1.5.2 Study of an Ecosystem 2

Organism Distribution

Qualitative survey
a study determining the presence/absence of a substance or organism in a sample or habitat

Quantitative survey
a study determining the amount of a substance or number of an organism present in a sample or habitat

Quantitative studies
(a) To calculate the frequency of an organism (suitable for plants and for sedentary and slow moving animals)
(b) To calculate the percentage cover of an organism (suitable for most plants)
(c) To calculate the population density of an organism (suitable for plants and for sedentary and slow moving animals)

Materials/Equipment Needed
Frame quadrat
Grid quadrat
Needle/pencil

Procedure
- Familiarise yourself with all procedures before starting.
- Select the sample area in the ecosystem and mark it off.
- Decide on the organisms to be studied and recorded.
- Throw a small object over your shoulder to select a random sample point. Place the quadrat at the random sample point.
- Record the presence or absence of the named organisms within the quadrat, on a chart
- Lower the needle at each sampling point and note the organism(s) hit.

Count and record the number of hits for each organism within the quadrat, on a chart similar to the one below
- Repeat for a number of throws.
- Use the formula below to calculate frequency / % cover
- Calculate the average number of organisms per quadrat. If you are using a $0.5 \times 0.5$ m quadrat you will have the number of organisms per 0.25 m$^2$.
- Calculate the number of organisms per m$^2$ (density).
- Transfer results to graph or bar chart.

(d) To conduct a quantitative study of organisms along a belt transect

(suitable for areas where there is an obvious environmental gradient or an unequal distribution of organisms)

Materials/Equipment Needed
Tape measure (30 m)
2 tent pegs
Frame quadrat/grid quadrat and needle

Procedure
1. Familiarise yourself with all procedures before starting.
2. Select the sample area in the ecosystem and stretch the tape across it.
3. Decide on the animal to be studied.
4. Search the area for the selected animal. Mark each animal found in a suitable way.
5. Count and record the number of animals captured and marked. Replace each animal where it was found.
6. Return to the area the following day. Search for animals in the same way. Count and record the total number of animals recaptured.
7. Count and record the number of marked animals in the recapture sample. Replace each animal where it was found.
8. Use the formula below to calculate the total number of animals in the sample area.

Total Population = \[ \frac{\text{No. captured and marked on 1st visit} \times \text{No. captured on 2nd visit}}{\text{Number of marked animals in the recapture sample}} \]