

National Unit Specification: General Information

UNIT The Ecology of Scotland (Higher)

NUMBER D897 12

COURSE

SUMMARY

The unit is designed to meet the needs of candidates following a range of programmes and is particularly suitable for the land-based sector. On completion of the unit candidates will be able to use standard ecological techniques to investigate and describe ecosystems and to identify a selection of their component organisms. In addition, candidates will have a detailed knowledge of particular ecosystems from a Scottish perspective.

OUTCOMES

- 1 Demonstrate knowledge and understanding of a given ecosystem.
- 2 Collect and analyse information obtained by investigation of a given ecosystem.
- 3 Use keys to identify a range of organisms in a given ecosystem.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained one of the following:

- Standard Grade Biology, Chemistry, Geography, Physics or Science at Grade 1 or 2
- Intermediate 2 Managing Environmental Resources or its component units, particularly Ecological Principles and Investigations (Int 2).

CREDIT VALUE

1 credit at Higher

Administrative Information

Superclass: RH

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Additional copies of this specification can be purchased from the Scottish Qualifications Authority. The cost is £2.50.

CORE SKILLS

Information on the automatic certification of any core skills in this unit is published in *Automatic Certification of Core Skills* in National Qualifications (SQA, 1999).

National unit specification: statement of standards

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Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to the Scottish Qualifications Authority.

Note on range for the unit

The unit should relate to any one of the following Scottish contents: coastal/marine, farmlands, forest/woodland, freshwater, moorland.

OUTCOME 1

Demonstrate knowledge and understanding of a given ecosystem.

Performance Criteria

- a) Ecological terms are used correctly to describe and identify components of, and interrelationships within, the given ecosystem.
- b) The abiotic features of the given ecosystem are described accurately.
- c) The biotic components of the given ecosystem are described accurately in terms of production, consumption, intraspecific relationships and interspecific relationships.
- d) The relationships between the biotic components and the abiotic features of the given ecosystem are described accurately.
- e) Habitats and microhabitats within the given ecosystem are described accurately.

Evidence Requirements

Written and/or oral evidence of the candidate's ability to demonstrate knowledge and understanding of the given ecosystem with information covering all performance criteria is required.

OUTCOME 2

Collect and analyse information obtained by investigation of a given ecosystem.

Performance Criteria

- a) Information is obtained by active participation in the investigation.
- b) Abiotic components of the given ecosystem are investigated accurately.
- c) The distribution of organisms in space and time is investigated accurately.
- d) The distribution of one organism is investigated accurately with respect to one other organism and one abiotic factor.
- e) The construction of a food web for the given ecosystem is correct.
- f) Relevant measurements and observations are recorded and presented in an appropriate format.
- g) Conclusions drawn are valid and explanations given are supported by evidence.

National unit specification: statement of standards (cont)

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Evidence Requirements

Evidence of an appropriate level of attainment must be generated with items covering all performance criteria. A report of an investigation of one ecosystem is required and must be the individual work of the candidate. The report must be based on an investigation in which the candidate has demonstrated an acceptable level of participation. The collection of the information may involve group work.

Three abiotic components and three organisms should be investigated for Performance criteria (b) and (c) respectively.

OUTCOME 3

Use keys to identify a range of organisms in a given ecosystem.

Performance Criteria

- a) Information is obtained by active participation in the investigation.
- b) The use of appropriate keys is consistent and accurate.
- c) Producer species in the given ecosystem are identified correctly.
- d) Primary consumer species in the given ecosystem are identified correctly.
- e) Secondary/tertiary consumer species in the given ecosystem are identified correctly.

Evidence Requirements

Evidence of an appropriate level of attainment must be generated with items covering all performance criteria. A report of an investigation of one ecosystem is required and must be the individual work of the candidate. The report must be based on an investigation in which the candidate has demonstrated an acceptable level of participation. The collection of the information may involve group work.

Five species must be investigated for each performance criterion (c) to (e).

National unit specification: support notes

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This part of the unit specification is offered as guidance. None of the sections of the support notes is mandatory.

GUIDANCE ON CONTENT AND CONTEXT

The actual ecosystem and habitats studied will be determined by candidate's interest and requirements and by local availability. Human influences such as resource extraction and pollution could be included at appropriate points. The following information on particular ecosystems may be helpful.

Coastal/Marine

Abiotic factors could include tides, salinity, temperature, substratum/sediment, immersion/emersion, pH and edaphic variations. Ecosystems could include both pelagic/planktonic and benthic. Microhabitats could include crevices, algal holdfasts, epiphytic and epizotic habits and parasites.

Farmland

Possible habitats here could include arable, grassland, hedgerows and other field boundaries, conservation headlands and set aside land. Abiotic factors could include climate, drainage, leaching of nutrients, inorganic fertilisers, pesticides and herbicides. Microhabitats could include soil surface, grass/weed tussocks and animal faeces.

Forest/Woodland

Candidates could study either natural woodland, forestry plantation or managed parkland. Coniferous and broadleaved woods would both be suitable areas of study. Abiotic factors could include climate, soil quality, shelter and topography. Appropriate microhabitats could include leaf litter, bark crevices and soil surface.

Freshwater

Abiotic factors could include rainfall and other climatic factors, water currents, pH, oxygen concentration, substratum. A range of river/lock/canal ecosystems could be studied with possible microhabitats including crevices, gravel and mud.

Moorland

Peat bogs, heather moor and rock scree could be suitable here. Abiotic factors could include rainfall and other climatic factors, degree of soil saturation, soil quality, pH, aeration and topography. Appropriate microhabitats could include leaf litter, bark crevices and soil surface.

GUIDANCE ON TEACHING AND LEARNING APPROACHES

A candidate-centred resource-based learning approach is recommended. The delivery of this unit would be improved by integration of outcomes during the practical investigation. The use of carefully structured worksheets could be a central support to the delivery and completion of the unit.

National unit specification: support notes (cont)

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GUIDANCE ON APPROACHES TO ASSESSMENT

Centres may use the instruments of assessment which are considered by teachers/lecturers to be the most appropriate. Outcome 1 can be assessed by an appropriate criteria level of attainment in an end-of unit test with questions covering all performance criteria. Outcomes 2 and 3 can be assessed by participation in investigations and appropriate levels of attainment in the associated reports.

SPECIAL NEEDS

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment and Certification Arrangements* (SQA, 1998).