BELLARINE & GREAT OCEAN ROAD DUNECARE PROJECT

Dunecare Secondary Schools Program

TEACHING GUIDE

Australian Government

CORANGAMITE CMA

BELLARINE CATCHMENT NETWORK

ecoLOGIC education & environment services

Victorian Fisheries AUTHORITY

Wadawurrung Traditional Owners

Acknowledgement of Country

We would like to acknowledge Wadawurrung, the Traditional Owners of the land on which we work and live, and pay our respects to their elders past, present and future.

'parrwang'

Introduction

The Dunecare Secondary Schools Program is organised and coordinated by a range of organisations and is supported by the Australian Government's Bellarine and Great Ocean Road Dunecare Project.
This resource was produced by Bellarine Catchment Network, the Corangamite Catchment Management Authority, Ecologic and the Victorian Fisheries Authority for the 2021 Dunecare program.

This program has occurred on an annual basis since 1986. During this time thousands of students, community and industry groups have participated in many types of improvement activities like brush matting and revegetation work which has resulted in the restoration of tens of kilometres of degraded coastline.

Dunecare aims

1. Increase their knowledge about coastal formation and sand dunes
2. Learn about Indigenous Cultural Heritage
3. Learn about the importance of vegetation in erosion management
4. Participate in an action program to stabilise dunes (brush matting)
5. Participate in the revegetation of stabilised dunes
6. Participate in litter audits (some sites only)

The Bellarine and Great Ocean Road Dunecare Project

The Australian Government's Bellarine and Great Ocean Road Dunecare Project is a $1.5M commitment to conserving coastal sand dune native flora and fauna habitat at risk of erosion, or of further erosion on coastal Crown Land between St Leonards and Marengo, Victoria. This project is supported by Corangamite CMA, through funding from the Australian Government's Environment Restoration Fund.

Photography

Southern Brown Bandicoot (C) Ricardo Simao, source: iNaturalist Australia, White-footed Dunnart (C) Andrew McCutcheon. All other images are stock images or sourced from Naomi Wells.

Resources

On this page, you will find a number of important of resources including YouTube videos, Apps, brochures and posters. These resources will help you complete the activities in this booklet and will give you a deeper understanding of dune systems. Video, website and posters are live links!

YouTube Videos

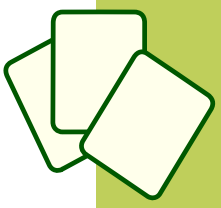
- Budgewoi Beach Dunecare
- Gardens For Wildlife
- Join Ocean Grove Coastcare
- Southern Brown Bandicoot
- Wadawurrung Language, Mother Tongue (by ABC Indigenous)

Websites

- Agricultural Victoria
- BirdLife Australia
- Coastal/marine species + ecosystems
- FeralScan
- Gardens For Wildlife
- Museums Victoria
- Wadawurrung
- Wadawurrung Country Plan

iPhone Apps

- Bay Country App
- FeralScan App
- iNaturalist
- Wadawurrung (language app)



Test your knowledge with these online flashcards!

Brochures and Posters

- Clarence Coast: Dune Plants
- Coastal Plants of the Bellarine
- Coastal Dunes (GORCAPA)
- Discover the Real Ocean Grove Booklet
- Wildlife of the Bellarine Peninsula
- Gardens For Wildlife

BCN Environment Videos

Bellarine Catchment Network has produced a series of educational YouTube videos covering a range of topics from environmental conservation, citizen science and cultural connections. Click the images to watch!

Link: https://youtu.be/JmZay-0ZiBA

Link: https://youtu.be/2SbP8HB_mAM

Link: https://youtu.be/8R3okEEzwYc

Link: https://youtu.be/Ocl9x-yopNM

Link: https://youtu.be/NbOhpK6_K4A

Link: https://youtu.be/lyWrXRE5o58

Link: https://youtu.be/p0gaoVJ3SiQ

Link: https://youtu.be/GGZ8TsdtJ3o

Resources and Links

Printer-friendly page

- **Agricultural Victoria**
  www.agriculture.vic.gov.au
- **Budgewoi Beach Dunecare**
  https://youtu.be/pVqtuaFSP5s
- **Clarence Coast: Dune Plants**
  http://clarencelandcare.com.au/wp-content/Brochures/coastalduneplants.pdf
- **BirdLife Australia**
  www.birdlife.org.au
- **CCMA Citizen Science**
  https://ccma.vic.gov.au/get-involved/citizen-science/
- **Coastal Plants Video**
  https://youtu.be/lyWrXRE5o58
- **Coastal Plants of the Bellarine**
  http://www.environmentbellarine.org.au/cb_pages/publications.php
- **Coastal/marine species + ecosystems**
  https://soe.environment.gov.au/theme/biodiversity/topic/2016/coastal-and-marine-species-and-ecosystems
- **Discover the Real Ocean Grove Booklet**
  http://www.environmentbellarine.org.au/cb_pages/publications.php
- **Feral Scan**
  https://www.feralscan.org.au/
- **Join Ocean Grove Coastcare**
  https://youtu.be/mC3mHqz8sco
- **Gardens For Wildlife**
  https://gardensforwildlifevictoria.com/ **AND** https://youtu.be/TuQnQ32m9ZQ
- **Museums Victoria**
  https://collections.museumsvictoria.com.au/collections
- **Southern Brown Bandicoot**
  https://youtu.be/l0HtA1yKJuw
- **Wadawurrung**
  www.wadawurrung.org.au
- **Wadawurrung Country Plan**
  https://www.wadawurrung.org.au/resources
- **Wadawurrung Language - Mother Tongue (by ABC Indigenous)**
  https://www.youtube.com/channel/UCeL4bsWHfMBIoaPTlQDC64g
- **Wildlife of the Bellarine Peninsula**
  http://www.environmentbellarine.org.au/cb_pages/publications.php

Dune systems

Coastal dune systems play a number of important roles that influence the local environment and how humans live and play near the coastline. Dunes play a significant role in biodiversity by providing habitat and food for many plants and animals.

There are many components to a dune system including the physical properties of the dune (e.g. foredune, swale), the living elements, from native wildlife to invasive weeds and the human related factors (e.g. recreational users, fencing).

This resource will illustrate the importance of dune systems, how they are under threat and what you as an individual can do to restore and protect them for the future.

Coastal Moonah

Short-beaked Echidna
'mon.garrk'

Running Postman

Why are dunes important?

1. Host native wildlife
2. Support plant communities
3. Provide stability for the coast
4. Source of carbon sequestration
5. Protect coastlines from waves
6. Provide aesthetic amenity

Wadawurrung

The Wadawurrung are the Traditional Owners for the Country of Geelong, the Bellarine, Surf Coast and beyond. The following statement is from the Wadawurrung Traditional Owners Aboriginal Corporation (WTOAC) 'Paleert Tjaara Dja Let's make Country good together 2020 – 2030: Wadawurrung Country Plan'. Visit www.wadawurrung.org.au.

"Comugeen budj-o thalikiyu kin bil beng-ordi-ngadak. Ngarrwabil, boron, guli, bagurrk. Comugeen budj-o bengadak ngarr-uk dja, ngubiyt, weagoon gobata gupma wurring-wurring baap beng-ordi-nganak, djarrima murrup-nhuk bengadak

Gobata Wadawurrung balug jumbuk didalbil murrup-nhuk Bundjil monomeeth beek-o weagoon. Mutjak-ak noogie n'uder durralully.

Wa-ngarrak Wadawurrung balug bengadak mirriyu boron-dja gobata-k ying, ngarrimilli, wah-ak, karrung, kuy-a, nyanay-it-yanunit, djilenawurr, baap willam beng-ordi-ngadak."

"We deeply respect our people of the past, Elders, children, men, women. We deeply respect their knowledge of Country, water, life, their care of the traditions and of each other, we stand with their spirit.

Great spirit 'Bundjil' told us to take care of the great life within the land. To only take what you need without selfishness.

Wadawurrung shared their knowledge of singing, dance, trade, camps, fishing, hunting, paintings, and homes to us to protect for our future generations.

We all need to help."

Stephanie Skinner
Wadawurrung Traditional Owner

'Bundjil'

Wadawurrung Language

Answers

Students will find these answers (see below for correct order) within the activity booklet, the Wadawurrung language app and the Wadawurrung Country Plan language page. Use the Wadawurrung language app for guidance around word pronunciation. Available on Apple devices.

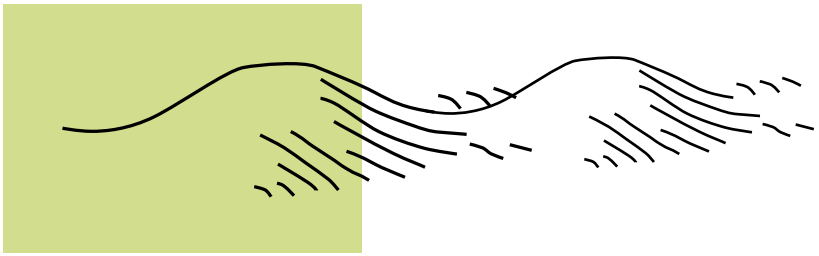
Wadawurrung	English
Bundjil	Wedge-tailed Eagle
djilang	Geelong
mon.garrk	Echidna
waa	Raven
barnong	Ringtail-Possum
balla-wein	Bellarine Peninsula
kudjing marra	Edible roots
parrwang	Magpie
bu	Bandicoot
karrap-karrap	Leaves
kalwerrk	Nankeen Kestrel
kadak	Snake

Physical properties

Coastal dunes are unique ecosystems that form over time from forces like wind, sand movement, vegetation and wave action. In general, dunes can be broken up into 3 different types:

Foredune

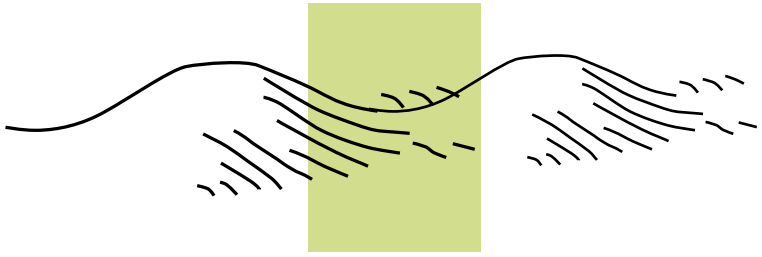
The front of the dune, where waves and sand meet the dune. Formed by sand particles being blown from the beach, foredunes experiences wave action, strong wind and salt spray.



Swale

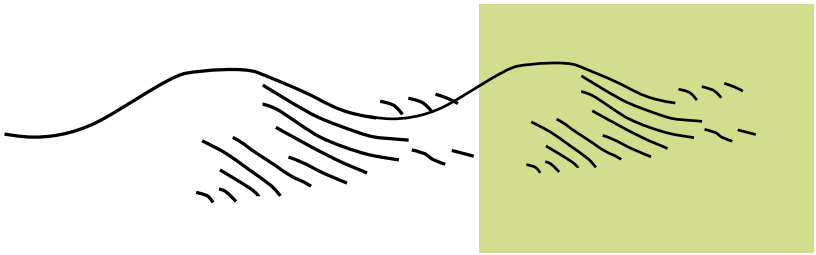
Lower section in-between higher dunes. Plants that require more stability and protection like orchids can be found here.

Greenhood Orchid



Secondary dune

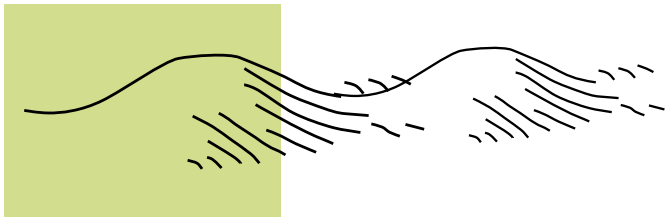
This is more protected than the foredune - conditions are not as extreme.



Physical properties

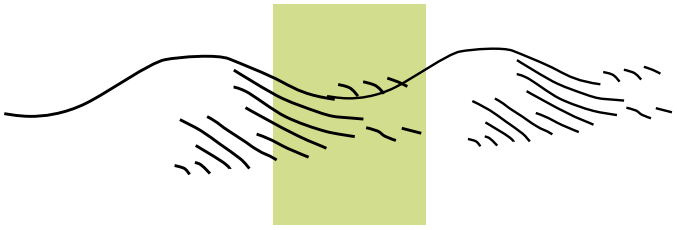
Suggested answers

Foredune



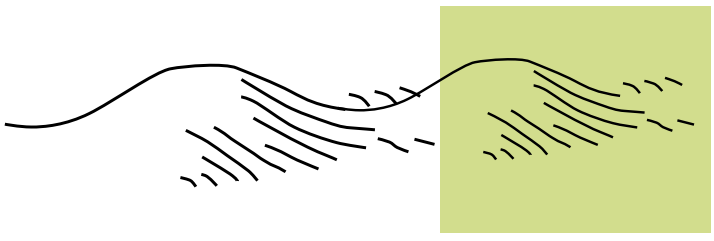
- on shore winds
- wave action
- normal erosion and accretion
- sand blowing up beach
- accelerated erosion from lack of vegetation
- vegetation 'sheared' by wind
- more human use

Swale



- less wind
- more protected in general
- more vegetation able to grow
- no wave action
- less human disturbance
- more sensitive flora like orchids

Secondary dune



- more vegetation
- larger vegetation (trees)
- more stable soil/sand
- some winds but generally more sheltered
- may sit adjacent to housing, roads, etc

Wildlife

Dune systems can support a diverse array of wildlife including birds, mammals, reptiles, amphibians, insects and micro-fauna. Below are just some of the species that you might find in a dune system.

Jacky Dragon 'lelon' (meaning lizard)

This lizard is common in dune systems and can be seen basking on logs, fences or rocks. They are highly camouflaged and blend in well with surrounding branches 'darra-kalk'.

Southern Brown Bandicoot 'bu'

This marsupial is about the size of a rabbit and was once very common. They nest in shallow holes in the ground and prefer grassy areas.

Threatened status: Vulnerable

White-footed Dunnart

This mouse-like marsupial is a carnivore and prefers coastal ecosystems. It is now very rare.

Threatened status: Vulnerable

Bats 'nganin-nganitj'

Australian Raven 'waa'

Ringtail Possum 'barnong'

Australian Magpie 'parrwang'

Wildlife

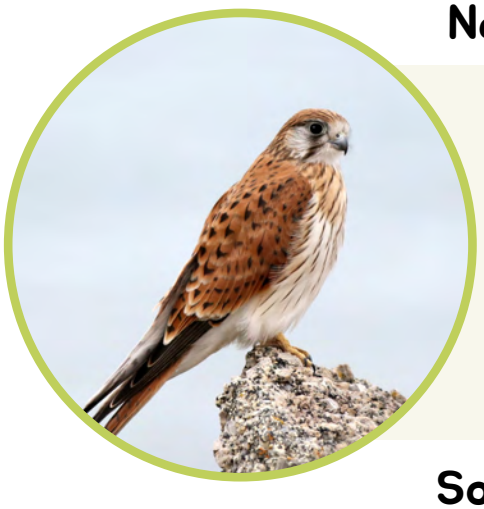
Suggested answers

Jacky Dragon 'lelon' (meaning lizard)

- Camouflage - blends into surrounds
- Semi-arboreal - sometimes seen on trees
- Omnivores (eat insects, berries, etc)
- Conceals eggs in leaf litter
- Fast moving

Echidna 'mon.garrk'

- Spines deter predators
- Backwards hindfeet to help dig holes
- Monotreme - lay eggs
- Sticky tongue to slurp up prey
- Tough beak to break through termite mounds



Nankeen Kestrel 'kalwerrk'

- can live in a wide range of habitats
- locates prey while hovering still
- nest in hollows, caves, cliffs, buildings
- varied diet: mammals, reptiles, birds, insects
- females incubate the egg

Southern Brown Bandicoot 'bu'

- prefer low, scrubby habitat for shelter
- nocturnal, sleeps in nests during the day
- omnivore (eats insects and plants)
- solitary with home ranges
- marsupial with up to 6 young

Plant diversity

Dune vegetation can vary from place to place. Some dunes are dominated by a type of flora community called 'Coastal Moonah Woodland' which is a threatened plant community listed under the Flora and Fauna Guarantee Act 1988. All habitats require diversity in plant species - meaning that you can find many different types.

Moonah

Moonah is one of the few trees that dominates Coastal Moonah Woodland, a threatened plant community. Moonah has short and thin triangular leaves 'murran' that come to a point and dense white flowers 'karrap-karrap' arranged in a long cluster.

Seaberry Saltbush

This shrub is dense, wide and has fleshy, arrow to oval shaped leaves 'murran'. The dark red berries appear as a clusters on a spike and are favoured by birds.

Pink Fairy Orchid

This orchid has a long, hairy basal leaf and flowers around spring. Orchids often have specialised pollination techniques and/or specialised habitat requirements making many rare. Some orchids have edible roots 'kudjing marra' and are an important food source for the Wadawurrung.

Plant diversity

Answers

Watch our video on coastal plants (click the icon) to complete.

Coast Beard Heath *(Leucopogon parviflorus)*

- is a shrub
- named after the beard-like hairs that coat the flower's petals
- dense leaves with a pointed tip
- produces white, bead-like fruit

Sea Box *(Alyxia buxifolia)*

- is a tree
- dense, slow growing tree
- has leathery, oval-shaped leaves
- white flowers and red berries

Seaberry Saltbush *(Rhagodia candolleana)*

- is a shrub
- green to red semi succulent leaves
- dark red berries that form a cluster
- berries are favoured by birds

Plant diversity

Answers

Bower Spinach *(Tetragonia implexicoma)*

- it is a creeper/climber
- often seen growing through or on objects
- succulent leaves that form a diamond
- bright yellow flowers and red berries

Karkalla *(Carpobrotus rossii)*

- is a ground cover
- has angled, fleshy leaves
- is great at binding soil and sand
- has light purple flowers and fleshy, juicy fruit.

Hairy Spinifex *(Spinifex sericeus)*

- fine, white hairs that coat the leaves and stems
- uses horizontal runners to help stabilize dunes and beaches
- has male and female plants

Pest plants and animals

Dune systems are not immune to the impacts of invasive plants and animals. These are species that come from another place and once introduced into a new area where they don't belong, can have negative impacts by competing for food, resources and space. Even plants native to Australia can become invasive if they originate from another state or region and end up where they don't naturally occur. Examples in dunes include:

Myrtle Leaf Milkwort

Polygala myrtifolia

Boneseed

Chrysanthemoides monilifera

Marram Grass

Ammophila arenaria

Rabbit

Oryctolagus cuniculus

Fox

Vulpes vulpes

Feral cat

Felis catus

Pest plants and animals

Example Answers

Students can use the invasive plant and animal profiles on the 'Biosecurity' section of the Agricultural Victoria website. Look for the 'Priority weeds' and 'Priority pests' section.

Pest plant

Species: Boneseed *(Chrysanthemoides monilifera)*

Origin: South Africa

Have you seen it around your area? Yes/No

Impacts: impacts native vegetation and can reduce biodiversity. When dense, can eliminate native species and reduce the regeneration abilities of native trees and shrubs. Can also severely impact on several coastal plant communities. The weed may negatively affect wildlife through the displacement of essential food plants.

Management: herbicide and physical removal (grubbing).

Pest animal

Species: European Rabbit *(Oryctolagus cuniculus)*

Origin: Southern France and Spain

Have you seen it around your area? Yes/No

Impacts: Native flora/fauna affected by competition and land degradation. Can severely affect the regeneration and recruitment of critical vegetation communities. Rabbits may sustain predators such as foxes. Contribute to loss of land through soil erosion and reduced water quality.

Management: monitoring, baiting, ripping, harbour management and fumigation.

Protecting our dunes

Dunes are vulnerable to threats such as weeds, erosion, litter, and trampling. These threats can reduce dune stability, biodiversity and habitat quality. As individuals, we can help protect dunes by walking along formed pathways, through the installation of fencing, with weed removal and revegetation efforts.

Fencing + pathways

Trampling (foot traffic through sensitive areas) is a major threat to dune systems. Installing fencing and forming designated pathways is a great way to encourage people to walk away from sensitive areas. However, this has to be balanced with access to discourage people making shortcuts through the dunes!

Revegetation

In areas that lack stabilising vegetation, revegetation is a great way to restore dune systems. The best way to revegetate is to choose low quality areas, as weeding alone can restore areas with higher quality. Plants must be locally Indigenous - i.e. they occur naturally in the same region.

Weed removal

Removing invasive weeds is a great way to restore biodiversity as it frees up space for native plants and reduces competition. Weeding is an extremely rewarding volunteering activity as you can see your impact straight away!

Protecting our dunes

a) Fencing b) Pathways c) Signage d) Revegetation e) Weeding

How would you protect a dune? Look at the image of a dune below and draw and label where you would install fencing, pathways and signage and where you would focus your efforts for revegetation and weeding.

Monitoring biodiversity

Monitoring is a great way to contribute to the management and protection of dunes. Monitoring is an essential part of scientific discovery and is a way to contribute to citizen science programs (click here to view some). You can monitor biodiversity in different ways to suit the question you are asking, your skills, interests and location.

Photopoint Monitoring

A photo provides a record of what something looks like at a particular place and time. If we take a photo in the same place later on, we can assess what has changed over time by comparing the photos.

Quadrats

A 'quadrat' is a sample area that is used to assess a study site and collect data on a small scale. What you see in the quadrat is a sample of what the surrounding environment looks like. Data collected from the same permanent vegetation quadrat allows any changes to be recorded over time.

Citizen science or 'community science' involves members of the public contributing to scientific discovery, mainly through monitoring. It is an easy way that any individual can help scientists and land managers make the right decisions to help protect our coast.

Monitoring biodiversity

Take this page (or a piece of scrap paper) into your garden, yard or balcony. Choose a section and sketch out what you see - plants, animals, bugs, mushrooms. Include natural and artificial objects (e.g. logs, plant pots) that may encourage biodiversity. Label what you see as best as you can.

Monitoring biodiversity

Q1: How many different species of plant did you find in your area? List any species you know (e.g. roses, eucalyptus, grass)

- if students need help identifying things, they can use Apps like iNaturalist that will suggest the most likely species based on appearance and location

Q2: Describe the living features: were any birds or insects present?

- these can be general descriptions or more detailed; how many, what types, what type of behaviour are they exhibiting (foraging, breeding, preening).

Q3: Do you consider this area to have good biodiversity? Explain your answer. If no, can you think of ways to encourage more plants/animals?

- A location generally has good biodiversity if you can identify a diverse range of living things. This also depends on the location (e.g. some animals or plants are specialised to live in certain areas). Biodiversity is generally measured looking at diversity (how many different types of things) and abundance (how many of each thing).

- Use the Gardens For Wildlife YouTube and website to help answer this. Includes things like: planting native plants, keeping logs where they are, reducing pesticide use, etc.

How you can help

Dune systems are unique ecosystems that face equally unique challenges; from erosion, trampling, invasive pest plants and animals and habitat loss. Dunes have cultural, environmental and social value and need our help! Environmental action is an important way to manage the threats that dunes face and you can do that in many ways.

Learn more about Wadawurrung

Wadawurrung are our local Traditional Owners. Click this link http:// to find out more about their connection to Country.

Join a group to volunteer

There are Coastcare, Landcare and 'friends of' groups across Victoria that conduct weeding, erosion monitoring, revegetation and more!

Be a Citizen Scientist

You can be a citizen scientist from anywhere using Apps like iNaturalist to record wildlife sightings, ClimateWatch to monitor climate change impacts on wildlife and plants, count seals with SealSpotter or monitor water quality with WaterWatch.

Lower your carbon footprint

Climate change has many different impacts on ecosystems, so every bit counts. Reduce your footprint through daily actions like reducing food waste, buying less plastic, using public transport and even flushing your toilet less!

Dune action poster

Choose one thing that you can do to protect or enhance dune ecosystems and create a poster about it. You can use Canva, or draw your own on paper. Use the space below to create a draft poster.

Get your school to share your poster on social media using the hashtag #Dunecare!