Random Sampling of Plant Populations Using Quadrats

Quadrats are **placed according to random numbers** after the area has been divided into a grid of numbered sampling squares (Figure 19.2). The different plant species present in the quadrat may be identified. Then, using the quadrat, an observer may estimate the **density, frequency, abundance** or **cover** of plant species in a habitat.

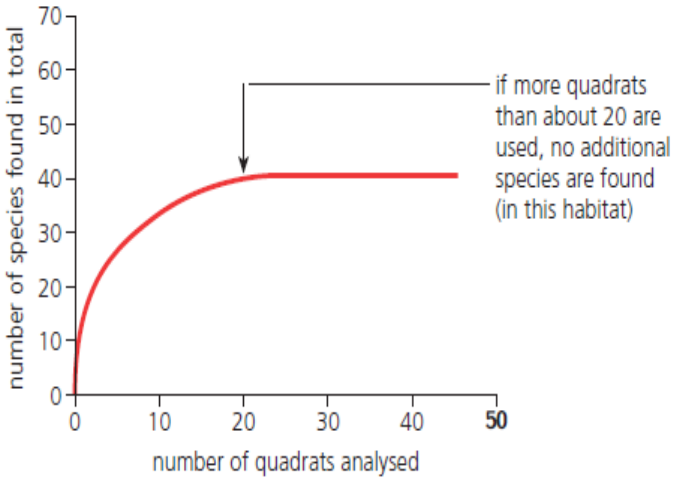
Figure 19.3 Estimating plant population size using a quadrat

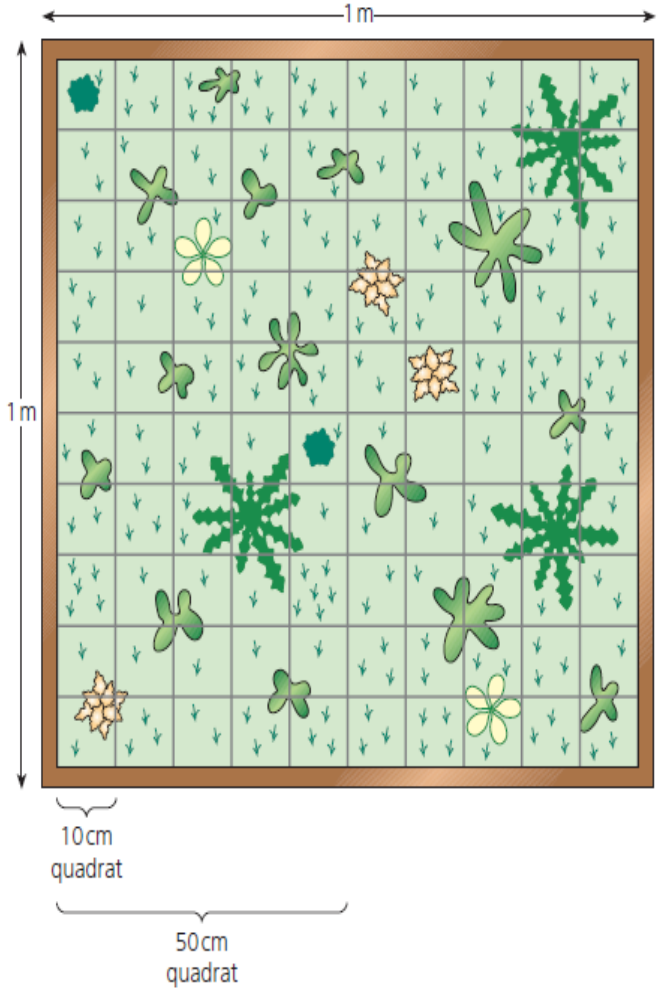
Use of the quadrat:
- positioned at random within habitat being investigated
- different species present are then identified
- without destroying the plants present and the microhabitats beneath them, plant species' density, frequency, abundance or cover can be estimated.

density = mean numbers of individuals of each species per unit area (time-consuming and may be hard to assess separate individuals)
frequency = number of quadrats in which a species occurs, expressed as % (rapid and useful for comparing two habitats)
cover = the % of ground covered by a species (useful where it is not possible to identify separate individuals)
abundance = subjective assessment of species present, using the DAFOR scale: D = dominant, A = abundant, F = frequent, O = occasional, R = rare (same observer must make 'abundance' judgements, which may be useful as comparisons of two or more habitats, rather than objective scores)

What is the optimum size of quadrat? This varies with the habitat, and the size of plants found. Look at the example here. In the 1 m quadrat there are six species present. How many different species are counted in the quadrat of sides 10, 20, 30, 40, 50, 60, 70, 80 and 90 cm? The optimum quadrat size is reached when a further increase in size adds no or very few further species as present.

How many quadrats? When there is no further increase in the number of species found, sufficient quadrats have been analysed in that habitat.





Estimating Species Distribution by Means of a Transect

The community present along a transect can be analysed from a straight line such as a measuring tape, laid down across an apparently representative part of the habitat. The positions of every organism present that touches the line are recorded either all the way along the line or at regular intervals. The result is a **line transect**

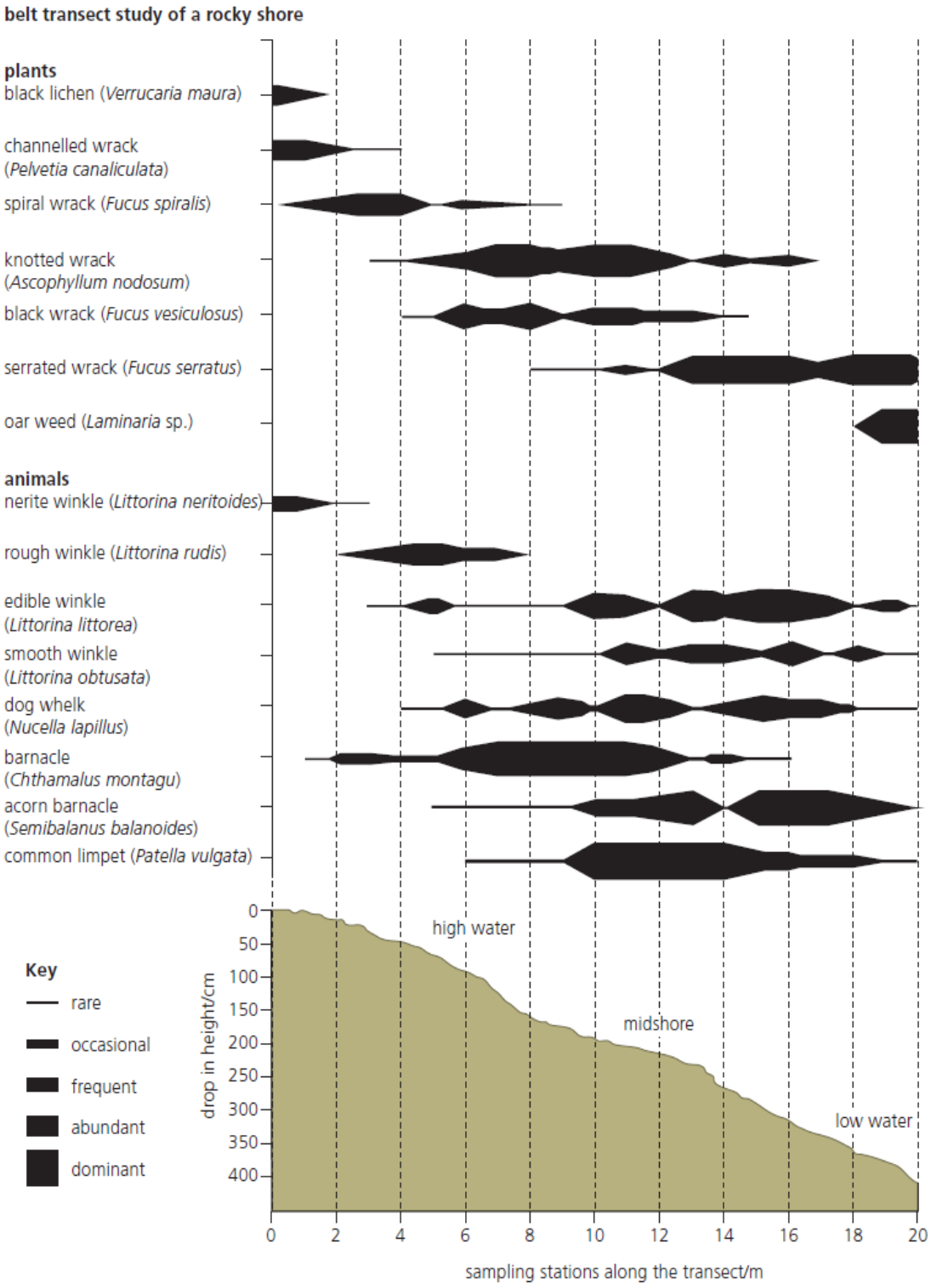


Figure 19.5 Profile and belt transect analysis of a rocky shore community