

A Level Biology A
H420/02 Biological Diversity

Question Set 16

1

The Lake District is the largest National Park in England, covering an area of 2362 km².

It contains a wide variety of species, some of which are under threat or endangered. The resident human population is 41 000. In 2016 the Lake District received 18.4 million tourists.

The proportion of Lake District land used for different purposes is shown in Fig. 18.

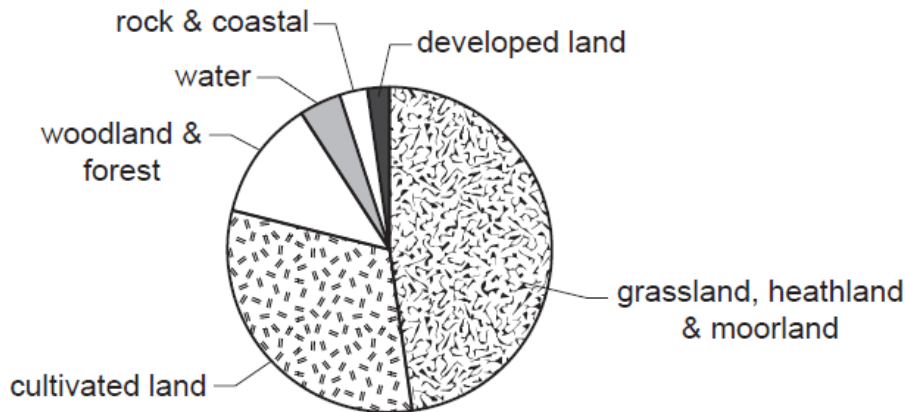


Fig. 18

- (a) Explain **one** way in which tourists can lead to an increase in the biodiversity of an area. [2]
- (b) The Lake District contains large areas where timber is produced. One of the aims of the management of National Parks is to produce timber sustainably.
- (i) Using Fig. 18, **estimate** the percentage of land that is covered by woodland and forest.
estimate = % [1]
- (ii) Timber can be produced economically by a technique called clear felling. Clear felling can damage biodiversity.
Explain how it is possible to produce timber sustainably using clear felling. [2]
- (iii) A traditional timber-production process that is still used in parts of the Lake District is coppicing.
Describe the process of coppicing **and** explain the potential benefits of coppicing to the biodiversity of a woodland. [6]

(c) Many schools visit the Lake District to undertake Biology fieldwork.

A group of students investigated the biodiversity of five herb plants they found in adjacent coppiced and mature areas of woodland in the spring of 2016.

Their results are shown in Table 18.

Species	Number of individuals (n)	
	Coppiced	Mature
Bluebell	35	46
Dog's mercury	2	12
Foxglove	5	1
Herb robert	20	4
Wood sorrel	8	4
Total	70	67

Table 18

- (i) The students calculated the Simpson's Index of Diversity (D) for the mature area to be 0.489.

Use the information in Table 18 to work out the Simpson's Index of Diversity (D) for the area of coppiced woodland.

$$D = 1 - \left(\sum \left(\frac{n}{N} \right)^2 \right)$$

Use the formula:

D = [3]

- (ii) Use the example of the students' fieldwork to explain how biodiversity can be considered at different levels. [3]

Total Marks for Question Set 16: 17

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