

MONARTO  
ZOO



## BOMA TRACK ACTIVITIES SENIOR SECONDARY



Government of South Australia

Department for Education and  
Child Development

## Acknowledgements

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This Education program for schools is a partnership between the Monarto Zoo and the Department of Education and Children's Services, South Australia.

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# For the Teacher

## General Information

Welcome to Monarto Zoo

Monarto Zoo is a fantastic educational resource. It is a 1450 hectare open range zoo located on former farming land. Large tracts of remnant mallee scrub exist in the areas between animal enclosures, and this natural scrub is being extended annually through an on-going revegetation program which involves many community and school groups. A huge variety of native fauna roams freely in the scrub areas.

Monarto Zoo is involved in many animal conservation programs and these include both native and exotic species, with a heavy focus on threatened species from desert and arid habitats.

Experiencing Monarto Zoo and learning about animals, ecosystems and conservation can be undertaken via

- Observing and handling the huge range of prepared skins, bones and other animal biofacts at the Visitor Centre.
- A safari bus tour of animal enclosures with a commentary provided by a trained host (for groups of 22 or more students in your own bus),
- Walking through the mallee scrub on signposted tracks,
- Taking as much time as you want to observe animals from viewing platforms around the Visitor Centre and at “Bus Stops”.

In planning this excursion, please consider your schedule and how you would like to arrange the class’ activities on the day. Discuss this with the Education Officer at the time of booking your visit.

**Activities and tasks in this resource relate only to the Boma Track.**

**Estimated time to complete this entire activity: 1 hour**

# Background notes for teachers, supervisors and students on the day.

This activity is designed for students to work individually, in pairs or in small groups.

Groups are asked to **stay on the walking track**, as the soil in this habitat is shallow and fragile. A thin covering of dry moss is important in stabilizing the soil. For best results in assessing the local bird species quiet discussion is encouraged.

The walk commences at the bridge over Rocky Gully Creek and concludes at the Boma which houses Southern White Rhinoceros. The walking track passes through remnant mallee scrub, vegetation which is very common in the area.

This activity can be completed **in reverse order**, though students should read through the first 2 tasks (Birds and Scats) at the start of the walk, so they can make ongoing observations.

The track is marked with stopping points that are numbered. (small posts in the ground with a brass number on top.) At each Stop, refer to your worksheet, read through the information provided and carry out the activities described.

The Map may help you to locate the Stops.



**Birds of Monarto**

As you progress along the walking track from the Bridge to the Boma (or Boma to Bridge), keep a tally of the number of **different** bird noises you hear.

Tally 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

If you are able to identify any birds, either by sound or by sight, write down the names of these birds.

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**Scats along the track**

Animal droppings are referred to as **scats**.

As you walk along the track, look for scats.

Draw sketches of any that you find and try to identify the animal from which each came. Indicate the size with a key or by marking in the dimensions of the scat.

**Stop 1 (Can be seen from the Bridge)**

Rocky Gully Creek only flows in times of flood. The base of the creek bed consists of Blanchetown clay. The creek enters the River Murray on the northern outskirts of Murray Bridge.

What evidence is there that this is a salty creek? \_\_\_\_\_

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Find some **lichen** growing on the rocks in the creek bed. Describe its appearance (colour, size, shape, ....)

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Lichen is actually a combination of two different plants living in a **symbiotic** association:

A blue-green algae forms the top layer. It is able to photosynthesise and hence manufacture food for itself and its partner, a fungus.

A fungus forms the lower layer. It is able to excrete an acid from its cells that slowly dissolves the rock. This provides minerals for the fungus and the blue green algae. It also begins the **weathering** of the rock.

Find some **moss** also growing on the rocks where there is a little soil.

Compare its appearance (colour, size, shape, ....) with lichen.

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Lichen causes the rock surface to crumble and soil accumulates in the cracks.

Moss grows in this soil. Moss plants have rudimentary roots which grow in the soil and into cracks in the rocks. This makes the rocks crack and crumble further.

The soil on the rocks gets deeper and small, shallow rooted plants are able to grow in this soil.

Find **some shallow rooted plants** growing in the deeper soil on the rocks. Describe their appearance. (Name them if you can).

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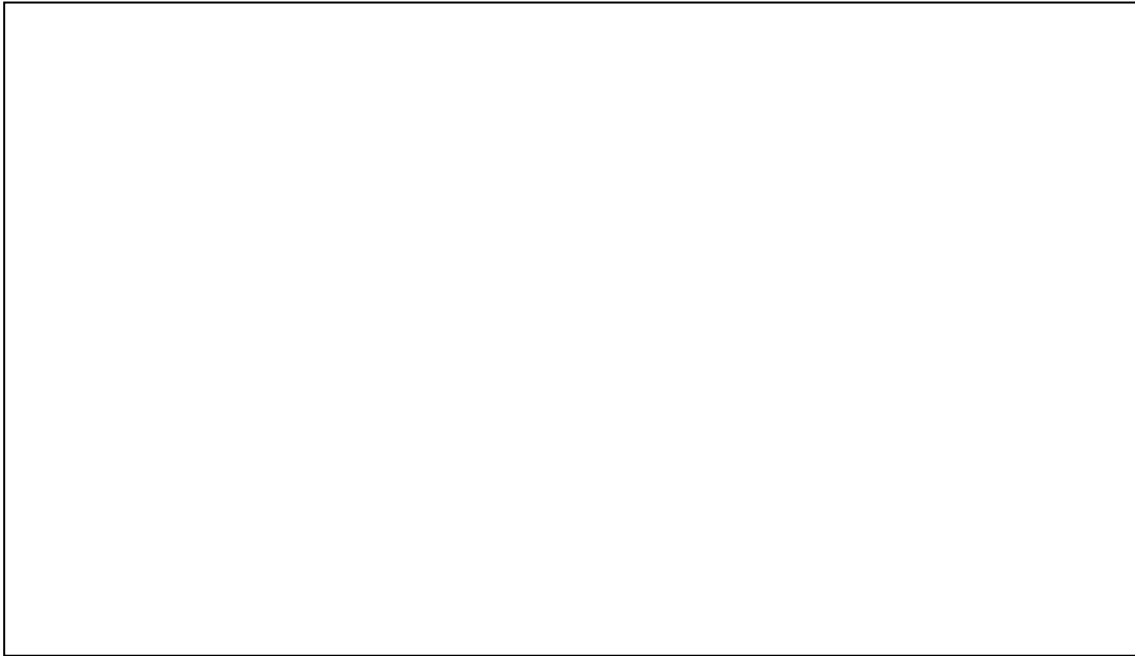
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The change in dominant plant species on the rocks from lichen to moss to shallow rooted plants is an example of **succession**.

Find a rock where succession is occurring.

Draw and label a diagram showing some of the different stages of succession.



**Stop 2**

Notice the bark being shed from the trunk of the eucalypts at this point.

What small native animals might be found under the bark? (Don't limit your ideas to only vertebrate animals.)

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Compare the bark of the eucalypts with the bark of the native pine trees (*Callitris preissii*) in this area.

How do they differ?

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Why do you think there is lichen growing on the trunks of the native pine trees, but not on the trunks of the eucalypts?

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Some of the eucalypts in this region have hollows in the trunks or branches.

Find the location of a hollow.

What insects are responsible for making these hollows?

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Why are these hollows important to the animal populations living here?

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Compare the eucalypts with native pine trees.

Are there any hollows in the native pine trees?

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Suggest a reason for your answer.

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How would the lack of tree hollows affect the bird species that inhabit the areas where native pines are the main trees?

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### **Stop 3**

The low spiky bushes at this point are *Dagger Leaf Wattle* (*Acacia rhigiophylla*) plants. Gently feel the leaves of a bush.

Describe the appearance and the feel of the leaves.

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Draw a diagram of a small part of the branch of the *Dagger Leaf Wattle* bush.

The spiky leaves of the *Dagger Leaf Wattle* bush deter larger animals from eating the leaves.

They also provide protection to small animals that shelter from predators either in or underneath the bush.

Name some small animals that may use the *Dagger Leaf Wattle* bushes for shelter.

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*Dagger Leaf Wattle* bushes grow well in soils which are slightly acidic.

The rocks near the *Dagger Leaf Wattle* bushes are Kanmantoo schist.

When these rocks are weathered and break down they form acidic soils.

At Monarto Zoo it is common to observe rocky outcrops of Kanmantoo schist where stands of *Dagger Leaf Wattle* bushes are growing.

#### **Stop 4**

The tufty tussocks of grass at this point are *Scented Matrush* (*Lomandra effusa*).

Notice the long, thin, coarse leaves.

How does this leaf shape help the *Scented Matrush* plant survive in arid conditions?

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Describe any evidence that larger animals have been present in this area previously.

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#### **Stop 5**

The tree in this location is a *South Australian Christmas Bush* (*Bursaria spinosa*). It has been given this name because it produces a profuse bloom of white flowers at about Christmas time each year.

Draw a diagram of a small section of a branch of a *South Australian Christmas Bush*.

Label the thorns, the leaves and any flower buds, flowers or seeds present.

How could the shape and arrangement of thorns and leaves be of benefit to this plant?

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### **Stop 6**

The tree in this location is a **Native Apricot** (*Pittosporum phylliraeoides*).

**Native Apricots** produce fruit and seeds that birds like to eat.

Why are almost all **Native Apricot** trees growing under larger trees?

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**Native Apricot** trees are sometimes mistaken for **Quandong** (*Santalum acuminatum*) trees since both species have slender, light olive leaves.

However the leaves of a **Quandong** tree are **opposite** each other on the stem, whereas the leaves of a **Native Apricot** tree are **alternate**.

Look closely at the leaves along the branch of a **Native Apricot** tree and sketch what you see.

### **Stop 7**

The **vine** growing at this location is “Old Man’s Beard” (*Clematis microphylla*).

It is not parasitic.

What are the advantages to a plant of growing **as a vine** ?

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**Stop 8**

The predominant rocks in this area are limestone.

The limestone forms a sheet or layer beneath the shallow topsoil.

Limestone causes soils to be alkaline.

The presence of this sheet limestone (calcrete) suggests that at one time this entire area was under the sea.

What would have been responsible for the deposition of a layer of limestone on the sea bed?

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When farmers were working this land, many areas were not cleared for growing crops because of the shallow topsoil and the presence of the sheet limestone.

Discuss some features of the native vegetation which enable it to grow successfully on this type of soil?

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**Stop 9**

The plants in this location are *Turpentine bushes*.

In this plant family there are male and female bushes.

The male plants produce pollen and the female plants produce fruit and seeds.

Look closely at the plants and try to identify which are male plants and which are female plants.

Draw a diagram showing the distinguishing characteristics of a female turpentine bush.

Turpentine bushes provide food for emus and mallee fowl.

Mallee Fowl were common in this area at one time, but currently there are no wild Mallee Fowl at Monarto Zoo.

What has contributed to the disappearance of Mallee Fowl from this region?

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**Stop 10**

Growing on the Box Mallee tree at this location is a *Box Mistletoe (Amyema miquelii)* plant.

Plants make their own food through a process called photosynthesis.

Most photosynthesis takes place in the leaves. A plant's leaves can be regarded as the "Food-making factories" for the plant.

Eucalypts are able to cut off the water and mineral supply to trunks and branches that do not make enough food for the plant.

Notice the dead limbs on this mallee tree.

Notice the dead mistletoe plants on the ends of the dead branches.

How could the mistletoe have contributed to the death of these branches?

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The seeds of the mistletoe plant are spread by the Mistletoe Bird (*Dicaeum hirundinnaceum*).

What may have contributed to the high concentration of mistletoe plants in this area?

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Observe other eucalypts to find other live mistletoe plants.

Describe the **end** of the tree branch from which the mistletoe plant is growing.

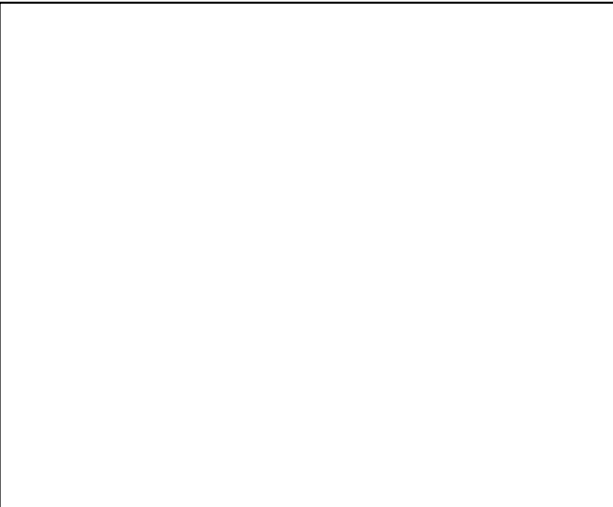
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**Stop 11**

The shape, size and structure of gum nuts are often used to distinguish between different species of the Eucalyptus genus.

Draw the gum nuts of two different kinds of Eucalypts in this area. Pay particular attention to their size, shape, how they are bunched together and how they are attached to the stem.



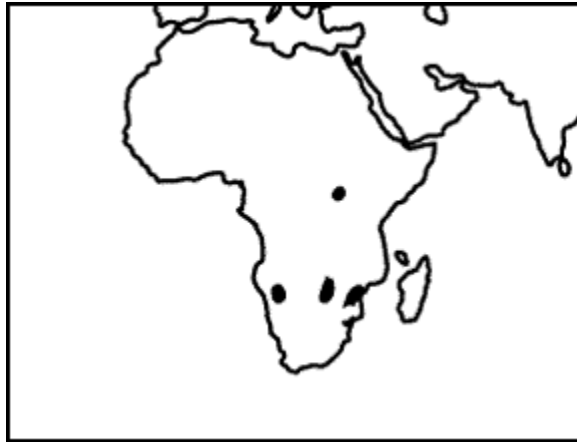
**Stop 12**

The tree in this location is a *Golden Wattle (Acacia pycnantha)*.

This is Australia's National Floral Emblem.

**Stop 13** (The lookout at the Rhino Boma.)

The Rhinoceros at this point is a Southern White Rhinoceros. It is native to Southern Africa. There are five surviving species of rhinoceros in the world. The Southern white rhinoceros is the largest of these. Rhinos are territorial animals and mark their territories by spraying urine and leaving dung piles called **middens** in different locations in their territory area.



Map of Southern White Rhinoceros habitat

What advantages are there for a rhinoceros to wallow in mud?

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The rhino has poor eyesight, but excellent hearing and a strong sense of smell.

Observe the rhino's ears for one minute.

Comment.

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Rhinos shape their horns by rubbing them against hard objects.

Draw the shape of this rhino's horns.

What evidence is there that this rhino has been shaping its horn?

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A rhino's horns are made of keratin fibres. Keratin is a protein which is found in hair, fingernails and feathers.

The white rhinoceros is not actually white, but slate or brownish-gray, like the black rhinoceros. The reference to "*white*" probably resulted from a mistranslation of the Afrikaner word for "*wide*" (referring to the **wide mouth**).

Rhinos have no front teeth, just molars at the back. A White Rhino's skin color is quite similar to that of the Black Rhino. An alternative name for the White Rhinoceros, more accurate but rarely used, is the Square-lipped Rhinoceros.

What is the advantage of a mouth of this shape to an animal feeding on short grass?

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Where is there hair visible on the rhino's body?

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Count the toes on one of the rhino's feet.

How many are there?

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Rhinos belong to a small group of animal species called **odd-toed ungulates**. Ungulates are **hoofed** mammals.

Name another species of odd toed ungulate. (Hint: there are 2 species living at Monarto).

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