# THE UNIVERSITY *of York*

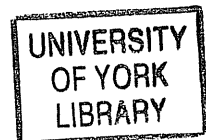## Degree Examination 2005

## ENVIRONMENT DEPARTMENT

## BSc in Environment, Economics and Ecology, Part 1b

## APPLIED ECOLOGY AND ENVIRONMENTAL MANAGEMENT

Time allowed: **one and a half hours**

Answer **ALL** questions

*Pay adequate attention to spelling, punctuation and grammar, so that your
answers can be readily understood*

**You should answer all questions. Please note that the total number of marks for this examination is 64, not 100.**

1. Name three life history characteristics that make a species particularly vulnerable to overexploitation. (3 marks)

2. Why are sensitive species – i.e. those especially vulnerable to over-exploitation – a particular problem in mixed species fisheries? (5 marks)

3. What is a stock-recruitment relationship? (2 marks)

4. What is recruitment overfishing? Suggest one remedy to reduce the problem of recruitment overfishing. (4 marks)

5. Marine reserves are areas that are permanently off limits to all fishing. Why are they needed? (6 marks)

6. Why are marine reserves, i.e. areas that are permanently off limits to all fishing, controversial with the fishing industry? (6 marks)

7. Thomas Huxley stated in the 19th Century that marine species could never become extinct as a result of fishing because the value of catches would decline to levels that would be uneconomic to fish long before biological extinction occurred. Was he right? Justify your answer. (6 marks)

8. You are asked to quantify the numbers of a particular rare plant species in a nature reserve which covers a river valley that is orientated east-west. The reserve area is split between three types of habitat as follows: 40% of the area covers north-facing slopes, 40% of the area covers south-facing slopes, and 20% of the area covers the bottom of the valley. You know that the species is more likely to be found on south-facing slopes than north-facing slopes and that it is unlikely to be found in the bottom of the valley. You are required to select 15 locations in the nature reserve where you will assess the cover of the species.

    (a). Name and briefly describe three types of sampling strategies which you could use to select the locations (3 marks).

(b). The site manager suggests that you choose five locations on the north-facing slopes, five locations on the south-facing slopes and five locations in the valley bottom. Do you think this is a good approach – explain your answer in one paragraph, indicating whether and why you expect the population estimate to be biased (5 marks).

(c). How would you assign the 15 sample locations between the three types of habitat to obtain an unbiased estimate of the population size? Explain the reasoning you used to reach your answer (5 marks).

9. Identify three reasons why the size of a habitat fragment may influence the number of species found within it (3 marks)

10. The UK Biodiversity Action Plan (UKBAP) was initiated in 1994 and aims to develop national strategies for the conservation of biodiversity and sustainable use of biological resources. Discuss briefly how UKBAP is being implemented, the progress made to date, and the main barriers to achieving the objectives and targets set within it (8 marks)

11. Name four objectives which there might be for a habitat restoration programme (4 marks)

12. Identify two examples in which active management for restoration needs to consider modifying soil nutrient status, indicating whether nutrient levels should be reduced or increased (4 marks).