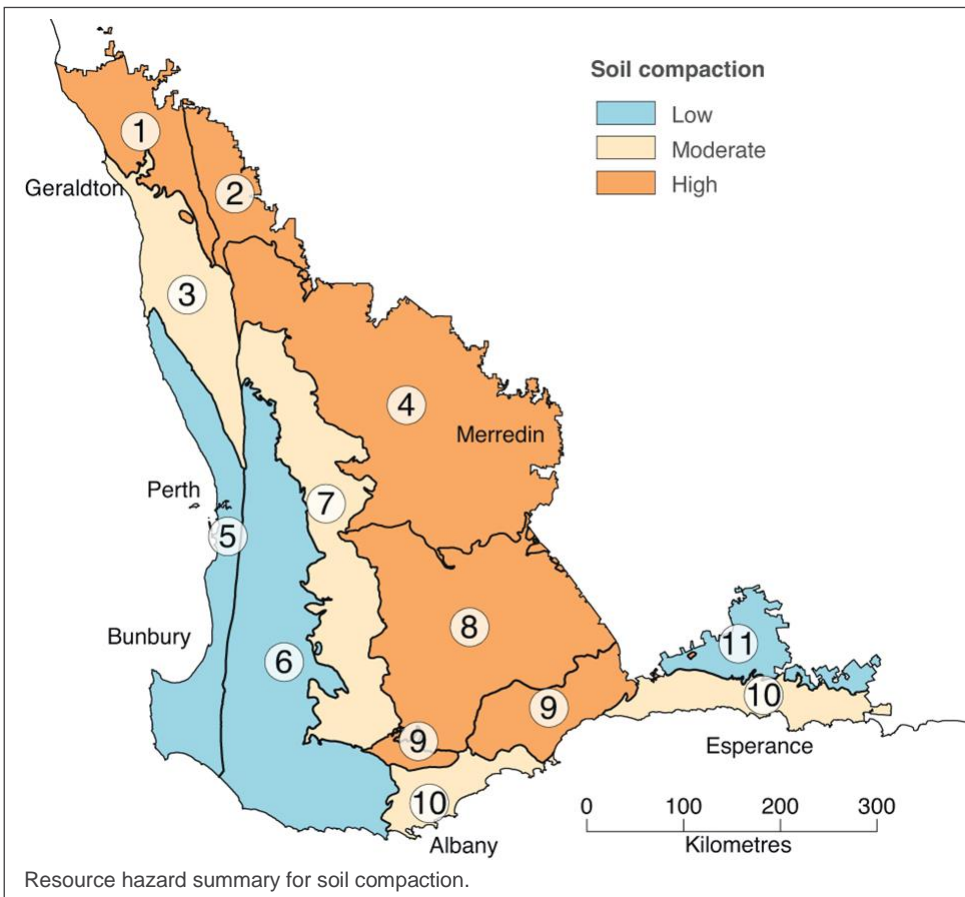
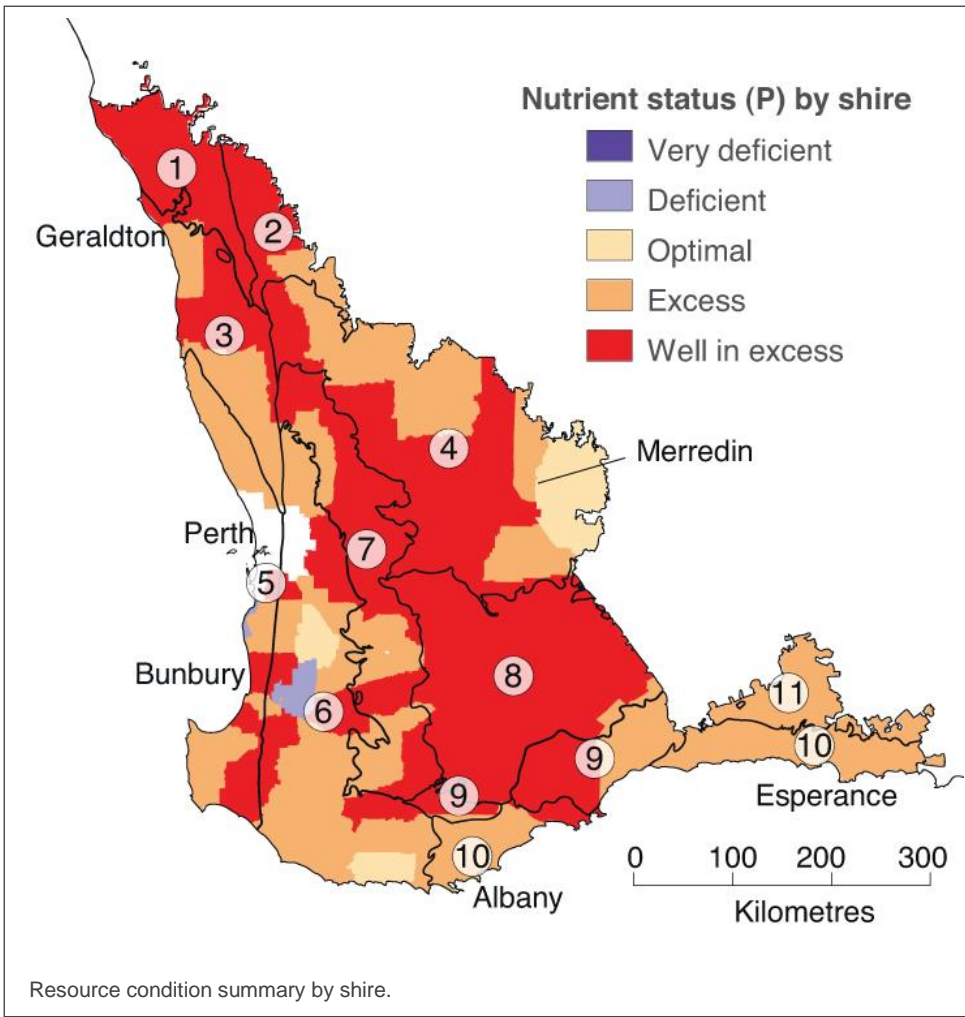
Maps below provide information about soil health in South West Australia. Images and data have been used with permission from the Department of Primary Industries and Regional Development.

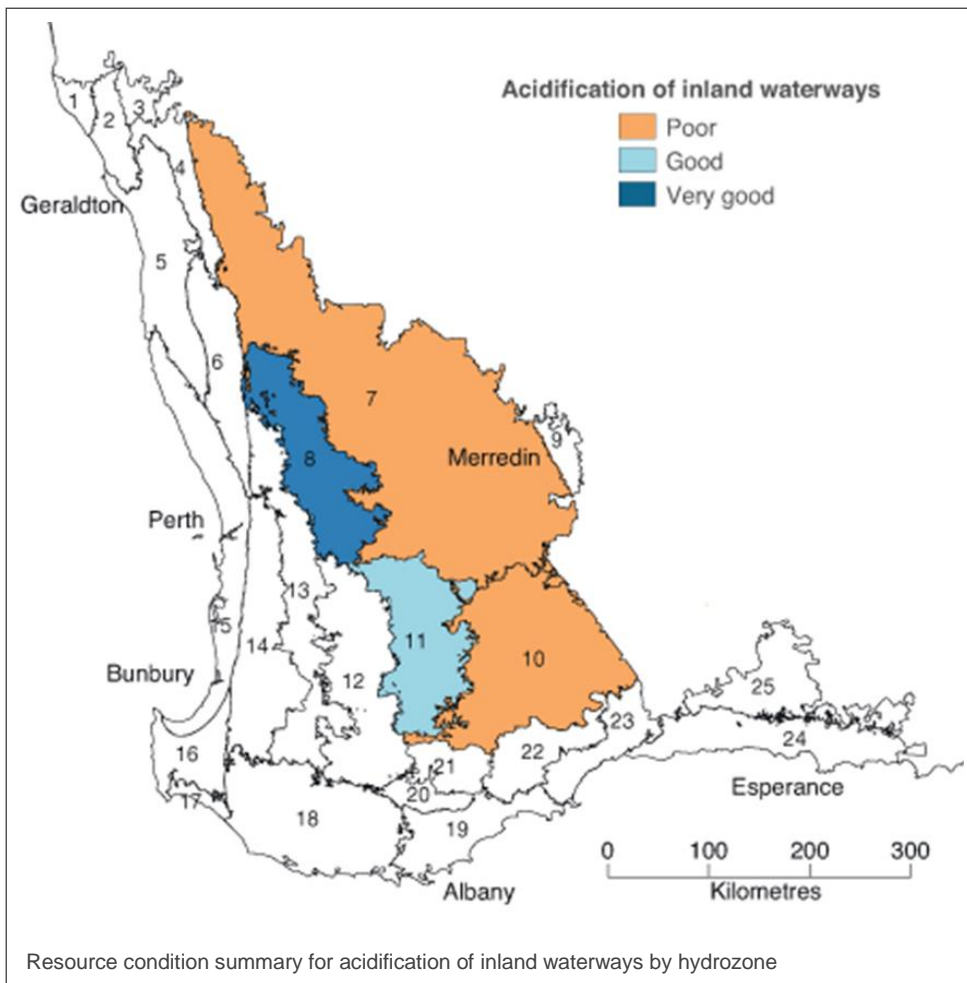
For further information about the report card and soil health can be found on the Department of Primary Industries and Regional Development website (<https://agric.wa.gov.au/n/2082>).







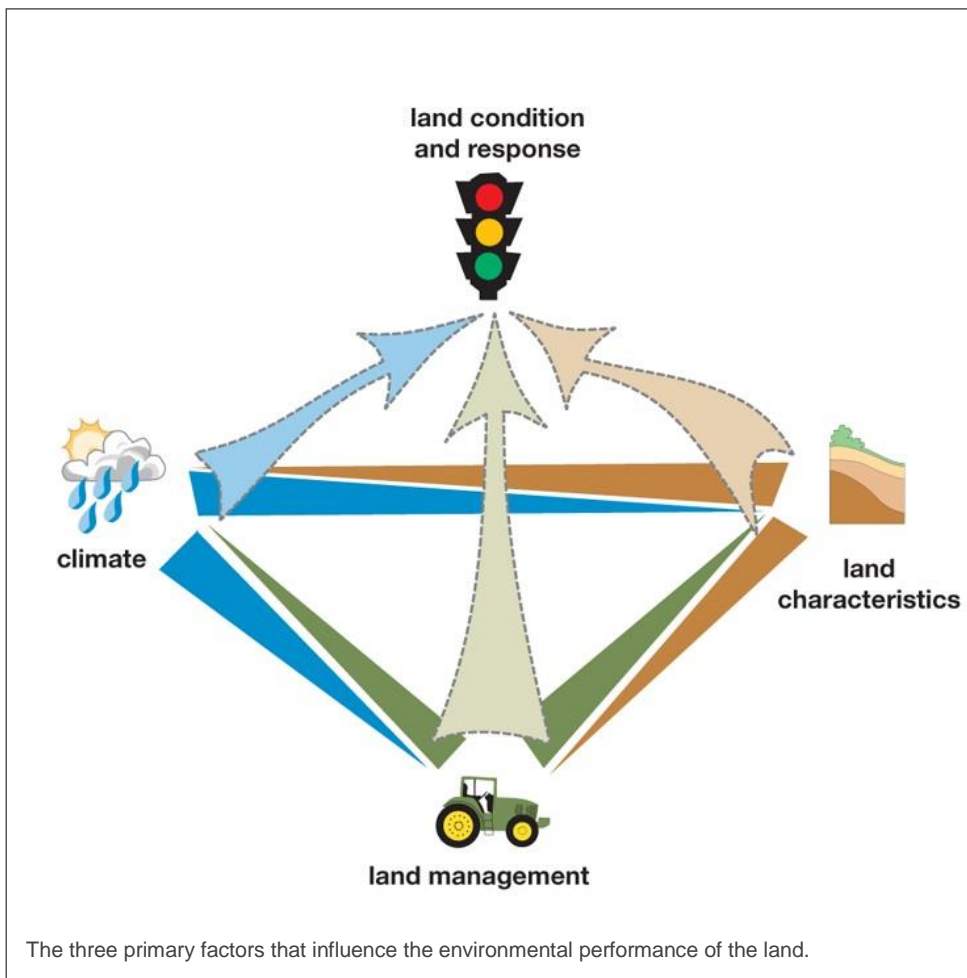




Resource status and trend summary for South West Australia.

Theme	Summary	Condition	Trend	Confidence in Condition	Confidence in Trend
Soil acidity	Severe and widespread and a major risk to production due to insufficient use of agricultural lime. In most areas, condition of the soil profile is declining.	Poor	Deteriorating	Adequate high-quality evidence and high level of consensus	Adequate high-quality evidence and high level of consensus
Water repellence	Widespread and often severe on sandy soils and can be a major limitation to production under current land management systems.	Poor	Deteriorating	Limited evidence or limited consensus	Limited evidence or limited consensus
Nutrient status (P)	In most areas, more phosphorus (P) than is required to optimise production is stored in many agricultural soils.	Excess	Stable	Limited evidence or limited consensus	Limited evidence or limited consensus

Theme	Summary	Hazard/ Risk	Trend	Confidence in Condition	Confidence in Trend
Wind erosion	Despite several below average growing seasons, the risk is largely managed through maintaining ground cover. Vigilance is required however, because after an exceptionally dry year, this issue may be significant.	Low	Variable	Limited evidence or limited consensus	Limited evidence or limited consensus
Water erosion	The risk is largely managed through current land management, although actual levels are mostly unknown.	Low	Stable	Limited evidence or limited consensus	Limited evidence or limited consensus
Soil compaction	Widespread issue but exact severity and trend is unknown.	High	Unclear	Limited evidence or limited consensus	Evidence and consensus too low to make an assessment
Dryland salinity	Widespread risk with variable spatial and temporal impact. Future extent threatens agricultural land, water resource and biodiversity assets. Containing and adapting to salinity is feasible, though recovery is viable in only a few areas.	Moderate	Deteriorating		Limited evidence or limited consensus



Discuss the three primary factors that influence the environmental performance of the land as shown on page 60.

- 1 Climate – how much rain falls, and when. When do the strong winds blow? What are the trends in climate change?
- 2 Land characteristics – the characteristics of our soils and landscapes that make up our diverse environment.
- 3 Land management – what we grow or graze and how we manage it. What land practices do we use in association with the different land uses?

## Activity 3

Students watch and discuss a video on traditional fire management being used today.

Upper Primary

Lower Secondary



Watch the *Korrelocking Fire Project*.

<https://www.youtube.com/watch?v=uYAKaTN12ww>

- Why did the Noongar people want to use fire on their Country?
- How did Kevan learn about traditional fire practices?
- What knowledge did Kevan share about using fire? For example, the difference between hot and cool fires?
- What were the results of using Noongar knowledge of fire practices?
- What is the benefit of engaging with Aboriginal people when it comes to caring for the environment?

### REFLECT

- How might the Australian environment have been different if early explorers had chosen to learn from Aboriginal people?
- What can we do now to protect the environment?
- What will you do? Promise to make one change.

### REVIEW YOUR KWL CHART.

- What did you learn?
- What did you most enjoy learning about?
- What questions do you have now?
- How might you be able to find the answers?

### ADDITIONAL RESOURCES

- Video: Yued Elder shares issues of human impact on Wedge Island.  
<https://www.youtube.com/watch?v=fZB6VgwGIf0>
- Website: Noongar information about the Stolen Generations.  
<https://www.noongarculture.org.au/stolen-generations/>
- Video, audio and text: *National apology to the Stolen Generations*.  
<https://www.australia.gov.au/about-australia/our-country/our-people/apology-to-australias-indigenous-peoples>
- Movie education resource: Rabbit Proof Fence education resource about the Stolen Generations in Western Australia.  
<http://curriculumproject.org/wp-content/uploads/Rabbit-Proof%20Fence%20Nov%2010.pdf>
- Website: AIATSIS First encounters and frontier conflict.  
<https://aiatsis.gov.au/explore/articles/first-encounters-and-frontier-conflict>