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THE UNIVERSITY of York

Degree Examination 2004

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

1. What is bycatch and give two reasons why it is a problem for fishery managers? (5 marks)

2. If a stock-recruitment relationship is density dependent, what does this signify about the association between the rate of recruitment and the size of the stock? (3 marks)

3. Describe the nature of the relationship between egg output of a fish and its body size (you may draw the relationship, give the equation, name of the relationship, or provide a verbal description of the shape of the relationship – any one of these is acceptable). What does this signify about the importance of large fish to the reproductive output of a population? (6 marks)

4. Which of the following two species of groupers would you predict was more vulnerable to overfishing? Explain why. (5 marks)

Black grouper: maximum size 80cm; age at maturity 6 years; size at maturity 35cm.
Blue-spotted grouper: maximum size 30cm; age at maturity 3 years; size at maturity 15cm.

5. What is growth overfishing? Suggest one remedy to reduce the problem of growth overfishing. (5 marks)

6. Why are politicians in Europe often blamed for the overfishing of fish stocks? (4 marks)

7. Provide two mechanisms by which marine reserves (areas permanently closed to all fishing) can benefit surrounding fisheries. (6 marks)

8. Why are deep-sea habitats and species especially vulnerable to harm from fishing? (6 marks)

9. What do manipulative experiments tell us about the relationship between the number of grassland plant species present and total primary production? (6 marks)

10. Describe the various levels of biological organisation at which biomonitoring the effects of contamination and stress may be carried out and provide an example of each. (6 marks)

11. What are the two main components of a diversity index, such as the Shannon-Weiner? Why is it important to measure both components. (4 marks)

12. What are rank-abundance plots and what do they describe? Illustrate your answer by providing a typical plot. (6 marks)

13. What characteristics would you look for when selecting a species for a marine pollution biomonitoring programme? (6 marks)

14. Which megafaunal groups have disappeared in the past from (a) New Zealand, and (b) Australia, and what were the causes in each case? (6 marks)

15. Give one example of a top-down policy instrument and one example of a bottom-up, participatory system for the management of nutrient issues within a catchment. (6 marks)

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