

MARNA BANGGARA

# Teacher Information Pack



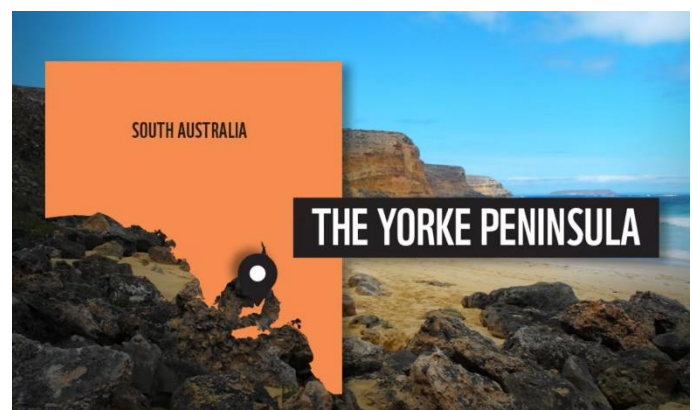
This Primary Teacher Information Pack includes an overview of southern Yorke Peninsula's Marna Banggara project and links to Australian Primary Curriculum.

## What is Marna Banggara?

Marna Banggara is an ambitious project that aims to restore southern Guuranda-Yorke Peninsula's spectacular landscape by returning locally-extinct species and reinvigorating the ecological processes that ensure the bushland's health. It is the first project of its kind in Australia to operate in a working landscape, where conservation, agriculture and the community exist side-by-side. There are multiple learning opportunities within the Australian Curriculum with Marna Banggara as a case study.

## About Marna Banggara

Marna Banggara is a long-term project located on southern Yorke Peninsula on the South Australian coast. The project area is located approximately 235 kilometres from Adelaide and incorporates a 170,000-hectare landscape combining agriculture, and large areas of high-quality native vegetation. Marna Banggara is a 'working landscape', as it is not a closed reserve, however it does include Dhilba Guuranda-Innes National Park and other conservation reserves. This project is partway through a 20-year timeline with



Source: WWF-Australia

staged reintroduction of key native species into the environment<sup>1</sup>. The purpose of Marna Banggara is to improve the environment, minimise decline of the unique vegetation and create resilience within the system. There are several aspects to Marna Banggara that provide educational opportunities;

## 1. Rewilding

*Rewilding is (defined as) a comprehensive, often large-scale, conservation effort focused on restoring sustainable biodiversity and ecosystem health by protecting core wild/wilderness areas, providing connectivity between such areas, and protecting or reintroducing apex predators and highly interactive species (keystone species).*<sup>2</sup>

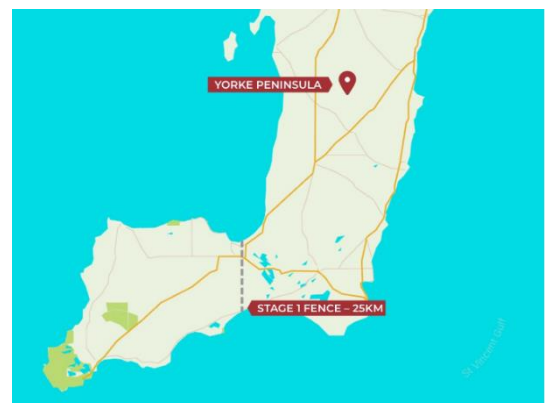
On Guuranda-Yorke Peninsula, 95% of native mammals are now locally extinct due to invasive fauna and flora species such as foxes and feral cats and habitat destruction. This has had a negative impact on the functioning of the ecosystem. Rewilding is predicated on the idea that returning native species to the area will enable the landscape to improve over time, from the health of the soil, surrounding vegetation and ultimately the entire habitat. Global examples have focussed on a reintroduction of apex predators to an area (such as wolves in Yellowstone) however, in recent years the focus has included species with an important function for the ecosystem. **Ecosystem engineers** have a beneficial impact on a landscape, by increasing/reducing structural layers of a habitat and improving soil characteristics<sup>3</sup>. This in turn would result in seed dispersal of flora, further enabling other species to flourish. Rewilding aims to build self-sustainability within an ecosystem which, in turn, reduces the cost of managing that system<sup>4</sup>.

## 2. Predator control and pest management

Managing invasive species is a challenge across Australia. The diversity of the Australian environment creates conditions for a variety of animals and plants to thrive in certain areas. Feral fox and cat management is critical to the success of Marna Banggara and requires a coordinated approach, including:

- Broad-scale fox control through baiting across the Yorke Peninsula landscape.
- Feral cat management through baiting, shooting, and trapping.
- Construction of a predator control fence.

Throughout 2019 and 2020, a 25-kilometre fence was constructed. 1.8 metres in height, the fence stretches from Flaherty Beach to Sturt Bay. The special design of the fence with a floppy top ensures feral cats can't climb over. There is also a 30cm mesh skirt to prevent digging underneath. Ultimately, reintroducing medium-sized native predators will enable the concept of self-sustainability of Marna Banggara, as the competition for food and resources will further reduce feral populations.



*The Stage 1 Fence crosses the 'foot' of Guuranda-Yorke Peninsula, north to south.*

<sup>1</sup> [https://cdn.environment.sa.gov.au/landscape/docs/ny/great\\_southern\\_ark\\_information\\_pack.pdf](https://cdn.environment.sa.gov.au/landscape/docs/ny/great_southern_ark_information_pack.pdf)

<sup>2</sup> <https://rewilding.org/what-is-rewilding/>

<sup>3</sup> [https://cdn.environment.sa.gov.au/landscape/docs/ny/great\\_southern\\_ark\\_information\\_pack.pdf](https://cdn.environment.sa.gov.au/landscape/docs/ny/great_southern_ark_information_pack.pdf)

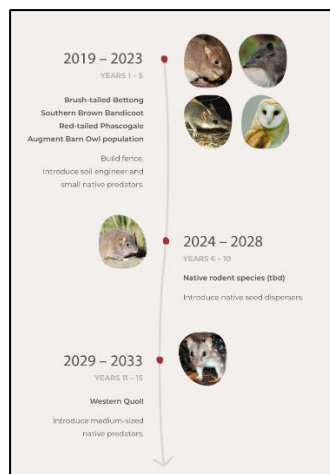
<sup>4</sup> Ibid

### 3. Returning key species: Brush-tailed Bettong (also known as Woylie in Noongar language or Yalgi in Narungga language)

Southern Yorke Peninsula is largely agricultural, however there are large areas of native vegetation that have been retained throughout the landscape. The geographical benefit of a peninsula with a predator control fence enabling low numbers of feral predators, creates a great opportunity to create a 'safe haven' for threatened species. A Yalgi (Brush-tailed Bettong) is a small marsupial that prefers thick, shrubby native vegetation. The species was selected as a reintroduction candidate because of its ecological function as a 'soil engineer'<sup>5</sup>. This crucial function in the environment has multiple benefits. Soil engineers increase nutrient turnover in the soil, improve water filtration and moisture. As they dig and turn over the soil, this creates micro habitat conditions for germination of native seedlings<sup>6</sup>.



In 2021, 40 Woylies from Western Australia were translocated to Dhillba Guuranda-Innes National Park. This reintroduction occurred after being extinct from mainland SA for more than a century.



Subsequent translocations occurred in 2022 and 2023, with 193 animals reintroduced. Monitoring has shown that they are thriving in the landscape, with evidence of female Yalgi carrying pouch young.

### 4. Project timeline: other species to reintroduce

Careful planning is required for each phase of the project and a timeline of activities has been established. To augment feral predator eradication, small native predators are selected. This will also help reduce the abundance of other pests in the area, such as house mice and rabbits, which can have a devastating impact on agriculture and the native environment.

Throughout the reintroduction of species, the project program includes other endeavours to support the overall project success; habitat restoration through weed removal and planting native

vegetation, sustainable agriculture practices and monitoring and supporting current native species populations.

## Australian Curriculum

Science and HASS curriculum are natural learning areas to complement an area of study like Marna Banggara. The ambition and unique context of Marna Banggara allows for in-depth incorporation of Cross-Curriculum Priorities and the General Capabilities.

Below is a summary of the ways Marna Banggara can be incorporated across the Australian Curriculum Foundation to Year 6. Links to sources, news and other information can be found at the end of this document.

<sup>5</sup> [https://cdn.environment.sa.gov.au/landscape/docs/ny/brush\\_tailed\\_bettong\\_v2.pdf](https://cdn.environment.sa.gov.au/landscape/docs/ny/brush_tailed_bettong_v2.pdf)

<sup>6</sup> [https://cdn.environment.sa.gov.au/landscape/docs/ny/great\\_southern\\_ark\\_information\\_pack.pdf](https://cdn.environment.sa.gov.au/landscape/docs/ny/great_southern_ark_information_pack.pdf)

# 1. Cross Curriculum Priorities

- [Aboriginal and Torres Strait Islander Histories and Cultures](#)

'Marna Banggara' was named from Narungga language, meaning 'Healthy, prosperous Country'. The relationship of Narungga Nation to Guuranda-Yorke Peninsula is culturally significant and ongoing. The Narungga nation was made up of four clans: the *Kurnara* in the north of the peninsula; *Winderera* in the east; *Wari* in the west; and *Dilpa* in the south. Today, the Narungga people continue to maintain strong cultural links to the region<sup>1</sup>.

Narungga participation and involvement throughout the rewilding project has been crucial to its success, particularly as caretakers of country with expert knowledge and input. The Narungga people have lived on Yorke Peninsula for many thousands of years and they know the land intimately – its physical features, animal and plant life and water resources.

The new Science elaborations within the AC assists teachers to incorporate Aboriginal and Torres Strait Islander historical and contemporary science innovation. The Unit Plans accompanying this Teacher Information Pack incorporates culturally responsive curriculum to engage students in respect and recognition of Narungga Nation and First Nations people throughout Australia.

- [Sustainability](#)

The underlining principles of Marna Banggara are embedded in sustainability. Crucially, the project has identified the overlapping relationships of agriculture, economy, and biodiversity in the Guuranda-Yorke Peninsula context. This acknowledgment ensures actions to improve sustainability are collective endeavours shared across the local community.

Marna Banggara is an example of the interconnectedness of human constructs and the environment, allowing learning opportunities for students to appreciate the science behind decision making and the real impact on the natural world around them.



Source: ACARA



Source: ACARA

# 2. General Capabilities

## [Literacy](#)

Students will develop literacy through a variety of teaching and learning activities related to Marna Banggara. As students explore the project, they will develop the literacy of science, recognising that language will vary according to context. This will allow them to use language flexibly. Vocabulary will become specific, with use of tier-3 vocabulary that is technical and appropriate for understanding. Examples include 'rewilding', 'soil engineer' and 'apex predator'.

## [Numeracy](#)

General numeracy and mathematical skills will be applied throughout Marna Banggara learning activities. This will be achieved through the collection and representation of data that can be analysed for meaning and understanding. Key examples are recorded numbers of fauna species within the Marna Banggara project area, collected over time.



### Information and Communication Technology (ICT)

Students will develop their understanding of the ways ICT can be used to communicate ideas. Marna Banggara utilises multiple technologies to determine the outcome of measures, such as VHF telemetry, remote sensor camera technology and drones. Large scale conservation projects are enabled using sophisticated technologies, which students will explore through their learning.

### Critical and Creative Thinking

By posing questions, gathering data and forming conclusions about Marna Banggara and the range of supporting resources, students will build their critical thinking about human impact on the natural environment. Students will use creative thinking to develop their own ideas and form solutions based on scientific understanding.

### Personal and Social Capability

Through an inquiry into Marna Banggara, students will engage in the debate of how scientific knowledge impacts their lives and those around them. It will further enable them to make informed choices and consider the ways Marna Banggara meets not only environmental needs, but also personal and social needs.

### Ethical Understanding

Marna Banggara presents ideas that challenge students' ethical judgements. The principles of the project and each stage of reintroducing species to the area require deep thinking about codes of practice, the use of scientific information and science applications for projects of this kind.

### Intercultural Understanding

Marna Banggara recognises and embeds the cultural significance of Narungga nation to Guuranda-Yorke Peninsula. Students will learn the way this relationship to country has shaped the approach to incorporate the expert knowledge of Narungga people.



### 3. F-6 Curriculum Links

#### Links to Australian Curriculum

<b>Science</b> <u>Key ideas<sup>7</sup>:</u> <i>Stability and change</i> <i>Systems</i>		
F-2	Science Understanding	Living things have basic needs ( <a href="#">ACSSU002</a> ) Science involves observing, asking questions about, and describing changes in, objects and events ( <a href="#">ACSHE013</a> ) Living things have a variety of external features ( <a href="#">ACSSU017</a> ) Living things live in different places where their needs are met ( <a href="#">ACSSU211</a> )
	Science as a Human Endeavour	Science involves observing, asking questions about, and describing changes in, objects and events ( <a href="#">ACSHE021</a> ) People use science in their daily lives, including when caring for their environment and living things ( <a href="#">ACSHE022</a> ) ( <a href="#">ACSHE035</a> )
	Science Inquiry Skills	Participate in guided investigations to explore and answer questions ( <a href="#">ACIS025</a> )
3-4	Science Understanding	Living things have life cycles ( <a href="#">ACSSU072</a> ) Living things depend on each other and the environment to survive ( <a href="#">ACSSU073</a> )
	Science as a Human Endeavour	Science knowledge helps people to understand the effect of their actions ( <a href="#">ACSHE051</a> ) ( <a href="#">ACSHE062</a> )
	Science Inquiry Skills	With guidance, identify questions in familiar contexts that can be investigated scientifically and make predictions based on prior knowledge ( <a href="#">ACIS053</a> ) ( <a href="#">ACIS064</a> ) Represent and communicate observations, ideas and findings using formal and informal representations ( <a href="#">ACIS060</a> ) ( <a href="#">ACIS071</a> )
5-6	Science Understanding	Living things have structural features and adaptations that help them to survive in their environment ( <a href="#">ACSSU043</a> ) The growth and survival of living things are affected by physical conditions of their environment ( <a href="#">ACSSU094</a> )

<sup>7</sup> <https://www.australiancurriculum.edu.au/f-10-curriculum/science/key-ideas/>

	Science as a Human Endeavour	<p>Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena and reflects historical and cultural contributions (<a href="#">ACSHE081</a>) (<a href="#">ACSHE098</a>)</p> <p>Scientific knowledge is used to solve problems and inform personal and community decisions (<a href="#">ACSHE083</a>) (<a href="#">ACSHE100</a>)</p>
	Science Inquiry Skills	<p>Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate (<a href="#">ACSIS090</a>) (<a href="#">ACSIS107</a>)</p> <p>Compare data with predictions and use as evidence in developing explanations (<a href="#">ACSIS218</a>) (<a href="#">ACSIS221</a>)</p> <p>Reflect on and suggest improvements to scientific investigations (<a href="#">ACSIS091</a>) (<a href="#">ACSIS108</a>)</p> <p>Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts (<a href="#">ACSIS093</a>) (<a href="#">ACSIS110</a>)</p>

<p><b>HASS</b></p> <p><u>Concepts of Interdisciplinary Thinking<sup>8</sup></u></p> <p><i>Cause and effect</i></p> <p><i>Interconnections</i></p> <p><i>Roles, rights and responsibilities</i></p>		
F-2	Inquiry and skills	<p>Collect data and information from observations and identify information and data from sources provided (<a href="#">ACHASSI002</a>) (<a href="#">ACHASSI019</a>) (<a href="#">ACHASSI035</a>)</p> <p>Sort and record information and data, including location, in tables and on plans and labelled maps (<a href="#">ACHASSI003</a>) (<a href="#">ACHASSI020</a>) (<a href="#">ACHASSI036</a>)</p> <p>Interpret data and information displayed in pictures and texts and on maps (<a href="#">ACHASSI007</a>) (<a href="#">ACHASSI024</a>) (<a href="#">ACHASSI040</a>)</p>

<sup>8</sup> <https://www.australiancurriculum.edu.au/f-10-curriculum/humanities-and-social-sciences/hass/structure/>

		Reflect on learning to propose how to care for places and sites that are important or significant ( <a href="#">ACHASSI009</a> ) ( <a href="#">ACHASSI026</a> ) ( <a href="#">ACHASSI042</a> )
	Knowledge and understanding <i>Geography</i>	<p>The representation of the location of places and their features on simple maps and models (<a href="#">ACHASSK014</a>)</p> <p>The Aboriginal or Torres Strait Islander Country/Place on which the school is located and why Country/Place is important to Aboriginal and Torres Strait Islander Peoples (<a href="#">ACHASSK016</a>)</p> <p>The natural, managed and constructed features of places, their location, how they change and how they can be cared for (<a href="#">ACHASSK031</a>)</p> <p>The ways in which Aboriginal and Torres Strait Islander Peoples maintain special connections to particular Country/Place (<a href="#">ACHASSK049</a>)</p>
3-4	Inquiry and skills	<p>Pose questions to investigate people, events, places and issues (<a href="#">ACHASSI052</a>) (<a href="#">ACHASSI073</a>)</p> <p>Record, sort and represent data and the location of places and their characteristics in different formats, including simple graphs, tables and maps, using discipline-appropriate conventions (<a href="#">ACHASSI054</a>) (<a href="#">ACHASSI075</a>)</p> <p>Interpret data and information displayed in different formats, to identify and describe distributions and simple patterns (<a href="#">ACHASSI057</a>) (<a href="#">ACHASSI078</a>)</p> <p>Draw simple conclusions based on analysis of information and data (<a href="#">ACHASSI058</a>) (<a href="#">ACHASSI079</a>)</p> <p>Present ideas, findings and conclusions in texts and modes that incorporate digital and non-digital representations and discipline-specific terms (<a href="#">ACHASSI061</a>) (<a href="#">ACHASSI082</a>)</p>
	Knowledge and understanding <i>Geography</i>	<p>The representation of Australia as states and territories and as Countries/Places of Aboriginal and Torres Strait Islander Peoples; and major places in Australia, both natural and human (<a href="#">ACHASSK066</a>)</p> <p>The importance of environments, including natural vegetation, to animals and people (<a href="#">ACHASSK088</a>)</p> <p>The custodial responsibility Aboriginal and Torres Strait Islander Peoples have for Country/Place, and how this influences views about sustainability (<a href="#">ACHASSK089</a>)</p> <p>The use and management of natural resources and waste, and the different views on how to do this sustainably (<a href="#">ACHASSK090</a>)</p>
5-6	Inquiry and skills	Develop appropriate questions to guide an inquiry about people, events, developments, places, systems and challenges ( <a href="#">ACHASSI094</a> ) ( <a href="#">ACHASSI122</a> )



	<p>Locate and collect relevant information and data from primary sources and secondary sources (<a href="#">ACHASSI095</a>) (<a href="#">ACHASSI123</a>)</p> <p>Organise and represent data in a range of formats including tables, graphs and large- and small-scale maps, using discipline-appropriate conventions (<a href="#">ACHASSI096</a>) (<a href="#">ACHASSI124</a>)</p> <p>Sequence information about people's lives, events, developments and phenomena using a variety of methods including timelines (<a href="#">ACHASSI097</a>) (<a href="#">ACHASSI125</a>)</p> <p>Interpret data and information displayed in a range of formats to identify, describe and compare distributions, patterns and trends, and to infer relationships (<a href="#">ACHASSI100</a>) (<a href="#">ACHASSI128</a>)</p> <p>Evaluate evidence to draw conclusions (<a href="#">ACHASSI101</a>) (<a href="#">ACHASSI129</a>)</p> <p>Use criteria to make decisions and judgements and consider advantages and disadvantages of preferring one decision over others (<a href="#">ACHASSI103</a>) (<a href="#">ACHASSI131</a>)</p> <p>Reflect on learning to propose personal and/or collective action in response to an issue or challenge, and predict the probable effects (<a href="#">ACHASSI104</a>) (<a href="#">ACHASSI132</a>)</p> <p>Present ideas, findings, viewpoints and conclusions in a range of texts and modes that incorporate source materials, digital and non-digital representations and discipline-specific terms and conventions )</p>
<p>Knowledge and understanding</p> <p><i>Geography</i></p>	<p>The influence of people, including Aboriginal and Torres Strait Islander Peoples, on the environmental characteristics of Australian places (<a href="#">ACHASSK112</a>)</p> <p>The environmental and human influences on the location and characteristics of a place and the management of spaces within them (<a href="#">ACHASSK113</a>)</p> <p>The geographical diversity of the Asia region and the location of its major countries in relation to Australia (<a href="#">ACHASSK138</a>)</p>

## 4. Unit Plans

Primary unit plans for AC Science and HASS will be available from January 2024. These unit plans will cover a range of learning activities and assessments using aspects of Marna Banggara as the area of focus.



## 5. Resources and Useful websites

- [Marna Banggara website](#)
- [WWF](#) – World Wildlife Fund
- [Landscape SA](#)

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<sup>i</sup> <https://www.parks.sa.gov.au/parks/dhilba-guuranda-innes-national-park>