Biodiversity of the Western Volcanic Plains

Quadrats Online: Teacher Notes

Elspeth Swan ©

Activity 2

Investigating changes along a transect

Objectives

After completing this activity, students will be able to:

- Determine species frequency using quadrats along a transect.
- Use these results to explain any patterns observed in the results.

Target audience

Levels 6 & 9

Activity 2

Investigating changes along a transect (Levels 6 & 9)

Duration

One 50-minute session

Materials

- Student worksheet
- 'Investigating changes along a transect' grassland map
- Small quadrats 4 cm x 4 cm (made by cutting a 4 cm x 4 cm square out of a piece of paper)
- Ruler

Activity

How can we investigate a possible pattern or change in vegetation in an area?

We may want to see how the vegetation changes near a footpath through an area of grassland, or to investigate how the vegetation changes as you move away from a river or stream?

Instead of using random quadrat sampling, we place quadrats along a specific line that follows the change in the environment being investigated. This line is referred to as a transect.

This is a short activity that will be used to introduce students to quadrat sampling along a transect. It is designed to allow students to think about how this exercise could be done in the field and what problems may be encountered.

Before beginning the activity

Explore student ideas about how we could measure the abundance of different species. What would we measure? How would we measure?

Carrying out the activity

1. Hand out a copy of the 'Investigating changes along a transect' grassland map.
2. Explain the symbols on the map to students.
3. After discussing the aim of the exercise, have the students decide where to place their transect line on the grassland map. Each group may place their line differently.
4. Students should then carry out quadrat sampling along the transect line at 6 cm intervals. They may want to draw a line with these intervals marked on the map.
5. Students should count the numbers of each species in each quadrat and record their answers in the results table provided.

Interpretation of results

1. Comment on the density of native grasses at different distances from the walking track.

Students should comment on the higher density of native grasses further away from the walking path.

2. Comment on the density of introduced grasses at different distances from the walking track?

Students should comment on the higher density of introduced grasses closer to the walking track.

3. Can you offer any reasons for these observations?

Walking on the area causes compaction of the soil. Native grasses require quite loose uncompacted soil for their seeds to germinate. Introduced grass species are able to germinate in compacted soil.

4. If the introduced plants were not planted there on purpose, suggest how they may have arrived in the grassland, particularly with regards their proximity to the walking track?

Seeds from introduced grasses may have been carried in on the soles of the shoes of people walking on the track. Some may have blown in with the wind.

5. Do you think your results give an accurate representation of this grassland area?

Students should comment on the fact that the recommended size and number of quadrats was used and that the quadrats were placed at random, so the results should be a fairly good representation of the whole area.

Conclusion

6. What is the effect of allowing people to walk through a native grassland area regularly, creating a worn track?

This can cause an increase in the density of introduced grass species and a decrease in the density of native grass species due to soil compaction and transfer of introduced seeds on shoes and other clothing.

7. Can you suggest any alternatives to a walking track?

A boardwalk that allows people to walk over the area would minimise the effect on the plants and animals. Other correct suggestions would also be acceptable.

8. Explain what would need to be considered when carrying out an activity such as this one in the field?

In the field students will need to consider site access and the effects of weather. The site itself may have obstacles to overcome such as rocks or large trees. Students will need to think about how to overcome any issues relating to their quadrats. It may be more difficult to decide whether plants around the edge of the quadrat should be counted. Students will need to minimise the amount of plant trampling, especially since the effect of this is what is being studied.