Coastal Vegetation

The aim of this activity is for you to map the different types of vegetation present on an island / coastal area and determine the reasons for their distribution. You will walk through a coastal area recording plant species, height, location from shore and soil conditions to gain an appreciation of how their distribution is influenced by the ocean, wind and other species.

Time

Two hours

Tools

- GPS or measuring tape
- Coral cay plant charts
- Soil pH kit
- Pad of paper
- Pencil
- Plant identification guide

Pandanus on Heron Island.

Background

Plants growing along coastlines are adapted to a salty, windy and often nutrient-poor environment. Some arrive on islands and beaches as buoyant saltwater-resistant seed pods, while others are deposited in the droppings of birds or blown to an area by the wind. The *Casuarina equisetifolia,* or she-oak, have bacteria in root nodules that convert nitrogen in the air to compounds that allow them to thrive in nutrient-poor beach sand. Low growing grasses and rounded bushes survive here as they are not as easily blown over in high winds. Many coastal plants have small or wax covered leaves to reduce water loss in salty environments. Some species can only grow after a succession of other plants have stabilised sand dunes and have formed a barrier to wind and spray. Birds attracted to the area will rain fertiliser down upon the ground (and heads of unwary visitors) as they feed and build nests, providing added nutrients to support a greater diversity of coastal plant life.

Field activity

1. Draw a diagram of the coastal area that you are surveying and use a GPS (if available) to plot your location.
2. Decide on a direction in which you will walk to conduct the survey (usually away from the shoreline using existing tracks if possible).
3. Approximately every 10m (this can be altered depending on your coastal area), stop and make the following observations of the area around you and record them in the 'Vegetation study results' table:
   a. distance travelled
   b. the dominant plant species
   c. average plant height
   d. height of the ground above sea level
   e. a symbol for each plant species you identify
4. When you notice a change in vegetation type or dominant species, stop and measure:
   a. soil pH
   b. colour of soil (e.g. white, sandy, grey, black, etc.)
5. Use these observations to plot the vegetation densities in the area on the map. Use the key symbols from your table to show the different plants in the area.

Teacher Hint
Laminate 'Plant species of a coral cay' to take in the field.

Vegetation study map

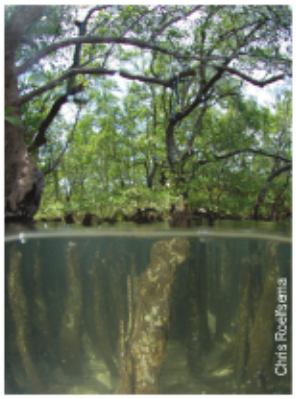
Plant species of a coral cay

***Pandanus* sp. (Screw Pine, Walking Palm)**

This tree has long keeled leaves with prickly margins. It is defined by its prominent root system and produces a fruit that ripens to a yellow colour.

***Sonneratia* (Apple Mangroves)**

Sonneratia leaves are rounded and leathery with berries that have a star shaped base and white flowers. The pneumatophores have a thick cone shape and use ultrafiltration to exclude salt.



***Albutilon asiaticum* (Chinese lantern bush)**

This shrub has heart shaped leaves with yellow to orange flowers that resemble a hibiscus.

***Scaevola sericea* (Cardwell cabbage)**

A shrub with shiny obovate leaves with white fan-shaped flowers.

Plant species of a coral cay

***Casuarina equisetifolia* (She-oak)**

This tree has grey bark with fine strand-like leaves and nodular seed pods.

***Sophora tometosa* (Silverbush)**

A shrub with fine hairy leaves and yellow flowers.

***Pisonia grandis* (Pisonia)**

This large tree has soft wooded trunks with large oval shaped leaves; the fruits are sticky. Pisonia are a dominant species that can be found on most coral cays.

***Argusia argentea* (Octopus bush)**

A shrub with dense leaves that are silvery and hairy; produces small white flowers. This is a foundation plant for coral cays, the seeds are extremely hardy and salt water resistant.

Vegetation study results table

Observer(s):

Location: Date:

Weather conditions: windy / calm / cloudy / sunny

DISTANCE (m)	PLANT SPECIES ID	PLANT HEIGHT (m)	HEIGHT ABOVE SEA LEVEL (m)	SOIL pH	COLOUR OF SOIL	KEY SYMBOL

Questions

1. List the abiotic factors that affect the plant distribution and growth.
2. What relationship exists between the changes in the shape and height of the vegetation and each abiotic condition?
3. How does soil pH affect the diversity of plant life in the area?
4. How is the vegetation in a windy area different from that in more sheltered areas of coastline? Discuss the factors that might cause these differences.
5. Why is bird poo important?
6. List three mechanisms of seed transport to islands.

Research projects

1. How do birds contribute to the nutrient cycles of the vegetation?
2. Compare the vegetation types found on a coral cay with those of a continental island. What are the fundamental differences in the processes of establishing the vegetation on these islands?
3. What are the major conservation issues for plants on coral cays? How could this effect bird population numbers on these islands?

References

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