

**ECOSYSTEMS AND SOCIETIES
STANDARD LEVEL
PAPER 2**

Wednesday 11 November 2009 (morning)

Candidate session number

2 hours

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INSTRUCTIONS TO CANDIDATES

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Section A: answer all of Section A in the spaces provided. Refer to the resource booklet which accompanies this question paper.
- Section B: answer two questions from Section B. Write your answers on answer sheets. Write your session number on each answer sheet, and attach them to this examination paper and your cover sheet using the tag provided.
- At the end of the examination, indicate the numbers of the questions answered in the candidate box on your cover sheet and indicate the number of sheets used in the appropriate box on your cover sheet.



SECTION A

Answer all of Section A in the spaces provided.

The resource booklet provides information on the North York Moors National Park (NYMNP). Use the resource booklet and your own studies to answer the following.

1. (a) (i) With reference to **Figure 2** and **Figure 3**, list **three** ecosystems that may exist within the NYMNP. [1]

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The NYMNP lies within a temperate deciduous forest biome.

- (ii) Define the term *biome*. [1]

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- (iii) List the **three** main abiotic factors that influence the distribution of biomes. [1]

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- (iv) State the abiotic factor which is most likely to be limiting net primary productivity in the NYMNP. [1]

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- (b) (i) With reference to **Figure 5**, calculate the number of species of breeding birds present in the NYMNP. [1]

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- (ii) Suggest **one** reason why there are many more plant species than mammal species in the UK. [1]

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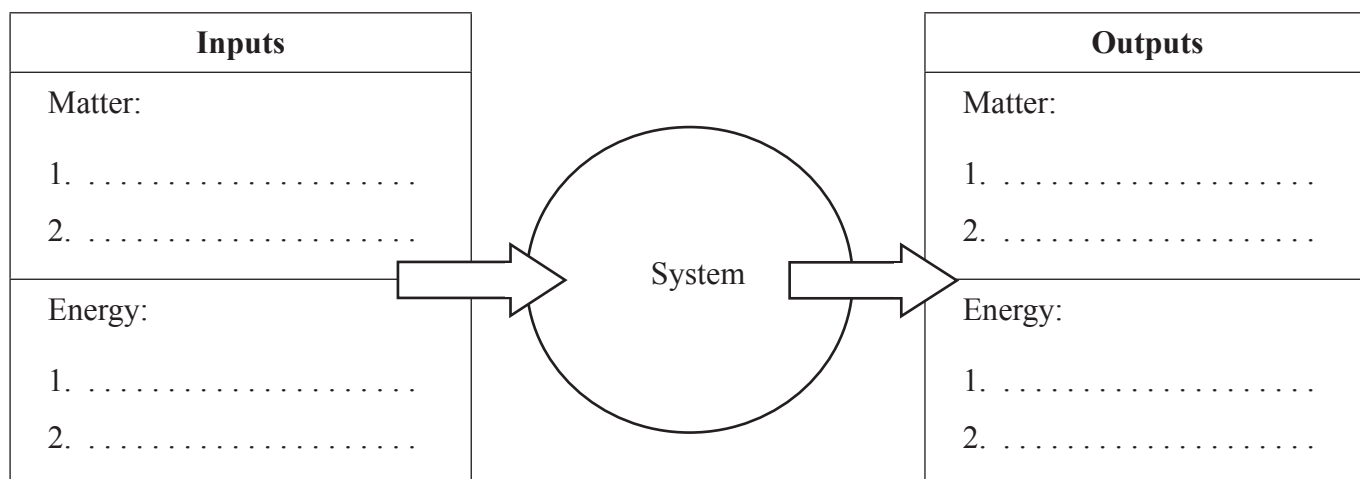
(Question 1 continued)

(c) Consider the NYMNP as a system.

(i) State whether the NYMNP is an open, closed or isolated system. [1]

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(ii) Annotate the flow diagram of the NYMNP below to show **two** inputs and **two** outputs of matter and **two** inputs and **two** outputs of energy. [2]



(d) With reference to **Figure 6**,

(i) describe the differences in population change from 1901 to 2001 in the NYMNP and the UK. [1]

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(ii) state the significance of the data which show the percentage of the population aged between 16 and 60 years of age. [1]

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(Question 1 (d) continued)

- (iii) describe the differences between the population structures in the NYMNP and the UK. [2]

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- (iv) suggest **two** possible reasons for the differences in the percentages of the population aged under 16 and over 60 in the NYMNP and the UK as a whole. [2]

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- (e) With reference to **Figure 6(d) and Figure 8**, outline **one** reason why the national parks of England and Wales are mostly in the north and west. [1]

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- (f) With reference to **Figure 7** and your own knowledge,

- (i) state **one** ecological and **one** economic reason why landowners try to prevent colonization by bracken. [2]

Ecological:

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Economic:

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- (ii) explain **two** disadvantages in using herbicide to control bracken. [2]

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(Question 1 continued)

- (g) Explain why UK national parks have relatively high human population densities compared to national parks in other countries such as the USA and in LEDCs. [2]

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- (h) With reference to **Figure 3** and **Figure 7**, predict the changes in vegetation that would occur if grazing animals were removed from the NYMNP. [1]

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- (i) State **one** argument for and **one** argument against the view that human interests should take priority over conservation. [2]

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SECTION B

Answer **two** questions. Write your answers on the answer sheets provided. Write your session number on each answer sheet, and attach them to this examination paper and your cover sheet using the tag provided.

Each essay is marked out of **[20]** of which **[2]** are for clarity of expression, structure and development of ideas:

[0] Quality of expression, structure and development is poor.

[1] Quality of expression, structure and development is limited.

[2] Quality of expression is clear, structure is good and ideas are well developed.

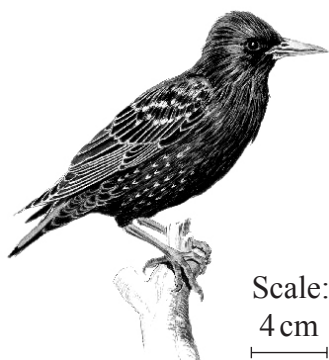
2. (a) Outline the concept of sustainability in terms of natural capital and natural income. With reference to a renewable natural resource you have studied, discuss its long-term sustainability. [7]
- (b) Suggest how scientific research may be used to make the resource industry discussed in part (a) more sustainable. [5]
- (c) Using examples, evaluate how technology can both hinder and promote the sustainability of a resource. [6]

Expression of ideas [2]

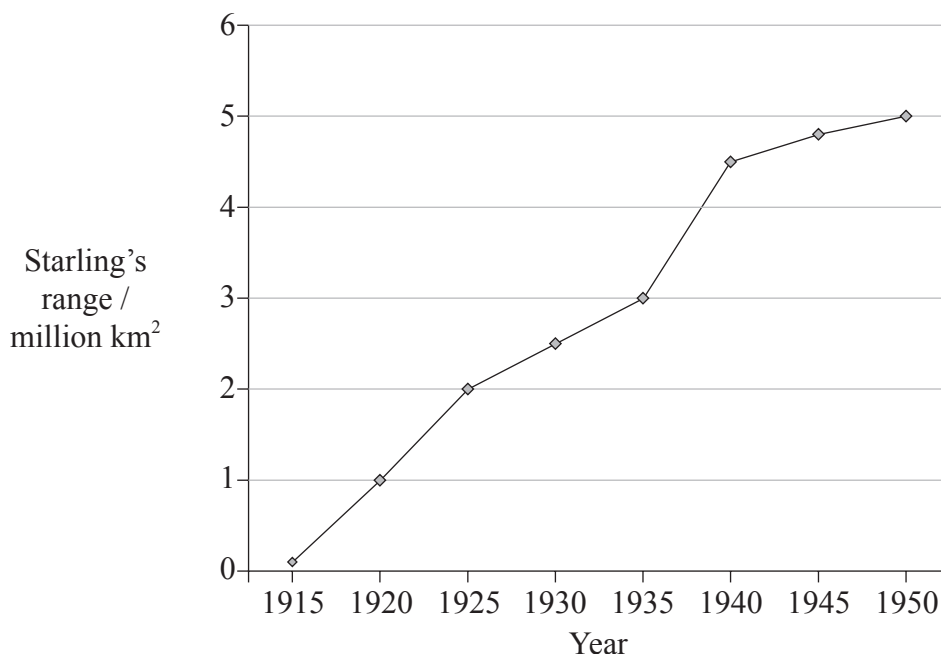


3. The graph below shows the expansion of the European starling's (*Sturnus vulgaris*) range in North America 1915–1950.

European starling



[Source: www.caplter.asu.edu/explorers/protocol/birds/starling.htm]



[Source: M Allaby, (2000), *Basics of Environmental Science*, Routledge]

- (a) (i) State what the graph reveals about the starling in North America. [2]
- (ii) Suggest what other data could have been used to study the European starling in North America. [1]
- (b) Using examples discuss **three** main impacts that alien (non-native) species may have on indigenous populations. [6]
- (c) Evaluate the role of local, national and international organizations in the conservation of biodiversity. [9]

Expression of ideas [2]

4. (a) Discuss the main reasons for global climate change in the last 100 years. [5]
- (b) Describe the possible reasons for global climate change in the last 5000 years. [4]
- (c) Evaluate the conflicting arguments surrounding global climate change and justify your own personal viewpoint. [9]

Expression of ideas [2]

5. (a) Define the term *soil* and state the properties of **two named** soils. [4]
- (b) Outline the causes of soil fertility loss and suggest how farmers can avoid degrading their soils by using both ecocentric and technocentric methods. [6]
- (c) Evaluate the environmental impact of **two** contrasting food production systems and justify your own personal viewpoint as to which of these systems is better for the environment. (Both examples must be **either** aquatic **or** terrestrial.) [8]

Expression of ideas [2]