



## Higher National Unit Specification

### General information

**Unit title:** Forest Harvesting (SCQF level 8)

**Unit code:** HX5P 34

**Superclass:** RK

**Publication date:** January 2018

**Source:** Scottish Qualifications Authority

**Version:** 01

### Unit purpose

This unit has been designed to allow the learner to develop their knowledge of forest harvesting systems, strategies and operational planning that will equip them to understand and apply the best practicable techniques appropriate for the harvesting of timber.

### Outcomes

On successful completion of the unit the learner will be able to:

- 1 Carry out site analysis to inform choice of harvesting systems.
- 2 Evaluate constraints on harvesting operations.
- 3 Evaluate harvesting machinery.
- 4 Create a harvesting plan.

### Credit points and level

2 Higher National Unit credit(s) at SCQF level 7: (16 SCQF credit points at SCQF level 7)

### Recommended entry to the unit

Entry to this unit is at the discretion of the centre, however, learners would benefit from having completed Higher National units *Forest Science* (HX5M 34) and *Establishment of Woodland* (F3YC 34). Learners may also benefit from undertaking unit *Forest Mensuration and Thinning Control* (HX5P 34) in conjunction with this unit.

## **Higher National Unit Specification: General information (cont)**

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### **Core Skills**

Opportunities to develop aspects of Core Skills are highlighted in the support notes for this unit specification.

There is no automatic certification of Core Skills or Core Skill components in this unit.

### **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.

### **Equality and inclusion**

This unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website [www.sqa.org.uk/assessmentarrangements](http://www.sqa.org.uk/assessmentarrangements).

## Higher 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 SQA.

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. Learners 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

Carry out site analysis to inform choice of harvesting systems.

#### Knowledge and/or skills

- ◆ Interpreting maps and aerial photographs
- ◆ Evaluating past management
- ◆ Plans for future management, including reference to the UK Forestry Standard and forest certification schemes
- ◆ Felling licence requirements
- ◆ Standing crop identification skills
- ◆ Harvesting methods and systems

### Outcome 2

Evaluate constraints on harvesting operations.

#### Knowledge and/or skills

- ◆ Site hazards (including topography and utilities)
- ◆ Environmental factors and constraints (including water and soil)
- ◆ Biodiversity constraints (including designated sites, etc)
- ◆ Social constraints (including recreation, neighbours, community)
- ◆ Historic environmental constraints (including designated sites and other features)
- ◆ Legislative constraints
- ◆ Plant health requirements, including where appropriate statutory plant health notices
- ◆ Forest certification (UKWAS) requirements

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### Outcome 3

Evaluate harvesting machinery.

#### Knowledge and/or skills

- ◆ Harvesting machinery:
  - motor-manual
  - harvester
  - forwarder
  - skidder
  - skyline
  - small scale machinery
- ◆ Crop surveys
- ◆ Crop sizes
- ◆ Terrain types
- ◆ Commercial and environmental factors
- ◆ Timber product specifications

### Outcome 4

Create a harvesting plan.

#### Knowledge and/or skills

- ◆ Harvesting work plan
- ◆ Objective and subjective planning skills
- ◆ Health and safety issues
- ◆ Site visits
- ◆ Work techniques

#### Evidence requirements for this unit

Learners will need to provide evidence to demonstrate their knowledge and/or skills across all outcomes by showing that they can:

#### Outcome 1

- ◆ Carry out a practical site analysis to include:
  - Analysis of Geographic Information System (GIS) data, site maps, stock maps and aerial photographs to correctly identify appropriate harvesting system(s) that could be adopted. Learners must justify their choice.
  - A statement on the past management of the area.
  - A statement on the future management of the area with reference to the required felling licence/felling plan.
  - A statement of crop species, age and size and harvesting system(s) to be placed on it.
  - A description of the site and its topographical constraints and access and placed on a map.

## Higher National Unit Specification: Statement of standards

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### Outcome 2

- ◆ Analyse the environmental factors and constraints of a site. Learners must analyse the site and relate findings on the ground to placing the squeeze points on the maps. The analysis must include using the maps to highlight the position of the water courses and riparian zones for the placing of protection systems, making use of water guidelines best practice
- ◆ Evaluate impacts of the planned harvesting operation(s) on the habitat including consideration of the constraints posed by protected flora and fauna (if any exist on the site)
- ◆ List the codes of practice that apply to habitats of protected flora and fauna (if any exist on the site), and sites of specific scientific interest
- ◆ Describe the role that statutory and non-statutory consultees and others have in the mitigation of constraints of the site
- ◆ Evaluate the social constraints in and around the harvesting site
- ◆ Evaluate the environmental considerations in relation to fuelling points for harvesting machinery and location of stacking areas
- ◆ Evaluate any plant health issues that may necessitate operational restrictions such as quarantine or decontamination of machinery

### Outcome 3

- ◆ Interpret data from a crop survey including tree plots, species, average tree Depth, Breadth and Height (DBH), top height, volume per hectare, basal area per hectare
- ◆ Evaluate harvesting machinery in relation to timber products, tree size and terrain. The timber products would include sawlogs, small roundwood, whole pole and whole tree
- ◆ Evaluate commercial and environmental factors of the appropriate harvesting machinery, ensuring that it is fit for purpose. The harvesting machinery would include harvester, motor manual, forwarder, skidder and skyline

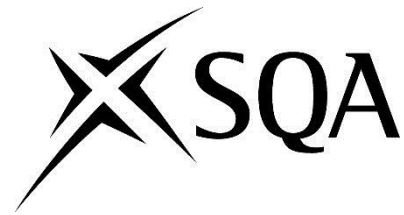
### Outcome 4

The learner is required to produce a harvesting plan. This must include interpretation of all evidence requirements from Outcomes 1, 2 and 3 to produce a structured forest harvesting project plan based on a given forest site. This must cover all of the steps required for the harvesting plan from creation to implementation. Learners must carry out site visits to establish the range of factors to create the harvesting plan.

Learners must draw conclusions, identify strengths and weaknesses and suggest actions which will inform future management of the given forest site. This plan must be integrated with a number of health and safety issues, environmental issues and social constraints.

Learners must consider the timescales and resources required to realise the project. Learners must identify the tasks and the work techniques relating to the felling, presentation and extraction of the timber on the given forest site.

Outcome 4 should be integrated with Outcomes 1, 2 and 3. Learners must produce a plan based on evidence gathered on a given or agreed site, which must be the same for each outcome.



## Higher National Unit Support Notes

**Unit title:** Forest Harvesting (SCQF level 8)

Unit support notes are offered as guidance and 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

This unit is intended to develop the learner's knowledge and understanding in relation to planning forest harvesting in a practical context.

The unit provides learners with an opportunity to take an in depth look at a forest and with the assistance of experienced forest managers produce detailed reports on forest harvesting, how it is planned and managed and how the management team adhere to the objectives set by the forest owner and the policies and objectives laid down by government agencies.

In Outcome 1 the requirement for appropriate planning in all forest operations will be emphasised and the steps necessary to plan a harvesting operation introduced. These steps include defining management objectives and meeting legal requirements (including felling licence regulations). Analysis of the harvesting site (location, terrain, access) and the forest crop to be harvested (tree species, tree sizes, total volume to be removed) must then be considered. Use can be made of aerial photos and digital mapping, but the importance of adequate on-site survey will be discussed and demonstrated.

The planning of forest harvesting operations must give due consideration to possible constraints on operations (Outcome 2). These may include hazards such as on site or adjacent utilities (power or telecommunications lines, gas or water pipes) or railway lines; water courses; environmental constraints (eg, designated sites such as SSSI); archaeological sites; recreation facilities or neighbouring landowners. Sources of information about these constraints will be explored, and the need for consultation with relevant bodies as part of the planning process will be discussed.

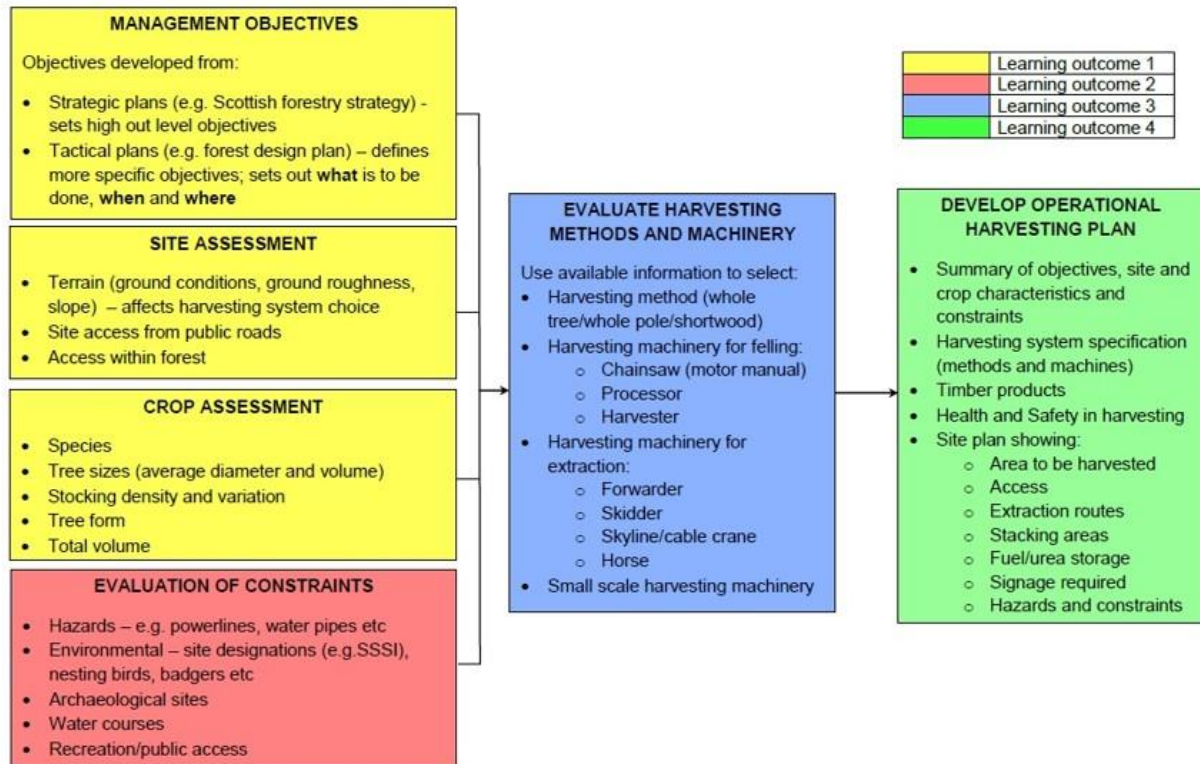
Once the management objectives, site conditions, crop characteristics and constraints have been evaluated, appropriate harvesting methods and machinery can be selected (Outcome 3). The advantages and disadvantages of different harvesting methods (whole tree/whole pole/shortwood) and machinery combinations must be considered in the light of the site and stand evaluation.

The final stage of the process of planning the harvesting operation will be to develop a harvesting plan (Outcome 4) which specifies: the methods and machinery to be used; the working plan (order of work, extraction routes, machine exclusion zones; stacking areas, access for timber haulage); timber products to be cut. Health and safety considerations must be included, including appropriate risk assessment and emergency planning. The harvesting plan will include a detailed site plan (map) showing the key information.

## Higher National Unit Support Notes (cont)

### Unit title: Forest Harvesting (SCQF level 8)

The way in which these elements are linked together is shown below:



### Guidance on approaches to delivery of this unit

The general approach with learners will be to prepare for assessment by way of site visits and lecture input supplemented by tutorials and suitable internet web site use. Health and safety considerations should be highlighted at all stages of delivery.

In Outcome 1 learners would benefit from the opportunity to discuss and apply site and stand assessment techniques in a forest setting. A group exercise could be used to enable learners to practise the necessary evaluation methods.

In Outcome 2 learners should be directed towards sources of information that can be used to identify possible site constraints (eg, existing long term forest plans, websites which map designated sites) and encouraged to research the relevant applicable best practice guidance (eg, UK Forestry Standard).

In Outcome 3 illustrated lecture sessions can be used to describe different harvesting methods and machines, with visits to harvesting sites providing an opportunity for learners to see some of these in operation. Use can be made of the enormous number of forest harvesting machinery videos that are available online.

In Outcome 4 learners will compile a harvesting plan for an agreed site. It would be extremely beneficial for learners to undertake a number of visits to active harvesting operational sites with the opportunity to discuss the day-to-day workings of a harvesting site with forest managers, and the operators involved and see infrastructure in place. Information they glean from their research will put them in good stead when they develop their own harvesting plan on the assessment site.

## Higher National Unit Support Notes (cont)

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### Open learning

This unit could be delivered via distance learning, provided learners are able to participate in the field-based practical work required. This could be through specific study days organised for distance learners at the delivery centre. Alternatively, learners could undertake the required field work independently using sites agreed with the unit tutor, and providing suitable evidence (eg, photos). The latter option is likely to be most appropriate for (but need not be restricted to) learners already working in the forestry, arboriculture or related sectors.

### Guidance on approaches to assessment of this unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

The evidence of achievement for Outcomes 1, 2, 3 and 4 could take the form of a holistic project.

It is suggested that this project is designed to give the learner the opportunity to create a harvesting plan based on a forest site. The scope of the assessment is such that they will have the confidence to apply their knowledge in the work place and/or during an industrial placement period as part of a management team, to take an in depth look at a forest they will get to know well and with the assistance of experienced forest managers produce detailed reports on forest harvesting and how it is planned and managed and how the management team adhere to the objectives set by the forest owner and the policies and objectives laid down by government agencies.

The project report could include the following sections and should be accompanied by appropriate maps:

- ◆ Site description
- ◆ Crop description
- ◆ Analysis of site access
- ◆ Analysis of site constraints
- ◆ Summary of harvesting plans, including reasoned choice of harvesting methods and machinery and clear harvesting site plan
- ◆ Health and safety requirements



## **Higher National Unit Support Notes (cont)**

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### **Opportunities for e-assessment**

E-assessment may be appropriate for some assessments in this unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the evidence requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at [www.sqa.org.uk/e-assessment](http://www.sqa.org.uk/e-assessment).

### **Opportunities for developing Core and other essential skills**

There is no automatic certification of Core Skills or Core Skills components in this unit, however there may be opportunities to develop the Core Skills of Communication, Numeracy and Working with Others at SCQF Level 5.

## History of changes to unit

Version	Description of change	Date

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## General information for learners

### Unit title: Forest Harvesting (SCQF level 8)

This section will help you decide whether this is the unit for you by explaining what the unit is about, what you should know or be able to do before you start, what you will need to do during the unit and opportunities for further learning and employment.

This unit, through active participation, will provide you with an understanding of forest harvesting planning and develop skills in selecting appropriate methods and systems for the harvesting of timber. On completion of this unit you will be able to play an active part as a forest management team member during an industrial placement period or in a practical role as part of a harvesting team. The unit is designed to provide you with a knowledge and understanding of the underlying principles for the efficient working of a forest management unit harvesting timber, under environmental constraints, the demands of open access and the timber supply to wood using industries. It will also develop your evaluation skills in matching what you observe with the stated forest objectives and policies.

The outcomes that you will acquire on completion of the unit are as follows:

Outcome 1 will make you aware of the various information sources for research such as maps and images that will help you understand site factors in terms of the environment, the crop type alongside social and operational requirements.

Outcome 2 will make you aware of the environmental constraints on harvesting operations and how they are managed.

Outcome 3 will give you an understanding of harvesting systems, market specifications and output compatible with crop size, terrain and machinery systems.

Outcome 4 will give you the opportunity to consolidate and apply the knowledge and skills you have developed in the previous three outcomes to create a comprehensive harvesting plan.

Overall, the knowledge and skills acquired in this unit will help you understand the factors that influence forest harvesting an area.

For learners already in employment this unit provides an opportunity to extend your existing knowledge and skills and lays a sound grounding for further study in forestry.

This unit may also give you the opportunity to develop Core Skills of *Working with Others*, *Numeracy*, and *Communication (Written)* to SCQF level 5 through the use of practical exercises and assignment submissions.

The unit will usually be assessed by a project assignment on a given or agreed forest harvesting site.