ECOLOGY LAB 10

Mohamed Sabbar

Application of Quadrat method

- **Background Information**
- A **quadrat** is a frame, traditionally **square**, used in ecology and geography to isolate a standard unit of area for study of the distribution of an item over a large area. Modern quadrats can for example be **rectangular**, **circular**, or **irregular**. The quadrat is suitable for sampling **plants**, **slow-moving animals**, and **some aquatic organisms**.

Application of Quadrat method

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- Many researchers prefer studying plants and animals in their **natural habitats** without disturbing them. However, ranges are often too large for a team of researchers to adequately study. Quadrats are randomly distributed plots that allow researchers to collect data and use it to make assumptions about the entire study area or the studied species.

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- Quadrats allow researchers to study plant and animal populations spread out over large areas. They are **inexpensive**, **relatively easy to design** and **adaptable for studying unevenly distributed populations**. Quadrats work well for observing changes to whole populations over time, including **distribution patterns**, **nesting** and **overall health**.

Study Populations

- Plants, slow-moving animals and faster-moving animals with a small range (like insects) are ideally suited for quadrat studies. For example, ants move fairly quickly but always organize around a stationary ant hill. Quadrats are useful for studying both the distribution of ant hills within a larger area and ant behavior within the sample area.

Study Populations

- Quadrat sampling is not useful for studying very fast-moving animals who will not stay within the quadrat boundaries. In general, quadrat sampling is **less harmful** to most species when compared with other methods. Some animals may experience harm if the scientist collects the population within the quadrat rather than studying it in the field.

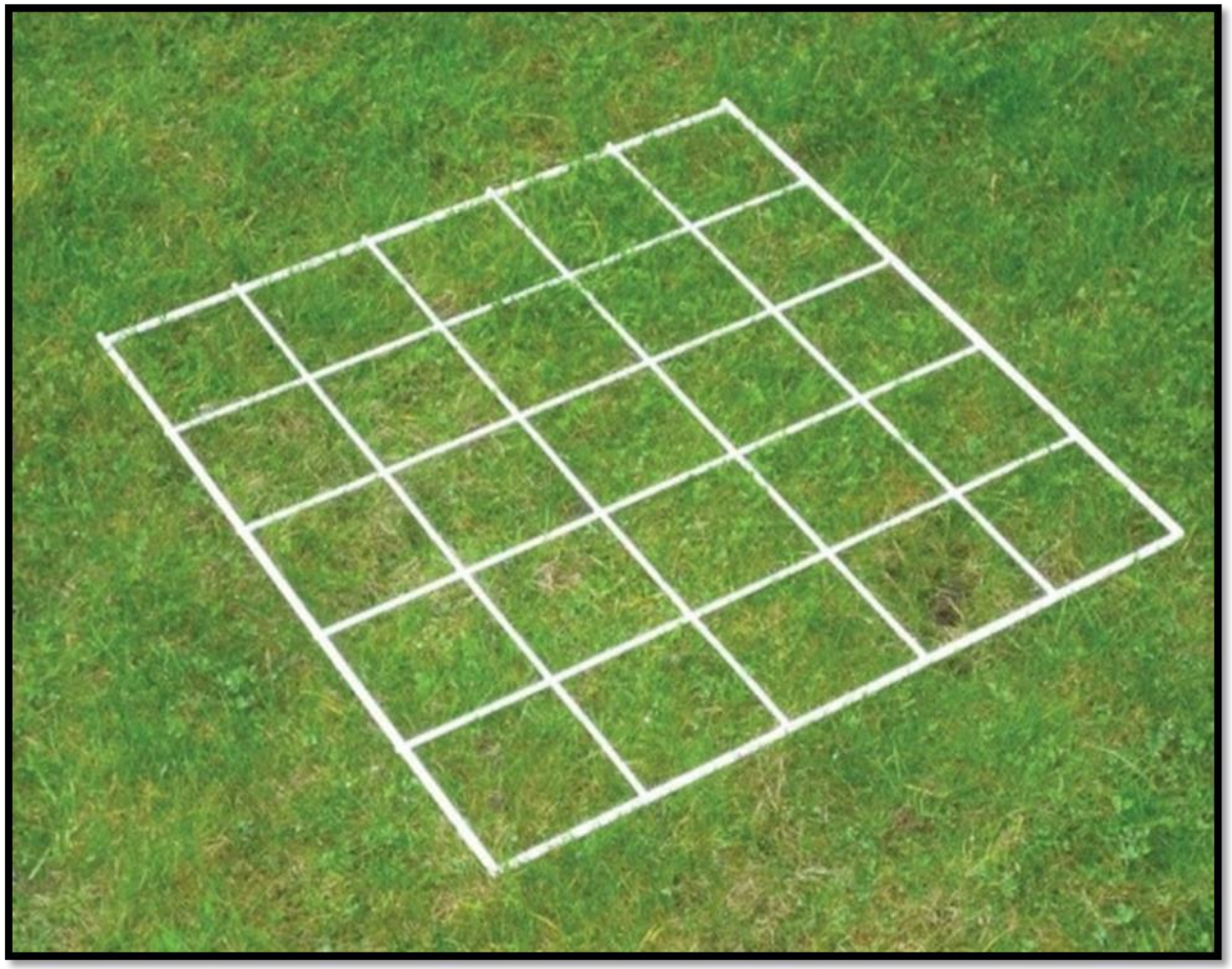
How to use quadrats in random sampling?

- There are two uses of quadrats. The first is to make estimates of population, the second to investigate the distribution of organisms in an ecosystem. Your school probably has playing fields and on the playing fields there will be plants such as dandelions. But how many dandelions live on your playing field?

How to use quadrats in random sampling?

Each quadrat has an area of $0.25m^2$ (50cm by 50cm). So let's imagine you randomly place your quadrat 10 times on the playing field and count the dandelion plants in it each time. You get the following results:

1,1,3,4,0,3,0,1,0,2



How to use quadrats in random sampling?

- This gives an average of 1.5 dandelions per quadrat. If this is a representative sample of the total population, you can now estimate the total population of dandelion plants in the field. You will need to know the total area of the field – let's pretend it is 200m^2. So each quadrat contains an average of 1.5 dandelions. How many quadrats in total represent the whole playing field? You would need 800 quadrats to cover the whole field, so our estimate for the total population of dandelions is 1.5 x 800 = 1200 dandelions.

How to use quadrats in random sampling?