

## Culbin Lesson Plan – Secondary School Biology Standard Grade – Biosphere

This plan is in 3 parts.

1. Introductory lesson with question sheet
2. Visit to Culbin with pupil worksheet
3. Follow up report to be completed by pupils

### Introductory lesson

The PowerPoint that accompanies this lesson outlines the history of Culbin and is available from Moray Forest District. Tel: 01343 820223.

### *Learning outcomes*

By the end of this lesson pupils should be able to:

1. Describe what Culbin looked like before the area became a forest
2. State that the removal of marram grass destabilised the sand dunes
3. Describe the different ways in which the Forestry Commission attempted to afforest Culbin, which of these was the most successful and why
4. State at least 3 purposes for which Culbin is currently managed.
5. Give examples of at least 3 habitats found in Culbin

### Lesson Plan (based on a 55 minute period)

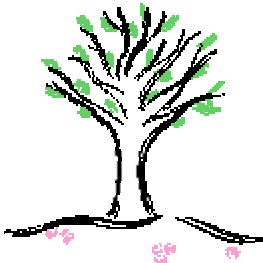
Give pupils sheets with questions about the history of Culbin . These can be photocopied so each pupil has a copy or can be used as non-consumables with pupils answering questions in jotters or on paper. The PowerPoint presentation should then be shown to the class, discussing the main points as they arise. Pupils can answer the questions as they go along or can simply make notes and use these to answer the questions later.

Going through the PowerPoint, answering the questions and discussing pupils' answers should take one lesson.

The information gained from this lesson can be used later on in the final report.

## The History of Culbin

1. What did the area look like 300 years ago?
2. How was the land mismanaged over the years?
3. What happened as a result of this?
4. Where did the sand come from?
5. What happened to Culbin after the war and what was the intended purpose of Culbin at this time?
6. The forestry commission tried to stabilise the dunes in two ways, what were they and which was the most successful?
7. What happened in 1939 in Culbin?
8. Culbin is now managed for several different purposes, name 3 of them.
9. Culbin contains several different habitats, give examples of 3 of them.
10. Why does Culbin not stay the same year after year?



## Visit to Culbin

Based on a whole day in the forest and on the shoreline. This trip requires a bus driver who is happy to drive around the forest. The tracks are suitable for buses and the option of being accompanied by a member of FCS staff is available (though this must be arranged in advance). The times given are estimates; remember to leave plenty of time for navigating around the forest in the bus!

The worksheet provided has a section to note down the results from each area of Culbin. The final part of the sheet has a set of questions designed to get pupils thinking about their report. This can be used on the day or back in class as a prompt for the report.

## Learning Outcomes

1. Identify the required qualities for a good timber tree
2. Correctly use an ecometer to measure soil moisture content
3. Correctly use an ecometer to measure light intensity
4. Use a quadrat to find the abundance of plant species
5. Calculate the average abundance of a plant species from 4 quadrats
6. Use a key to correctly identify plants and/or animals
7. Correctly use a net to sample from a freshwater pond

### 1. The species trial (est. 30 minutes)

Pupils examine each of the species in the species trial area of the forest, looking at straightness, width and number of branches. They then need to decide which tree would be the best to use in Culbin Forest. A sheet is available from the Forestry Commission to help with this.

### 2. The Forest Floor (est. 45 minutes)

Pupils take four quadrats near the species trail area of the forest. They should look at abundance of lichens, dead material, heathers, sedge grass and small trees. Pupils can also use ecometers to measure light intensity and soil moisture content. A temperature sensor would also be useful here. It is also possible at this point to dig a small hole in the forest floor to demonstrate the forest's sandy soil. Soil samples can also be taken back to class to test soil pH.

### **3. The Salt Marsh (est. 45 minutes)**

Pupils take four quadrats at the salt marsh. The plants will vary at different times of the year but include many grasses and sea pinks. Again pupils can use ecometers to measure light intensity and soil moisture content. Temperature can also be measured again here. Pupils can use keys to help identify the different salt marsh plants. The Forestry Commission has one copy of a salt marsh key available but more are needed for a large group so it may be an idea to source these beforehand if you wish to use keys here.

### **4. The Beach (est. 1 hour)**

A good place to stop for lunch. There are two choices, the Buckie Loch or the bay opposite Findhorn. Findhorn Bay has a colony of seals nearby and has a reasonably sheltered area for eating lunch. After lunch pupils can beachcomb and any interesting finds can be discussed.

### **5. Pond dipping (est. 1 hour)**

There are two ponds to choose from, Dragonfly Pond or Gravel-pit Ponds. In spring the Gravel-pit ponds have many tadpoles in different stages of development and you may find some larvae. The duck pond has fewer tadpoles but a much more impressive array of other animals, including caddis fly larvae, dragonfly larvae, water boatmen, mayfly nymphs, small fish etc. Care must be taken at the Dragonfly Pond as it is much deeper at the edges than the Gravel-pit ponds. Again keys can be used to help pupils identify their finds. It is a good idea to pool all interesting finds in one basin and to briefly discuss these to ensure all pupils have seen everything of interest.

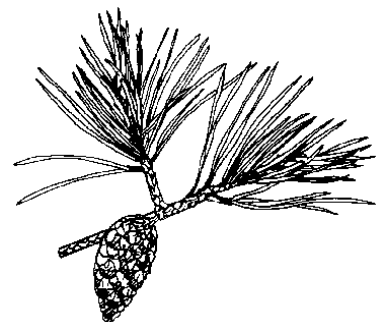
## Culbin Ecosystems Study

### Forest Floor

	Quadrat				Average
	1	2	3	4	
Light intensity					
Temperature (°C)					
Soil Moisture					
Plant Species	1	2	3	4	Average Abundance

### Questions

1. Which plant is the most abundant on the forest floor?

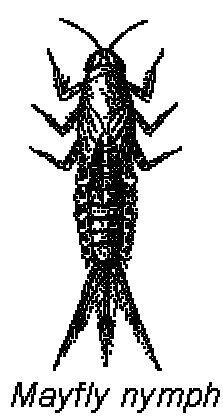


2. What might limit the number and variety of plants found on the forest floor?

**Pond**

Describe the conditions in this area.

Species Found	Notes



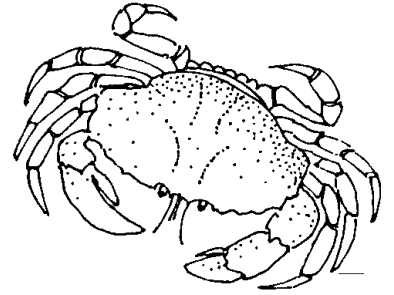
*Mayfly nymph*

**Beach**

Describe the conditions in this area.

Species Found	Notes

## Salt Marsh



	Quadrat				Average
	1	2	3	4	
Light intensity					
Temperature (°C)					
Soil Moisture					
Plant species	1	2	3	4	Average Abundance

## Questions



1. Why is it important that the salt marsh is carefully looked after?

2. Why might horse riders and quad bikes be a problem in this area of Culbin?

## Report

In your report of this trip you will need to consider the ecosystems we have studied and the similarities and differences between them.

Answering these questions will help you to think about this and will help you to write your final report.

1. Considering abiotic factors, what are the main differences between the salt marsh and the forest floor?
2. Why do you think these differences occur?
3. Considering biotic factors, what are the main differences between the salt marsh and the forest floor?
4. Why do you think these differences occur?
5. Do you think that the plants that are most common in the salt marsh would be able to survive in the forest? Why?

## The follow up report

On their return from Culbin pupils are asked to write a report about the trip. The structure is as follows:

### 1. *Introduction -the history of Culbin*

- The history of the forest, pupils can use information from the introductory lesson to complete this part of the report

### 2. *The Forest Floor*

- Results from the quadrats taken on the forest floor should be presented in a suitable form; this could be a table or a graph. Pupils are also asked to discuss the abiotic factors and how these might affect what can grow in this area of Culbin

### 3. *The Salt Marsh*

- Results from the quadrats taken on the salt marsh should be presented in a suitable form; this could be a table or a graph. Pupils are also asked to discuss the abiotic factors and how these might affect what can grow in this area of Culbin

### 4. *Comparison of forest floor and salt marsh*

- Pupils are asked to discuss the differences between the two habitats and why these differences exist. For example they could compare the moisture content of the soil in both areas and then discuss how this affects what grows in each area.

### 5. *The beach*

- A brief description of what pupils found when beach combing

### 6. *The pond*

- Pupils can discuss what they found in the pond area and provide more detail about their favourite find

## *7. Summary*

- Pupils sum up their main findings and conclude the report

The report is quite flexible and can be tailored in any way you wish. You may want pupils to focus on a particular area only or encourage them to do some more research on their favourite Culbin ecosystem or animal. Pupils can be asked to produce a written report, a PowerPoint presentation to give to the class or a poster for display in the classroom. The work can be done individually, in pairs or small groups.