



## Higher National Unit specification

### General information for centres

**Unit title:** Ecological Surveying

**Unit code:** F433 35

**Unit purpose:** This Unit develops understanding and knowledge of techniques available for surveying and monitoring plant and animal populations and habitats. The Unit discusses how ecological principles are applied to practical procedures and gives the candidate an opportunity to develop practical skills by carrying out and reporting on an ecological survey.

On completion of the Unit the candidate should be able to:

- 1 Explain the principles and procedures of surveying vegetation and habitats.
- 2 Analyse the principles and procedures of surveying animal populations.
- 3 Carry out and report an ecological survey.

**Credit points and level:** 1 HN credit at SCQF level 8: (8 SCQF credit points at SCQF level 8\*)

*\*SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

**Recommended prior knowledge and skills:** Access to this Unit will be at the discretion of the centre. It would be beneficial, but not essential, if candidates had experience of studying ecology at SCQF level 6 or 7, or have equivalent experiential knowledge.

**Core Skills:** There are opportunities to develop the component '*Planning and Organising*' of the Core Skill *Problem Solving* at SCQF level 5 and the component '*Written Communication*' or '*Oral Communication*' of the Core Skill *Communication* at SCQF level 5 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

**Context for delivery:** If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

**Assessment:** Outcome 3 of this Unit should be assessed by a practical ecological survey and the production of a report in an appropriate format. To reduce the assessment load, some of the Knowledge/Skills of Outcomes 1 and/or 2 could be assessed in combination with Outcome 3. The remainder of Outcomes 1 and 2 could be assessed by a series of extended response questions.

## Higher National Unit specification: statement of standards

**Unit title:** Ecological Surveying

**Unit code:** F433 35

The sections of the Unit stating the Outcomes, Knowledge and/or Skills, and Evidence Requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

### Outcome 1

Explain the principles and procedures of surveying vegetation and habitats

#### Knowledge and/or Skills

- ◆ Legislative and ethical issues
- ◆ Phase 1 habitat survey methods
- ◆ National Vegetation Classification
- ◆ Topographic and geographic survey
- ◆ Environmental factors

#### Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ explain the principle legislative and ethical issues to be considered when carrying out a vegetation or habitat survey
- ◆ explain the principles, procedures and applications of a Phase 1 habitat survey, including standard mapping methodology, dominant species codes and target notes
- ◆ explain the principles, procedures and applications of the National Vegetation Classification, including the use of measures of dominance and abundance
- ◆ explain the principles, procedures and applications of surveying topographical and geographic features, including the basic principles and uses of geographic information systems
- ◆ describe appropriate methods of measuring physical, chemical and edaphic environmental factors in a given situation

#### Assessment Guidelines

This Outcome could be assessed by a series of extended response questions based on a case study scenario, or in combination with Outcome 3, wholly or in part, in which case principles and procedures could be described and discussed as part of a report of practical work. Alternatively, assessment could be by means of a structured log book to be completed following site visits.

## Higher National Unit specification: statement of standards (cont)

**Unit title:** Ecological Surveying

### Outcome 2

Analyse the principles, procedures and applications of surveying animal populations

#### Knowledge and/or Skills

- ◆ Legislative and ethical issues
- ◆ Bird census techniques
- ◆ Invertebrate sampling
- ◆ Mark-release-recapture techniques

#### Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ explain the principal legislative and ethical issues to be considered when carrying out a survey of animal populations
- ◆ explain the principles, procedures and application of bird census surveys
- ◆ explain methods for obtaining absolute and relative measuring of invertebrate populations
- ◆ analyse the results of mark-release-recapture techniques for estimating animal populations

#### Assessment Guidelines

This Outcome could be assessed by a series of extended response questions based on a case study scenario, or in combination with Outcome 3, wholly or in part, in which case principles and procedures could be described and discussed as part of a report of practical work. The fourth Evidence Requirement could be assessed through a practical exercise or by analysis of data provided by the candidate.

### Outcome 3

Carry out and report an ecological survey

#### Knowledge and/or Skills

- ◆ Environmental variables
- ◆ Recording biotic data
- ◆ Collating and presenting results

#### Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ select and apply appropriate techniques for measuring environmental variables
- ◆ select and apply appropriate methods for recording biotic data
- ◆ collate results of an ecological survey and present them in a properly formatted report

## **Higher National Unit specification: statement of standards (cont)**

### **Unit title:** Ecological Surveying

This Outcome should be assessed by a practical ecological survey, to include both environmental and biotic variables. Evidence should be presented by the production of a report in an appropriate written, visual or oral format.

### **Assessment Guidelines**

Candidates could carry out the practical work individually or in small groups but the production of the report should be each candidate's individual work. To reduce the assessment load, some of the Knowledge/Skills of Outcomes 1 and/or 2 could be assessed in combination with Outcome 3.

## Administrative Information

**Unit code:** F433 35  
**Unit title:** Ecological Surveying  
**Superclass category:** RH  
**Original date of publication:** August 2008  
**Version:** 01

### History of changes:

Version	Description of change	Date

**Source:** SQA

© Scottish Qualifications Authority 2008

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of Higher National qualifications.

Additional copies of this Unit specification can be purchased from the Scottish Qualifications Authority. Please contact the Customer Contact Centre for further details, telephone 0845 279 1000.

## **Higher National Unit specification: support notes**

### **Unit title:** Ecological Surveying

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

### **Guidance on the content and context for this Unit**

This Unit is intended to introduce candidates to practical ecological survey techniques. It builds upon knowledge of basic ecological principles and processes and will enable candidates to carry out simple surveys in a variety of contexts. It is intended that a practical approach to the Unit will be adopted throughout, with demonstrations of techniques, site visits and opportunities for candidates to carry out a range of formative practical exercises.

Survey techniques should be seen in context and the range of techniques covered should be discussed in terms of the particular habitats and sites in which they are being used. The techniques must also be seen in relation to the survey objectives and while survey design is not part of this Unit it is important that candidates are aware that techniques cannot be chosen at random. The range of techniques chosen will to some extent depend on the locations and expertise available at the presenting centre but it is expected that quadrats (for plants and animals), transects, trapping/capturing, light, temperature, slope, wind and soil factors will all be included. The use of GIS technology should be described and candidates given an opportunity to become familiar with it if possible.

A good understanding of the principles of both Phase 1 and the National Vegetation Classification should be emphasised as the basis of habitat and vegetation surveys. Bird survey methods are likely to be covered as class discussions, including techniques of ringing, mist netting and counting nesting and overwintering populations. Practical animal surveys will most likely concentrate on invertebrates. The distinction between absolute and relative measures should be clarified. Populations surveyed could be flying or ground-active insects, soil invertebrates, freshwater invertebrates or rocky shore communities. Techniques could include flight interception traps, sweep netting, pitfall traps, tullgren extraction and kick sampling. Mark-release-recapture techniques such as the Lincoln Index could be covered as a class exercise or a practical exercise using, for example, snails or woodlice.

The practical survey in Outcome 3 should build upon the techniques learned in Outcomes 1 and 2, with candidates identifying objectives of a specified survey, deciding which techniques to employ and collating the results. They should also be required to prepare risk assessments as part of the planning process.

### **Guidance on the delivery and assessment of this Unit**

This Unit, which is likely to form part of a Group Award, is designed to develop the knowledge and understanding of candidates following countryside and environmental studies awards,

A practical approach to the Unit should be adopted. Techniques should be demonstrated, site visits organised and candidates given opportunities to carry out practical exercises.

It is recommended that some of the Knowledge and/or Skills items for Outcomes 1 and 2 be assessed in combination with Outcome 3.

## Higher National Unit specification: support notes (cont)

### Unit title: Ecological Surveying

It is proposed that, in most cases, candidates should have projects suggested to them so that they can focus on the work and not be distracted by trying to think up a project of their own. Projects should be designed to cover aspects of the assessment of Outcomes 1 and 2. However where a candidate has a particular interest this should be encouraged where possible. The emphasis should be on aspects of biological surveying but appropriate environmental factors should be surveyed also. Candidates are expected to use existing identification skills and not have to start from scratch with a new group of organisms; those with limited experience of plant or animal identification could carry out single-species surveys, perhaps with more complex environmental aspects. It is envisaged that practical work will be carried out during scheduled class time but the planning, data collation and report preparation would be mainly in the candidate's own time, with appropriate guidance given in class. The report could be presented in standard format, presented as a poster or in electronic format, or as an oral presentation. It should cover the aims, methods, results and conclusions of the work and be properly referenced as appropriate.

#### *Opportunities for developing Core Skills*

Although the Unit is designed to provide candidates with the knowledge and skills related to their specific occupational area there are opportunities to develop the Core Skills of *Problem Solving* and *Communication* in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

The practical project will involve the candidate analysing the problem, setting aims and selecting appropriate methods and will contribute towards the Component *Planning and Organising* of the Core Skill *Problem Solving* at SCQF level 6.

The production of a report which was well structured, logical, clear and properly referenced would contribute towards the Component *Written Communication* or *Oral Communication* of the Core Skill *Communication* at SCQF level 6.

### Open learning

It would be possible to deliver this Unit by blended learning methods, including internet-based material and directed reading. Arrangements would have to be made for one or more field trips to visit selected sites and demonstrate practical techniques. Candidates would be required to carry out a practical investigation; this could be done during a field trip or they could choose a location local to their homes.

However, it would require planning by the centre to ensure the sufficiency and authenticity of candidate evidence.

### Candidates with disabilities and/or additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* ([www.sqa.org.uk](http://www.sqa.org.uk)).

## **General information for candidates**

### **Unit title:** Ecological Surveying

The Unit will provide you with an introduction to practical ecological survey techniques and will give you experience of carrying out simple surveys in a variety of contexts. A range of survey techniques will be demonstrated in the context of particular habitats and sites and in relation to specific survey objectives.

In Outcome 1 you will develop a good understanding of the principles of both Phase 1 and the National Vegetation Classification as the basis of habitat and vegetation surveys.

In Outcome 2 bird survey methods are likely to be covered as class discussions, while practical animal surveys will most likely concentrate on invertebrates, for example flying or ground-active insects, soil invertebrates, freshwater invertebrates or rocky shore communities.

In Outcome 3 you will carry out a practical survey project which builds upon the techniques learned in Outcomes 1 and 2, in which you will identify objectives of a specified survey, decide which techniques to employ and collate the results. You will be expected to use existing identification skills and not have to start from scratch with a new group of organisms, but if you have limited experience of plant or animal identification you could carry out a single-species survey, perhaps with more complex environmental aspects. It is envisaged that practical work will be carried out during scheduled class time but the planning, data collation and report preparation would be mainly in your own time, with appropriate guidance given in class.

Outcome 3 will be assessed by the project report, which will also cover some parts of Outcomes 1 and/or 2. The remainder of Outcomes 1 and 2 could be assessed by extended response questions, a case study and/or a log book.