
The Sand Dune Ecosystem

Level

8

Key question

How do you measure the morphology of a sand dune ecosystem.

Key outcome

Appreciate the balances which exist within the sand dune ecosystem and human influence on these balances.

Adapted from field sheets of St Aidan's School, Corinda, Brisbane, Australian Littoral Society's *Moreton Bay Kit*, and Yallingup Coastal Geomorphology and Ecology Fieldwork, Geographical Association of WA.

What you need for each group

Clipboard, paper, pencil
Tape measure, ruler
Soil thermometer
Air thermometer
Hygrometer or other instrument for measuring humidity
Field guide to plants within sand dunes
Salinity probe or kit (may be shared across groups)

What you do in small groups

Draw the shape of the dunes looking from the beach.

- Are there any blowouts (hollows) or gullies?
- Estimate their heights from base to top.

The following information should be collected by each group so that it is available later for each individual to construct a detailed transect. Use the data sheet to record your findings.

Divide the coastal dune into these main areas: beach; foredune seaward side; foredune top; foredune landward side; hollow behind sand dune; and make observations about each of these areas on the data sheet.

Soil characteristics

At five locations, record the following information about the soil:

- depth of dry sand
- temperature at a depth of 10 cm
- amount of organic material (mainly plant roots) at a depth of 10-15 cm
- salt content – collect a test-tube sample from a depth of 5 cm so that it may be tested later.

Micro-climates

At the same five locations, record the following climatic information:

- air temperature
- relative humidity
- aspect and exposure to sun and wind (is the aspect sunny or shady in the morning/afternoon)
- Is the location exposed to or sheltered from westerlies?

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Fauna

You probably won't see much fauna, but record the position of any that you see. Don't forget insects.

It is quite likely that there will be plenty of animal tracks. Record their position on the cross-section and try to identify them.

Flora

Wherever your cross-section intercepts any plants:

- Record where the ground is covered with plants.
- Identify the species.
- Discuss any adaptations they seem to have in order to cope with the conditions.
- Note whether the plants appear healthy or under stress. If stressed, why?

List observations of the human influence on these dunes.

Summarise changes in the physical factors, type of vegetation, and animals present as you walk inland from the beach.

Extension

Using the information collected by the whole group (see next page), prepare a detailed transect of the dune system. This should be done on large sheets of graph paper.

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Data sheet for Dune Study

Observe	beach	foredune seaward side	foredune top	foredune landward side	hollow behind dune
topography					
wind direction					
slope					
temperature					
light intensity					
composition of sand					
• humus					
• carbon					
• rutile					
• quartz					
• other					
grain size					
amount of moisture					
vegetation					
use lists to identify prominent plants in each part					