Unit 16: Understanding Heathland Habitat Management

Unit code: J/600/9411

QCF Level 3: BTEC National

Credit value: 10

Guided learning hours: 60

● Aim and purpose

This unit aims to introduce learners to the skills and knowledge in heathland habitat management and how these can be applied in practice. It is designed for learners in centre-based settings looking to progress into the sector or onto further/higher education. The unit ensures that the learner is given the necessary knowledge, experience and management skills to enable them to manage an area of heathland effectively. Assessment methods include the presentation of a management plan, and practical skills assessment.

● Unit introduction

The UK landscape is semi-natural, having been influenced by human activity since the Atlantic period (7000 to 5000 years BC). Today, the presence of heathland communities within this landscape continues to be a result of human activity, but the relationship has changed. Until recent times the exploitation of heaths and other wastelands for their raw materials was central to the development, and in some cases survival, of local rural economies throughout the UK. Today they serve as reservoirs of species of national and international importance and as such the priority has become their protection and management for conservation.

In this unit learners will develop the knowledge and skills needed to understand the history of the British countryside, field identification techniques and practical heathland management.

Learners will examine the origins and ecology of heathlands, developing an understanding of how these particular habitats have been created and why they are ecologically important. Having established their importance, learners will examine the range of threats to the continued existence of heathlands and how these threats can be minimised. This will enable them to develop a greater understanding of wider issues in countryside management and the range of often difficult dilemmas landowners and site managers face.

Learners will also have the opportunity to develop practical skills in heathland management and conservation.

● Learning outcomes

On completion of this unit a learner should:

1   Understand the origins and ecology of heathlands

2   Know potential threats to the existence of heathlands

3   Know appropriate management techniques for heathland sites

4   Be able to plan and carry out practical heathland management.

Unit content

1 Understand the origins and ecology of heathlands

Origins: post-glacial development of north-west European landscapes, extent and distribution of woodland and heathland during Atlantic period (7000 – 5000 years BC), Neolithic clearance of woodland; chronology of heathlands through other notable points in history eg Bronze Age, Iron, Roman, Norman (forest deer parks), Medieval, Napoleonic and 20th century (including formation of Forestry Commission in 1919); afforestation and agricultural developments in late 20th and early 21st century; recent recognition of importance of heathland conservation

Ecology: definitions of heathland; difference between lowland heath and moorland; biotic and abiotic factors relating to the existence and distribution of heathlands, formation of podsolic soils, wet and dry heath communities, plant adaptation to low levels of nitrogen, characteristic heathland specialists (plants, invertebrates, amphibians, reptiles, mammals and birds), heathland indicator species (field identification keys), importance of bare ground; dynamic heathland lifecycle (heather (*Calluna vulgaris*))

Habitat requirement: characteristics of heathland habitats (dry heath, humid heath, wet heath, mire, grassland), factors affecting heathland community development (soil nutrient availability, soil moisture, frost, precipitation patterns)

2 Know potential threats to the existence of heathlands

Potential threats: natural (encroachment by shrubs, trees, bracken and grass, acidification and nitrogen enrichment from air pollution, uncontrolled fire); anthropogenic (fragmentation, habitat loss caused by road and housing development, conversions to forestry plantations, tree and scrub removal, fencing for conservation grazing, excessive recreational pressures, fly tipping); lack of financial resources, abandonment; reduced markets for traditional heathland products

Protection regulations: relevant legislation eg Wildlife and Countryside Act 1981, Countryside and Rights of Way Directive 2000, Natural Environment and Rural Communities Act 2006, Heather and Grass Burning Regulations 2008; designation eg as Sites of Special Scientific Interest (SSSI), special protection areas (SPAs)

3 Know appropriate management techniques for heathland sites

Appropriate management techniques: scrub control (eg clear trees and scrub, treat regeneration, weed seedlings); grass control (eg scarify, mowing, grazing regimes, stocking rate density, choice of grazing livestock); heather management (eg burning, cut and collect); gorse management (eg coppicing, burning), bracken control (eg use of herbicide, cutting), timing and importance of timing of operations; practical implications eg staffing, equipment, health and safety; ecological disposal of arisings: reasons and methods eg removal in saleable lengths, use of woodchipper

Objectives: ecological (eg management for selected species of importance, improvements to species biodiversity, heathland restoration); cultural (eg relating to landscape character, historical features, archaeology, local community and user interests, cultural and amenity value)

Conflicting management requirements: actions to protect one species which may reduce another; methods used to prioritise species eg species significance (ecologically or culturally), public opinion, cost factors, funding constraints, sustainability, regulations

4   Be able to plan and carry out practical heathland management

Practical heathland management: scrub management; other management techniques eg pine control, rhododendron control, heather management, gorse management, bracken management, fencing, livestock handling; practical task administration (health and safety considerations on heathland, risk assessment, the use of volunteers); management planning (interpretation and practical application of management prescriptions); current codes of practice and legislation

Management plans: objectives; methods and techniques; prioritisation of actions, timing of actions; balancing conflicting requirements; reviewing and recommending alternative management options; methods of evaluating and determining success

Risk assessment: assessment of likelihood of risk, severity of risk, methods to mitigate risk, assessment of risks to self and others

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
P1 explain the historical development of heathlands [IE, SM]	**M1** explain in detail the origins and ecology of heathlands including indicator species	**D1** discuss management strategies to reduce the impact of potential threats to heathland ecology
P2 outline the ecology of heathlands [IE, SM]		
P3 explain key elements of heathland species [IE, SM]		
P4 discuss the ecology and habitat requirement of one heathland species [IE, SM]		
P5 outline selected potential threats to existing heathland [IE, CT]	**M2** discuss potential threats to existing heathland and the impact that they may have on heathland species and communities	
P6 describe the impact of potential threats to heathland species and communities [IE, CT]		
P7 state the protection regulations that protect heathlands [IE]		
P8 identify selected techniques available for heathland management [IE]	**M3** explain how ecological and cultural objectives impact on heathland management	**D2** evaluate in depth practical heathland management making recommendations for improvement.
P9 describe ecological and cultural objectives for heathland management [IE]		

Assessment and grading criteria

To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
P10 outline conflicting management requirements for promoting heathland diversity [EP]		
P11 state how arisings can be disposed of ecologically [TW]		
P12 plan for, and carry out, practical heathland habitat management to achieve given objectives [CT, TW]	**M4** explain how practical habitat management work completed contributes to habitat improvement.	
P13 evaluate selected practical heathland habitat management [CT]		
P14 outline recommendations for improving management plans [IE, CT, RL]		
P15 conduct a risk assessment of practical activity. [IE, SM]		
P16 interpret a management plan [IE]		

PLTS: This summary references where applicable in the pass criteria, in the square brackets, the elements of the personal, learning and thinking skills. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Tutors delivering this unit have opportunities to use as wide a range of techniques as possible. Lectures, discussions, seminar presentations, site visits, supervised heathland management practicals, internet and/or library-based research and the use of supervised paid/voluntary work are all suitable.

Where used to support this unit, work experience placements should be monitored regularly to ensure the quality of the learning experience. Work experience placement supervisors and learners should be made aware of the requirements of the unit before any work-related activities are undertaken, so that learners can have the opportunity to gather naturally occurring evidence. For example, learners may have the opportunity to survey or carry out practical heathland management. They should ask for observation records and/or witness statements to be provided as evidence of this. Photographic and/or video evidence may also be useful.

Visiting expert speakers could add to the relevance of the subject. For example, a site manager could talk about their work, the situations they face and the methods they use. Learners are expected to observe safe working practices and environmental good practice in all practical activities.

Whichever delivery methods are used, it is essential that tutors stress that a number of heathland species are protected by law and that licences from Natural England are required to handle them.

Health and safety issues relating to site visits must be stressed and reinforced regularly, and risk assessments must be undertaken before any practical activities.

Learning outcome 1 provides the ecological and historical background needed to contextualise the place of heathland sites within the wider countryside. This is likely to be delivered through formal lectures and group discussion. Plant succession models need to be explored so that learners develop an understanding of dynamic systems in nature. Both the continuous woodland cover model and Vera's (1999) grazed forest model should be explored in detail. It is important that learners gain an understanding of the relationship between human activity through the ages and heathland development and distribution.

The ecology of heathlands is best covered using specific site visits and, where possible, supported by guided walks and talks from the site managers. If this is not possible then tutors should make use of high-quality specimens, audio equipment and visual material. Indicator species for wet and dry heath and the heather (*Calluna vulgaris*) lifecycle should both be studied. The use of field identification keys is essential and learners will need the opportunity to develop their identification skills of common heathland species.

Learning outcome 2 investigates the potential threats to the existence of heathlands, both actual and perceived. This is likely to be delivered using a range of methods which may include formal classroom-based activities, discussion and independent learner research. By linking this with learning outcome 1, learners will gain a significant amount of information from site visits and discussions with site managers.

Learning outcome 3 looks at the main methods used in the management of heathlands. Delivery is likely to include practical activity to enable learners to identify management techniques, their objectives and impact. Delivery also needs to explore the types of objectives of importance in heathland habitat management and the potentially conflicting management requirements in species protection. A guest speaker involved in heathland management could help to articulate these potential conflicts, and how they reach a decision about which species to prioritise.

High quality audio/video equipment is capable of illustrating a variety of management tools, including mechanical, and the various forms of available livestock. Again, access to local heathland sites is important. To demonstrate the effects of burning, real-life examples of heathland before and after in the field, or high quality audio-visual materials could be used.

Learning outcome 4 is concerned with practical heathland management. Learners are required to use the knowledge they have gained from the previous learning outcomes and apply it to a heathland site or sites. Learners will need supervised access to a heathland habitat to carry out practical management activity. Given the careful management planning of most UK heathland, it is important to plan this well in advance to fit with the timing planned by the landowner or managing body. The importance of health and safety should be stressed, as should the importance of minimising environmental impact through habitat management activities.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan gives **an indication of the volume of learning it would take the average learner** to achieve the learning outcomes. It is **indicative and is one way of achieving the credit value.**

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Topic and suggested assignments/activities and/assessment
Introduction to the unit, structure and programme of assignments.
Assignment 1: Habitat Development (P1, P2, P3, P4, M1). Tutor introduces the assignment brief.
Formal input – origins of heathlands, models, chronology.
Visits to see heathland and heathland species.
Formal input – ecology of heathlands, fauna and flora.
Practical – species identification.
Learner research and assessment completion.
Assignment 2: Habitat Threats (P5, P6, P7, M2, D1) Tutor introduces the assignment brief.
Class discussion – threats to existence: physical threats, financial threats, effects of threats.
Visiting speakers (eg estate managers).
Learner research and presentation – protection regulations.
Learner research and assessment completion.
Assignment 3: Management Techniques (P8, P9, P10, P11, M3) Tutor introduces the assignment brief.
Formal input and class discussion – appropriate management techniques.
Visiting speakers (eg estate managers): conflicting management requirements.
Theory session – disposal of arisings, reasons for disposal, methods of disposal.
Research and prepare materials for presentations.
Deliver presentations (whole group).
Assignment 4: Practical Heathland Management (P12, P13, P14, P15, P16, M4, D2) Tutor introduces the assignment brief.
Formal input – practical heathland management, management planning.
Classroom activity – interpreting management plans.
Formal input – legislation, health and safety, use of tools and equipment, risk assessments, PPE, planning of practical activities.
Practical activities.
Prepare and present evidence for practical portfolio.

Assessment

For P1, learners are required to explain the historical development of UK heathlands. They should produce a detailed chronology exploring key events that have influenced the development and contraction of UK heathland. Evidence may be in the form of an annotated timeline, poster or report.

For P2, learners need to provide an outline of the ecology of heathlands, which should include the key aspects in the unit content. Evidence may take the form of an illustrated report, poster or leaflet.

P3 requires learners to explain the key elements of heathland species. Identification of species does not need to be comprehensive, but should be indicative of locally occurring heathland sites. Evidence may be through observation of a practical assessment.

For P4, learners are required to discuss the ecology and habitat requirement of one heathland species. Evidence may be a verbal or written report.

It would be feasible for assessments for P1, P2, P3 and P4 to be linked in one assessment, for example a case study based on visits to selected heathland habitats.

P5 and P6 are linked and could be assessed together. For P5 learners are required to outline selected threats and for P6 to describe their impact. A minimum of three potential threats should be covered. This could be assessed by means of an illustrated poster, verbal presentation or written report.

P7 requires learners to state the regulations that protect heathlands. Learners should include the full name or any regulations or designation, and outline the protection offered.

P8, P9, P10 and P11 could be assessed together. Learners are required to identify selected techniques (minimum of six, including burning) available for heathland management (P8), describe ecological and cultural objectives (P9), outline conflicting management requirements for promoting heathland diversity (P10) and state how arisings can be disposed of ecologically (P11). Evidence may take the form of an illustrated project or PowerPoint presentation.

P12, P13, P14, P15 and P16 can be linked and learners could present their evidence as a practical portfolio. Learners must produce an interpretation of a management plan for a selected heathland habitat (P16) and suggest recommendations for improving the plan (P14). Learners are required to carry out a risk assessment of a practical activity at a selected heathland habitat (P15). Then, they must plan for and carry out practical heathland management activities (P12) and evaluate the practical activity they undertake (P13). A minimum of three practical heathland activities should be included.

For M1 learners are required to extend the evidence produced for P1, P2, P3 and P4 to explain the origins and ecology of heathland in detail.

For M2 learners need to extend the evidence produced for P5 and P6 to discuss the potential threats and their impact. Evidence may be in the same format as for P5 or P6.

For M3 learners are required to explain how ecological and cultural objectives impact on heathland management. At least four objectives and their impacts should be explored and evidence may take the same format as for P8, P9, P10 and P11.

M4 requires learners to review the practical habitat management work completed and explain how it contributes to habitat improvement. Evidence could take the form of a verbal or written report.

For D1 learners are required to discuss management strategies to reduce the impact of potential threats. This discussion may be written or verbal and should include a comparison of at least three different strategies in terms of their effectiveness, cost and practical implications.

For D2 learners could produce a report which evaluates, in depth, the practical heathland habitat management activities that were undertaken and recommends improvement. Improvements should be based on better meeting the habitat management objectives and/or in terms of cost and resource deployment.

Programme of suggested assignments

The following table shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, P4, M1	Habitat Development	You have been asked by a conservation charity to produce an information guide for visitors to a heathland area. Include in your guide a chronology explaining the events that influenced their development and contraction and give an outline of their ecology. Provide an explanation of the key elements of heathland species and discuss the ecology and habitat requirements of one selected heathland species. Explain in detail the ecology of the heathlands and include the significance of indicator species.	Information guide.
P5, P6, P7, M2, D1	Habitat Threats	The conservation charity has asked you to do further work. Produce a visitor guide specifically for use with school groups which shows the potential threats to a heathland area and explains the impact of these potential threats to heathland species and communities. Include a comparison of the different management strategies which can be used to minimise the threats.	Visitor guide.
P8, P9, P10, P11, M3	Management Techniques	The conservation group has asked you to brief a group of volunteers. Prepare and deliver a PowerPoint presentation in which you identify heathland management techniques. You must describe ecological and cultural objectives for heathland management and explain how they impact on heathland management. Outline conflicting management requirements for promoting heathland diversity and state how arisings can be disposed of ecologically.	Presentation.

Criteria covered	Assignment title	Scenario	Assessment method
P12, P13, P14, P15, P16, M4, D2	Practical Heathland Management	In your ongoing work for the conservation charity you have now been asked to take part in practical management of the heathland area. Produce a portfolio which you can use for further interviews on completion of this project. Your portfolio needs to include an interpretation of a management plan for the heathland, your recommended improvements to the plan, risk assessments for each practical activity and observation records and photographs of you undertaking three practical activities. Include an evaluation of each activity you carry out and an explanation of how it contributes to habitat improvement. Produce a report which evaluates in depth the practical heathland habitat management activities that you carried out and recommends improvement.	Practical portfolio.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC land-based sector suite. This unit has particular links with:

Level 2	Level 3
Participate in Providing Estate Maintenance	Element CU88.2 Co-ordinate and oversee habitat management work
	Element CU88.3. Monitor the effectiveness of habitat management work
	Undertake Estate Skills

Essential resources

Learners will require supervised access to as wide a range of sites as is practically possible so that they can observe at first hand the ecology and management of heathland habitats. Learners will also require access and suitable equipment in order to undertake practical surveys of heathland habitats. This may require centres to arrange transport. Relevant tools, equipment, materials, PPE and risk assessments are essential. Tutors delivering this unit should be competent and experienced in countryside management, ideally with recent industrial or voluntary experience, and first aid certificated. Knowledge of survey techniques and competent field identification of fauna and flora is essential.

Employer engagement and vocational contexts

Visits to large estates, visiting speakers such as land managers, local Wildlife Trusts officersand relevant work experience placements will enhance delivery of this unit.

Indicative reading for learners

Textbooks

Day J, Symes N – *A Practical Guide to the Restoration and Management of Lowland Heathland* (RSPB 2003) ISBN 978-1901930382

Gimmingham G – *The Lowland Heathland Management Handbook* (English Nature, 1993) ISBN 978-1857160772

Green B – *Countryside Conservation: Land Ecology, Planning and Management, Third Edition* (Taylor & Francis 1996) ISBN 978 – 0419218807

Lane A, Tait J – *Grasslands, Heaths and Moors* (Hodder Arnold 1992) ISBN 978-0340533703

Michael N – *The Lowland Heath Management Booklet* (English Nature 1996) ISBN 978-1857162660

Price E – *Lowland Grassland and Heathland Habitats* (Habitat Guides 2002) ISBN 978-0415187633

Rose F – *The Wild Flower Key: How to Identify Wild Plants, Trees and Shrubs in Britain and Ireland* (Warne 2006) ISBN 978-0723251750

Sutherland W, Hill D – *Managing Habitats for Conservation* (Cambridge University Press 1995) ISBN 987-0521447768

Tubbs C – *New Forest: The History, Ecology and Conservation* (New Forest Ninth Centenary Trust 2001) ISBN 978-0952612063

Vera F – *Grazing Ecology and Forest History* (CABI Publishing 2000) ISBN 978-0851994420

Journal

Enact

Websites

www.ashdownforest.org	Ashdown Forest
www.dardni.gov.uk	Department of Agriculture and Rural Development (NI)
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.environment-agency.gov.uk	Environment Agency
www.hants.org.uk/newforest	The New Forest
www.jncc.gov.uk	Joint Nature Conservation Committee
www.naturalengland.org.uk	Natural England
www.ukbap.org.uk	UK Biodiversity Action Plan
www.wildlifetrusts.org	County Wildlife Trusts

Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are …
Independent enquirers	reporting on the historical development and ecology of heathlands
	describing potential threats to heathlands
Creative thinkers	assessing the ecology and habitats of heathland species
	identifying threats to heathland species
	planning maintenance requirements
Reflective learners	recommending how to improve management plans
Team workers	taking responsibility for the environment
	carrying out practical activities safely
Self-managers	reporting on the ecology and development of heathlands
	selecting appropriate tools and equipment for practical activities
	carrying out practical tasks safely
Effective participators	describing how to overcome conflicting management requirements for promoting heathland diversity.

Although PLTS opportunities are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	investigating key points of current protection regulations, health and safety legislation and codes of practice
Creative thinkers	applying techniques to maintenance tasks
Reflective learners	evaluating own performance
	action planning and target setting for future activities
Team workers	receiving and giving peer help and support during tasks
Self-managers	completing risk assessments
Effective participators	investigating problems that occur when carrying out practical activities.

● Functional Skills – Level 2

Skill	When learners are ...
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	using ICT systems to research information for the assignments
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	action planning and monitoring work that needs to be completed
Manage information storage to enable efficient retrieval	saving information into files and folders
Follow and understand the need for safety and security practices	using ICT systems safely – sitting correctly at the computer, keeping food and drink away from computer equipment
Troubleshoot	
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	carrying out research for assignments
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: ● text and tables ● images ● numbers ● records	producing a case study on heathland development designing an illustrated poster producing a risk assessment for practical tasks
Bring together information to suit content and purpose	creating documents from research for assessment activities
Present information in ways that are fit for purpose and audience	creating documents from research for assessment activities
Evaluate the selection and use of ICT tools and facilities used to present information	
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	
Identify the situation or problem and the mathematical methods needed to tackle it	

Skill	When learners are ...
Select and apply a range of skills to find solutions	producing a risk assessment for practical tasks
Use appropriate checking procedures and evaluate their effectiveness at each stage	
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	
Draw conclusions and provide mathematical justifications	
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting information on heathland management techniques
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	researching information about the ecology and historical developments of heathlands
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	reporting on the ecology and historical developments of heathlands reporting on the threats to heathlands reporting on the protection regulations in place to protect heathlands producing a risk assessment for practical tasks.