

# 4 Biodiversity

**Aims:** Describing a process | Using the active and passive voice  
 Signposting a sequence of events | Using the language of cause and effect  
 Overviewing the academic style

## Part 1: Vocabulary



1 Match the pictures 1–6 above with the natural habitats a–f.

- |           |                  |              |
|-----------|------------------|--------------|
| a estuary | c mangrove swamp | e grasslands |
| b forest  | d desert         | f rainforest |

2 The expressions a–g below describe sources of damage to the environment. Complete the sentences 1–7 using these expressions. The first one has been done for you.

- |                            |             |                  |
|----------------------------|-------------|------------------|
| a oil spills               | d logging   | f overgrazing    |
| b <i>intensive farming</i> | e acid rain | g global warming |
| c strip mining             |             |                  |

- 1 *Intensive farming* in wheat-growing countries like Canada has led to the loss of natural grasslands.
- 2 \_\_\_\_\_ causes damage to forests as well as limestone monuments.
- 3 Indiscriminate \_\_\_\_\_ of tropical hardwoods has contributed to the destruction of rainforests.
- 4 \_\_\_\_\_ of grasslands by cattle and sheep is associated with soil erosion and desertification.
- 5 Off-shore \_\_\_\_\_ frequently result in damage to mangrove swamps and the unique species that live there.
- 6 The thinning of the arctic icecap has been attributed to \_\_\_\_\_.
- 7 \_\_\_\_\_ for minerals near river banks is linked to soil erosion and degradation of estuaries.

- 3 Look again at sentences 1–7 in exercise 2 and answer the questions 1–3.
- 1 Which sentences express a cause-and-effect relationship?
  - 2 Which sentences express an association (possibly, but not necessarily, cause-and-effect)?
  - 3 How is *contribute to* different from *cause*?

- 4 Cause-and-effect relationships can also be expressed using a number of different words and expressions:

**because + dependant clause**

*Because mangrove swamps have been damaged, many unique species are now endangered.*  
*Many unique species are now endangered because mangrove swamps have been damaged.*

**because of + noun phrase**

*Because of damage to mangrove swamps, many unique species are now endangered.*

**due to**

*Many unique species are now endangered due to damage to mangrove swamps.*

**therefore/consequently/as a result + clause**

*Mangrove swamps have been damaged; therefore, many unique species are now endangered.*

**so**

*Mangrove swamps have been damaged, so many unique species are now endangered.*

**so + that + clause**

*Mangrove swamps have been so damaged that many unique species are now endangered.*

Re-write the sentences 1–4 below using the words in brackets. Make any other changes necessary.

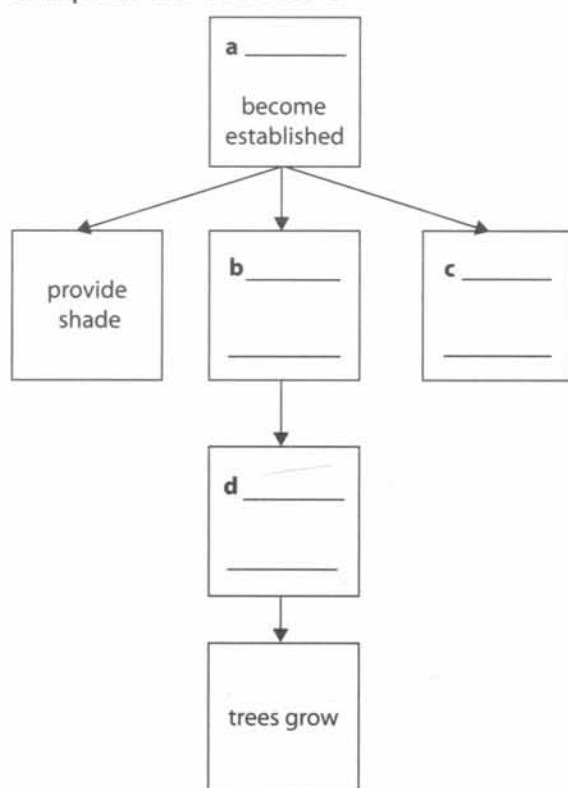
- 1 Land has been farmed so intensively that there has been a significant decline in biodiversity. (contributed to)  
 Intensive farming \_\_\_\_\_.
- 2 Loss of vegetation has caused a decline in the insect population. (consequently)  
 Vegetation \_\_\_\_\_.
- 3 Because there are fewer insects, the small animals that feed on them have moved elsewhere. (so)  
 There are \_\_\_\_\_.
- 4 The disappearance of prey species has resulted in a marked reduction in numbers of predators such as wild cats and owls. (because of)  
 There has been \_\_\_\_\_.

- 5 Each pair of words or phrases in italics in the sentences 1–5 below expresses a similar meaning. Underline the word which makes the sentence more moderate.

- 1 Acid rain has *damaged/destroyed* acres of forest.
- 2 As a result, many woodland species *have become extinct/are endangered*.
- 3 The *loss/disappearance* of predator species has caused an increase in numbers of prey species.
- 4 Many forests can no longer be *used/exploited* for commercial purposes.
- 5 Governments should *ban/limit* the burning of fossil fuels, which causes acid rain.

## Part 2: Practice exercises: Task 1

- 1 Read the two process descriptions below. Use information from the second description to complete the flowchart.



### Clear cutting

The flow chart illustrates the process of clear cutting, a logging practice which involves the complete removal of trees from a given area.

Firstly, access roads to the area are cut. Secondly, the entire crop of standing trees is felled by mechanized harvesters. The trees are then 'extracted', or brought to the road side.

Once the trees have been extracted, they are processed by chain saw. The limbs and tree tops are removed. The stems are 'bucked', that is cut into logs of a specified length. The logs are then sorted by size and loaded onto logging trucks for transport to the sawmill.

In the final stage, the land is prepared for future harvests. The remaining scrub is gathered into large piles and burnt. The area is then re-planted.

### Forest re-growth

The flowchart illustrates the process of forest re-growth following a period of widespread deforestation.

The first plants to grow are 'pioneer' plants, which can survive in harsh conditions. They provide shade, gather moisture, and return organic material to the soil. They therefore create the conditions for other plants to thrive.

In the second phase of re-growth, shrubs emerge. They quickly cover the ground, crowding out the pioneers. However, they too eventually die off as young trees push through the brush. Within ten years, trees finally take over, preventing light from reaching the forest floor.

Now look at options i and ii and decide in each case whether you would normally use the active or the passive voice.

- i when the process is natural
- ii when there is a human agent

- 2 The descriptions on page 34 contain examples of how several stages of a process can be combined in one sentence. Read the descriptions again and notice how the groups of sentences 1–5 below have been combined. Study the examples and then join each group of sentences without looking at the model texts. The first one has been done for you.

Example: *The first plants to grow are pioneer plants. Pioneer plants can survive in harsh conditions.*

*The first plants to grow are pioneer plants, which can survive in harsh conditions.*

- 1 Pioneer plants provide shade. Pioneer plants gather moisture. Pioneer plants return organic material to the soil.  
\_\_\_\_\_
- 2 Shrubs quickly cover the ground. Shrubs crowd out the pioneers.  
\_\_\_\_\_
- 3 However, shrubs too eventually die off. Young trees push through the brush.  
\_\_\_\_\_
- 4 The logs are sorted by size. The logs are loaded onto logging trucks. They are transported to the sawmill.  
\_\_\_\_\_
- 5 The trees have been extracted. The trees are processed by chain saw.  
\_\_\_\_\_

- 3 The descriptions in Exercise 1 also contain examples of **signposting** language, which mark the stages of the process. Find examples from the texts in Exercise 1 that signpost the following stages:

**beginning stages:** *Firstly*

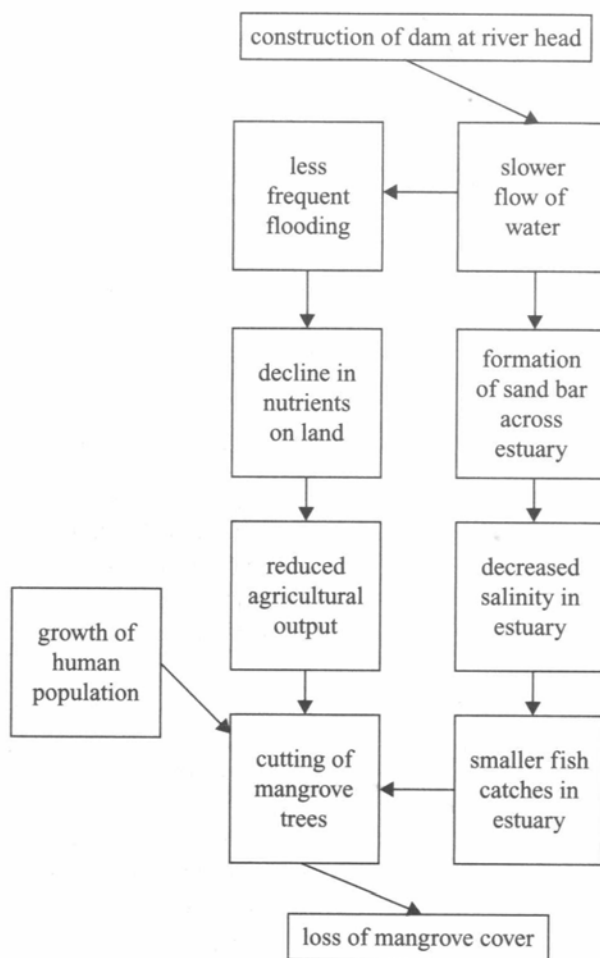
**middle stages:**

**end stages:**

**Exam tip:** Do not overuse signposting expressions. One signposting expression at the start, one or two in the middle and one at the end are sufficient in most cases. In process descriptions, the most frequently used signpost is the adverb *then*. It is normally placed between the subject and verb (*Precipitation then increases*) or between the auxiliary verb and the main verb (*The trees are then extracted*).

4 The process diagram below includes both man-made and natural phenomena. Complete the sentences 1–10 using an active or passive verb form. The first one has been done for you.

- 1 A dam *is constructed* at the river head.
- 2 The flow of water \_\_\_\_\_ down.
- 3 Flooding \_\_\_\_\_ less frequent.
- 4 A sand bar \_\_\_\_\_ across the estuary.
- 5 The quantity of nutrients on land declines and agricultural output \_\_\_\_\_.
- 6 Salinity in the estuary \_\_\_\_\_.
- 7 The human population \_\_\_\_\_.
- 8 Fewer fish \_\_\_\_\_.
- 9 Mangrove trees \_\_\_\_\_.
- 10 Mangrove cover in the estuary \_\_\_\_\_.



5 Join each pair of sentences a–f below using the structure, word or expression in brackets. Make any other necessary changes. Then rewrite the sentences as a passage, adding any signposting expressions from Exercise 3 that you think are suitable.

- a 1 and 2 (-ing clause) Example: *A dam is constructed at the river head, slowing the flow of water.*
- b 3 and 5 (because) \_\_\_\_\_
- c 4 and 6 (as a result) \_\_\_\_\_
- d 6 and 8 (as) \_\_\_\_\_
- e 7, 8 and 9 (due to) \_\_\_\_\_
- f 9 and 10 (once) \_\_\_\_\_

## Part 3: Exam practice

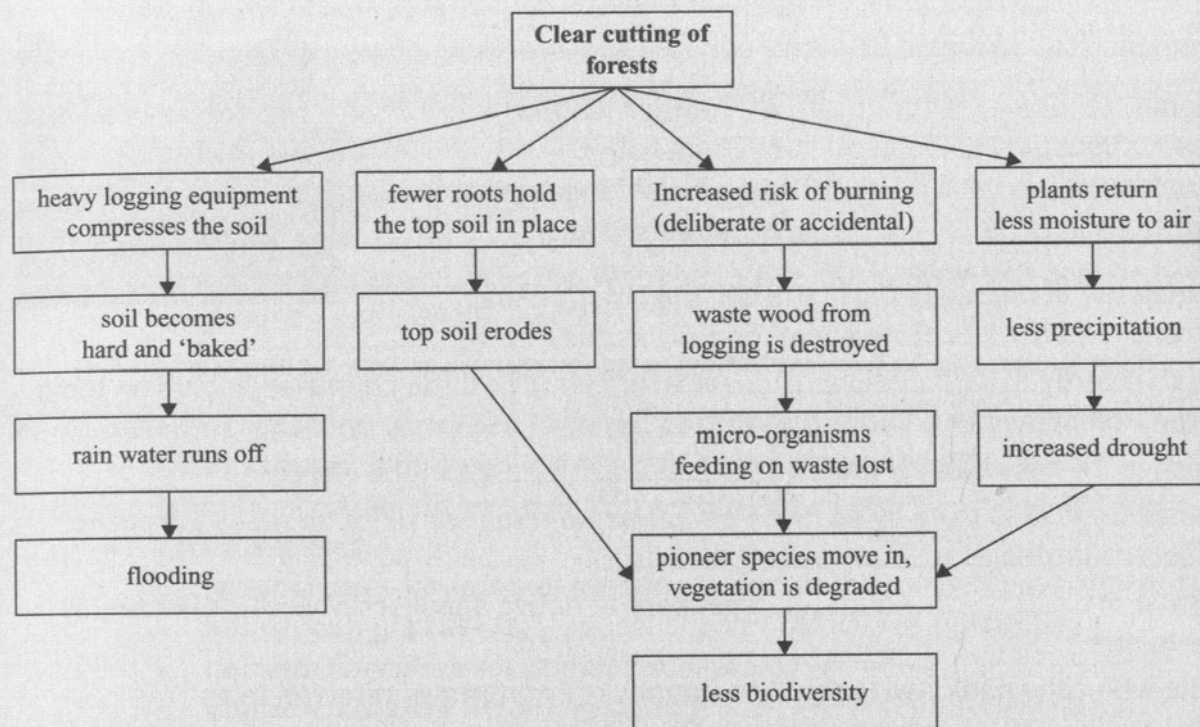
### WRITING TASK 1

You should spend about 20 minutes on this task.

*The flow chart illustrates the consequences of deforestation.*

*Summarise the information by selecting and reporting the main features.*

Write at least 150 words.



### WRITING TASK 2

You should spend about 40 minutes on this task.

Write about the following topic:

*The importance of biodiversity is being more widely recognised as increasing numbers of species come under threat.*

*What can be done to maintain biodiversity?*

Give reasons for your answer and include any relevant examples from your own knowledge or experience.

Write at least 250 words.

# 4 Biodiversity

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## Part 1: Vocabulary

### Exercise 1

a 2, b 1, c 6, d 5, e 3, f 4

### Exercise 2

1 b, 2 e, 3 d, 4 f, 5 a, 6 g, 7 c

### Exercise 3

- 1 Sentences 1, 2, 3, 5, 6
- 2 Sentences 4, 7
- 3 *Contribute to* implies there is more than one cause.

### Exercise 4

- 1 Intensive farming has contributed to a significant decline in biodiversity.
- 2 Vegetation has been lost; consequently, the insect population has declined.
- 3 There are fewer insects, so the small animals that feed on them have moved elsewhere.
- 4 There has been a marked reduction in numbers of predators such as wild cats and owls because of the disappearance of prey species.

### Exercise 5

- |                  |         |
|------------------|---------|
| 1 damaged        | 4 used  |
| 2 are endangered | 5 limit |
| 3 loss           |         |

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## Part 2: Practice exercises: Task 1

### Exercise 1

a pioneer plants, b gather moisture,  
c return organic material to the soil, d shrubs

- i the active voice
- ii the passive voice

### Exercise 2

- 1 They provide shade, gather moisture and return organic material to the soil.
- 2 They quickly cover the ground, crowding out the pioneers.
- 3 However, they too eventually die off as young trees push through the brush.
- 4 The logs are then sorted by size and loaded onto logging trucks for transport to the sawmill.
- 5 Once the trees have been extracted, they are processed by chain saw.

### Exercise 3

beginning stages: *Firstly, first*  
middle stages: *Secondly, then, In the second phase*  
end stages: *In the final stage, finally*

### Exercise 4

- |              |              |
|--------------|--------------|
| 2 slows      | 7 grows      |
| 3 is/becomes | 8 are caught |
| 4 forms      | 9 are cut    |
| 5 is reduced | 10 is lost   |
| 6 decreases  |              |

**Exercise 5****Suggested answers**

- b Because flooding is less frequent, the quantity of nutrients on land and agricultural output decrease.
- c A sand bar forms across the estuary; as a result, salinity in the estuary decreases.
- d As salinity in the estuary decreases, fewer fish are caught.
- e Due to the growth of the human population and smaller fish catches, mangrove trees are cut.
- f Once the mangrove trees are/have been cut, mangrove cover in the estuary is lost.

**Suggested answer**

First, a dam is constructed at the river head, slowing the flow of water. Secondly, because flooding is less frequent, the quantity of nutrients on land and agricultural output decrease. A sand bar forms across the estuary; as a result, salinity in the estuary decreases. As salinity decreases, fewer fish are caught. Finally, due to population growth and smaller fish catches, the mangrove trees are cut. Once they have been cut, mangrove cover in the estuary is lost.

**Part 2: Practice exercises: Task 2****Exercise 6****Response 1**

If you look at it that way, it's true that humans and animals have conflicting interests. People have always exploited animals for food and clothing, and farmers have brought bigger and bigger areas of wild land under cultivation. But should we keep on doing this?

In regions of the world where the population is growing, and there aren't enough resources, the conflict between humans and animals is really bad. If you go to Africa, for example, you can see large nature reserves alongside really poor human settlements. I love the idea of elephants and lions living in the wild. But often it's the poor farmer living nearby who's got to pay the cost in terms of land and lost earnings.

**Response 2**

Looked at from a broad historical perspective, it is true that humans and animals have had conflicting interests. People have always exploited animals for food and clothing, whilst farmers have brought ever increasing areas of wild land under cultivation. Whether this process should continue is a question that requires careful consideration.

In regions of the world where the population is growing and resources are scarce, the conflict between humans and animals is particularly problematic. This can be seen in parts of Africa, for example, where large nature reserves sit alongside very poor human settlements. People living thousands of miles away may value the idea of elephants and lions living in the wild. However, often it is the poor farmer living nearby who must pay the cost in terms of land and lost earnings.

- 1 Response 1 is informal in style; Response 2 is academic in style.
- 2 Response 2 is more impersonal and less emotional. There are fewer conjunctions and more subordinators. There are no colloquialisms or contracted forms.



**Part 3: Exam practice****Task 1: Model answer**

The flow chart shows what typically occurs as a consequence of deforestation. When trees are removed, there are four main immediate effects, which eventually result in flooding, degraded vegetation and a loss of biodiversity.

One immediate effect is soil which has been compacted by heavy equipment. The resulting hard, 'baked' soil contributes to the run off of rain water and, eventually, flooding.

Another immediate consequence of logging is a reduction in the number of roots holding the soil together. This leads to soil erosion. As a consequence, the quality and variety of vegetation is compromised.

The third immediate effect is burning, both deliberate and as a consequence of an increased risk of forest fires. The waste that remains after logging is destroyed and the microorganisms that feed on this material are lost. This leads to degraded vegetation.

The final immediate consequence is a reduction in the amount of moisture plants return to the air. Because there is less moisture in the air, there is less precipitation and an increased incidence of drought. This too reduces plant growth and ultimately results in degraded vegetation and a loss of biodiversity.

**Task 2: Model answer**

As natural resources come under increasing pressure, the list of endangered plants and animals continues to grow. The causes are many: developments in agriculture, mining, forestry and transport. Some would argue that the loss of biodiversity is a price we must pay for progress. In my view, however, there is much that governments can and should do to protect the world's plants and animals.

Governments could promote greater understanding of plants and animals by investing in the research and preservation efforts of universities, zoos, and botanical institutes. This may ensure the survival of individual species and produce tangible benefits in the form of new medicines and products. However, this strategy alone would do little to protect whole ecosystems that are under threat.

An alternative strategy would be to protect natural habitats by expanding nature reserves. This would have immediate positive consequences for those areas by preserving delicate ecosystems. However, this strategy also has limitations. It does not protect from phenomena such as acid rain and water pollution, which can cross boundaries and affect large areas.

The most effective solution is to limit the damage at its source. Companies that engage in practices that harm the environment should be required to demonstrate that they have taken all reasonable efforts to minimise the damage. Public contracts for roads and buildings should only be awarded to firms that have a good environmental track record.

The strategies outlined above: preservation, protection and, above all prevention, can do much to reverse the destruction that threatens the world's plants and animals. The aesthetic and practical benefits of doing so are well worth the cost.