Higher National Unit specification

General information for centres

Unit title: Forestry: Forest Protection

Unit code: F3YV 35

Unit purpose: This Unit is designed to give the candidate knowledge and understanding of the potential risks to forests from damaging agents and the controlling measures available to manage the potential risk. The Unit is relevant to candidates requiring a knowledge and understanding of forest protection.

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

1 Evaluate the potential risk to a forest stand by damaging agents.
2 Produce a fire plan.
3 Plan forest design features to minimise risks from damaging agents.

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: Access to this Unit is at the discretion of the centre. It would be beneficial if candidates had prior knowledge of this area through HN Units F3YW 34 *Forestry: Forest Science* and F3YC 34 *Establishment of Woodland*.

Core Skills: There are opportunities to develop the Core Skills of *Communication* and *Information Technology* to 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: The assessment for this Unit could take the form of an identification test for part of Outcome 1 and a holistic project for the remaining part of Outcome 1 and Outcome 3. Outcome 2 could be assessed by a project.

Higher National Unit specification: statement of standards

Unit title: Forestry: Forest Protection

Unit code: F3YV 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

Evaluate the potential risk to a forest stand by damaging agents

Knowledge and/or Skills

- Abiotic damaging agents to forestry
- Biotic damaging agents to forestry
- Biotic agents' life cycles
- Frequency and range of occurrence
- Damage caused and traces left
- Potential damage to a forest/woodland area
- Current control methods and costs

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can evaluate the potential risk to a forest stand by damaging agents. Candidates must:

- correctly identify common damaging agents and the damage that they cause. This must include: fungal, bacterial, mammals, insects, climatic.
- explain the biotic agents' life cycles and identify the damaging stages of these life cycles.
- explain the frequency and range of the agents' damage occurrence where appropriate.
- assess the potential damage to a forest/woodland for each damaging agent.
- explain the control methods currently available for each damaging agent.
- evaluate the best control method of each damaging agent. The evaluation must include the cost of the control method in relation to the likely damage risk.

Assessment Guidelines

Part of the evidence for Outcome 1 could be generated through an identification test concentrating on the identification of common damaging agents and the damage caused. The test could concentrate on common forest and tree pests and will cover bacteria, fungi, insects, mammals and climatic damage. The test should include a minimum of 12 common damaging agents and eight common examples of damage and concentrate on the most significant damaging agents at the time. The identification test could have the same agent represented in both parts of the test.

This could be presented to the candidate as a laboratory identification test where all the exhibits can be brought together in one place so that actual examples can be used or photographic images displayed where this is not possible. 10x hand lenses may be made available to the candidates to assist in identifying smaller objects, eg aphids, but this should not be necessary for the majority of the test.

The remainder of this Outcome could be assessed with Outcome 3 in the form of a project.

Outcome 2

Produce a fire plan

Knowledge and/or Skills

- Methods of control
- Stages in the process of control
- Fire plan production
- Industry guidelines
- Codes of practice
- Wild fire
- Controlled burn/Muirburn
- Legal aspects of forest protection
- Function of mutual aid/liaison groups

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can produce a fire plan for a given or agreed site. Candidates must:

- evaluate different methods of control and develop proposals that are appropriate, correct and realistic to the site and include presupression and prevention, suppression and aftercare of forest fire
- plan measures to control an outbreak of wild fire and for the appropriate operation of a controlled burn/Muirburn, which comply with industry guidelines, codes of practice and legal constraints
- explain the legal aspects of forest protection, which includes aspects of negligence, compensation and the function of mutual aid/liaison groups

Assessment Guidelines

The evidence for Outcome 2 could take the form of the production of a fire plan as laid out in the Evidence Requirements above. It is highly recommended that candidates include diagrammatic and sourced map materials to support their plan.

Outcome 3

Plan forest design features to minimise risks from damaging agents

Knowledge and/or Skills

- Forest design features
- Cost/benefit evaluation
- Non-forest benefits
- Forest protection

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can plan forest design features to minimise risks from damaging agents. The candidate must:

- evaluate the benefits of good design in relation to the effect on damaging agents and these agents effects.
- plan appropriate design features to minimise the risks of forest damage.
- evaluate the cost/benefit of forest protection measures in relation to crop value.
- evaluate non-forest benefits. This must include recreation, landscape and amenity.

The evaluation of the principles and design factors to be considered in the layout of a forest in relation to forest protection must include the following:

- open space, deer glades
- size and dimensions of space, deer glades
- size and dimensions of forest blocks
- access and sight lines
- fencing
- species choice — susceptibility, monoculture, mixed forest
- species age structure and tree health
- habitat diversity
- natural predation
- topography
- fire breaks and water sources
- establishment and harvesting timing and methods
- silvicultural systems
- seasons and climatic factors
- treatments for damaging agents

Higher National Unit specification: statement of standards (cont)

Unit title: Forestry: Forest Protection

This Outcome is integrated with Outcome 1, in that Outcome 1 will provide the underpinning knowledge and skills on damaging agents.

Assessment Guidelines

This Outcome could be assessed as a project in conjunction with part of Outcome 1.

Administrative Information

Unit code: F3YV 35

Unit title: Forestry: Forest Protection

Superclass category: SG

Original date of publication: August 2008

Version: 01

History of changes:

Version	Description of change	Date

Source: SQA

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: Forestry: Forest Protection

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 content of this Unit should provide the candidate with the knowledge and understanding of the potential risks to woodlands and forests from damaging agents and the controlling measures available to manage the potential risk in relation to the UK.

It would be beneficial if candidates were given the opportunity to visit one or more woodland sites to assess damage and damage potential in a forest or woodland situation and undertake actual site assessment where possible.

Outcome 1

- an understanding of the wide variety of damaging agents and knowledge of the principles of pathology in trees
- common damaging agents' lifecycles and the identification of the damage stage and the damage they cause
- potential damage to forest crops in the UK
- potential damage from agents not currently in the UK, or in restricted areas of the country
- control methods currently available: natural: biological; artificial; forest design
- cost/benefit of control methods
- control methods actually employed currently
- potential damaging agents not currently present
- the potential influence of climate change
- animals: deer species, rabbits, grey squirrels, insects
- fungi, bacteria, viruses
- climatic factors: wind; blast; frost; drought; sun scorch
- man
- fire (covered in detail in Outcome 2)

Outcome 2

- general context of wild fire in British forestry, set within an International perspective and against a background of increasing potential risk due to Global warming and a diminishing workforce
- the reality of fire control in modern forests
- evaluation of basic methods of prevention and minimisation of damage through education and design

- methods of assessing danger: weather factors, amounts of fuel and its condition, and the likelihood of occurrence are examined.
- planned responses. Firefighting methods from Beater to Helicopter including foam use.
- Safety and Risk Assessment, fire suppression, aftercare, remedial action, monitoring and reviewing, total fire cost, devising suitable fire plans.
- Muirburn. The need for more and better managed controlled burns. Good practice codes and legal duties/constraints, aspects of negligence, liability, compensation and damages.
- devising work methods to satisfy aims and to achieve sound environmental results.
- the role of Liaison Groups and Mutual aid agreements between landowners, neighbours, tenants and Fire brigade, in both Wildfire and Controlled burn situations.

Outcome 3

- susceptibility to damage from deer other animals, insects, fungi, man and weather effects
- damage risk situations
  - — crop structure — age, species, species diversity, climatic influences
  - — crop treatment — establishment and harvesting
  - — soil and vegetation factors
  - — damaging agents' population dynamics
  - — tree health and land use classification
- control methods available and their design to fit into the forest environment
  - — fencing — positioning, type and access devices
  - — size, dimensioning and positioning of deer glades
  - — access to the forest and into the forest
  - — use of water courses, roads and rides
  - — pesticide use
  - — predator habitat
- incorporation of these design principles in a forest management
  - — maps
  - — forest edge
  - — open space
  - — use of topographical features
  - — high risk area identification
  - — evaluation and analysis of risks
  - — fire breaks and water sources
  - — establishment and harvesting timing and methods
  - — silvicultural systems

Higher National Unit specification: support notes (cont)

Unit title: Forestry: Forest Protection

Guidance on the delivery and assessment of this Unit

Outcome 1

Delivery of this Outcome could be by means of hands-on identification in the field where possible and in the laboratory or classroom supported by photographic examples.

Lifecycles, damage potential and control methods could be accessed through candidate centred learning, through web research and library use.

Candidates could also be given at least one agent to research and then prepare and deliver a presentation on that agent to the rest of the group. This approach should be supported and augmented with lectures and tutorials.

It is suggested that part of the assessment for this Outcome could be designed as a classroom/laboratory practical test where the candidate is asked to identify at least 12 damaging agents and the damaging agents that caused eight types of damage. Either English or Latin names are acceptable.

The test could focus on common pests and disorders and cover animals, insects, fungi and non-pathogenic disorders such as wind, frost and drought.

Fresh samples should be used whenever possible but photographs could be used for smaller pests and unavailable specimens.

Outcome 2

Delivery of this Outcome could be by integrated group activity, personal study, lectures, site visits, video and photographic material. Reference can be made to a variety of Internet sites from both Government and other organisations/groups.

Candidates will demonstrate their understanding by production of a Fire plan for a site, given or mutually agreed with the tutor, which clearly and concisely aims to reduce fire damage through control methods that reflect current industry standards/guides.

Candidates will be strongly encouraged to use diagrammatic and map material to support their plan.

Higher National Unit specification: support notes (cont)

Unit title: Forestry: Forest Protection

Outcome 3

Candidates could use library facilities and web searches and this will be backed up with lectures and tutorials. It is recommended that one site visit is organised to evaluate protection design and suitable visiting speakers should be encouraged.

It is suggested that the assessment for Outcome 3 takes the form of a project, which could be integrated with part of the assessment for Outcome 1. This would be good preparation for the work place.

It is suggested that the assessment could be made available to the candidate midway through the Unit delivery so that analysis and evaluation relating to the given or agreed site can start.

Suggested contexts for this project could be:

(a) A project that looks in detail at a chosen damaging agent, its lifecycle and potential damage risk, control methods available and a cost/benefit analysis of the control. The project could plan the forest with protection against the agent as the primary factor and could evaluate the forest and non-forest benefits of this potential course of action. Candidates could produce a report, which could be supported with maps and diagrams, where appropriate.

Or

(b) A project on a given site that displays enough diversity of terrain and vegetation type that would require the candidate, individually or as part of a small team, to utilise maps and site visits to visually assess the area for risk from potential damaging agents. The project could produce a forest management design to minimise the risk of damage.

- the site could be an existing forest, a restock site or an area yet to be planted
- it is expected that deer, rabbits, fungi, insect, fire risk, human and climatic factors could be evaluated and included for in the design in an integrated fashion
- N.B: a detailed fire plan is catered for in Outcome 2 so this will not be covered in detail in this assessment
- the report should be supported with maps and diagrams, where appropriate

Or

(c) As above, but in the case of a Distance/Open Learning candidate, for a site of the candidate's choice ie at their work or close to their home, with the caveat that the site has to be agreed as suitable beforehand by the Unit tutor and that there is prior agreement for candidate and possible tutor access to the site by the landowner.

Higher National Unit specification: support notes (cont)

Unit title: Forestry: Forest Protection

Opportunities for developing Core Skills

There may be opportunities to develop the Core Skills of *Communication* and *Information Technology* to SCQF level 5 in this Unit. Candidates may develop written Communication through reading and producing work for formative and summative assessment. If candidates participate in presentations on damaging agents, this will provide opportunities to develop Oral Communication. If candidates use IT for research/information gathering purposes and to produce work, this will allow them to develop the Core Skill of *Information Technology*.

Open learning

All Outcomes are appropriate for open and distance learning approaches provided candidate are supported by learning materials and tutor input at all stages. Centre devised supervision agreements should detail any controlled conditions to ensure authenticity of 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)**.

General information for candidates

Unit title: Forestry: Forest Protection

This Unit is designed to provide you with a basic knowledge and understanding of the potential threats to forest and woodland areas in the UK from potential damaging agents. The Unit will provide you with the required skills and knowledge to evaluate the risk of damage and to put in place management criteria to limit the risk and damage.

The Outcomes that you will acquire on completion of the Unit are as follows:

Outcome 1 will give you the skill to identify damaging agents such as insects, fungi, mammals, and climate and an understanding of their lifecycles, the damage they cause and the control measures available. It will also give you the understanding to be able to evaluate the risk of damage to a forest or woodland.

Outcome 2 will develop the ability to produce a Fire Plan for a forest or woodland site utilising modern methods of design, prevention, and techniques for the control of wild fire and controlled burning.

Outcome 3 will give you the knowledge to plan forest design features to minimise the potential damage from a host of damaging agents, such as deer, rabbits, insects, fungi, man, and climatic factors.

Overall, the knowledge and skills acquired in this Unit will help you understand and evaluate the factors that pose a threat to the successful health and growth of a forest or woodland and the tools at your disposal to minimise the risks.

For candidates already in employment this Unit provides an opportunity to extend existing knowledge and skills and lays a sound grounding for further forest management study.

This Unit may give you the opportunity to develop your Core Skills in *Information Technology* and *Communication* to SCQF level 5.