

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
TOTAL	



General Certificate of Education
Advanced Subsidiary Examination
June 2009

Environmental Studies

ENVS1

Unit 1 The Living Environment

Tuesday 2 June 2009 1.30 pm to 2.30 pm

You will need no other materials.
You may use a calculator.

Time allowed

- 1 hour

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Answers written in margins or on blank pages will not be marked.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.
Two of these marks are for the Quality of Written Communication.
- You will be marked on your ability to:
 - use good English
 - organise information clearly
 - use specialist vocabulary where appropriate.
- Question 4 should be answered in continuous prose.
Quality of Written Communication will be assessed in this answer.



JUN09ENVS101

SA9051/June09/ENVS1

ENVS1

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ANSWER IN THE SPACES PROVIDED**



Answer **all** questions in the spaces provided.

1 The table describes conservation designations.

Complete the table by selecting the appropriate letter from the list below.
The first one has been completed for you.

- A** Site of Special Scientific Interest
- B** Marine Nature Reserve
- C** National Nature Reserve
- D** Special Protection Area
- E** Special Area of Conservation
- F** AONB
- G** National Park
- H** Ramsar site

Conservation Designation	Letter
Area designated for conservation under the European Union Birds Directive	D
Coastal area that is of national importance and is managed for wildlife	
Important and representative habitat, under the European Union Habitats Directive	
Area with particular biological, geological or physiographic importance	
Large accessible area of naturally beautiful countryside that is used to promote recreation, education and landscape conservation	
Areas of land that are good examples of important habitats and contain complete communities of species	

(5 marks)

5

Turn over ►



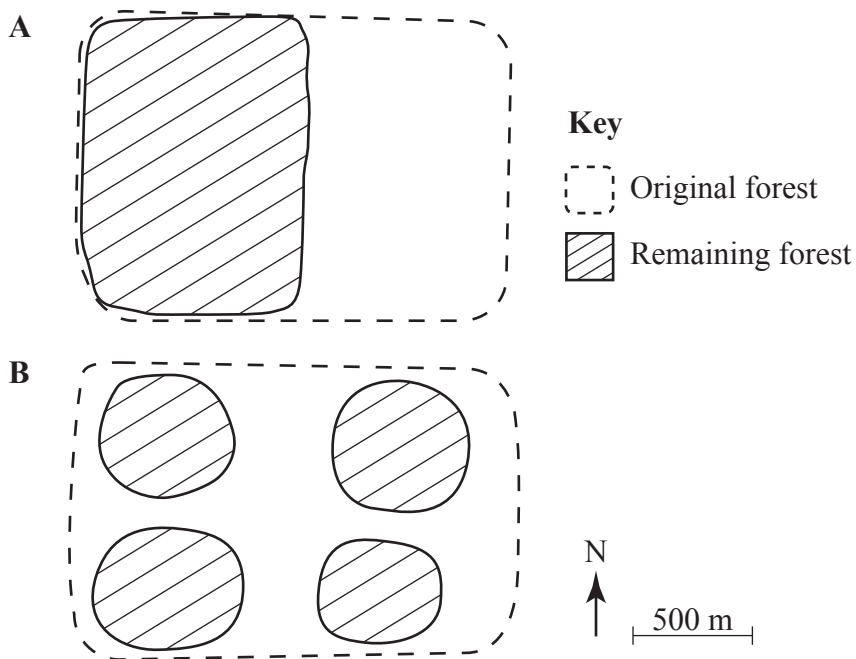
2 (a) Give **two** threats to tropical rainforest ecosystems.

1

2

(2 marks)

2 (b) The diagram shows two similar-sized areas of tropical rainforest of which half the original area has been lost.



Suggest how the abiotic factors in the remaining forest are affected by the different patterns of loss.

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(2 marks)



- 2 (c) Antbirds, family *Thamnophilidae*, are found in tropical rainforests in South America. They follow army ants and eat the animals which are disturbed by the ants. Antbirds do not fly out of the shade of trees. Explain why antbirds may be more vulnerable to population decline in site **B** than in site **A**.

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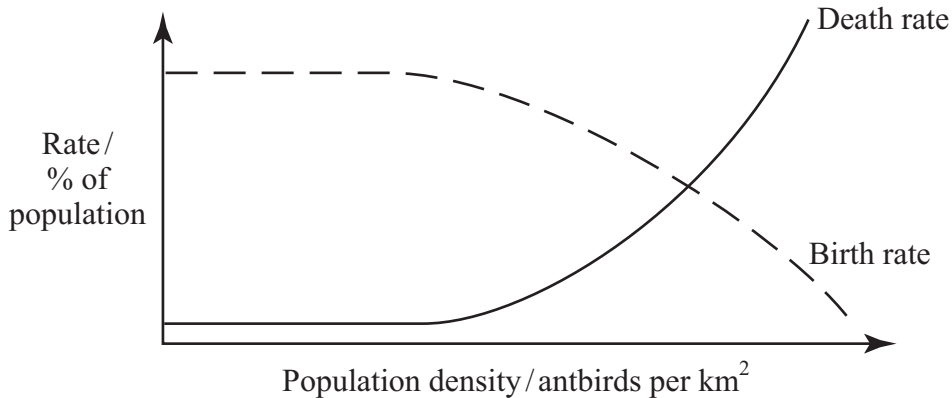
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(4 marks)

- 2 (d) The graph shows how density-dependent factors may affect the birth and death rates in the antbird populations.



- 2 (d) (i) Mark on the x axis the point at which the population density of antbirds may be at the carrying capacity of the ecosystem. (1 mark)

- 2 (d) (ii) Give **one** example of a density-dependent factor that affects populations.

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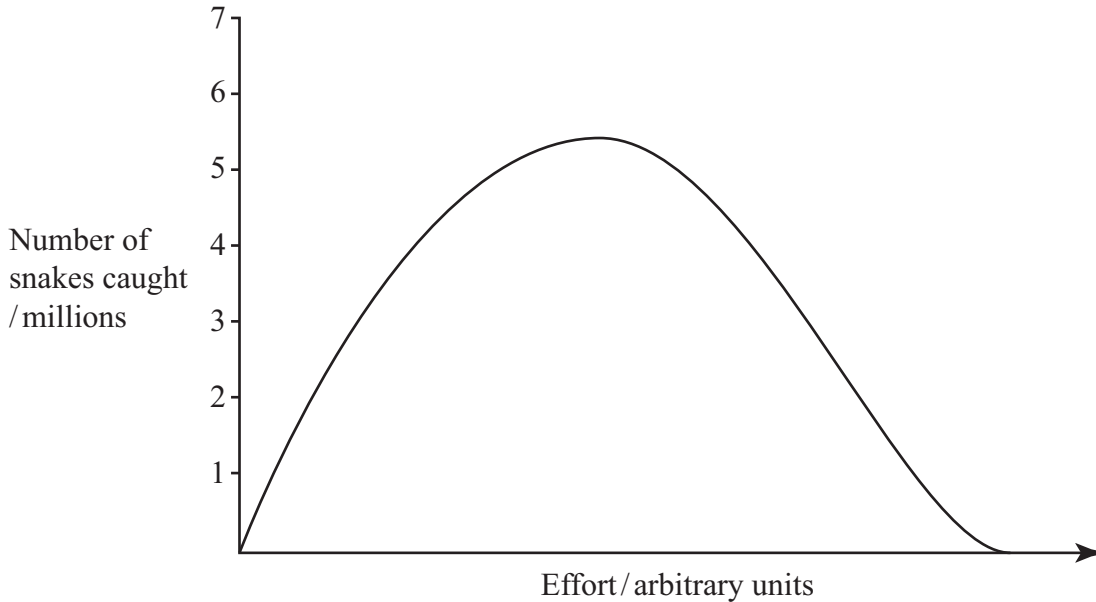
(1 mark)

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- 3 (a) The world’s largest snake harvest is from a freshwater lake in Cambodia. About seven million rainbow water snakes, *Enhydris enhydris*, are killed each year. This harvest seems to be above the Maximum Sustainable Yield.

The graph shows a theoretical catch–effort curve for this population of water snakes.



- 3 (a) (i) Explain how the water snake population may change if the snakes continue to be harvested above the Maximum Sustainable Yield.

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(2 marks)

- 3 (a) (ii) Estimate the number of water snakes that would be harvested at the Maximum Sustainable Yield.

..... million
(1 mark)



3 (a) (iii) Other than the number of individuals harvested, give **two** pieces of data that are needed to calculate the Maximum Sustainable Yield of a population.

1

2

(2 marks)

3 (a) (iv) The water snakes are used as food on crocodile farms.

Give **two** reasons, other than for their use as crocodile food, why the snakes should be conserved.

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(2 marks)

3 (b) Suggest how wildlife populations can be threatened accidentally by methods of human food production.

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(3 marks)

10

Turn over for the next question

Turn over ►



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(8 marks)

10

Turn over for the next question

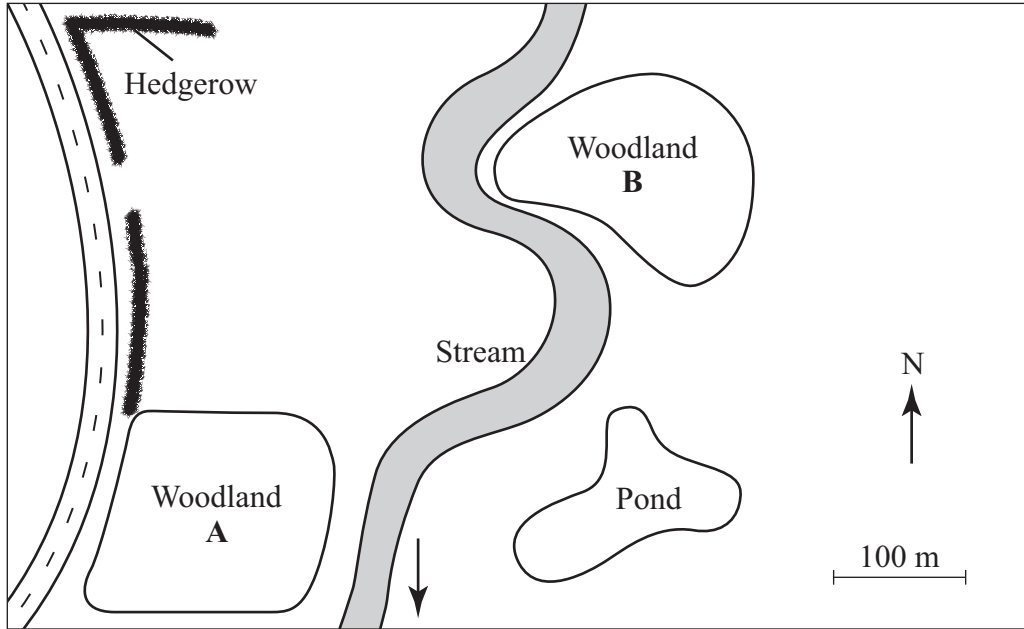
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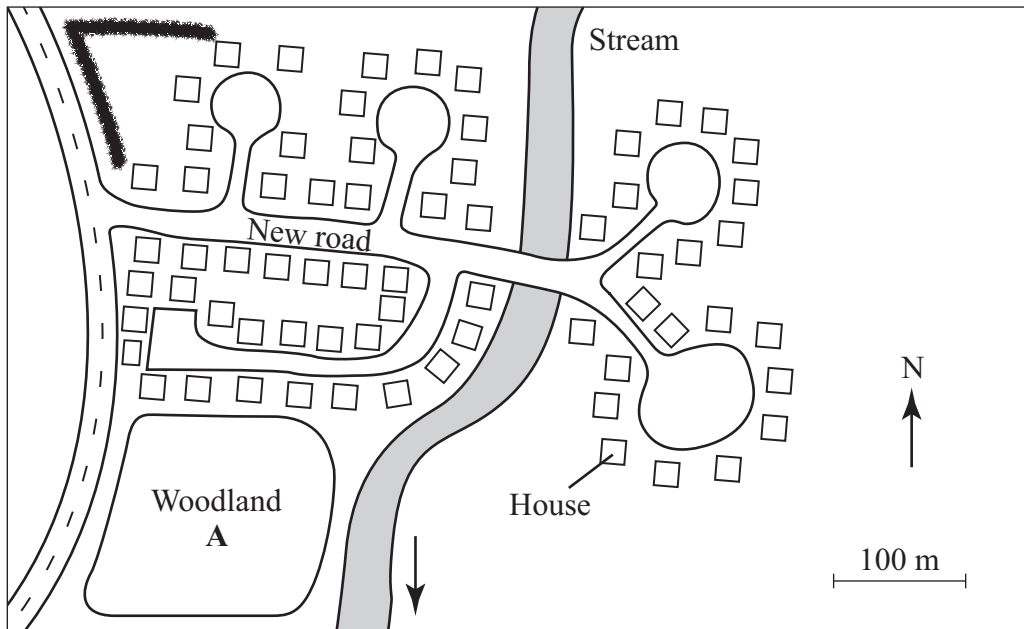
5 **Map 1** shows the site of a proposed housing development in the UK.

Map 2 shows the site as it would be after the development is completed.

Map 1



Map 2



5 (a) The diagram shows part of a Leopold matrix which was used in the planning of the housing development.

Magnitude Impotence				ACTION				
				Site clearance	Road construction	Site drainage	House construction	Material transportation
Environmental Conditions	Physical	Soil	Quality					
			Erosion					
		X						
	Y							
	Biological							
	Chemical							

5 (a) (i) Name the management tool of which a Leopold matrix may be part.

.....
(1 mark)

5 (a) (ii) Suggest **two** other *physical environmental conditions* that could be included as X and Y in the Leopold matrix.

1

2

(2 marks)

Question 5 continues on the next page

Turn over ►



- 5 (b) The table shows some data collected from the two woodlands at the development site.

Tree Species	Number of individuals	
	Woodland A	Woodland B
Ash	15	9
Birch	23	14
Holly	27	21
Oak	18	5
Sycamore (non-native)	4	39
Total	87	88
Species Diversity / D	4.3	

- 5 (b) (i) Use the data in the table and the equation below to calculate the species diversity (**D**) of **Woodland B**. Show your working.

$$D = \frac{N(N-1)}{\sum n(n-1)}$$

Where

N = total number of organisms of all species

n = total number of organisms of a particular species

Σ = the sum of

Answer
(2 marks)



5 (b) (ii) Using the information in the table and the maps, suggest why the developer is planning to keep only **Woodland A**.

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(5 marks)

10

Turn over for the next question

Turn over ►



6 (a) (i) Outline how three **named** farming practices have harmed wildlife.

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(6 marks)

6 (a) (ii) Other than by stopping these harmful practices, describe how more wildlife might be encouraged on farmland.

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(4 marks)



6 (a) (iii) Name the scheme under which grants are given to farmers for managing their land for wildlife.

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(1 mark)

6 (b) Wildlife conservation often requires active management. Sometimes it is appropriate to maintain an area as a plagioclimax.

6 (b) (i) Explain what is meant by a *plagioclimax*.

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(2 marks)

6 (b) (ii) Explain how a plagioclimax, such as a meadow, might be maintained.

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(2 marks)

END OF QUESTIONS

15



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