



Higher National Unit specification

General information for centres

Unit title: Plants and Habitats: Ecology and Conservation

Unit code: F2B5 35

Unit purpose: This Unit is designed to introduce the fundamental ecological processes that govern plant distribution and the structure, formation and function of plant communities. From this foundation the Unit considers how various processes and actions alter balances in nature and so damage and threaten plants and their habitats. Finally the various approaches to conserving plant species and their habitats are studied. This Unit is intended for students who plan to enter the amenity/landscape, botanic garden and heritage sectors of the horticultural industry but the principles and issues are relevant to most aspects of the industry.

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

- 1 Describe major plant habitats and concepts of plant ecology.
- 2 Apply methods of vegetation analysis to describe communities and monitor vegetation.
- 3 Explain plant and habitat conservation methods.
- 4 Prepare a strategy for the conservation of plants and habitats within a given area.

Credit points and level: 2 HN credits at SCQF level 8: (16 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: It would be beneficial for candidates to have a basic knowledge of plant ecology, for example through a standard-grade in Biology. The first year Units *Plant Recognition* and *Soil Management* would be valuable introductions to several key elements of the Course. Some students may have first-hand experience of conservation projects as volunteers, and such experience could also be useful.

Core Skills: There are opportunities to develop Core Skills of *Communication* and *Problem Solving* at SCQF level 6 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.

General information for centres (cont)

Assessment: Outcomes 1, 2 and 3 could be assessed using an invigilated closed–book mixed test containing short and structured questions. Alternatively, Outcomes 1, 2 and 3 could be assessed through a case study or assignment in which candidates must produce a written report covering the knowledge and/or skills for both Outcomes and generate the evidence required.

Outcome 4 could be assessed through an assignment that requires students to apply knowledge and skills to a site of their choice. Students should produce a short report detailing conservation recommendations for a given site. The site chosen need not be very large but of a suitable size and diversity to give the candidate scope to consider various approaches to maintain or enhance the condition of the site and justify their recommendations. Depending on site accessibility, this assessment could also include a description of the site based on survey work. In any case, this assessment will also require application of knowledge gained for Outcomes 1, 2 and 3.

Higher National Unit specification: statement of standards

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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

Describe major plant habitats and concepts of plant ecology

Knowledge and/or Skills

- ◆ Understanding of the components of the biosphere and major vegetation types
- ◆ Past and present factors that affect plant distribution and concepts of threat and rarity
- ◆ Energy flow within ecosystems
- ◆ Structure and dynamics of plant communities and plant populations

Evidence Requirements

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

- ◆ state the major components that constitute the biosphere and describe the main habitat types
- ◆ describe the main climatic and biological factors that affect the distribution of plants
- ◆ describe how energy travels through a simple food chain
- ◆ explain the concept of plant communities and how they are maintained
- ◆ explain the structure and dynamics of plant populations

Assessment Guidelines

Evidence for the knowledge and/or skills in this Outcome may be provided on a sample basis. Evidence could be generated through an invigilated, closed-book, mixed test of short and structured response answers. Where the knowledge is sampled, the sample should comprise at least two of the bullet points in the Evidence Requirements listed above. In order to ensure that candidates will not be able to foresee the sample, the whole of the content listed must be taught and available for assessment and a different sample is required each time the Outcome is assessed, to which candidates must give a satisfactory response.

Alternatively, evidence could be generated through a written report based on a case study or an assignment. The report should cover all of the items listed in the knowledge and skills section for Outcome 1 and generate the evidence in the bullet points in the Evidence Requirements listed above.

Higher National Unit specification: statement of standards (cont)

Unit title: Plants and Habitats: Ecology and Conservation

Outcome 2

Apply methods of vegetation analysis to describe communities and monitor vegetation

Knowledge and/or Skills

- ◆ Vegetation classification
- ◆ Monitoring vegetation change
- ◆ Assessment of similarity/dissimilarity between vegetation samples

Evidence Requirements

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

- ◆ understand the method of data collection and analysis to classify vegetation samples
- ◆ can select and apply appropriate methods for determining vegetation change
- ◆ select appropriate methods for objective comparison between vegetation samples

Assessment Guidelines

Whether a short or structured restricted response test or a report based on a case study or an assignment is used, the assessment for this Outcome can be combined with Outcome 1.

Outcome 3

Explain plant and habitat conservation methods

Knowledge and/or Skills

- ◆ Global and local threats to plants and habitats
- ◆ Roles of various conservation agencies and organisations
- ◆ Conservation legislation
- ◆ Public Education
- ◆ Evaluation of wildlife sites
- ◆ Habitat management

Evidence Requirements

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

- ◆ explain the major threats to plants and habitats on a local and global scale
- ◆ explain the roles of a range of local, national and international conservation bodies
- ◆ describe the development of legislation to protect plant species and habitats
- ◆ describe the importance and methods of educating the public regarding plant and habitat conservation
- ◆ explain the criteria by which wildlife sites are evaluated for conservation protection
- ◆ describe the methods used to practically manage a given habitat and explain the effects of different treatments

Higher National Unit specification: statement of standards (cont)

Unit title: Plants and Habitats: Ecology and Conservation

Assessment Guidelines

Where the knowledge and/or skills are sampled, the sample should consist of at least four of the six knowledge and skill requirements. The candidates should not be able to foresee which will be assessed; all must be taught and available for assessment.

Outcome 4

Prepare a strategy for the conservation of plants and habitats within a given area

Knowledge and/or Skills

- ◆ Conservation strategy preparation
- ◆ Factors influencing the development
- ◆ Relevant legislation

Evidence Requirements

Each candidate will need evidence to show that they can:

- ◆ prepare a plant and habitat conservation strategy
- ◆ apply selected knowledge and skills from Outcomes 1, 2, and 3

Assessment Guidelines

The assessment for this Outcome should be a written report for a site chosen by the student but approved by the tutor. The chosen site should provide enough scope to make realistic recommendations regarding habitat monitoring, species recording, habitat management, public education, and other conservation methods taught in Outcomes 1,2, and 3. Sites that cover a few different habitat types, habitat transition zones or relatively uncommon habitat types are of particular interest and often offer students more to discuss than uniform, common habitat types.

Administrative Information

Unit code: F2B5 35

Unit title: Plants and Habitats: Ecology and Conservation

Superclass category: QA

Original date of publication: March 2007

Version: 01

History of changes:

Version	Description of change	Date

Source: SQA

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Higher National Unit specification: support notes

Unit title: Plants and Habitats: Ecology and Conservation

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 80 hours.

Guidance on the content and context for this Unit

The Unit aims to provide knowledge and skills needed for understanding the fundamental ecological processes that have shaped past and present vegetation types, plant communities and plant populations. It also provides knowledge of how the ecological balance can be altered to the detriment of wild plants and natural habitats and the range of methods and approaches that are undertaken to conserve and protect them. The Unit is of general relevance to students who intend working in horticulture or in many environmentally-related professions. It will also serve as a sound grounding for students who plan to pursue more advanced studies in plant ecology and conservation.

Outcome 1 should begin with an introduction to the concept of the biosphere and a consideration of the major factors and processes that have driven change and development of in plant habitats and geographical distribution of plants, these include continental drift, historic changes in climate including the cycles of ice ages. After a broad introduction the Unit should then focus on the concept of the ecosystem including food chains and food webs. Other initial topics should consider plant distribution and rarity. The structure, function and dynamics of plant communities and plant populations should then be described.

Outcome 2 should start by describing the procedure of data gathering for identifying plant communities (the National Vegetation Classification methods are advised); it is recommended that this is carried out as a group exercise in the field. Further methods of vegetation analysis for monitoring change or for comparison of similarity between vegetation samples should also be explained and demonstrated. The impact of man, animals and pollution on the environment in general should be taken into account.

Outcome 3 builds on Outcomes 1 and 2 and should firstly consider examples of both global and more local threats to plant habitats and then review the range of conservation methods including legislation, survey and evaluation of sites, and habitat management. The roles of various organisations that carry out conservation should also be surveyed with examples of local, national and international bodies.

Outcome 4 provides the facility to apply the knowledge and skills gained in Outcomes 1, 2 and 3 to produce a conservation strategy for a real site. It also enables candidates to liaise and communicate with relevant conservation bodies that may provide further information or assistance. Students should be advised regarding choice of site so that it provides enough diversity and scope to be of some conservation interest but not so large as to be daunting. The area should ideally be within easy travelling distance so repeated visits do not present a problem. Candidates should study the kinds of vegetation on the site and then consider the current uses of the site and decide whether there are any obvious threats, damaging or potentially damaging activities and how these may be reduced or prevented. They should also make suggestions regarding improvement of the site for conservation and ways in which it may potentially provide public education and involvement. Candidates should be made aware of all relevant legislation.

Higher National Unit specification: support notes (cont)

Unit title: Plants and Habitats: Ecology and Conservation

Guidance on the delivery and assessment of this Unit

This Unit is likely to form part of a Group Award, which is primarily designed to provide candidates with technical or professional knowledge and skills related to occupations in amenity horticulture or landscape management. Students will need to relate information learnt in this Unit to the requirements of the Graded Unit.

Candidates should study the kinds of vegetation on the site and then consider the current uses of the site and decide whether there are any obvious threats, damaging or potentially damaging activities and how these may be reduced or prevented. They should also make suggestions regarding improvement of the site for conservation and ways in which it may potentially provide public education and involvement.

Delivery should combine formal lectures with practical fieldwork and at least one visit to demonstrate and help reinforce some ecological concepts. Access to a range of relevant literature should be available via library facilities and the web. The following texts may be helpful in the delivery of this Unit:

- ◆ Anon (1989), *'Guidelines for the selection of biological SSSIs'*, Nature Conservancy Council
- ◆ Crawley, M. ed. (1986) (ed.), *'Plant Ecology'* Blackwell Science, London
- ◆ King, T.J. (1989), *'Ecology'* Nelson
- ◆ Marren, P. (2002), *'Nature Conservation'* Collins, London
- ◆ Moore, D.M. (1982) *'Green Planet'* Cambridge University press, Cambridge
- ◆ Rodwell, J.S. (Ed. — 5 volumes) *'British Plant Communities'* Cambridge University Press, Cambridge
- ◆ Rodwell, J.S. (2006) *'National Vegetation Classification users' handbook'* Joint Nature Conservation Committee

Opportunities for developing Core Skills

There are opportunities to develop Core Skills of *Communication* and *Problem Solving* at SCQF level 6 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

Open learning

Elements of this Unit could be delivered by distance learning, for example, Outcomes 1,2 and 3. It is probable that candidates would need to attend the centre to gain experience in the breadth of skills within the Unit.

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).

General information for candidates

Unit title: Plants and Habitats: Ecology and Conservation

This Unit is designed to provide you with knowledge and practical skills to give you a broad and solid understanding of the fundamental ecological processes that affect past and present plant distribution and the structure and dynamics of plant communities and populations. You will also learn how the delicate balance between species can be disrupted by various factors and how this can lead to changes in vegetation and habitats. The next section of the Unit will consider how plant communities can be identified and the various methods of monitoring change in vegetation. We will then survey the approaches to help conserve and protect plants and their habitats including legislation, survey and evaluation of sites for SSSI designation, habitat management, and public education. Lastly, you will have the chance to apply knowledge from the Unit to devise a conservation management strategy for a site of your choosing. Besides formal lectures there will be some fieldwork and as a group you will go through the standard procedure of collecting a vegetation sample for identifying a plant community using the National Vegetation Classification. In order to complete this Unit successfully, you will be required to achieve a satisfactory level of performance in three pieces of assessed work, a group presentation, a written report and one examination.