
1.10 DESCRIBING PLANT DISTRIBUTION AND ABUNDANCE

INTRODUCTION

In the course of their work many people seek to describe the vegetation patterns of a particular area.

- A forester studies the recovery of an area of bush burnt in a bushfire.
- A wildlife ranger investigates changes in vegetation as a result of increasing kangaroo numbers in the Hattah-Kulkyne National Park.
- A biologist describes an area of tropical rainforest for the first time.
- A farmer wishes to re-establish some of his cleared marginal land with native vegetation.

The reason for studying vegetation in this way is usually to find the answer to one or more of three questions:

- 1 What plant species are present in the area?
- 2 How abundant are the different plant species?
- 3 How are the different plant species distributed?

A walk through an area being studied would probably reveal many of the larger plant species, but a detailed investigation will be needed to answer questions about abundance and distribution of all the plant species.

Biologists use several techniques to obtain data from which they can answer these questions.

QUADRATS

A quadrat is a square, rectangular or circular frame of convenient size, used to mark out an area in which the vegetation is to be sampled. The shape and size of the quadrat depends on the type of vegetation. A square with 50 cm sides would be suitable for sampling a lawn, whilst a square with 10 m sides may be used for sampling trees in a forest.

When a quadrat is used to sample vegetation, first a list is compiled of all the plants contained in the quadrat. Repeating this for several quadrats should provide a composite list of the species present in the area. Quadrats can also be used to give an estimate of the **abundance** of one or more of the species.

FIGURE 1 One metre quadrat in use for sampling an area of 'lawn'. In this case the density of dandelions is 4 per m² and the cover is 10%.

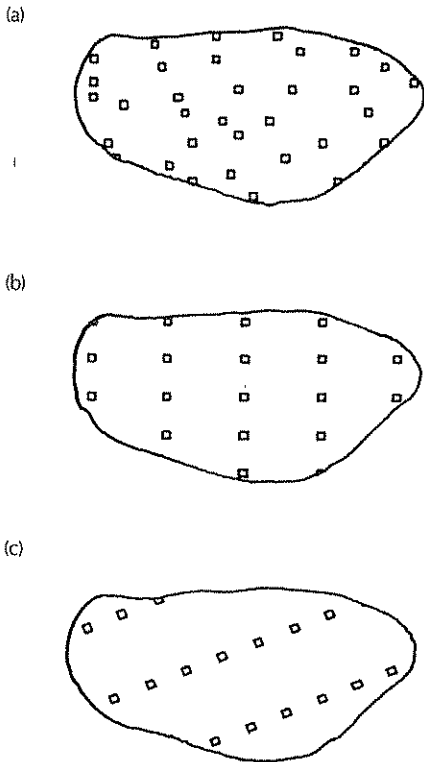
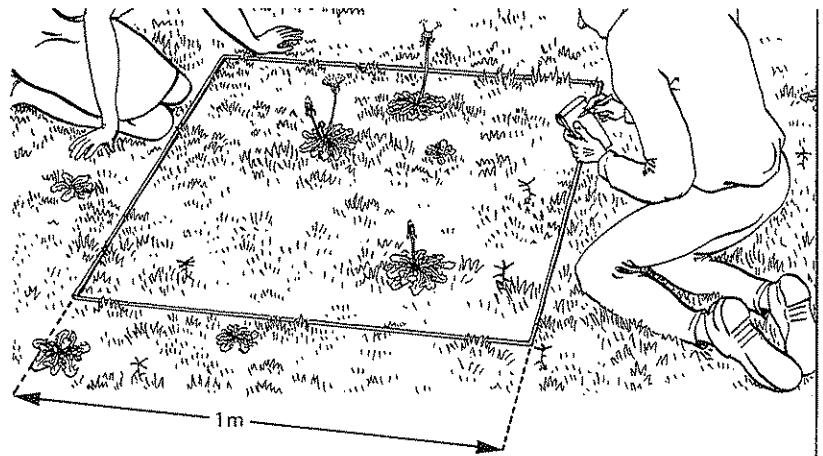


FIGURE 2 Methods of distributing quadrats: (a) random distribution, (b) spaced as widely and evenly as possible (grid), (c) distributed evenly along transect lines.

Two ways of measuring abundance are:

- 1 Count the number of a particular plant in the quadrat. This gives the **density** of the plant, for example, the number of dandelions in a lawn per square metre.
- 2 **Cover** is the percentage area of the quadrat covered by a particular plant species, for example, the area of the quadrat of lawn that is covered by dandelion plants.

Quadrats may either be located randomly over the area being sampled, or they can be located at regular intervals along a transect or on a grid.

TRANSECTS

Transects are lines or belts set out through an area as a guide for recording what plant species are present. They provide a useful method for assessing changes in the abundance of a particular species in response to changes in some physical variable in the environment, such as slope or soil moisture content.

LINE TRANSECT (LINE INTERCEPT TRANSECT)

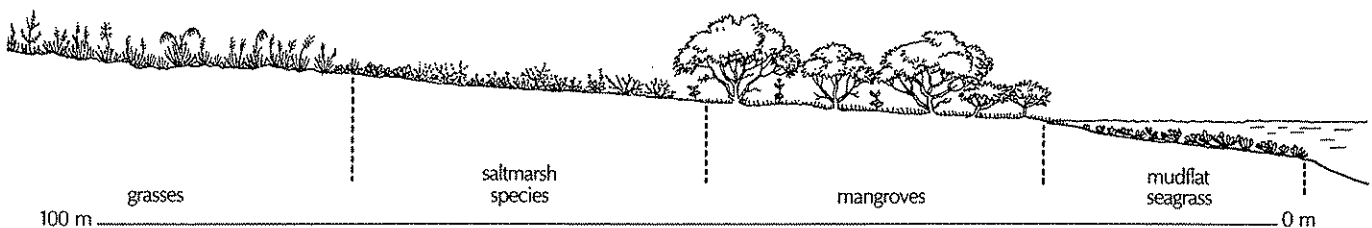
A line transect is made by running out a tape measure or marked line across the area to be sampled. The observer systematically works along the line, recording the name and position of each plant that the line passes over, under or through. The data are recorded on paper on a corresponding line drawn to scale.

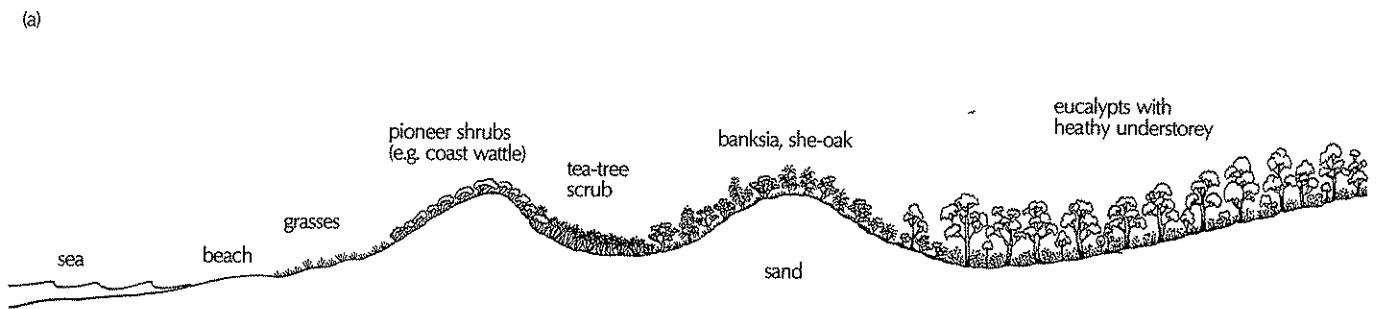
BELT TRANSECT

This is similar to a line transect except that all the vegetation between two parallel lines is recorded. In a way it is like a long, thin quadrat.

A transect can also be used as a location line for quadrats, in which the cover of each species can be estimated (see Figure 2).

FIGURE 3 Transect line showing location of seagrass, mangrove and saltmarsh species.





PROFILE DIAGRAM

A profile diagram is a scale drawing of the profile or 'side view' (also called the elevation) of the vegetation along a line. It may also show the shape of the land surface and details of soil type. Care needs to be taken with the choice of the vertical scale so that the drawing is not too distorted.

Profile diagrams are able to show the horizontal layers or strata of the vegetation. Well-drawn profiles are often useful for making qualitative comparisons between different plant communities.

IDENTIFICATION OF PLANTS

When studying a plant community it is important to have a ready means of identifying the species present. A commonly used method is to make use of a field herbarium. A field herbarium contains specimens of each of the plants in the area, collected and pressed between newspaper. The important parts to collect are those which are useful for identification in the field, such as leaves, flowers and fruits. When dry these are mounted on sheets of card, labelled and stored in plastic sleeves. Plants which cannot be readily identified can be labelled as species A, species B, etc.

Good quality colour photographs are also useful aids to identification in the field.

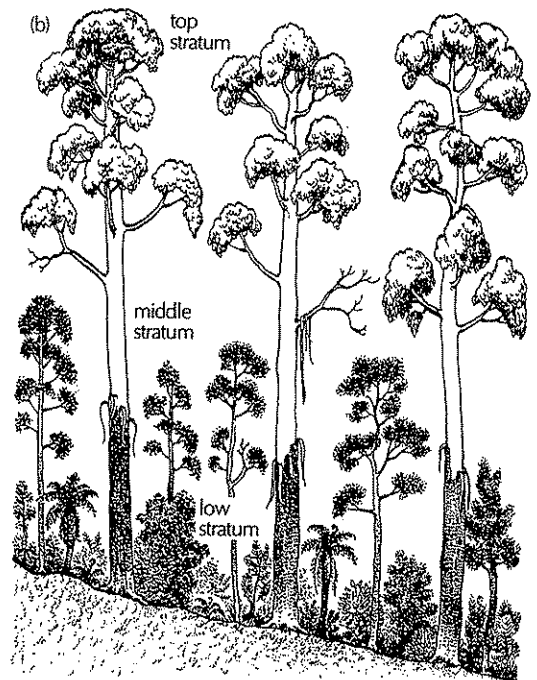


FIGURE 4 (a) Profile of vegetation growing on sand dunes. (b) Detailed section of profile of a wet sclerophyll forest.