Terrestrial Ecology

Ecology Fieldwork

Chapter 1: Flora Habitats Study Site Vegetation Survey



Foghlaim Páirceanna Náisiúnta National Parks Learning Ecology is the study of living organisms and how they interact in the environment.

As the world faces an enormous loss of biodiversity, the study of ecology has never been more important. Take this opportunity to select a habitat and investigate the plants and animals that live there.



How It Works

This Lesson Plan has been developed to enable teachers and students to confidently carry out ecology fieldwork.

The following documents should be used together for the Lesson Plan.

Explanatory Notes:

- Chapter 1: Flora
- Chapter 2: Fauna
- Chapter 3: Factors

Ecology Worksheet: Print one per student to record their findings at the study site.

Identification Notes:

- Invertebrate Key
- Mammal Guide
- Bird Guide
- Tree Guide
- Flower Guide

Habitat

This study focuses on a terrestrial habitat, for example grassland, woodland, farmland, urban park or school grounds.

An aquatic or wetland habitat (river, lake, bog) requires a different methodology and keys.



Ecology Fieldwork Notes

Name	
Date	
Location	
Habitat	
Adjacent Habitats (if applicable)	

Habitats Some typical terrestrial habitats are listed here. There are also many others.

Woodland:

- Deciduous woodland
- Evergreen/Plantation woodland
- Mixed woodland

Grassland:

- Recreational grassland (parks, pitches)
- Farmland
- Flower-rich meadow

• Hedgerow (effectively a linear woodland)







Marking Out the Study Site

Mark out a 10m square in your habitat. This will be a **Representative Sample** of the whole habitat.

Method

- Use a measuring tape to measure each 10m side.
- Use canes to mark the corners.
- Stretch ropes along the ground between the canes to mark the sides.

Mapping the Study Site

Draw a rough map of your study site in the square on the next page.

Do not forget to include an arrow to show where north is. This may not be at the top of the page - it depends on how you draw your map. You can use a compass to establish where North is.

Include a key underneath to show what everything represents. Items to map include:

- Areas of grass/leaf litter/ moss/ soil, etc
- Large rocks
- Large logs
- Trees (trunk and canopy)
- Shrubs
- Anything else of interest

Equipment

A measuring tape 4 Canes 4 x 10m ropes

A compass (or a compass app on a mobile phone)

Equipment

Key

Here are some examples of symbols that you could use. Or you could design your own symbols.



Study Site Map

10 m

Key

10 m

Vegetation & Habitats



Vegetation Surveys

A survey of the vegetation will give us an understanding of the habitat:

What species grow there? How common is each species within the habitat? How much area does each species cover? A **Qualitative** survey records the presence or absence of a species.

A **Quantitative** survey gives more detail. It records the quantity of each species.

Vegetation Layers in a Habitat



Plant Identification

Use plant keys or field guides to identify at least five plant species within your delineated study site.

We shall be using these five species in our vegetation survey, so select species that represent the habitat and the layers within it. For example, in a woodland consider identifying one or two tree species, a shrub species, and two herb layer species.

How to Identify and Describe Plant Species

- Note the size of the plant. Large tree or low growing herb?
- Is it evergreen or deciduous?
- What shape are the leaves?
- Are the leaves hairy?
- Does it have flowers? Colour? Number of petals?
- Does it have other notable features? Nuts or seeds? Catkins? Thorns?

A Word of Warning

You may not be able to identify every species. There are 100's of species in Ireland, and some can be difficult to identify. In addition, many species have been introduced as forestry or garden species, and these may not be in your guide book. Concentrate only on the common species.

Some groups of plants can be challenging. For example, mosses. Unless you have an expert with you, simply group all mosses as just 'moss'.

Time of Year

The time of year has a major effect on the appearance plants. For example, deciduous trees will be without leaves in winter and even in early spring. This makes identification more challenging.

Most flower species only flower for a short period at a specific time of the year. Many woodland flowers only flower in early spring before the leaves appear in the trees overhead and block the light.



Botany is the study of plants.

A person who studies plants is called a **botanist**





Plant Identification

Identify five plant species. Give an accurate description of each, and draw a leaf.

Species	Description	Leaf

Using a Quadrat

Equipment

50cm Quadrat

- A quadrat is used to to survey the vegetation within your 10m x 10m study site.
- There might be many, many species growing within the study site. To simplify things, only survey the five species that you have identified.
- Randomly place the quadrat ten times.
- With each quadrat placement, carry out two survey methods (qualitative & quantitative). See below.
- When you collate your results, compare the two methods. Which gave the most useful results?

Remember

Only record living plants. Ignore dead leaves lying on the ground.



Don't forget the canopy overhead. If it covers your quadrat, then it is in your quadrat.

Don't be worried if the % cover figures for all the species in each quadrat come total more than 100. Remember, species can overlap.

Three Ways to Place a Quadrat

To ensure a random placement of each quadrat, use one of the methods below.

- Throw the quadrat.
- Throw a pen, and place your quadrat where the pen lands.
- Before you start your study, draw a 10x10m map and place the quadrat at ten random locations within the site.



Line Transect

A line transect is another method used to determine where to place a quadrat. It is useful in a habitat that has a variation across it. Example: On an area of grassland that has a well grown area and a trampled area.

Method:

- Set up a 10m line. This can be a tape measure, or you can use the edge of your 10m study site.
- Survey a quadrat at 1m intervals across the line (ie: with the left edge of the quadrat at 0m, 1m, 2m, etc.)
- At each quadrat location, carry out both a qualitative and a quantitative survey.



Frequency Survey (Qualitative)

Method

- List your five species to be surveyed in the table on the next page.
- For each of the 10 quadrats, simply record the presence or absence of each species. (Plus or minus)
- Add up the total number of quadrats that each species appears in, and multiply by 10 to get the % of quadrats that the species grows in.

In the example below, Flower A is not present in the quadrat, so it scores imes

The other four species are present in the quadrat and score 🧹



Percentage Cover Survey (Quantitative)

Method

- List your five species to be surveyed in the table on the next page.
- For each of the 10 quadrats, calculate roughly what percentage of each quadrat is covered by each species.
- After ten quadrats, add up the total for each species and divide by 10 to get the mean percentage that each species covers within your study site.

In the example above, we need to estimate how much of the quadrat is covered by each plant species. It helps to remember that each of the 25 squares within the quadrat is 4%.

	Tree	50%
We have estimated the results as follows:	Shrub	9%
	Grass	65%
	Flower A	0%
	Flower B	3%

Frequency Table (Qualitative)

Record the presence (\checkmark) or absence (\thickapprox) of each species within each quadrat.

Quadrat Species]	2	3	4	5	6	7	8	9	10	Total	%

Percentage Cover Table (Quantitative)

Record the percentage (%) of each quadrat that is covered by each species.

Quadrat Species	1	2	3	4	5	6	7	8	9	10	Total	%

Protect Nature

We believe that everyone deserves the opportunity to learn, love and protect Nature.



Learning to recognize our native plants and



Love

Growing to love Nature. We love what we know.



Protect

Protecting Nature. We protect what we love.

What Next?

animals







We would love to hear from you

We hope that you enjoyed this Lesson Plan and that you found the resources easy to use.

If you have any suggestions on this lesson, or ideas for future resources, please contact us.

