

# Biodiversity

## Human Effect on Ecosystem

### Question Paper 1

<b>Level</b>	GCSE (9-1)
<b>Subject</b>	Combined Science – Trilogy - Biology
<b>Exam Board</b>	AQA
<b>Topic</b>	4.7 Ecology
<b>Sub-Topic</b>	Biodiversity – Human Effect on Ecosystem
<b>Difficulty Level</b>	Gold Level
<b>Booklet</b>	Question Paper 1

**Time Allowed:** 60 minutes

**Score:** / 60

**Percentage:** /100

**Grade Boundaries:**

**Q1.** The UK contains large areas of peat bogs that have been present for thousands of years.

- (a) Peat is removed from peat bogs.

The peat can be mixed with air and added to garden compost.

The release of carbon dioxide from peat is a problem.

Give **two other** reasons why gardeners should use less peat-based compost in the future.

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**(2)**

- (b) Explain why mixing peat with air leads to the release of carbon dioxide.

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**(4)**

**(Total 6 marks)**

**Q2.** In the last 200 years the concentration of carbon dioxide in the Earth's atmosphere has risen.

Explain how a rise in carbon dioxide concentration in the atmosphere can decrease biodiversity.

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(Total 6 marks)

**Q3.** Human activities affect the environment.

- (a) Deforestation results in an increase in carbon dioxide levels in the atmosphere.

Give **two** reasons why.

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(2)

- (b) *In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.*

A dairy farmer washes out his cow shed each day. The waste water contains urine and faeces. The waste water overflows into a stream by mistake.

The waste water will have an effect on the plants and invertebrates living in the stream.

Explain why.

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[illegible]

The curry spice coriander works like an antibiotic. Adding coriander to animal food

reduces methane production by about 40%.

- (a) (i) Why does adding coriander to an animal's food reduce methane production?

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(1)

- (ii) Explain **one** advantage to a farmer of adding coriander to the animal's food.

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(2)

- (b) Farm animals give off large amounts of methane.

Explain the effects of adding large amounts of methane to the atmosphere.

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(3)

(Total 6 marks)

- Q5.** Large areas of rain forest are being cleared and burnt in many parts of the world. The cleared land will often produce crops for only a few years.

- (a) Explain why rain forests are being burnt to provide land for crops in many parts of the world.

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(2)

- (b) Explain why such cleared land will often produce crops for only a few years.

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(2)

- (c) Explain the effects that large-scale burning of forests may have on the Earth's atmosphere in the short and in the long term.

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(4)

(Total 8 marks)

**Q6.** Professor John Lawton researches into the problem of controlling the spread of bracken. Bracken is a fern which threatens upland farms, partly because it poses a health risk to people and animals.

Professor Lawton is waiting for government permission to release the Conservular caterpillar which feeds on the bracken.

The Secretary of State has to decide whether the Conservular caterpillar can be released.

The article printed below describes some of the problems faced by the Secretary of State.

### **David the caterpillar to bracken's Goliath**

Yorkshire farmer Maurice Cottrill has just forked out £500 to have a helicopter hover over his land and spew out gallons of chemicals aimed at destroying one of the most pervasive and dangerous weeds known to man – bracken. In a little box in a laboratory near Ascot, Berkshire, lies a tiny caterpillar which could have done the job for nothing.

Whether or not that caterpillar and thousand of its chums will ever be let loose on the massive carpet of bracken that is sweeping over Britain at the rate of 53 square kilometres a year has to be decided by the Secretary of State for the Environment.

Weed control through the release of imported insects has never been tried in Britain before. If the Secretary of State permits the experiment, the caterpillar is in for the feast of its life, because five years of painstaking research have proved that bracken is its only food. However, is that the full story? Will the beast stop there, or will it go on, wreaking unforeseen devastation. Can scientists predict what will happen when imported insects are released into the wild?

Bracken is poisonous – more than 20 000 sheep and 1 000 cattle suffer poisoning each year. Its spores are carcinogenic, posing a threat to hill walkers. Bracken costs a depressing £4m a year to control while rendering useless grazing land valued at £5m annually. “Bracken is one factor which is leading to hill farming becoming uneconomic”, says the director of the Ramblers Association. “We are worried about that because, the more uneconomic hill farms become, the more prospect there is of the forestry industry taking over.”

The National Farmers Union are concerned about the consequences of the caterpillar getting out of control. What if it started consuming garden ferns? What if it loved potatoes? On the other hand, the caterpillar might help to preserve important uplands where wildlife flourishes when bracken is kept at

bay. However, the experiment takes the scientists into unknown territory.

World-wide, 94 species of weeds have been controlled by biological releases involving 215 types of animal in 50 countries. Professor Lawson says that approximately one-third have achieved effective control and the remainder have failed.

Upland farms are artificial ecosystems, created and maintained mainly for the rearing of sheep and cattle. These farms are being threatened by the spread of bracken. Up to now the only treatment for bracken has been to use herbicides.

Use the article to explain, as fully as you can, what advice you would give the Secretary of State.

Explain the arguments for and against that lead to your decision.

You will **not** receive marks for simply copying extracts from the article.

**(Total 8 marks)**

**Q7.** In tropical areas of the world, forests are being cut down at the rate of 150 hectares every minute of every day.

(a) Give **two** reasons why forests in tropical areas are being cut down at a high rate.

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2 .....

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**(2)**

(b) Explain how this deforestation is affecting the composition of the atmosphere.

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(5)  
(Total 7 marks)

**Q8.** Read the passage.



## Glutton up a gum tree

Along the banks of the Cygnet River on Kangaroo Island, the branches of the dying gum trees stretch out like accusing fingers. They have no leaves. Birds search in vain for nectar-bearing flowers.

The scene, repeated mile upon mile, is an ecological nightmare. But, for once, the culprit is not human. Instead, it is one of the most appealing mammals on the planet – the koala. If the trees are to survive and provide a food source for the wildlife such as koalas that depend on them, more than 2000 koalas must die. If they are not removed the island's entire koala population will vanish.

Illegal killing has already started. Worried about soil erosion on the island, some farmers have gone for their guns. Why not catch 2000 koalas and take them to the mainland? "Almost impossible," says farmer Andrew Kelly. "Four rangers tried to catch some and in two days they got just six, and these fought, bit and scratched like fury."

Use the information from the passage and your own knowledge and understanding to give the arguments for and against killing koalas to reduce the koala population on Kangaroo Island.

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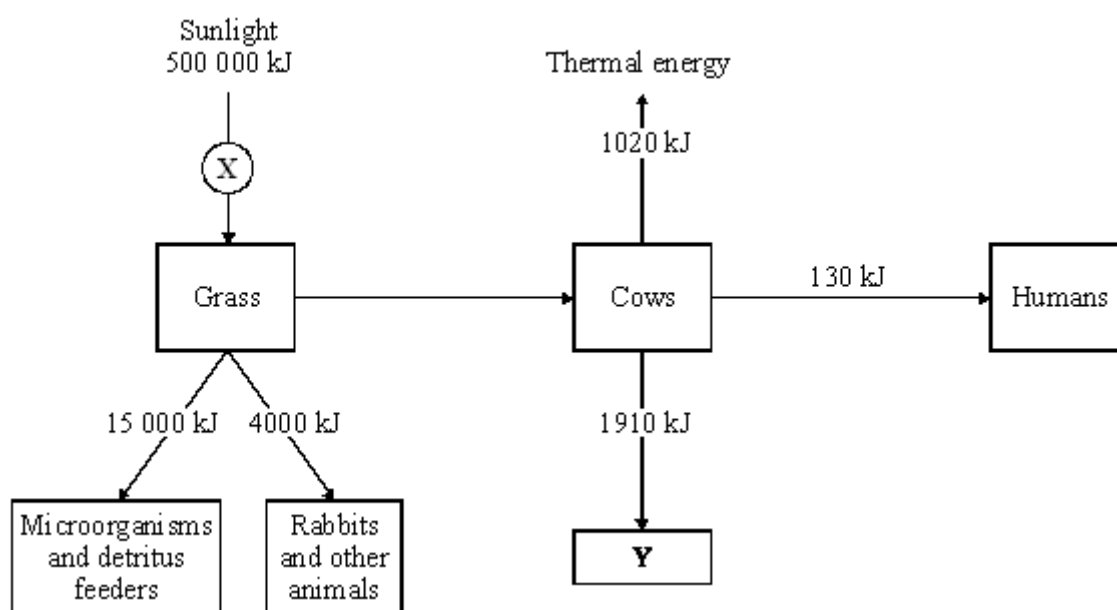
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(Total 4 marks)

- Q9.** The diagram shows the amounts of energy that are transferred, over a period of time, through some living things in a grassland habitat.



- (a) Calculate the amount of energy transferred from the grass to the cows.

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Amount of energy = ..... kJ

(1)

(b) **X** is a process in plants.

(i) Calculate the amount of energy usefully transferred by process **X**.

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Amount of energy = ..... kJ

(1)

(ii) Name process **X**.

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(1)

(c) Give **two** ways in which energy is 'lost' from the cows at **Y**.

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2

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(2)

(d) Describe how hormones can be used to improve the efficiency of producing food from plants.

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(2)  
(Total 7 marks)