**Estimating Populations**

The **population** is the number of organisms of a particular species living in a habitat. Scientists often study changes in the population and **distribution** (how the organisms are spread out) of species.

A **quadrat** is a piece of equipment that is used to estimate the number of plants in a large area when there are too many to count.

It is a rectangular grid that is placed randomly in the area. The number of organisms inside the quadrat are counted. This number is then multiplied by how much larger the total area (example: field) is compared to the quadrat (for example if the quadrat is 1 m2 and the field is 100 m2, the field is 100 times larger so you multiply by 100).

This method is not very accurate if you only sample once (there may be more plants in one area and less in others). To make it more accurate, you sample many times and calculate an **average**.

Remember that this is an **estimate**! It will not be 100% accurate. The more samples you take, the more accurate it will be.

**How to use a quadrat**

1. Place the quadrat **randomly** and count the number of organisms inside. If more than half is showing count as 1, if less than half is showing ignore it, if exactly half is showing count as 0.5. Calculate the **total** (sum) for all repeats.
2. Calculate an **average** (divide the sum by the number of repeats)
3. Measure the dimensions of the “**field**”. Calculate the **area** (length x width).
4. Measure the dimensions of the **quadrat**. Calculate the **area** (length x width).
5. Calculate how much larger the field is compared to the quadrat ($\frac{total area}{quadrat area}) . $Estimate the plant population by multiplying the average number of plants counted in the quadrat by how much larger the field is.

Estimated plant population = ( $\frac{total area}{quadrat area} )$ x *(average number in quadrat)*

**Quadrats - Daisies**

|  |  |
| --- | --- |
| Quadrat Experiment | Number of Plants |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |
|  |  Total =  |

1. Total number of plants in 10 quadrats =
2. Average number of plants (A ÷ 10) =
3. Area of quadrat = \_\_\_\_\_\_\_\_\_\_ cm2
4. Total area sampled = \_\_\_\_\_\_\_\_\_\_ cm2
5. Estimated plant population ($ \frac{D}{C }$ *x B* ) =