City & Guilds Level 2 Certificate, Extended Certificate and Diploma in Countryside and Environment (0076-02)

www.cityandguilds.com
September 2023
Version 2.3

Qualification handbook for centres
500/8573/6
500/8578/5
500/8574/8

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City & Guilds City & Guilds Level 2 Certificate, Extended Certificate and Diploma in Countryside and Environment (0076-02)

Qualification handbook for centres

Qualification title	Number	QAN
Level 2 Certificate in Countryside and Environment	0076-02	500/8573/6
Level 2 Extended Certificate in Countryside and Environment	0076-02	500/8578/5
Level 2 Diploma in Countryside and Environment	0076-02	500/8574/8

Version and date	Change detail	Section
V2.1 September 2017	• Added TQT and GLH details. • Removed QCF	Qualification at a glance Appendix 2, Guidance for delivery, unit summary
V2.2 September 2021	• Updated Unit 230 Undertake Tree Climbing and Rescue to reflect legislation and industry changes in the use of ropes to access trees (The Arboricultural Association Technical Guide 1)	Unit 230 learning outcomes 1 and 3, references.
V2.3 September 2023	• Change of font, removal of images and reformatting to address upload errors.	Throughout.

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Contents

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1 Introduction to the qualifications

This document contains the information that centres need to offer the following qualifications:

Qualification title and level	GLH	TQT	City & Guilds qualification number	Qualification accreditation number
Level 2 Certificate in Countryside and Environment	90	150	0076-02	500/8573/6
Level 2 Extended Certificate in Countryside and Environment	180	300	0076-02	500/8578/5
Level 2 Diploma in Countryside and Environment	360	600	0076-02	500/8574/8

Qualification Summary

Qualification title and level	Credits	Guided Learning Hours (GLH)
Level 2 Certificate in Countryside and Environment	15	90
Level 2 Extended Certificate in Countryside and Environment	30	180
Level 2 Diploma in Countryside and Environment	60	360

These qualifications meet the needs of learners in a centre-based environment who may wish to work within the countryside and environment industry or progress to further learning and/or training. These qualifications allow learners to develop underpinning knowledge whilst practising skills that could be used within employment in the Countryside and Environment industry. These qualifications replace the National Certificate in Environmental Conservation (0342) which expires on 31 August 2010 (QAN 100/1703/3).

These qualifications were developed in association with Lantra SSC, Landex and the industry.

Specialist Learning (SL)

Specialist Learning (SL) offers young people the opportunity to study a particular topic in more depth or broaden their studies through complementary learning. The NPTC Level 2 Certificate and Extended Certificate in Countryside and Environment have been approved as SL by the Environmental and Land-based Diploma DDP and Ofqual for the Higher Diploma in Environmental and Land-based Studies. They have been designed to:

- complement principal learning within the Higher Diploma Environmental and Land-based Studies
- provide a broad background understanding of the Environmental and Land-based sector and an introduction to the practical skills and knowledge required
- provide an awareness of the range of jobs and work settings in the Environmental and Land-based sector
- enable learners to make an informed assessment of their own aptitude for work in this sector and to make informed decisions about careers
- encourage learners to reach a level of knowledge and skills that will facilitate progress into further vocational learning or to potential employment in the sector
- introduce learners to the discipline of the working environment and to encourage mature attitudes to the community in general
- encourage learners to value continued learning and remain in the learning process
- allow learners to learn, develop and practise selected skills required for progression in the sector

- provide opportunities for progression to the Higher Diploma Environmental and Land-based and other related qualifications in the sector.

1.1 Qualification structure

Level 2 Certificate

To achieve the **Level 2 Certificate in Countryside and Environment**, learners must achieve 15 Credits from any combination of the units.

Unit accreditation number	City & Guilds unit number	Unit title	Credit value	Excluded combination of units (if any)
Optional units				
Y6009364	Unit 203	Participate in Providing Estate Maintenance	10	
D6009835	Unit 204	Tractor Driving	5	
L6009393	Unit 205	Introduction to Boundary Habitat Conservation	10	
M6009161	Unit 206	Introduction to Coastal Zone Management	10	
F6009164	Unit 207	Introduction to Countryside Access and Recreation	10	
Y6009168	Unit 208	Undertaking Ecological Surveys and Techniques	10	
Y6009400	Unit 211	Introduction to Game Management	10	
Y6009171	Unit 212	Introduction to Environmental Studies	10	
R6009380	Unit 213	Conservation and Improvement of British Habitats	10	
K6009403	Unit 222	Introduction to Animal and Plant Husbandry	10	

T6009808	Unit 224	Understand the Basic Principles of Plant Science	5	
H6009819	Unit 225	Understand the Basic Principles of Soil Science	5	
Y6010398	Unit 229	Undertake tree felling operations	10	
D6010399	Unit 230	Undertake tree climbing and pruning operations	10	
R6011677	Unit 231	Carry out ground-based arboricultural operations	10	
K6010437	Unit 232	Introduction to fish biology	5	
J6010445	Unit 233	Introduction to fish health	5	
K6009160	Unit 234	Introduction to agriculture and conservation	10	

Level 2 Extended Certificate

To achieve the **Level 2 Extended Certificate in Countryside and Environment**, learners must achieve 30 Credits from any combination of the units below.

Unit accreditation number	City & Guilds unit number	Unit title	Credit value	Excluded combination of units (if any)
Optional units				
Y6009364	Unit 203	Participate in Providing Estate Maintenance	10	
D6009835	Unit 204	Tractor Driving	5	
L6009393	Unit 205	Introduction to Boundary Habitat Conservation	10	
M6009161	Unit 206	Introduction to Coastal Zone Management	10	
F6009164	Unit 207	Introduction to Countryside Access and Recreation	10	
Y6009168	Unit 208	Undertaking Ecological Surveys and Techniques	10	
D6009169	Unit 209	Understanding Ecology of Trees, Woods and Forests	10	
K6009398	Unit 210	Introduction to Freshwater and Wetland Conservation	10	
Y6009400	Unit 211	Introduction to Game Management	10	
Y6009171	Unit 212	Introduction to Environmental Studies	10	
R6009380	Unit 213	Conservation and Improvement of British Habitats	10	

F6009794	Unit 214	Introduction to Land-based Workshop Practice	10	
K6009594	Unit 215	Introduction to the Principles of Land-based Machinery	5	
A6009406	Unit 219	Introduction to Practical Forestry Skills	10	
F6009407	Unit 220	Introduction to Urban Habitat Ecology	10	
K6009403	Unit 222	Introduction to Animal and Plant Husbandry	10	
T6009808	Unit 224	Understand the Basic Principles of Plant Science	5	
H6009819	Unit 225	Understand the Basic Principles of Soil Science	5	
R6009167	Unit 228	Introductory Deer Management	5	
Y6010398	Unit 229	Undertake tree felling operations	10	
D6010399	Unit 230	Undertake tree climbing and pruning operations	10	
R6011677	Unit 231	Carry out ground-based arboricultural operations	10	
K6010437	Unit 232	Introduction to fish biology	5	
J6010445	Unit 233	Introduction to fish health	5	
K6009160	Unit 234	Introduction to agriculture and conservation	10	

Level 2 Diploma

To achieve the **Level 2 Diploma in Countryside and Environment** learners need to achieve 20 credits from the mandatory group and 40 credits from the optional group. A total of 60 credits must be achieved.

Unit accreditation number	City & Guilds unit number	Unit title	Credit value	Excluded combination of units (if any)
Mandatory group				
H6009335	Unit 201	Undertake Work Related Experience in the Land-based Industries	10	
F6009357	Unit 202	Environmental and Land-based Business	10	
Optional group				
Y6009364	Unit 203	Participate in Providing Estate Maintenance	10	
D6009835	Unit 204	Tractor Driving	5	
L6009393	Unit 205	Introduction to Boundary Habitat Conservation	10	
M6009161	Unit 206	Introduction to Coastal Zone Management	10	
F6009164	Unit 207	Introduction to Countryside Access and Recreation	10	
Y6009168	Unit 208	Undertaking Ecological Surveys and Techniques	10	
D6009169	Unit 209	Understanding Ecology of Trees, Woods and Forests	10	
K6009398	Unit 210	Introduction to Freshwater and Wetland Conservation	10	

Y6009400	Unit 211	Introduction to Game Management	10	
Y6009171	Unit 212	Introduction to Environmental Studies	10	
R6009380	Unit 213	Conservation and Improvement of British Habitats	10	
F6009794	Unit 214	Introduction to Land-based Workshop Practice	10	
K6009594	Unit 215	Introduction to the Principles of Land-based Machinery	5	
J6009215	Unit 216	Undertake Freshwater Sport Fishery Management	10	
T6009825	Unit 217	Introduction to Game and Coarse Angling	10	
T6009405	Unit 218	Introduction to Pest and Predator Control	10	
A6009406	Unit 219	Introduction to Practical Forestry Skills	10	
F6009407	Unit 220	Introduction to Urban Habitat Ecology	10	
J6009408	Unit 221	Introduction to Waste and Pollution Control and Management	10	
K6009403	Unit 222	Introduction to Animal and Plant Husbandry	10	
T6009596	Unit 223	Introduction to Land-based Machinery Operations	10	
T6009808	Unit 224	Understand the Basic Principles of Plant Science	5	

H6009819	Unit 225	Understand the Basic Principles of Soil Science	5	
T6009968	Unit 226	Establish and Maintain Plants Outdoors	10	
A6009356	Unit 227	Presentation and Service for Retailing in the Land-based Sector	10	
R6009167	Unit 228	Introductory Deer Management	5	
Y6010398	Unit 229	Undertake tree felling operations	10	
D6010399	Unit 230	Undertake tree climbing and pruning operations	10	
R6011677	Unit 231	Carry out ground-based arboricultural operations	10	
K6010437	Unit 232	Introduction to fish biology	5	
J6010445	Unit 233	Introduction to fish health	5	
K6009160	Unit 234	Introduction to agriculture and conservation	10	

1.2 Opportunities for progression

On completion of these qualifications learners may progress into employment or to the following City & Guilds qualifications:

- Level 3 Certificate, Subsidiary Diploma, Diploma and Extended Diploma in Countryside Management
- Level 2 or 3 qualifications in Work-based Environmental Conservation
- Other related qualifications

1.3 Qualification support materials

City & Guilds also provides the following publications and resources specifically for these qualifications:

Description	How to access
Assignment guide	www.cityandguilds.com
Marking guide	information@cityandguilds.com
Information Sheets	www.cityandguilds.com
Fast track approval forms/generic fast track approval form	www.cityandguilds.com

2 Centre requirements

This section outlines the approval processes for Centres to offer these qualifications and any resources that Centres will need in place to offer the qualifications including qualification-specific requirements for Centre staff.

Centres already offering the Level 2 National Certificate in Environmental Conservation (0342-02)

Centres approved to offer the qualification Level 2 National Certificate in Environmental Conservation (0342-02) may apply for approval for the new Level 2 Certificate, Extended Certificate and Diploma in Countryside and Environment using the **fast track approval form**, available from the City & Guilds website.

Centres may apply to offer the new qualifications using the fast track form

- providing there have been no changes to the way the qualifications are delivered, and
- if they meet all of the approval criteria specified in the fast track form guidance notes.

Fast track approval is available for 12 months from the launch of the qualification. After this time, the qualification is subject to the **standard** Qualification Approval Process. It is the centre's responsibility to check that fast track approval is still current at the time of application.

New centres must apply for centre and qualification approval. Further information on this process is available on the City & guilds website.

Existing City & Guilds centres that do not offer the Level 2 National Certificate in Environmental Conservation will need to get specific qualification approval to run these qualifications (contact your City & Guilds Local Office).

2.1 Resource requirements

Human resources

Staff delivering these qualifications must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be technically competent in the areas for which they are delivering training and/or have experience of providing training. This knowledge must be at least to the same level as the training being delivered
- have recent relevant experience in the specific area they will be assessing
- be occupationally knowledgeable in the area of countryside and environment for which they are delivering training. This knowledge must be at least to the same level as the training being delivered
- have credible experience of providing training.

Centre staff may undertake more than one role, eg tutor and assessor or internal verifier, but must never internally verify their own assessments.

Assessors and internal verifiers

The centre must provide Assessor personnel who must be occupationally competent in the industry either qualified to at least level 2 and/or have current experience of working in the industry at this level.

The centre must provide Internal Quality Assurance personnel who must be occupationally competent in the land-based sector either qualified to at least level 2 and/or have current experience of working in the industry at this level.

Assessors/Internal Quality Assurance personnel may hold relevant qualifications such as D32/33/34 or A1/V1 or TAQA however they are not a mandatory requirement for this qualification. They should have had formal training in assessment/IQA, which may be the qualifications above, or other training that allows the assessor to demonstrate competence in the practice of assessment/IQA. This training may be carried out in-house or with an external agency.

TAQA qualifications are considered very appropriate as Continuing Professional Development (CPD) or as best practice standards for new centre staff to work towards.

Continuing professional development (CPD)

Centres are expected to support their staff in ensuring that their knowledge remains current of the occupational area and of best practice in delivery, mentoring, training, assessment and verification, and that it takes account of any national or legislative developments.

2.2 Learner entry requirements

There are no formal entry requirements for learners undertaking these qualifications. However, centres must ensure that learners have the potential and opportunity to gain the qualifications successfully.

As part of the assessment for the Level 2 Diploma qualification, learners must have access to a work setting/placement for the work experience unit.

2.3 Age restrictions

These qualifications have been approved/accredited for learners aged pre-16, 16-18, 18+ and 19+ learners. However, there are no age limits attached to learners undertaking the qualification unless this is a legal requirement of the process or the environment.

3 Course design and delivery

Initial assessment and induction

Centres will need to make an initial assessment of each learner prior to the start of their programme to ensure they are entered for an appropriate type and level of qualification.

The initial assessment should identify:

- any specific training needs the learner has, and the support and guidance they may require when working towards their qualifications. This is sometimes referred to as diagnostic testing.
- any units the learner has already completed, or credit they have accumulated which is relevant to the qualifications they are about to begin.

City & Guilds recommends that centres provide an induction programme to ensure the learner fully understands the requirements of the qualifications they will work towards, their responsibilities as a learner, and the responsibilities of the centre. It may be helpful to record the information on a learning contract.

3.1 Recommended delivery strategies

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualifications before designing a course programme.

Centres may design course programmes of study in any way which:

- best meets the needs and capabilities of their learners
- satisfies the requirements of the qualifications.

When designing and delivering the course programme, centres might wish to incorporate other teaching and learning that is not assessed as part of the qualifications. This might include the following:

- functional skills
- personal learning and thinking skills (PLTS)

Where applicable, this could involve enabling the learner to access relevant qualifications covering these skills.

4 Assessment

4.1 Summary of assessment methods

For these qualifications, learners will be required to complete the following assessments:

- **one** assignment for **each** unit

City & Guilds provides the following assessments:

- Assignment guide containing assignments for each unit

Time constraints

The following time constraints must be applied to the assessment of these qualifications:

- All assignments must be completed and assessed within the learner's period of registration. Centres should advise learners of any internal timescales for the completion and marking of individual assignments.

4.2 Assignments

The assignment guide for these qualifications is available to download from www.nptc.org.uk**.**

4.3 Recognition of prior learning (RPL)

Recognition of Prior Learning (RPL) recognises the contribution a person's previous experience could contribute to a qualification. RPL is allowed and is also sector specific.

4.4 Resubmission of Assignments

Centres are advised to adopt the following policy on the re-submission of work:

Learners who fail an assignment on the formal (summative) submission, or who would like the opportunity to improve their grade, may re-submit once only and may then achieve either a Pass, Merit or Distinction as appropriate. An appropriate time period between formal submission and re-submission should be set by the centre. Multiple re-submissions are not permitted. Learners who fail to hand in work on the formal submission date, where there is no legitimate reason, should be capped to a maximum of a Pass grade only at the re-submission stage. It is at the discretion of the centre to set informal (formative) submission dates, if appropriate, and a formal submission date.

Units

Summary of units

City & Guilds unit number	Title	QCF unit number	Credits
201	Undertake Work Related Experience in the Land-based Industries	H6009335	10
202	Environmental and Land-based Business	F6009357	10
203	Participate in Providing Estate Maintenance	Y6009364	10
204	Tractor Driving	D6009835	5
205	Introduction to Boundary Habitat Conservation	L6009393	10
206	Introduction to Coastal Zone Management	M6009161	10
207	Introduction to Countryside Access and Recreation	F6009164	10
208	Undertaking Ecological Surveys and Techniques	Y6009168	10
209	Understanding Ecology of Trees, Woods and Forests	D6009169	10
210	Introduction to Freshwater and Wetland Conservation	K6009398	10
211	Introduction to Game Management	Y/600/9400	10
212	Introduction to Environmental Studies	Y6009171	10
213	Conservation and Improvement of British Habitats	R6009380	10
214	Introduction to Land-based Workshop Practice	F6009794	10
215	Introduction to the Principles of Land-based Machinery	K6009594	5
216	Undertake Freshwater Sport Fishery Management	J6009215	10
217	Introduction to Game and Coarse Angling	T6009825	10
218	Introduction to Pest and Predator Control	T6009405	10
219	Introduction to Practical Forestry Skills	A6009406	10
220	Introduction to Urban Habitat Ecology	F6009407	10
221	Introduction to Waste and Pollution Control and Management	J6009408	10
222	Introduction to Animal and Plant Husbandry	K6009403	10
223	Introduction to Land-based Machinery Operations	T6009596	10
224	Understand the Basic Principles of Plant Science	T6009808	5
225	Understand the Basic Principles of Soil Science	H6009819	5
226	Establish and Maintain Plants Outdoors	T6009968	10
227	Presentation and Service for Retailing in the Land-based Sector	A6009356	10

228	Introductory Deer Management	R6009167	5
229	Undertake tree felling operations	Y6010398	10
230	Undertake tree climbing and pruning operations	D6010399	10
231	Undertake ground-based arboricultural operations	R6011677	10
232	Introduction to fish biology	K6010437	5
233	Introduction to fish health	J6010445	5
234	Introduction to agriculture and conservation	K6009160	10

Certification/grading modules

City & Guilds unit number	Title
901	Certification module for Level 2 Certificate in Countryside and Environment – pass grade
902	Certification module for Level 2 Certificate in Countryside and Environment - merit grade
903	Certification module for Level 2 Certificate in Countryside and Environment - distinction grade
904	Certification module for Level 2 Extended Certificate in Countryside and Environment - pass grade
905	Certification module for Level 2 Extended Certificate in Countryside and Environment - merit grade
906	Certification module for Level 2 Extended Certificate in Countryside and Environment - distinction grade
907	Certification module for Level 2 Diploma in Countryside and Environment - pass grade
908	Certification module for Level 2 Diploma in Countryside and Environment - merit grade
909	Certification module for Level 2 Diploma in Countryside and Environment - distinction grade
922	Certification module for Level 2 Certificate in Countryside and Environment – distinction* grade
923	Certification module for Level 2 Extended Certificate in Countryside and Environment – distinction* grade
924	Certification module for Level 2 Diploma in Countryside and Environment – distinction* grade

5 Registration and Certification

The Level 2 Certificate, Extended Certificate and Diploma in Countryside and Environment qualifications have been grouped into one programme for registration.

Tutors and Examination Officers should ensure that learners are registered onto 0076-02 and that all 0076-02 documentation for teaching and administration with City & Guilds is used.

When learners' results are submitted to City & Guilds, centres should also submit the relevant Certificate, Extended Certificate and Diploma component, according to which units the learner has achieved, so that the appropriate certificate is generated. The overall grade can be calculated using the formula in the assignment guide.

Please note: There are four certification/grading modules for each of the qualifications which differentiates the four grades – pass, merit, distinction and distinction*. Once the overall grade for the assignments has been calculated, the correct certification/grading module needs to be indicated on the results entry.

For example, if a learner achieves the Level 2 Certificate in Conservation and Environment at an overall merit grade, then the certification module 902 needs to be submitted. Please see the Rules of Combination below or the City & Guilds catalogue.

Level 2 Certificate in Countryside and Environment QAN 500/8573/6	
Rules for achievement of qualification	15 credits from (203 **–** 208), (211 –213), 222, (224 – 234) Plus 901 for certification at pass grade

Level 2 Certificate in Countryside and Environment QAN 500/8573/6	
Rules for achievement of qualification	15 credits from (203 **–** 208), (211 –213), 222, (224 – 234) Plus 902 for certification at merit grade

Level 2 Certificate in Countryside and Environment QAN 500/8573/6	
Rules for achievement of qualification	15 credits from (203 **–** 208), (211 –213), 222, (224 – 234) Plus 903 for certification at distinction grade

Level 2 Certificate in Countryside and Environment QAN 500/8573/6	
Rules for achievement of qualification	15 credits from (203 **–** 208), (211 –213), 222, (224 – 234) Plus 922 for certification at distinction* grade

Level 2 Extended Certificate in Countryside and Environment QAN 500/8578/5	
Rules for achievement of qualification	30 credits from (203 – 215), (219 – 220), 222, 224-225, (228 – 234) Plus 904 for certification at pass grade

Level 2 Extended Certificate in Countryside and Environment QAN 500/8578/5	
Rules for achievement of qualification	30 credits from (203 – 215), (219 – 220), 222, 224-225, (228 – 234) Plus 905 for certification at merit grade

Level 2 Extended Certificate in Countryside and Environment QAN 500/8578/5	
Rules for achievement of qualification	30 credits from (203 – 215), (219 – 220), 222, 224-225, 228(228 – 234) Plus 906 for certification at distinction grade

Level 2 Extended Certificate in Countryside and Environment QAN 500/8578/5	
Rules for achievement of qualification	30 credits from (203 – 215), (219 – 220), 222, 224-225, 228(228 – 234) Plus 923 for certification at distinction* grade

Level 2 Diploma in Countryside and Environment QAN 500/8574/8	
Rules for achievement of qualification	20 credits from (201 – 202), plus a minimum of 40 credits from (203 – 234) Plus 907 for certification at pass grade

Level 2 Diploma in Countryside and Environment QAN 500/8574/8	
Rules for achievement of qualification	20 credits from (201 – 202), plus a minimum of 40 credits from (203 – 234) Plus 908 for certification at merit grade

Level 2 Diploma in Countryside and Environment QAN 500/8574/8	
Rules for achievement of qualification	20 credits from (201 – 202), plus a minimum of 40 credits from (203 – 234) Plus 909 for certification at distinction grade

Level 2 Diploma in Countryside and Environment QAN 500/8574/8	
Rules for achievement of qualification	20 credits from (201 – 202), plus a minimum of 40 credits from (203 – 234) Plus 924 for certification at distinction* grade

- Learners must be registered at the beginning of their course. Centres should submit registrations using Walled Garden or Form S (Registration), under scheme/complex 0076-02.
- When assignments have been successfully completed results should be submitted on Walled Garden or Form S (Results submission). One of the certification/grading modules 901 to 909 or 922 to 924 need to be submitted to generate the appropriate certificate and grade. Centres should note that results will not be processed by City & Guilds until verification records are complete
- Learners achieving one or more assessment components will receive a Certificate of Unit Credit listing the assessment components achieved. Learners achieving the number and combination of assessment components required to meet a defined Rule of Combination will, in addition, be issued with a certificate. Centres must submit a certification/grading component to allow this to happen.

Full details on the procedures for all City & Guilds qualifications registered and certificated through City & Guilds can be found on the City & Guilds on-line catalogue.

Unit 201 Undertake Work Related Experience in the Land-based Industries

Level: 2

Credit value: 10

Unit aim

The aim of this unit is to give learners the skills needed to identify, participate in and review work experience in a land-based environment. The unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know the range and scope of job roles within an environmental and land-based industry
2. Be able to use relevant documents and skills relating to work experience
3. Be able to plan and review self development during work experience
4. Be able to report on the work experience

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

n/a

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 201 Undertake Work Related Experience in the Land-based Industries

Outcome 1 Know the range and scope of job roles within an environmental and land-based industry

Assessment Criteria

The learner can:

1. Describe different **types of jobs** within an environmental and land-based industry
2. Describe the **skills and qualifications** required for different types of jobs within an environmental and land-based industry

Unit content

Types of jobs

Types of jobs relevant to the industry: managerial, supervisory, team worker, trainee, volunteer, common job titles within the relevant industry, main duties and responsibilities

Skills needed to fulfil duties and responsibilities of appropriate jobs: job specific, vocational and personal

Skills and qualifications

Types of qualifications available to the industry, e.g. GCSE and A level, the Diploma(including Functional Skills), Apprenticeships (including Work-based Learning qualifications), Foundation Learning (Entry Level and Level 1), standalone/industry specific vocational, e.g. Centre-based (City & Guilds NPTC, Edexcel and others), practical competence based e.g. Certificates of Competence, other

Progression pathways from trainee or team worker positions to supervisory and management posts. Skills, qualifications and experience required to achieve career progression

Evaluate career and progression opportunities: advantages and disadvantages of identified pathways, suitability to personal interests, skills and qualifications, role of work experience in preparing for a selected career

Skills valued by employers: commitment and reliability, time management, people skills, confidentiality and discretion

Unit 201 Undertake Work Related Experience in the Land-based Industries

Outcome 2 Be able to use relevant documents and skills relating to work experience

Assessment Criteria

The learner can:

1. Locate three advertisements for jobs from **different sources** available within the environmental and land-based industry
2. Produce an **application** for work experience in the environmental and land-based sector
3. **Prepare for an interview** for work experience
4. **Undertake an interview** for work experience

Unit content

Different sources

Locate three advertisements from for example trade magazines, websites, employer approaches to the centre, local paper, Countryside Jobs Service

Application

Suitable work experience position based on existing skills, experience, qualifications, development of skills and experience to achieve future employment goals
Personal details, education and training, professional membership, training, employment history, qualifications held, skills and general information, declarations

Prepare for an interview

Interview preparation: research the business and job role, suitable dress and personal presentation, information to find out and suitable questions to ask

Undertake an interview

Interview performance: attend punctually and dressed appropriately, answering questions, completion of other tests (e.g. practical, aptitude), and reflection on interview performance

Unit 201 Undertake Work Related Experience in the Land-based Industries

Outcome 3 Be able to plan and review self development during work experience

Assessment Criteria

The learner can:

1. **Review own skills and experience** against the requirements for a specific industry
2. Prepare a **self development plan** for work experience
3. **Review** self development plan during and after work experience

Unit content

Review own skills and experience

Current skills and experience compared with those required for the job, identify training and development needs

Self development plan

New skills, knowledge, understanding, experience, development of existing knowledge and skills, training needed

Review

Skills, knowledge, understanding and experience that have been developed during work experience, impact on technical ability to perform the job role, work as a member of a team, future employability, future employment ambitions, further training and development

Unit 201 Undertake Work Related Experience in the Land-based Industries

Outcome 4 Be able to report on the work experience

Assessment Criteria

The learner can:

1. **Gather and prepare evidence** during the work experience
2. **Present information** to others on work experience

Unit content

Gather and prepare evidence

Position within the organisation structure, job description of work role, working practices, health and safety, daily work routine, diary of work activities, report from work experience provider

Present information

Written or oral report on the work experience, name of work experience provider, nature of the organisation (type of business, products or services), job role, health and safety, skills and knowledge developed

Unit 201 Undertake Work Related Experience in the Land-based Industries

Notes for guidance

Learners on centre-based courses should have experience of the type of work that they hope to do and of the expectations of potential future employers. Some level 2 learners are likely to already have experience of working in the land-based and environmental industries, so this unit seeks to provide new experience opportunities for these learners.

This unit should be undertaken in a real business environment relevant to the subject interest of the learner but work experience may be gained by a number of routes, e.g. as part of an industrial placement whilst within the programme, whilst working on a planned daily or weekly basis on the centre's commercial and/or educational facilities, whilst undertaking voluntary work within the industry, or as a member of a group of learners invited to carry out practical work on a suitable business.

Any Act or legislation that is sector specific should be adhered to. This includes duty of care if working with animals.

Learners should complete the equivalent of 4 weeks (or 150 hours) work experience to achieve this unit. Centres should be mindful of their responsibilities for ensuring that work placements have appropriate supervision, insurance and health and safety policies in place and that learners have access to appropriate support whilst on placement.

In Outcome 1, learners will explore the different job roles, responsibilities and job titles commonly associated with them in their specialist sector. This background understanding is likely to require some classroom teaching but learners should be encouraged to explore the range of employment opportunities within their specialist sector. It would be appropriate for employers to be invited to outline to learners their expectations in the workplace. Learners will be required to consider the skills and qualifications that are required for appropriate jobs, and should be encouraged to think about the skills and qualifications that they may need to acquire to achieve their employment ambitions. This should also help them to identify a suitable work experience placement.

Outcome 2 involves learners undertaking the process of applying for work experience. They will need to locate suitable job adverts but can be supported by centres suggesting suitable placements. When applying for work experience learners should produce, as a minimum, a detailed curriculum vitae and letter of application using a computer. Learners may need to be given supported workshop time on computers to develop these documents. Before attending a work experience interview, it would be appropriate for learners to role play an interview and be given feedback on their interview technique. After attending an interview, they should reflect on their performance and how they could improve their effectiveness.

In Outcome 3, learners will review their existing skills, knowledge and experience against those required for a specific job role and how they will seek to develop these during the work experience. This development will be reviewed at a mid-point during the work experience and at the end, when they will reflect on how the work experience has helped to develop their future employability in line with their employment ambitions. Whilst learners are on work experience, and especially if this is an extended placement away from the centre, it is important that they have access to and support available from tutors.

Outcome 4 requires learners to gather basic evidence on their work experience, including the organisation name, main products or services, organisation staffing structure and their role within the

organisation. The learner does not need to keep a diary of all duties undertaken each day but should produce a detailed description of the usual work routine and supplement this with a diary of any additional tasks, events, activities or items that represent learning opportunities. They should also note how health and safety of staff and, if relevant, customers is managed in the workplace. A feedback report from the work experience provider will form part of the evidence for this outcome. The final report on work experience could be presented in written form or as a presentation to tutors and other learners. As a minimum, it should include the range listed. It would be appropriate to include the final review and reflection on work experience from Outcome 3 in this report.

Unit 202 Environmental and Land-based Business

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of business within the environmental and land-based sector, and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or to further education and training.

The learner will investigate the structure of one industry within the land-based sector and the principal organisations within it. They will explore regulations and legislation relevant to that industry. The learner will develop the knowledge of common business operations and the simple administrative tasks.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know an industry within the environmental and land-based sector
2. Know the relevant legislation and codes of practice within the environmental and land-based sector
3. Know common business operations
4. Know how to carry out simple administrative tasks

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

n/a

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 202 Environmental and Land-based Business

Outcome 1 Know an industry within the environmental and land-based sector

Assessment Criteria

The learner can:

1. Describe the **structure** of one industry within the environmental and land-based sector covering:
    - size
    - employment
    - main activities
    - geographical influence
    - economic contribution
2. Identify the **principal organisations and trade associations** within an industry in the environmental and land-based sector.

Unit content

Structure

Features and characteristics of the industry, different types of businesses and organisations and the type of goods and services they provide, size of these businesses/organisations e.g. numbers employed, regional differences, allied industries (what they are, the goods and services they supply and the role they play), trends and issues currently affecting the industry

Principal organisations and trade associations

Roles and aims of key selected organisations in the industry e.g. statutory, Department for Environment, Food and Rural Affairs ((Defra) England), Welsh Assembly Government (Wales), Scottish Executive Environment and Rural Affairs Department (SEERAD), or Department of Agriculture and Rural Affairs (DARD (Northern Ireland), Health and Safety Executive, Department of Trade and Industry (DTI), Environment Agency, Food Standards Agency, non-governmental, major land-owning or representative e.g. The Royal Society for the Prevention of Cruelty to Animals (RSPCA), British Veterinary Association (BVA), Royal Horticultural Society (RHS), Institute of Groundsmanship (IOG), Lantra Sector Skills Council, British Horse Society (BHS), National Farmers Union (NFU), National Trust, Natural England

Unit 202 Environmental and Land-based Business

Outcome 2 Know the relevant legislation and codes of practice within the environmental and land-based sector

Assessment Criteria

The learner can:

1. Identify the main United Kingdom or European **legislation and codes of practice** relating to one industry within the environmental and land-based sector
2. Identify key requirements of current **employment law** on the environmental and land-based sector

Unit content

Legislation and codes of practice

United Kingdom legislation: consideration of the main relevant current legislation relating to an industry in the land and environment sector for example Agriculture Tenancies Act (1995), Animal Health Act (2002), Welfare of Animal (Transport) Order 2006, Animal Welfare Act 2006, Environment Protection Act 1990 (as amended 1995), Control of Pesticides Regulations 1986 (COPR), Riding Establishments Act 1970, Horse Passports (England) Regulations 2004, Control of Dogs Order 1992, Dangerous Dogs Act 1991(as amended 1997), codes of practice e.g. welfare of farm or companion animals
European legislation: relevant European directives e.g. relating to employment, the environment and the specific industry in the land and environment sector

Employment law

The main relevant current legislation relating to employment e.g. Health and Safety at Work etc Act 1974, Control of Substances Hazardous to Health Regulations (2002) (COSHH), Working Time Regulations 1998 (as amended 2002), Disability Discrimination Acts 1995 (as amended 2005), Employment Act 2002, National Minimum Wage Act 1998, Race Relations Act 1976 (as amended 2003), Sex Discrimination Act 1975

Unit 202 Environmental and Land-based Business

Outcome 3 Know common business operations

Assessment Criteria

The learner can:

1. Describe how **common IT software** can be used in everyday business operations
2. State the purpose and operation of **common business tasks**
    - financial and banking
    - marketing
    - administrative tasks

Unit content

Common IT software

Examples of business uses of: word processor (e.g. letters, notices), spreadsheets (e.g. records, timesheets), database (e.g. records), graphics (e.g. advertisements, posters), e-mails

Common business tasks

Financial and banking: taking payments by cash, cheque, debit card and credit card, ordering procedure for supplies, invoices, types of bank account (current, savings), loans, overdraft, methods of payment (debit card, cheques, bank giro credit, standing order, direct debit)
Marketing: ways to promote a business (advertisements, promotional events, referral / word of mouth, importance of customer care), preparation of promotional materials
Administrative tasks: file documents, complete simple records (e.g. production, customers), check stock levels and complete stock control records, communicate using written and electronic media, importance of security and confidentiality of business records

Unit 202 Environmental and Land-based Business

Outcome 4 Know how to carry out simple administrative tasks

Assessment Criteria

The learner can:

1. Use appropriate methods to **prepare, present, sort and retrieve information**
2. Carry out simple **accounting and administrative tasks** appropriate to the business

Unit content

Prepare, present, sort and retrieve information

Use of IT and paper filing systems, completion of simple business records, preparation of business documents (e.g. letters, advertisements)

Accounting and administrative tasks

Completion of orders, invoices, cheques, conduct stock check and complete stock records

Unit 202 Environmental and Land-based Business

Notes for guidance

This unit can be applied to any of the industries in the environmental and land-based sector, and delivery should be specifically tailored to the vocational interests of learners and the qualification being studied. They will learn about the industry and legal context in which businesses in the chosen sector takes place, and important operations necessary to manage a business.

In Outcome 1, learners will study the structure of their industry. They may be encouraged to represent graphically the range of businesses and their products/services, and also the ancillary businesses on which the primary businesses depend. They could relate these ideas to a specific business, whilst also investigating the range of businesses found locally and nationally. Learners will also find out about the principal organisations and trade associations concerned with their industry, and will investigate the roles and impact of selected organisations. They will investigate some of the key trends and issues facing their industry and how it is responding. Delivery of this outcome would be enriched by speakers from selected organisations.

Outcome 2 examines the UK and European legal framework affecting businesses in the particular land-based industry. Learners are not expected to become legal experts, but to develop an awareness of the main pieces of legislation and how they impact on business in their industry. Delivery of this outcome could be enhanced by guest speakers with experience of running a business or becoming self employed for the first time.

In Outcome 3, learners will identify how common IT software can be used to perform a range of everyday business operations. Some of these are common to all businesses (e.g. writing letters), but tutors should ensure that examples are vocationally relevant to the subject area of the learners. It would be helpful for learners to have the opportunity to practice some of the IT skills to carry out simulated business tasks. Learners should find out about day-to-day business activities involving finance and banking, but will not be expected to learn about accounts. It would help learners to have the opportunity to study a range of records (financial and non-financial) that are kept in a specific business, and how these are maintained and used.

Outcome 4 links closely with Outcome 3 and gives learners the opportunity to understand and engage in operations and tasks identified previously. This should include preparing a range of business outputs using the IT applications listed. These could relate to other items in the content, e.g. advertisements, posters, specific records appropriate to businesses in their industry. They will also complete examples of paper based records and ensure that both IT and paper records are filed appropriately.

References

Books

Carysforth, C. Neild, M. 2006. *BTEC First Business*. 2nd ed. Oxford: Butterworth Heinemann.
Canwell, D., Sutherland, J. 2006. *BTEC First Business*. Cheltenham: Nelson Thornes.

Websites

www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.bized.ac.uk	Business Education Websites
www.hse.gov.uk	*Health and Safety Executive*
www.dti.gov.uk	*Department for Trade and Industry*
www.environment-agency.gov.uk	*Environment Agency*
www.food.gov.uk	*Food Standards Agency*
www.rspca.org.uk	*Royal Society for the Prevention of Cruelty to Animals*
www.bva.co.uk	*British Veterinary Association*
www.rhs.org.uk	*Royal Horticultural Society*
www.iog.org.uk	*Institute of Groundsmanship*
www.lantra.co.uk	*Lantra Sector Skills Council*
www.bhs.org.uk	*British Horse Society*
www.nfuonline.com	*National Farmers Union*
www.nationaltrust.org.uk	*The National Trust*
www.naturalengland.org.uk	*Natural England*

Unit 203 Participate in Providing Estate Maintenance

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of estate skills and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The aim of this unit is allow learners from a range of land-based disciplines to develop the skills and knowledge to maintain boundaries, surfaces or habitats.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to select, transport and use a range of hand tools and equipment for estate maintenance
2. Be able to maintain estate boundaries
3. Be able to maintain surfaces or habitats
4. Know how to work safely and minimise environmental damage

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU2.2 Maintain good standards of health and safety for self and others
CU20.1 Maintain structures and surfaces
CU20.2 Repair structures and surfaces
CU22.1 Construct, maintain and repair boundaries
CU23.1 Construct, maintain and repair paths

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SCC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 203 Participate in Providing Estate Maintenance

Outcome 1 Be able to select, transport and use a range of hand tools and equipment for estate maintenance

Assessment Criteria

The learner can:

1. Select appropriate **tools and equipment** for specific **estate maintenance tasks**
2. **Lift tools and equipment safely** using appropriate techniques
3. **Transport and use tools** and equipment **safely**
4. **Maintain and store** tools and equipment according to instructions

Unit content

Tools and equipment

Selection of appropriate tools and equipment (hammer, saw, spade, shovel, pickaxe, post driver, wire strainers, hoe, rake, fork, secateurs, shears, power tools)

Estate maintenance tasks

Constructing, maintaining and mending boundaries, structures and surfaces

Lift tools and equipment safely

Use of appropriate safe lifting techniques, in line with manual handling guidelines and Manual Handling Operations Regulations 1992, straight back, bend knees

Transport and use tools safely

Manual transport, mechanically assisted transport, security of tools

Maintain and store

Routine maintenance, (preparation, checking, adjusting, cleaning), storage, according to instructions

Unit 203 Participate in Providing Estate Maintenance

Outcome 2 Be able to maintain estate boundaries

Assessment Criteria

The learner can:

1. Assess the **condition of boundaries** to determine the maintenance requirement
2. Carry out **routine maintenance** of boundaries safely
3. Carry out **routine repairs** of boundaries safely
4. Dispose of **waste materials** in line with instructions

Range

Boundaries

Living boundaries: hedge, bank, ditch

Constructed boundaries: fence (post and rail, post and wire, electric, netting), wall (stone, brick)

Unit content

Condition of boundaries

Identified purpose, fitness for purpose, visual appearance, state of repair, health and safety implications (for people, livestock or vehicles and access)

Routine maintenance

Appropriate identified maintenance tasks, for example trimming hedges, clearing ditches, restoring banks, checking and adjusting wire tension, improving/maintaining access infrastructure (for example gaps, gates, stiles)

Routine repairs

Appropriate identified repair tasks (wood, brick or stone replacement or treatment)

Waste materials

By-products of repair or maintenance (hedge clippings, debris, litter, rotten wood)

Unit 203 Participate in Providing Estate Maintenance

Outcome 3 Be able to maintain surfaces or habitats

Assessment Criteria

The learner can:

1. Assess the condition of **surfaces** or **habitats** to determine the maintenance requirement
2. Carry out appropriate **maintenance or repairs** of surfaces or habitats

Unit content

Surfaces

Appropriate to the sector: solid (decking, concrete, paving), loose (gravel, wood chippings, sand), horse riding arena surfaces

Habitats

Appropriate to the sector: pond, woodland, heath, field margins, grassland, grazing land

Maintenance or repairs

Identified tasks: adding surface, applying a surface treatment, levelling surface, clearing or restoring a habitat, improving/maintaining access infrastructure (for example boardwalks, stone pitching, grass sward management)

Unit 203 Participate in Providing Estate Maintenance

Outcome 4 Know how to work safely and minimise environmental damage

Assessment Criteria

The learner can:

1. State the current environmental and health and safety **legislation and codes of practice**
2. Describe how to overcome **problems** presented by **services**
3. Describe how **environmental damage** can be minimised
4. Describe how **organic and inorganic waste** may be **disposed** of

Unit content

Legislation and codes of practice

Health and Safety at Work etc Act 1974, Control of Substances Hazardous to Health Regulations (2002) (COSHH), Waste Management (England and Wales) Regulations 2006 (as amended 2008)

Problems

Damage, leakage, disruption to supply, health and safety/emergency procedures, reporting to supervisor

Services

Water, electricity, gas, telephone

Environmental damage

Pollution (water courses, through litter or debris, noise), damage to habitats**,** wastage of resources

Disposal of organic and inorganic waste: organic waste (recycling, composting, chipping, burning), inorganic waste (recycling, discarding safely, landfill)

Organic and inorganic waste

Organic: wood and plant products, soil, weeds, green waste, animal dung and waste

Inorganic: metal, plastics, concrete, brickwork, oils and lubricants

Disposed

Organic: composting, recycling, chipping, burning, burial

Inorganic: recycling, landfill, approved disposal contractor

Unit 203 Participate in Providing Estate Maintenance

Notes for guidance

This unit has a very practical focus and aims to enable learners to develop estate skills which can be applied to a range of situations and circumstances. The unit has been written such that naturally occurring and locally relevant opportunities can be used in selecting boundaries, structures and surfaces, to repair and maintain.

As learners will be engaged in practical activity there should be an emphasis on safe working practices, including the use of appropriate Personal Protective Equipment (PPE) and appropriate risk assessments should be undertaken. Learners should also be made aware of the impact on the environment, and sustainability concepts should also be demonstrated where possible. Where learners are using tools, they should be supervised and must be made aware of the safety of themselves and others around them.

Learners should have the opportunity to undertake estate skill activity in a setting appropriate to their area of work wherever possible to maximise the vocational relevance. It will be most beneficial if the structures, boundaries, and surface or habitat selected are for a clear purpose.

Outcome 1 is likely to be predominantly practical, as learners are required to select and safely transport and use a range of hand tools. It is not expected that learners demonstrate a practical ability for the full range shown in the unit content, but a minimum of four hand tools should be covered.

Outcomes 2 and 3 require opportunities for supervised practical experience. This may link with an appropriate work placement. It is anticipated that the tutor will guide selection of the repair or maintenance work required. It is particularly important that due regard is given to health and safety, including the use of appropriate PPE.

Outcome 4 will be largely embedded throughout delivery of the practical aspects of this unit. Learners should view working safely, with due regard to the environment as an integral feature of estate skills tasks, rather than as stand alone components.

It is anticipated that most delivery of this unit will take place in a practical setting, with supervised practice of skills. Delivery will also include some classroom based activity in ensuring learners have a good understanding of safe techniques and underpinning knowledge.

References

Books

Agate, E. 2001. *Fencing: A Practical Handbook*. Doncaster: BTCV. ISBN 094675229X.

Agate, E. 1996. *Footpaths: A Practical Handbook*. Doncaster: BTCV. ISBN 0946752311.

Agate, E. 2000. *Toolcare: A Maintenance and Workshop Manual*. Doncaster: BTCV. ISBN 0946752249.

Agate, E. 2001. *Tree Planting and Aftercare: A Practical Handbook*. Doncaster: BTCV. ISBN 0946752257.

Agate, E. 2002. *Woodlands: A Practical Handbook*. Doncaster: BTCV. ISBN 0946752338.

Agate, E., Brooks, A. 1998. *Hedging: A Practical Handbook*. Doncaster: BTCV. ISBN 0946752176.

Agate, E., Brooks, A. 2001. *Waterways and Wetlands: A Practical Handbook*. Doncaster: BTCV. ISBN 0946752303.

Agate, E., Brooks, A., Adcock, S. 999. *Dry Stone Walling: A Practical Handbook.* Doncaster: BTCV. ISBN 0946752192.

MacLean, M. 1992. *New Hedges for the Countryside*. Ipswich: Farming Press Books and Videos. ISBN 0852362420.

Journals

Scottish Executive Rural Affairs Department — Prevention of Environmental Pollution from Agricultural Activity: Code of Good Practice Dos and Don’ts Guide

(Scottish Executive, 2002) ISBN 0755905180

Websites

www.btcv.org.uk	British Trust for Conservation Volunteers
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of agriculture and Rural Affairs (Northern Ireland)
www.fwag.org.uk	Farm Wildlife and Advisory Group
www.hse.gov.uk	Health and Safety Executive
www.lantra.co.uk	Lantra Sector Skills Council

Unit 204 Tractor Driving

Level: 2

Credit value: 5

Unit aim

This unit aims to provide learners with an understanding of the principles of tractor driving and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The aim of this unit is to provide learners with skills, knowledge and understanding to enable them to carry out tractor driving operations legally, safely and efficiently with the minimum of supervision.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know the key components and operator controls on a tractor
2. Know the relevant legislation and codes of practice for tractor driving
3. Be able to carry out simple maintenance tasks and settings to a tractor
4. Be able to operate tractor and attachments

Guided learning hours

It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU11 Preparation and operation of a tractor and attachments

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignments covering practical skills and underpinning knowledge.

Unit 204 Tractor Driving

Outcome 1 Know the key components and operator controls on a tractor

Assessment Criteria

The learner can:

1. Name the **key components** that make up the build of a current tractor
2. Identify and explain the purpose of all **controls and instrumentation** of a modern tractor

Range

As appropriate to area of study:

Agriculture - Currently available Tractors over 35Kw

All Terrain vehicles (ATVs)

Unit content

Key components

Power unit*:* guards and covers, fuel tank and filters, cooling system, radiator / fan, pressure cap, coolant, filter screens, oil level indicators and filter, battery, transmission gearbox, final drive and reductions, four wheel drive axle, wheels, tyres and brakes, hydraulic reservoir and filters, drawbar and hitch(es), external services, power take off

Controls and instrumentation

Controls*:* Operator ergonomics, safety start device, start/heat start switch, clutch(es), brakes, transmission controls, hydraulic controls, power take off controls, cab heating/conditioning, hazard/indicator switches, lighting switches, four wheel drive, differential lock

Instrumentation*:* Warning lights, audible warning signals, engine performance gauges, Analogue, digital, LED formats, data/performance storage systems

Unit 204 Tractor Driving

Outcome 2 Know the relevant legislation and codes of practice for tractor driving

Assessment Criteria

The learner can:

1. Outline the **relevant legislation** that apply to tractor driving
2. Outline the relevant **codes of practice** that apply to tractor driving
3. Define the **limitations imposed on young or inexperienced tractor drivers**

Range

As appropriate to area of study:

Agriculture - Currently available Tractors over 35Kw

All Terrain vehicles (ATVs)

Unit content

Relevant legislations

Road Traffic Act 1984 (as amended 1991), Health and Safety at Work etc Act (1974) (HASWA), Provision and Use of Work Equipment Regulations (1998), Control of Noise at Work Regulations (2005), Environment Protection Act 1990 (as amended 1995), Construction and Use Regulations 1986

Codes of practice

Highway Code, Manufacturers' recommendations, risk assessments, use of Personal Protective Equipment (PPE)

Limitations imposed on young or inexperienced tractor drivers

Insurance policy compliance, evidence of instruction and training, certification, operating on the land, road restrictions, licensing laws, weight restrictions

Unit 204 Tractor Driving

Outcome 3 Be able to carry out simple maintenance tasks and settings to a tractor

Assessment Criteria

The learner can:

1. Carry out **pre-start checks** on a tractor
2. Perform **pre-operational maintenance** tasks prior to undertaking tractor driving operations
3. Carry out **adjustments to the tractor to match the operator** to the tractor
4. **Prepare** the tractor to accept a range of selected **attachments**

Range

Agriculture - Currently available Tractors over 35Kw-
All Terrain vehicles (ATVs)

Unit content

Pre start checks

Fuel level, oil level, coolant level/air screens clear, tyre condition / inflation pressures, transmission oil level, clean windows and mirrors, loads and attachments secure, brake check, road legal lighting, horn, screen wash/wipe, insurance, taxation, safety guards

Pre-operational maintenance

Replenish engine, transmission and hydraulic oil levels, check air intake screens/pre cleaner condition, drain fuel water trap, replenish radiator coolant levels, and adjust tyre pressures, replenish screen wash, brake/clutch fluids

Adjustments to the tractor to match the operator

Seat fore-aft position, seat height, seat suspension, seat rotation for field work / fixed for road work, control panel/joystick adjustments, rear view mirrors, heat and air conditioning settings

Prepare the tractor to accept attachments

Trailed equipment:
Drawbar: length, height, offset, swing, jaws, suitable hitch pins, safe load limit
Automatic pick up hitch: wear on hitch components, hitch lock adjustment, safe load limit
Linkage mounted equipment: correct category, stabilisers, sway chains, top link position, front linkage, maximum height setting, speed of drop setting
Auxiliary fitment: counterweight, wheel ballast, hydraulic connentions, electrical connections, remote controls, lighting sockets, marker boards, wheel track widths, tyre pressures

Unit 204 Tractor Driving

Outcome 4 Be able to operate tractor and attachments

Assessment Criteria

The learner can:

1. Drive a tractor **safely and efficiently** around to meet given objectives
2. Safely **hitch** selected attachments to a tractor
3. **Operate tractors** and attachments safely to meet given objectives
4. Prepare tractors and attachments for **storage** ensuring they are ready for future use

Range

As appropriate to area of study:

Agriculture - Currently available tractors over 35Kw
- linkage and trailed attachments relating to the agricultural land-based industry

All Terrain vehicles (ATVs)

Unit content

Safely and efficiently

Assess risks, operator/bystander injuries, stock, obstructions, ground conditions, public access, fuel consumption, emissions, tyre wear, damage to equipment

Hitch procedures

Assess risks, power unit isolation, external hydraulic controls, stored energy release, correct use of jacks, parking stands, attachment adjustment, road transport/field work

Operate tractors

Correct starting, use of gears/speeds, power take off engagement, hydraulic control, electrical control, mechanical remote control, wet, dry and icy conditions, slopes, field procedures, tramlining, markers, global positioning system

Storage

Cleaning, decontamination, disconnection of attachments, refuelling, storage of linkage connectors, check on condition, reporting procedures

Unit 204 Tractor Driving

Notes for guidance

This unit is designed to give learners sufficient theoretical and practical instruction to gain the necessary underpinning knowledge and practical skills to operate tractors safely and economically. The tractors and equipment should cover a range that the learner would be expected to encounter in their area of study. Learners will need access to a range of tractors incorporating the level of technology expected of modern day equipment. When undertaking operational tasks it is essential that all activities are closely supervised and learners are able to assess hazards and risk for each task.

Health and safety - centres and tutors need to be aware of the requirement to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of machinery is involved. Legally, learners can drive a tractor from the age of 13 (around a farm/workplace but not on the public highway) therefore it is essential that they are properly trained in this area. The units in this qualification require the learner to undertake tractor driving under close supervision, and this is the same for any unit within the qualification that requires the learner to operate or use machinery. The HSE guidance INDG185 'Tractor Action – a step by step guide to using tractors safely' is highlighted in the guidance section for this unit and tutors and learners are encouraged to follow these safe guidelines for operation. Additionally The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

Outcome 1 requires learners to familiarise themselves with a range of tractors typically used in their area of learning, Learners should be able to recognise all components of the tractor which will need the attention of the operator prior to, during and after land based operations.
Learners will be able to identify and explain all controls and instruments on a range of modern tractors.

In Outcome 2 the learners must demonstrate awareness of legal aspects of tractor driving, both on the land and on the road. They must also be aware of codes of practice, which, if not followed, could lead to health and safety infringements, injuries, or damage to property and/or equipment.

In Outcome 3 the learners will need to carry out basic service tasks and pre start checks to ensure a tractor is safe, legal and ready carry out land-based operations.

Throughout the unit the emphasis will be on safe, legal practices, working to manufacturers' recommended procedures and attention to detail when recording information. Depending on the land-based area the learner is studying, formal lecture delivery may be generic to all areas but practical experiences and learning should be appropriate to the area of study.

In Outcome 4, learners will be able to demonstrate their ability to safely start and drive a tractor around a set course that will include forward and reverse manoeuvres, transmission ratio selection and correct power unit settings. Following positive outcome in this element the learner will be required to match tractor to identified machines and demonstrate safe hitching and operating techniques. It is expected that learners will then demonstrate knowledge and ability to prepare tractors and attachments for storage. At all stages of practical work, the learner must conform to legislations and safe working practices and beware of hazards and risks which may change during the tasks being carried out.

Learners will need access to a range of modern tractors and machines typically available to their area of study. Due to the complexity of many modern tractors it is essential that operations be closely supervised to ensure safety at all times.

References

Books

Bell B. 2005. *Farm Machinery.* Old Bond Publishing. ISBN: 1-903-36668-2.
Culpin C. 1992. *Farm Machinery, 12th edition.* Blackwell Science. ISBN: 0-632-03159-X.
Hawker M and Keelyside J**.** 1985. *Horticultural Machinery, 3rd edition.* Longman Higher Education. ISBN: 0-582-40807-5.

Journals

Farmers Weekly
Profi
Amenity Machinery and Equipment

Websites

www.hse.gov/pubns/indg185.pdf	Tractor Action
www.hse.gov.uk	Health and Safety Executive
www.roadtransport.com	Road Transport
www.direct.gov.uk/highwaycode	Public Services Website

Unit 205 Introduction to Boundary Habitat Conservation

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of boundary habitat conservation and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will develop their understanding of the conservation of boundaries in the landscape both for their cultural value, and for their importance for nature conservation. They will learn to assess the importance of hedgerows, traditional banks and walls, fences, ditches, field margins, road verges, railway embankments and canal sides, and assist in their management.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know boundary features and importance
2. Be able to assist in the management of existing boundaries
3. Be able to assist in the management of roadside verges and field margins for wildlife conservation
4. Understand the management of railway lines and canals

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU87 Carry out habitat management work

CU2.2 Maintain good standards of health and safety for self and others

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 205 Introduction to Boundary Habitat Conservation

Outcome 1 Know boundary features and importance

Assessment Criteria

The learner can:

1. Identify **boundary features** in the landscape
2. Describe the importance of boundary features from a **cultural and wildlife conservation point of view**

Unit content

Boundary features

Hedges, walls, banks, fences, ditches

Cultural point of view

Historical value, boundary denoting ownership or parish, proximity to road, visual impact, impact on the landscape

Wildlife conservation point of view

Species distribution and diversity, provision of habitat, shelter, shade, water

Unit 205 Introduction to Boundary Habitat Conservation

Outcome 2 Be able to assist in the management of existing boundaries

Assessment Criteria

The learner can:

1. Survey a selected **boundary** reporting its value to wildlife
2. Assist in the **management** of existing hedgerows, walls, banks, fences and ditches to improve their value for wildlife conservation
3. Describe the **conservation value** of boundary management carried out

Unit content

Boundary

Hedge, wall, bank, fence, ditch

Management

Trimming, coppicing, laying, clearing, repairing, planting, pollarding, checking, dredging, weed control, importance of timing

Conservation value

Improvements to habitat availability, shelter, species diversity and distribution

Unit 205 Introduction to Boundary Habitat Conservation

Outcome 3 Be able to assist in the management of roadside verges and field margins for wildlife conservation

Assessment Criteria

The learner can:

1. Assist in the **management** of roadside verges and field margins to improve their value for wildlife conservation
2. Follow **conservation guidelines and good practice**
3. Describe the **conservation value** of roadside verge and field margin improvement carried out

Unit content

Management

Mowing (timing, frequency, techniques), planting, clearing debris

Conservation guidelines and good practice

Wildlife and Countryside Act 1981, Conservation (Natural Habitats etc) Regulations 1994, Hedgerow Regulations 1997, Natural England and Department for Environment, Food and Rural Affairs (Defra), Welsh Assembly Government, Scottish Executive Environment and Rural Affairs Department and Department of Agriculture and Rural Affairs (Northern Ireland) guidelines

Conservation value

Improvements to habitat availability, species diversity and distribution

Unit 205 Introduction to Boundary Habitat Conservation

Outcome 4 Understand the management of railway lines and canals

Assessment Criteria

The learner can:

1. Assess the importance of a selected **railway line** and **canal** as wildlife habitats
2. Explain the **management** of railway lines and canals.

Unit content

Railway line

In active use, area outside permanent way (embankment, verge, cutting)

Canal

Towpath verge, canal, submerged ledge, off side verge

Management

Mowing, clearing, inspection, improving visibility, restricting access

Unit 205 Introduction to Boundary Habitat Conservation

Notes for guidance

This unit aims to provide learners with an understanding of the importance of boundaries as habitats for wildlife and develops their practical skills in habitat management.

As learners will be engaged in practical activities there should be an emphasis on safe working practices, including the use of appropriate personal protective equipment (PPE), and appropriate risk assessments should be undertaken.

For Outcome 1, learners need to gain an understanding of the different types of boundary feature and their significance, both to wildlife and from a cultural perspective. It is anticipated that delivery will include site visits to a range of boundary features, including features with a range of age to help learners to appreciate their cultural and historical significance.

In Outcomes 2 and 3, learners need to develop practical skills in habitat management of different boundary features. Learners should gain practice of assisting with a range of different habitat management techniques and gain an understanding of the reasons why different techniques are used. Delivery should include an emphasis on the importance of timing of habitat management activity in wildlife conservation. Learners also need to be able to carry out a basic survey to enable them to identify the conservation value of the boundary feature. It is anticipated that most delivery of these outcomes will be practically based, so a particular emphasis should be given to safe working practice.

For Outcome 4, learners will need to visit at least one railway line, which should still be in use, and one canal, to enable them to gain an understanding of the potential wildlife habitat value. These visits will need to be carefully supervised, given the potentially hazards in each location. A guest speaker from a railway management company or British Waterways would add interest and relevance to this outcome.

At level 2 it is likely that there will be differences in learners' prior experience, knowledge and confidence, and practical activity is likely to require a differentiated approach to ensure all learners progress appropriately.

References

Books

Agate E. 2001. *Fencing: A Practical Handbook.* BTCV. ISBN: 0-946-75229-X.

Agate E. 2001. *Tree Planting and Aftercare: A Practical Handbook.* BTCV. ISBN: 0-946-75225-7.

Brooks A and Agate E. 1998. *Hedging: A Practical Handbook.* BTCV. ISBN: 0-946-75217-6.

Brooks A and Agate E. 2001. *Waterways and Wetlands: A Practical Handbook.* BTCV. ISBN: 0-946-75230-3.

Brooks A, Adcock S and Agate E. 1999. *Dry Stone Walling: A Practical Handbook.* BTCV. ISBN: 0-946-75219-2.

Carr S and Bell M. 1991. *Practical Conservation: Boundary Habitats.* Open University. ISBN: 0-340-53367-6.

MacLean M. 1992. *New Hedges for the Countryside.* Farming Press Books and Videos. ISBN: 0-852-36242-0.

Stokes A. 1999. *Health and Safety Overview for Practical Conservation Project: A Guide to Good Practice for Conservation Groups and Land Managers.* BTCV.

Tait J, Lane A and Carr S. 1988. *Practical Conservation: Site Assessment and Management Planning.* Open University. ISBN: 0-340-49003-9.

Websites

www.btcv.org.uk	British Trust for Conservation Volunteers
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.defra.gov	DEFRA
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.fwag.org.uk	Farm Wildlife and Advisory Group
www.hse.gov.uk	Health and Safety Executive
www.lantra.co.uk	Lantra Sector Skills Council
www.naturalengland.org.uk	Natural England

Unit 206 Introduction to Coastal Zone Management

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of coastal zone management and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The aim of this unit is to ensure learners understand the features of the coastal zone and the different techniques for managing coastal habitats.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know features of the coastal zone
2. Know the threats to the coastal zone
3. Understand techniques for managing the coastal zone
4. Be able to carry out practical management work on coastal habitats

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

EC2 Survey and report on the condition of the environment

EC34 Work with the local coastal environment

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 206 Introduction to Coastal Zone Management

Outcome 1 Know features of the coastal zone

Assessment Criteria

The learner can:

1. Define the **coastal zone**
2. Describe **physical features** of a selected coastal zone
3. Identify **common plant and animal species** of a selected coastal zone

Unit content

Coastal zone

Concept of coastal zone incorporating land and sea, definition of landward and seaward boundaries

Physical features

Cliffs, cliff top land, beaches, spits, sand dunes, mudflats, sand flats, salt marshes, estuaries, caves, blow holes, sea stacks

Common plant and animal species

Cliff and cliff top species (salt tolerant plants, cliff nesting birds), shore and shingle species (seaweeds, sand fixing plants, dune grassland, shingle nesting birds, invertebrates, mammals), aquatic species (fish, shellfish, crustaceans)

Unit 206 Introduction to Coastal Zone Management

Outcome 2 Know the threats to the coastal zone

Assessment Criteria

The learner can:

1. Describe **common natural threats** to the coastline of the UK
2. Outline **common human threats** to the coastline of the UK.

Unit content

Common natural threats

Erosion (tide based, wind based), sediment movement and deposits

Common human threats

Pollution, tourism, access requirements, sea defences affecting sediment movement, changes affecting rivers (e.g. building on flood plains, flood defences, redirecting rivers), and land use adjacent to rivers (e.g. for agriculture, for recreation and sport)

Unit 206 Introduction to Coastal Zone Management

Outcome 3 Understand techniques for managing the coastal zone

Assessment Criteria

The learner can:

1. Evaluate coastal zone management techniques:
   - **hard engineering**
   - **soft engineering**

Unit content

Hard engineering techniques

Use of permanent engineered structures, for example breakwaters, groynes, revetments, seawalls

Consequential effects to other coastal areas

Soft engineering techniques

Use of natural processes and materials, for example beach recycling, beach re-nourishment, dune grass planting and marsh regeneration

Unit 206 Introduction to Coastal Zone Management

Outcome 4 Be able to carry out practical management work on coastal habitats

Assessment Criteria

The learner can:

1. **Monitor** an area of coastal habitat
2. Carry out **practical management** of coastal habitats **safely**.

Unit content

Monitor

Review species types and numbers, monitor for signs of erosion, monitor influence of human activity

Practical management

Conservation and soft engineering techniques, e.g. planting windbreaks, mowing, weeding and dune grass planting

Safely

In line with Health and Safety at Work etc Act 1974

Unit 206 Introduction to Coastal Zone Management

Notes for guidance

This unit introduces learners to the concept of the coastal zone and its management, and develops their practical skills in identifying common plant and animal species within the zone and in habitat management.

As learners will be engaged in practical activity there should be an emphasis on safe working practices, including the use of appropriate Personal Protective Equipment (PPE), and appropriate risk assessments should be undertaken. Health and safety issues relating to working near water and on cliff tops should be given particular emphasis.

Learners will need access to at least one coastal zone to study and undertake practical activity, which could be through visits, study tours and work experience.

Outcome 1 requires learners to investigate a coastal zone, and its plant and animal species. As there is no single agreed definition of the coastal zone, learners will need to gain an understanding of the concept, i.e. the inclusion of a portion of land and sea within a defined zone, and to agree the zone boundaries with their tutor for the purpose of this outcome. It is expected that delivery of this outcome will be largely practical in nature, and that learners will have access to a section of the coast to study.

In Outcome 2, learners need to explore the natural and human threats to coasts in the UK, bearing in mind that some of these threats can be consequential due to activities further inland. It would be helpful in the delivery of this unit for learners to visit a part of the coast where there is clear evidence of detrimental natural or human activity. This could be linked with outcome 3, in looking at potential solutions and preventative actions.

Outcome 3 requires learners to gain an appreciation of the different approaches behind hard and soft engineering techniques and the possible consequences of each. Delivery of this outcome will be enhanced through either coastal visits or high quality visual case study material based on the longer term impact of engineering techniques.

Outcome 4 has a practical focus, and requires learners to take part in coastal habitat management. This could include involvement in soft engineering techniques, if this activity is taking place in the coastal area studied or could involve cliff top based habitat management and establishment.

At level 2 it is likely that there will be differences in learners' prior experience, knowledge and confidence, and practical activity is likely to require a differentiated approach to ensure all learners progress appropriately.

References

Books

Agate E and Brooks A. 2000. *Sand Dunes: A Practical Handbook.* BTCV.
ISBN: 0-946-75232-X.
Brown K, Tompkins E and Adger N. 2002. *Making Waves: Integrating Coastal Conservation and Development*. Earthscan Publications Ltd. ISBN: 1-853-83912-4.

French P. 1997. *Coastal and Estuarine Management.* Routledge. ISBN: 0-415-13759-4.
Hill M. 2004. *Coasts and Coastal Management.* Hodder Education. ISBN: 0-340-84638-0.
Kay R and Alder J. 2005. *Coastal Planning and Management.* Taylor & Francis. ISBN: 0-415-31773-8.
Soothill E and Thomas M. 1993. *Natural History of Britain's Coasts.* New Orchard. ISBN: 1-850-79222-4.
Waugh D. 2000. *Geography: An integrated approach.* Nelson Thornes. ISBN: 9-780-17444-706-1.

Websites

www.buglife.org.uk	Invertebrate conservation trust
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.eclife.naturalengland.org.uk	Living with the sea project
www.environment-agency.gov.uk	Environment Agency
www.eoeath.org	Encyclopaedia of earth
www.naturalengland.org.uk	Natural England
www.saltmarshmanual.co.uk	Salt marsh management

Unit 207 Introduction to Countryside Access and Recreation

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of countryside access and recreation and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will develop knowledge of issues surrounding the management of land for access and recreation. They will develop skills in working with the public and understanding of legal issues

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know opportunities for countryside recreation
2. Know effects of access and recreation
3. Understand the importance of countryside access and recreation
4. Be able to promote responsible use of the environment

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

EC1.2 Care for members of the public and others

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 207 Introduction to Countryside Access and Recreation

Outcome 1 Know opportunities for countryside recreation

Assessment Criteria

The learner can:

1. Identify **recreational opportunities** in a specified area
2. Outline **reasons for increase** in given recreational activities.

Unit content

Recreational opportunities

Opportunities: space, location, natural features for example woodland, parkland, rivers, access, availability for parking

Activities: walking, dog walking, cycling, running, horse riding, bird watching, angling, boating, adventure activities

Reasons for increase

Interest in wildlife and countryside, leisure time, access opportunities, income pressure, interest in activities closer to home, awareness of importance of exercise, sustainable leisure activity

Unit 207 Introduction to Countryside Access and Recreation

Outcome 2 Know effects of access and recreation

Assessment Criteria

The learner can:

1. Outline **threats** the public might pose to:
   - a given site
   - flora and fauna
   - health and safety
2. Identify **benefits** of given recreational activities**.**

Unit content

Threats

Damage to plant life, litter and debris, effects on wildlife species, disturbance to habitats, damage to boundaries and paths, noise, vehicle traffic and parking, congestion, pollution, erosion

Benefits

Income generation, opportunities for diversification, employment opportunities in rural areas, increased public interest in countryside, supply of volunteers, improvements to sites for wildlife, creation and management of habitats, increased opportunities for relaxation and exercise

Unit 207 Introduction to Countryside Access and Recreation

Outcome 3 Understand the importance of countryside access and recreation

Assessment Criteria

The learner can:

1. Explain the impact of **organisations** involved in countryside recreation
2. Discuss **laws and codes of practice** relevant to countryside recreation

Unit content

Organisations

Natural England, The Forestry Commission, Environment Agency, Department for Environment, Department for Environment, Food and Rural Affairs (England) (Defra), Welsh Assembly Government (Wales), Scottish Executive Environment and Rural Affairs Department (SEERAD), or Department of Agriculture and Rural Affairs (DARD (Northern Ireland), British Waterways, Sport England, National Trust, Association of National Park Authorities, Countryside Alliance, local councils, wildlife trusts, local charitable organisations and volunteer groups

Laws and codes of practice

National Parks and Access to the Countryside Act 1947 (as amended 1949), Countryside Act 1968, Wildlife and Countryside Act 1981 (as amended 1991), Countryside and Rights of Way Act 2000, Hunting Act 2005, Countryside Code

Unit 207 Introduction to Countryside Access and Recreation

Outcome 4 Be able to promote responsible use of the environment

Assessment Criteria

The learner can:

1. **Maintain the safety** of the public and others during visits to a given site
2. Provide **information and advice** to encourage members of the public to use a given site responsibly.

Unit content

Maintain the safety

Carry out risk assessment, give appropriate advice and warnings, plan access routes, provide supervision as needed

Information and advice

Site history, wildlife species, footpaths and access routes, location of facilities, identification of recreation opportunities, restrictions and rules

Unit 207 Introduction to Countryside Access and Recreation

Notes for guidance

This unit aims to provide learners with an understanding of the factors which affect countryside access and recreation opportunities and how these opportunities can benefit those accessing the countryside, those living and working in it and the countryside itself.

As learners will be engaged in visits and some practical activity there should be an emphasis on safe working practices, including the use of appropriate Personal Protective Equipment (PPE), and appropriate risk assessments should be undertaken.

In Outcome 1, learners will need to gain an understanding of the types of recreational opportunities available in the countryside, and particularly in their local area. It would be helpful to experience this first hand through trips and visits to a range of local recreational sites. This outcome also includes gaining an understanding of reasons for an increase in countryside recreation: increases should be considered as those taking place over the last ten years. It would be particularly relevant to include recent factors, such as the economic climate and increased interest in the environment.

Outcome 2 requires learners to develop an understanding of the potentially conflicting effects of increasing countryside access: the benefits and threats that might arise. Following some classroom based input this could best be investigated through a site visit, where it would be helpful to have input from a manager who can explain these potential benefits and threats, and how they can be best resolved.

In Outcome 3 learners need to gain an overview of the relevant organisations that influence countryside access and recreation, either through policy making, lobbying or managing the countryside. Learners also need to be aware of the legislation that impacts on countryside access and the guidelines set out in the Countryside Code. A guest speaker from one of the organisations would add interest and vocational relevance.

In Outcome 4, learners will need supervised access to a site and members of the public, which could be other learners. It is likely that this could be delivered through a group activity, where all learners have the opportunity to practice maintaining safety and giving guidance. Input from a guest speaker, such as a countryside ranger, would be helpful in setting the context for learners. This outcome could also be delivered in conjunction with an appropriate and supervised work placement.

References

Books

Countryside Agency. 2004. *Positive Access Management: practical ways to manage public access on your land.* Countryside Agency.

Countryside Commission. 1999. *Countryside Recreation: enjoying the living countryside.* Countryside Commission. CCP 544 ISBN: 0-861-70506-8.

Forestry Commission. 1992. *Forest Recreation Guidelines*. The Stationery Office Books. ISBN: 0-117-10311-X.

Glyptis S. 1991. *Countryside Recreation*. Longman Group Ltd. ISBN: 0-582-05035-9.

McCool S and Moisey R. 2001. *Tourism, Recreation and Sustainability: Linking Culture and the Environment.* CABI Publishing. ISBN: 0-851-99505-5.

National Trust. 2000. *Recreational Activities at National Trust Properties*. National Trust.

Parkes C. 1994. *Law of the Countryside*. CMA. ISBN: 0-950-92712-0.

Websites

www.ccw.gov.uk	Countryside Council for Wales
www.countryside-alliance.org.uk	Countryside Alliance
www.countrysideaccess.gov.uk	Natural England
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.environment-agency.gov.uk	Environment Agency
www.forestry.gov.uk	Forestry Commission
www.nationalparks.gov.uk	Association of National Parks
www.nationaltrust.org.uk	National Trust
www.snh.org.uk	Scottish National Heritage

Unit 208 Undertaking Ecological Surveys and Techniques

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of ecological surveys, techniques and records and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will investigate the planning, surveying and reporting of terrestrial and aquatic habitats. They will be able to demonstrate the selection of different methods of survey, using the correct tools and equipment to accurately collect and report data collected in the field and laboratory. Basic statistical analysis will be used on data.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will be able to:

1. Be able to plan surveys using safe working methods and appropriate techniques
2. Know how to identify terrestrial and aquatic species using identification keys
3. Be able to carry out surveys and accurately record data in different situations and habitats
4. Understand the use of basic statistical analysis in the production of reports

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

EC2.1 Collect and record data on the natural environment
EC23 Prepare, conduct and report on field surveys
EC25 Research and plan environment interpretations

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 208 Undertaking Ecological Surveys and Techniques

Outcome 1 Be able to plan surveys using safe working methods and appropriate techniques

Assessment Criteria

The learner can:

1. Use terrestrial and aquatic **survey** planning **techniques**
2. Carry out **risk assessment** relevant to surveys planned

Range

Phase 1 habitat survey, vertebrate surveys, invertebrate surveys

Unit Content

Surveys techniques

Quantitative (e.g. quadrats and simple line transects) and qualitative (quantity of habitat, species distribution), correlation of species and effects of abiotic factors

Present information from surveys in various forms (written, data and pictorial) graphs, pie chart, basic statistics

Risk assessment

Identification of potential risks and hazards, severity of potential injury (hazard), likelihood of harm (risk), control methods to minimise or avoid risk

Unit 208 Undertaking Ecological Surveys and Techniques

Outcome 2 Know how to identify terrestrial and aquatic species using identification keys

Assessment Criteria

The learner can:

1. **Identify** terrestrial and aquatic animals and plants using appropriate **keys**
2. Describe the importance of **indicator species**

Range

Vertebrates and invertebrates, trees flowering plants, grasses, algae

Unit Content

Identification keys

Single access keys, multi access keys, binominal nomenclature of organisms (genus, species), pictorial

Indicator species

Top predators, climax vegetation, aerobic and anaerobic invertebrates

Unit 208 Undertaking Ecological Surveys and Techniques

Outcome 3 Be able to carry out surveys and accurately record data in different situations and habitats

Assessment Criteria

The learner can:

1. Carry out **terrestrial** and **aquatic** surveying
2. **Record and collate** terrestrial and aquatic data accurately
3. Undertake **analysis** of survey data
4. **Present** results in appropriate formats

Unit Content

Terrestrial

Examples (as appropriate) could include: coastal, lowland, upland, woodland, grassland, urban, farmland, marshland, heathland, moorland, boundaries

Aquatic

Examples (as appropriate) could include: tidal, ponds, lakes, streams, rivers, estuaries, canals

Record and collate

Date, time, location, recorder, species (type, quantity and distribution), abiotic data

Analysis

Mean, median (both with confidence intervals), variance, standard deviation, standard error, minimum, maximum, correlation

Present

Tables, graphs, pie charts, distribution maps, scatter gram, annotated drawings

Unit 208 Undertaking Ecological Surveys and Techniques

Outcome 4 Understand the use of basic statistical analysis in the production of reports

Assessment Criteria

The learner can:

1. Explain the **use of statistical analysis** relating to surveys carried out
2. Discuss possible sources of **error** and their minimisation/prevention

Unit Content

Use of statistical analysis

Reasons: Confirm validity of results, improve accuracy of interpretation, and identify correlations between species

Methods: mean, median (both with confidence intervals), variance, standard deviation, standard error, minimum, maximum

Error

Bad survey technique, lost records, misidentification, mathematical

Unit 208 Undertaking Ecological Surveys and Techniques

Notes for Guidance

This unit will provide the learner with the opportunity to learn key aspects of ecological surveys and how to identify species. This type of work is vital for sustainable development. Understanding the factors that influence population numbers and distribution allows planners and land managers make informed decisions. Learners will learn about how to choose the correct survey technique, looking at not only the disturbance to wildlife but also their health and safety. Once the information is recorded its presentation and interpretation will be considered. Learners will be given tuition via lectures, demonstrations and group work before undertaking their own survey.

In delivery, the range of habitats should ideally include two terrestrial and at least one aquatic and cover plants, invertebrates, and vertebrates.

In Outcome 1, the learner will look at the advantages and disadvantages of quantitative and qualitative data from a range of survey methods looking at the distribution of plant communities (phase 1 surveys) as well as fauna. The learner will also cover how to carry out surveys relating from abiotic factors to biotic distribution, for example invertebrates to water speed and sediment depth. Health and safety via a risk assessment will be looked at for carrying out specific survey work.

In Outcome 2, being able to instantly identify any group of animal or plants is a special skill learnt via enthusiasm and time, and unfamiliar species need the use of observation and keys. Using published keys the learner will be able to identify various species found in the habitat range, and by creating their own it will help them recognise plants or animals within the species key for a specific site.

In Outcome 3, the learner can put into practice identification skills and survey techniques to examine terrestrial and aquatic habitats. Group work is encouraged, but a simple survey devised by the learner should be carried out, with a safe working method statement produced via a risk assessment.

In Outcome 4 a report is meaningless if the results can not be compared with similar work, whether it is flock size recorded daily or a distribution survey carried out over 10 years. These comparisons requires statistical analysis and before learners undertake all the range of outcome 3 they should be shown how statistics can be used and interpreted, whether it be through graphs, tables, pie charts or via simple mathematical formulae.

Centres are encouraged to use local habitats, but combining this unit with specific habitat management units would be encouraged. The basic methodology of surveys and the interpretation of the results are achievable with the time frame, and it is hoped that it will encourage the learner to continue increase their identification skills of one or many groups of flora or fauna.

References

Books

Holmes. 2003. *Fieldwork investigations a self study*.
Williams G. 1987. *Techniques and Fieldwork in Ecology*.
The Institute of Environmental Assessment. 1995. *Guidelines for Baseline Ecological Assessment*. ISBN: 0-419-20510-1.
Southwood R. 2004. *Ecological Methods: With Particular Reference to the Study of Insect Populations*.
British Ecological Society. 1990. *River Water Quality*.
Helmut van Emden E. 2008. *Statistics for the Terrified Biologist*. Blackwell Publishing. ISBN: 978-1-4051-4956-3.

Unit 209 Understanding Ecology of Trees, Woods and Forests

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of ecology of trees, woods and forests and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will study trees, woods and forests in the UK and how these are integral to our landscape. They will identify important tree and shrub species and investigate how these relate to animal and humans. They will develop their understanding of forest and woodland exploitation and how these can be done in a sustainable way. They will also encourage responsible public use of woodlands or forests.

Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Know locally important and commercial tree and shrub species
2. Know the major parts of trees and shrubs
3. Understand the relationships between trees and other plants and animals
4. Understand the effects of human influence on the distribution and composition of forests and woodlands
5. Be able to promote good public use of forests or woodlands

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

EC 1.2 Promote responsible public use of the environment

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 209 Understanding Ecology of Trees, Woods and Forests

Outcome 1 Know locally important and commercial tree and shrub species

Assessment Criteria

The learner can:

1. **Identify** specified locally important and commercial **trees and shrubs** in and out of leaf
2. Describe the **life-cycle** of a commercially important broadleaved tree and a commercially important coniferous tree

Unit content

Identify trees and shrubs

Use of identification keys, broadleaved trees (for example *Acer platanoides, Acer pseudoplatanus, Aesculus hippocastanum, Alnus glutinosa, Betula pendula, Castanea sativa, Fagus sylvatica, Fraxinus excelsior, Quercus robur, Quercus petraea, Sorbus aucuparia, Ulmus glabra)*, coniferous trees (e.g. *Abies grandis, Larix decidua, Picea sitchensis, Picea abies, Pinus sylvestris, Pseudotsuga menziesii, Taxus baccata)* shrubs *(e.g. Buxus sempervirens, Cornus sanguinea, Prunus spinosa, Rubus fruticosa, Rhamnus cathartica, Sambucus nigra, Viburnum opulus)*

Life-cycle of a tree

Seed, germination, seedling, juvenile, maturation, flowering, pollination, fruiting, dispersal

Unit 209 Understanding Ecology of Trees, Woods and Forests

Outcome 2 Know the major parts of trees and shrubs

Assessment Criteria

The learner can:

1. Identify **major parts** of trees and shrubs
2. Describe the **function(s)** of the major parts of trees and shrubs

Unit content

Major parts

Roots, root hairs, bark, cambium, phloem, xylem, trunk, sapwood, heartwood, annual rings, branches, twigs, crown, leaves, buds, foliage, flowers, fruit, seed, mychorriza

Function(s)

Anchorage, water uptake, nutrient uptake, protection, growth, water transportation, photosynthesis, reproduction

Unit 209 Understanding Ecology of Trees, Woods and Forests

Outcome 3 Understand the relationships between trees and other plants and animals

Assessment Criteria

The learner can:

1. Explain **relationships** between trees and other plant and animal species in a given location
2. Evaluate the **impact** of specified **pest species** on the growth and development of trees and shrubs

Unit content

Relationships

Provision of habitat, shelter, competition for light, water and nutrients, impact on tree growth, invasive weeds, under storey plants, food chain/web, importance of root zone suitability for healthy tree growth

Impact of pest species

Deer, rabbits, grey squirrel, voles, bark beetles and insect species

Unit 209 Understanding Ecology of Trees, Woods and Forests

Outcome 4 Understand the effects of human influence on the distribution and composition of forests and woodlands

Assessment Criteria

The learner can:

1. Explain major **human influences** currently affecting a specified wood or forest
2. Discuss the **sustainable exploitation** of forests and woodlands

Unit content

Human influence

Positive: forestry management, sustainable forestry practices, management to promote tree growth and optimise health, re-planting strategies

Negative: exploitation, over use, poor management, planning pressure, impact of recreational use

Sustainable exploitation

Timber production, forest products, conservation, amenity, recreation, game rearing

Unit 209 Understanding Ecology of Trees, Woods and Forests

Outcome 5 Be able to promote good public use of forests or woodlands

Assessment Criteria

The learner can:

1. Provide **information and advice** to encourage members of the public to use a forest or woodland in a way which is consistent with its purpose and condition
2. **Maintain the safety** of the public and others during visits to forest or woodland

Unit content

Information and advice

Methods: signage, leaflets, posters, orientation boards, presentations

Purpose: woodland history, tree and wildlife species, footpaths and access routes, location of facilities, identification of recreation opportunities, restrictions and rules

Maintain the safety

Health and safety, countryside code, respect, use of paths, signs, fencing, timing of maintenance, communication

Unit 209 Understanding Ecology of Trees, Woods and Forests

Notes for guidance

This unit is designed to provide the learner with an introduction to the principles of ecology relating to trees, woods and forests. Learners will develop an ability to identify trees and shrubs and understand how they interact with their surroundings. The unit should cover a varied range of locally important species and a variety of woods and forests.

Throughout the unit the emphasis should be on safe working and sustainability. It is expected that learners will be aware of safe working practices and familiar with accepted practices and behaviours within the context in which they are working.

In Outcome 1, the leaner will be required to know and be able to identify locally important trees and shrubs. Learners will develop an awareness of identifying features of trees and shrubs and be able to describe the life cycle of locally important trees and shrubs. This outcome will require some formal delivery but should also be delivered through site visits and identification sessions. Guided visits to woodlands and arboreta will add relevance to the learner.

Outcome 2 requires the learner to be able to identify the major parts of trees and shrubs and be able to describe the functions of these parts. This can be linked in with the identification of trees and shrubs in outcome 1 but should be supplemented with practical laboratory sessions.

In Outcome 3, the learner will develop knowledge about the ecological relationships within a woodland environment. This outcome will require formal lectures and should include site visits to allow learners to assess ecological relationships first hand. The use of expert speakers and guides involved in ecology work of woodland and forests will add relevance to the learner and put formal lectures into context.

Outcome 4 requires the learner to understand how humans affect distribution and composition of woodlands. The learner will develop knowledge of how humans can have both a positive and negative effect on wooded areas and how these areas often fulfil a multifunctional role in the countryside. The importance of a sustainable approach to any exploitation of forests and woodlands should be emphasised to the learner throughout delivery of this outcome. This outcome should be delivered through formal lectures, site visits and learner research. The use of guest speakers involved in the sustainable exploitation of forests and woodlands would give context to the learner.

Outcome 5 requires the learner to be able to communicate with the public through a variety of means to ensure safe and appropriate use of forests and woodlands. Some formal delivery will be required but the use of workshops and site visits will assist the learners understanding of available means of communication.

This unit aims to extend the learners knowledge and skills involved in woodland and forest ecology. Emphasis should be placed upon sustainable practice and health and safety.

Centres are encouraged to introduce employers and specific professionals from industry to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of establishments to add depth to the learner experience and put practices into context.

It is accepted that formal lectures will be necessary for this unit but it is recommended that they are they are linked directly with interactive lessons in a real environment. Learners must be given the opportunity to visit forests and woodlands to assess the ecological relationships first hand.

References

Books

Blamey M, Fitter A and Fitter R. 2003. *Guide to the British and Irish Flora.* A&C Black Publishers Ltd. ISBN: 0-713-65944-0.

Harris E H M, Harris J and Mercer I. 2003. *Wildlife Conservation in Managed Woodlands and Forests.* Research Studies Press. ISBN: 0-863-80206-0.

Horsfall A. 2003. *Woodlands.* The Dovecote Press Ltd. *ISBN: 1-904-34911-0.*

Mitchell A. 2006. Trees of Britain and Northern Europe. A&C Black Publishers Ltd.

ISBN: 0-713-67238-2.

Rackham O. 2001. *Trees and Woodlands in the British Landscape: The Complete History of Britain's Trees, Woods and Hedgerows.* Phoenix Press. ISBN: 1-842-12469-2.

Starr C. 2005. *Woodland Management a Practical Guide*. The Crowood Press Ltd.

ISBN: 1-861-26789-4.

Websites

www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.environment-agency.gov.uk	The Environment Agency
www.forestry.gov.uk	Forestry Commission
www.naturalengland.org.uk	Natural England
www.woodland-trust.org.uk	The Woodland Trust

Unit 210 Introduction to Freshwater and Wetland Conservation

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of freshwater and wetland conservation and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

This unit provides learners with an understanding of the development and value of freshwater and wetland habitats that can be used in their management and conservation.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know how freshwater and wetland habitats have developed
2. Be able to determine the value of freshwater and wetland habitats
3. Understand how to manage freshwater and wetland habitats
4. Understand the source and effect of pollution on freshwater and wetland habitats

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

EC2.6 Conduct and report a field survey for habitat type

EC2.1 Prepare to undertake and report on a field survey

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 210 Introduction to Freshwater and Wetland Conservation

Outcome 1 Know how freshwater and wetland habitats have developed

Assessment Criteria

The learner can:

1. Describe how a given **freshwater** or **wetland habitat** has been **formed**

Unit content

Freshwater habitats

Natural: loch, llyn, lough, lake, glacial ponds, cwms/corries, meres, river, stream, brook

Manmade: ditch, pool, pond, lake, dykes, drains, canals

Wetland habitats

Fens, sedge/ reedbeds, carrs, mires, swamps, marshes, blanket bogs, raised bogs, wet grasslands, flood meadows, water meadows

Formed

Natural and man-made, processes, over time

Unit 210 Introduction to Freshwater and Wetland Conservation

Outcome 2 Be able to determine the value of freshwater and wetland habitats

Assessment Criteria

The learner can:

1. Produce a **key or guide** to identify **freshwater and wetland species**
2. Use the **key or guide** to identify **freshwater and wetland species**.

Unit content

Freshwater and wetland species

Flora: submerged, aquatic, marginal, floating leaved, free floating, bankside, native, non native
Fauna: birds, mammals, amphibians, invertebrates, native, non native

Identification keys

Single access keys, multi access keys, binomial nomenclature of organisms (genus, species), pictorial

Unit 210 Introduction to Freshwater and Wetland Conservation

Outcome 3 Understand how to manage freshwater and wetland habitats

Assessment Criteria

The learner can:

1. Discuss different **methods** of **managing ponds, ditches or streams.**

Unit content

Methods of managing ponds

Planting, cutting aquatic/bank-side vegetation, managing succession, restoration, de-silting, re-profiling

Methods of managing ditches

Dredging, de-silting, re-profiling, bank protection and enhancement, vegetation control

Methods of managing streams

Restoring natural features, in stream works (gravel raking, installing deflectors, faggoting, revetment, fencing, planting, coppicing/pollarding)

Unit 210 Introduction to Freshwater and Wetland Conservation

Outcome 4 Understand the relationships between trees and other plants and animals

Assessment Criteria

The learner can:

1. Identify and explain the **source of pollution** on a given **freshwater or wetland habitat**
2. Identify and explain the **effect of pollution** on a given **freshwater or wetland habitat**.

Unit content

Source of pollution

Industrial pollution (for example oil, chemicals), agricultural pollution (for example silage effluent, nitrogen run off, pesticides), human pollution (for example sewage, litter), sediment, introduction of destructive non native species (for example top mouth gudgeon)

Effect of pollution

Damage to habitat, reduction of species, consequential effects on food chain, changes in species balance, eutrophication, short term effects and long term effects

Freshwater and wetland habitats

Natural: loch, llyn, lough, lake, glacial ponds, cwms/corries, meres, river, stream, brook

Manmade: ditch, pool, pond, lake, dykes, drains, canals

Fens, sedge/ reedbeds, carrs, mires, swamps, marshes, blanket bogs, raised bogs, wet grasslands, flood meadows, water meadows

Unit 210 Introduction to Freshwater and Wetland Conservation

Notes for guidance

This unit is designed to provide the learner with sound knowledge and skills required to manage and maintain the various water courses and wetlands found across the United Kingdom. The context of teaching will differ depending on the outcomes and the centres access to the different water courses and wetlands local to them. The unit should cover a range of water courses and wetlands to give learners a good understanding of freshwater and wetland conservation.

Throughout the unit, the emphasis should be on safe working. It is expected that learners will be aware of safe working practices and be familiar with accepted practices and behaviours when working in and around water courses and wetlands.

In Outcome 1, the learner will be required to know the different types of freshwater habitats and wetlands found across the United Kingdom. They will be able to know how and why these habitats have been formed. It is accepted that this outcome will require formal delivery using where possible pictorial presentations to show the different water courses. In addition where possible site visits should be undertaken to enhance the learners understanding of water courses and wetlands.

Outcome 2 covers the flora and fauna found in freshwater and wetland habitats. Learners should be encouraged to undertake survey work on a wide range wetland and freshwater habitats using a range of keys/guides. Learners should then produce their own key/guide based on the survey work undertaken and guides/keys used. Information Technology should be used where possible when producing the guide/key. When carrying out the survey, risk assessments should be undertaken and health and safety should be considered along with the environmental implications of such work.

In Outcome 3, the learner will know how to manage ponds, ditches or streams. Where possible this should be done in a practical way and reinforced during classroom sessions. When working, risk assessments and safe working practices should be undertaken as well as the environmental implications of undertaking such work

In Outcome 4 the learner will be able to identify and explain the source and effects of pollution on a watercourse or wetland. It is expected that this outcome will be delivered by formal lectures using case study examples. Research and guided learning should also be encouraged along with visits to different habitats to look at possible sources of pollution and the affect it could have on that environment. Current legislation should also be covered in this outcome.

This unit aims to extend the learners knowledge and skills involved in freshwater and wetland management. It is important that the learner is aware of current legislation and Codes of Practice in relation to freshwater and wetland management.

Centres are encouraged to introduce employers and specific professionals from industry e.g. Wetland Officer from the local Wildlife Trust, Water Quality Officer from the Environment Agency to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of habitats to add depth to the learner experience.

It is accepted that formal lectures will be necessary at level 2 but for this unit it is recommended that they are linked directly with interactive lessons in a real environment. Learners must be given the opportunity to see a range of freshwater and wetland habitats.

References

Books

Brooks A and Agate E. 1997. *BTCV Waterways and Wetlands a practical handbook.* BTCV. ISBN: 0-950-16438-0.

English Nature. 1997. *Wildlife and freshwater: an agenda for sustainable management.* English Nature. ISBN: 1-857-16260-9.

Friday L. 1997. *Wicken Fenn: The making of a wetland reserve.* Harley Books. ISBN: 0-946-58933-X.

Holmes N. 1994. *Rivers and Wildlife Handbook.* A and C Publishers. ISBN: 0-903-13870-0.

Williams P J. 1999. *Pond Book: A guide to the creation and management of ponds.* Ponds Conservation Trust.

Websites

www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.environment-agency.gov.uk	The Environment Agency
www.ramsar.org	The Ramsar Convention on Wetlands
www.rspb.org	Royal Society for the Protection of Birds
www.therrc.org	The River Restoration Centre
www.ukbap.org.uk	UK Biodiversity Action Plan

Unit 211 Introduction to Game Management

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of game management and how this can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

Gamekeepers play an important role in the management and conservation of the countryside in the UK. In order to achieve their objectives they must understand the many complex interactions that occur between and within the animal and plant populations they manage. The management of relevant business criteria, such as budget and stock control, and of their customers, are also requirements for the successful gamekeeper.

Gamekeeping is often regarded as an occupation that uses traditional methods. In reality, as external influences create new pressures, modern gamekeepers combine the best of the traditional methods with new technologies, knowledge and methods.

This unit concentrates on the work of gamekeepers in the UK. It is a broad ranging unit that can be adapted according to the location of the learner and the particular aspect of game/deer management that is practised in their area. Therefore it could be applied to highland gamekeepering that is practised in Scotland but also to Grouse Keeping as practised in the uplands of Britain. However, for most learners the emphasis will be on lowland gamekeeping, whether this be wild game management or the production of released game.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know the role of game/deer management
2. Be able to carry out gamekeeping tasks
3. Know game species in the UK
4. Know game habitats and their features

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

Ga2.1 Determine game population characteristics

Ga3.1 Maintain game populations

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 211 Introduction to Game Management

Outcome 1 Know the role of game/deer management

Assessment Criteria

The learner can:

1. Outline the **management** of a **game or deer species** in a given area
2. Describe the relationship between game or deer management and **other land uses** in a given area
3. State how gamekeepers should manage specified **poaching** situations

Unit content

Game or deer species

Game: Pheasant, grey partridge, red-legged partridge, red grouse, black grouse, ptarmigan (Scotland only)
Deer: red, roe, fallow, muntjac, Chinese water deer, sika
Upland, lowland, highland, forest or woodland

Management

Use of fencing, housing, husbandry, feeding, rearing, stock numbers and control methods
Close seasons, open seasons

Other land uses

Agriculture, private estates, forestry, recreation, access, nature conservation

Poaching

Day or night-time, gangs, dogs, guns, police and poacher watch schemes

Unit 211 Introduction to Game Management

Outcome 2 Be able to carry out gamekeeping tasks

Assessment Criteria

The learner can:

1. Carry out **routine tasks** associated with game or deer management to meet given objectives to cover:
    - pest and predator control
    - habitat management
    - running shoot days
    - estate security
2. Identify **signs** of presence and/or **damage** of game or deer species

Unit content

Routine tasks

Rearing and releasing of gamebirds (for example day old chicks, poults, feed, rearing pens, timing of release, controlled release, managed released birds for example feeders and enclosures)
Pest and predator control, habitat management, running shoot days (prepare shoot areas and equipment, work according to planned shooting programme, transport, sort and store game carcasses), estate security (boundaries, poachers, control of public access)

Signs and damage

Tracks, feeding, fur or feathers, homes/nests, faeces, damage to vegetation, injured or killed game or deer species

Unit 211 Introduction to Game Management

Outcome 3 Know game species in the UK

Assessment Criteria

The learner can:

1. Describe **major species** of game and deer associated with game management in the UK
2. State the main **geographical locations** for specific game and deer species

Unit content

Major species

Gamebirds: Pheasant, partridges (grey, red-legged), grouse (red, black), ptarmigan (Scotland only)
Duck: mallard, teal, wigeon, pintail, shoveler, gadwall, tufted duck, pochard, goldeneye, scaup (NI only)
Geese: pink footed, greylag, white fronted (England and Wales only), Canada
Waders: golden plover, common snipe, jack snipe (NI only), curlew, woodcock
Rail: Coot (England, Wales and Scotland only), moorhen (England, Wales and Scotland only)
Mammals: hares, rabbits
Deer: red, roe, fallow, Muntjac, Chinese water deer, Sika
Pests: pigeons, rooks, fox

Geographical locations

Location of specific game and deer species in the UK (lowland, upland, highland and forest areas, specific parts of the UK, e.g. Ptarmigan in Scotland only)

Unit 211 Introduction to Game Management

Outcome 4 Know game habitats and their key features

Assessment Criteria

The learner can:

1. Identify key game and deer **habitats**
2. Describe the key **features** that make habitats suitable for game and deer

Unit content

Habitats

Farmland, forest and woodland, moorland, wetlands, heathland

Features

Topography, structure, water habitats, size and layout, cover, presence of other species, food availability and source, predator presence or absence

Unit 211 Introduction to Game Management

Notes for guidance

This unit is designed to provide the learner with sound knowledge and skills required in game management. Depending upon the location of the centre this unit is delivered through, the context of teaching will differ. The unit should cover either lowland gamekeeping, grouse management or highland gamekeeping.

Throughout the unit, the emphasis should be on safe working. It is expected that learners will be aware of safe working practices and familiar with accepted practices and behaviours within the context in which they are working.

Health and safety - Centres and tutors aware of the need to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of machinery is involved. This unit requires learners to undertake routine game management tasks including pest and predator control. The use of hazardous or dangerous substances and equipment should be avoided. The guidance in this unit requires that Health and Safety must be strictly enforced and repeated throughout. The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

For Outcome 1, learners will be expected to study the management of game/deer species found in a specific area. This should also involve an examination of the interaction of game/deer management with other land-uses. A good way to tackle this would be to undertake a detailed investigation of a large estate, which would include meeting with the various managers of each department – game, farming, forestry, fishing, recreation etc.

Outcome 2 requires learners to carry out specified tasks associated with: game bird production, release and post-release, shoot day activities, and wild game management to meet given objectives. Tutors should identify the specified objectives or agree them in discussion with the learner. These are likely to be dictated in part by the needs of the estate or shoot that is being used for assessment purposes. Where possible the size and complexity of the objectives should be the same for each learner to ensure the fairness of assessment. This criterion could be assessed directly by the tutor during practical activities. If this format is used, observation records completed by the learner and tutor would be suitable evidence. If assessed during a placement, witness statements should be provided by a suitable representative and verified by the tutor.

Outcome 3 requires learners to know major species of game/deer associated with game management in a specified area. Tutors should identify the specified area (which may be the same as that used to meet other criteria) or agree it in discussion with the learner. Learners should be encouraged to develop their identification skills at every opportunity when out on practical's or visits.

Outcome 4 requires learners to identify the main habitats and their key features associated with lowland game management in a specified area. Tutors should identify the specified area (which may be the same as that used to meet other criteria) or agree it in discussion with the learner. This outcome would lend itself to a practical survey of habitats on an estate with an assessment of how valuable each one is for the game species found there.

Centres are encouraged to introduce employers and specific professionals from industry to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of establishments to add depth to the learner experience.

References

Books

Barnes M. 2005. *The game shooting handbook.* Wiltshire: The Crowood Press.
Catlin C. 2007. *The game book: a shooting anthology*. Shropshire: Quiller Publishing Ltd.
Hudson D. 2006. *Gamekeeping.* Shropshire: Swan Hill Press.
Tapper S. 1992. *Game heritage - an ecological review from shooting and gamekeeping records*. Shropshire: Game Conservancy.

Websites:

www.gwct.org.uk	Game and Wildlife Conservation Trust
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.basc.org.uk	The British Association for Shooting and Conservation
www.ngo.org.uk	National Gamekeepers Organisation
www.rspb.org.uk	Royal Society for the Protection of Birds

Unit 212 Introduction to Environmental Studies

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an introduction to the knowledge and skills underpinning environmental studies. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be introduced to a range of scientific investigation skills enabling them to collect, analyse and compare environmental information about different sites. They will investigate the relationships between plants, animals and humans and consider energy and nutrient flows.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to collect data from ecosystem components
2. Know factors that affect microclimates
3. Understand components of ecosystems
4. Understand the relationship between water and the hydrological cycle

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

EC2.2 Report on the condition of the natural environment

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 212 Introduction to Environmental Studies

Outcome 1 Be able to collect data from ecosystem components

Assessment Criteria

The learner can:

1. Collect and collate **microclimate and species data** for different sites
2. Produce **soil profile diagrams** for different sites.

Unit content

Microclimate data

Maximum and minimum temperatures, soil temperature, air temperature, light levels, rainfall, wind speed, relative humidity, hours of sunlight

Species data

Types and distribution of species, use of quadrats and simple transect to collect data

Soil profile diagrams

Profile diagram showing soil horizons (topsoil, subsoil, parent, bedrock)

Unit 212 Introduction to Environmental Studies

Outcome 2 Know factors that affect microclimates

Assessment Criteria

The learner can:

1. Describe **factors** that affect the microclimates of given sites
2. Compare **microclimate data** from different sites

Unit content

Factors

Location of site, proximity and location relative to boundary features, proximity to other structures and features, aspect, altitude

Microclimate data

Maximum and minimum temperatures, soil temperature, air temperature, light levels, rainfall, wind speed, relative humidity, hours of sunlight

Unit 212 Introduction to Environmental Studies

Outcome 3 Understand components of ecosystems

Assessment Criteria

The learner can:

1. Explain a **simple food chain** from information collected
2. Evaluate **soil characteristics** from information collected.

Unit content

Simple food chain

Producers, consumers (primary, secondary and tertiary), energy transfer, feeding levels

Soil characteristics

Type of soil (clay, sand, loam), water holding capacity, aeration, stability, organic matter, pH, soil structure

Unit 212 Introduction to Environmental Studies

Outcome 4 Understand the relationship between water and the hydrological cycle

Assessment Criteria

The learner can:

1. Explain the **hydrological cycle** based on a selected area
2. Explain how water can become **polluted** as a result of land use

Unit content

Hydrological cycle

Evaporation, transport, precipitation, run off, collection

Water pollution

Fertiliser and slurry runoff, silage effluent, accidental spillages, herbicide and pesticide use

Unit 212 Introduction to Environmental Studies

Notes for guidance

This unit aims to provide learners with an understanding of the science which underpins environmental conservation and to equip them with some scientific investigation skills.

As learners will be engaged in visits and some practical activity there should be an emphasis on safe working practices, including the use of appropriate Personal Protective Equipment (PPE) and appropriate risk assessments should be undertaken.

For Outcome 1, learners need to have the opportunity to collect microclimate data and soil profile information for at least two different sites. The sites chosen should link with the learners' vocational interests, but do not need to be large in order to collect valid data. It is anticipated that delivery of this outcome will include classroom based activity both before and after data collection to help develop learners' understanding of the relevance and importance of microclimates and soil profiles.

It is anticipated that delivery of Outcome 2 will be closely linked to outcome 1 and that collection of data from different sites will help learners gain an appreciation of the factors which affect microclimates. Learners will need to be able to compare data from at least two sites in different locations over the same timescales. This may be achieved through two site visits and using the data collected in outcome 1 or by linking with another college or school and comparing data collected in different localities. Learners will need to have information about both sites as well as the microclimate data in order to make comparisons.

Outcome 3 requires learners to draw conclusions from data and information collected. This may be data collected by learners, for example through undertaking simple soil experiments, data collected by the class as part of a field trip, or data provided by the teacher. Learners will need to be able to interpret the data and draw some basic conclusions about the nature of the food chain and soil characteristics.

For Outcome 4, learners need to gain an understanding of the hydrological cycle and how water may become polluted. It is anticipated that a significant proportion of delivery might be classroom based but could be supplemented by a visit, for example to a farm adjacent to a river or to a lake or reservoir, to see aspects of the theory in a practical setting. A guest speaker, for example a farmer who could explain how they avoid water pollution through revised farming practices, could add vocational interest and relevance.

References

Books

Allaby M. 2004. *A Dictionary of Ecology.* Oxford University Press. ISBN: 978-0-19-860905-6.
Roberts M and Ingram N. 2001. *Biology.* Nelson Thornes Ltd. ISBN: 0-748-76238-8.
Soffe R. 2003. *The Agricultural Notebook.* 20th ed. Blackwell Science. ISBN: 0-632-05829-3.

Websites

www.defra.gov.uk	Department for Environment, Food & Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.environment-agency.gov.uk	Environment Agency
www.forestry.gov.uk	Forestry Commission
www.lantra.co.uk	Lantra SSC
www-saps.plantsci.cam.ac.uk	The Science and Plants for Schools Website
www.soils.org.uk	British Society of Soil Science

Unit 213 Conservation and Improvement of British Habitats

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of conservation and improvement of British habitats and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will explore a range of British habitats, their characteristics and locations as well as methods use in habitat conservation, improvement and maintenance. They will learn the importance of habitat conservation through monitoring and reporting of habitat conditions, their flora and fauna and how to best enhance and protect a local habitat. They will carry out practical habitat improvements to develop their skills in the field.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know types of habitat found in the British Isles
2. Know factors that affect wildlife in the British Isles
3. Be able to collect and present information concerning flora and fauna
4. Be able to improve a habitat

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU 87.1, 2 Carry out habitat management

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 213 Conservation and Improvement of British Habitats

Outcome 1 Know types of habitat found in the British Isles

Assessment Criteria

The learner can:

1. Identify major British **habitat types**
2. Describe major British **habitat types**
3. Outline **characteristics** of a given habitat.

Unit content

Habitat types

Upland, lowland, freshwater (ponds, lakes, reservoirs, reed beds), coastal (beaches, sand dunes, rock pools, mud-flats, buffer zones), wetland (marsh, peat bogs), grassland, heath land, meadows, woodland (ancient, deciduous, evergreen, mixed), hedgerows, rural, semi-rural, urban

Characteristics

Location, topography, climate, soil type, rainfall, temperature, flora and fauna

Unit 213 Conservation and Improvement of British Habitats

Outcome 2 Know factors that affect wildlife in the British Isles

Assessment Criteria

The learner can:

1. Describe **biotic and abiotic** factors that affect a given species of wildlife within a specified habitat
2. Outline **relationships between species** within a specified habitat

Unit content

Abiotic factors

Climate, soil, temperature, location, resources

Biotic factors

Flora and fauna, predation, grazing, competition, non-indigenous species

Relationships between species

Prey/predator relationships, parasitic relationships, food chains, competition, territorial behaviour, social behaviour

Unit 213 Conservation and Improvement of British Habitats

Outcome 3 Be able to collect and present information concerning flora and fauna

Assessment Criteria

The learner can:

1. Select and use **survey techniques** in accordance with survey specification
2. Conduct a survey of a specified local habitat, recording **flora and fauna**
3. **Present data** collected.

Unit content

Survey techniques

Quadrat and transect surveys

Flora

Individual species relevant to habitat

Fauna

Invertebrates, fish, amphibians, reptiles, mammals, birds relevant to habitat

Present data

Present information from surveys in various forms (written, data and pictorial), graphs, pie charts, basic statistics (percentages, ratios)

Unit 213 Conservation and Improvement of British Habitats

Outcome 4 Be able to improve a habitat

Assessment Criteria

The learner can:

1. Select and use appropriate **equipment**
2. Carry out **habitat improvements** safely according to site management plans
3. Carry out work in a manner which minimises **environmental damage**.

Unit content

Equipment

Basic habitat clearance: rakes, secateurs, loppers, bill hooks, and spades or other equipment appropriate to operations

Habitat improvements

Work safely; carry out site specific risk assessment, Health and Safety at Work etc Act (1974)
Conservation, re-establishment of habitats
Methods used to improve habitats for example fencing, coppicing, hedge laying, pond formation and clearance, land clearance, establishing and maintaining boundaries
Benefits of habitat improvement: flora, fauna, human communities, tourism, conservation
Clearance techniques: manual, mechanical

Environmental damage

Damage to flora by trampling, disturbance to fauna and nests, dens, sets, habitat, safe waste disposal, not leaving litter, avoiding damage by machinery and vehicles, appropriate timing of the work operations to minimise disturbance and damage

Unit 213 Conservation and Improvement of British Habitats

Notes for guidance

This unit is designed to enable the learner to explore a range of British habitats, their characteristics, locations as well as methods used in habitat conservation, improvement and maintenance. They will learn the importance of habitat conservation through monitoring and reporting of habitat conditions, their flora and fauna and how to best to enhance and protect a local habitat. They will carry out practical habitat improvements to develop their skills in the field.

This unit should consider the full range of British habitats, a representative range of flora and fauna species (plants, mammals, reptiles, insects, birds) and should aim to take advantage of the local biogeography and speciation to enable the learner to fully engage with their community's ecology.

The unit should emphasise both a National and Local perspective for habitat and their respective bio-communities allowing the learner to develop an overview of the flora and fauna of the British Isles. Inclusion of local habitats will facilitate practical delivery and will help the learner fully engage with the concepts discussed in a real environment. Safe working practices and compliance with relevant legislation, codes of practice and health and safety should be emphasised before and during practical surveying and identification.

In Outcome 1, the learner will develop their knowledge and understanding of the variety of habitats and the species that inhabit them across the British Isles. Delivery will be a combination of formal delivery and practical visits. Guest speakers or links with national and local agencies with stewardship responsibility for habitats such as the National Trust, Forestry Trust and Wildlife Trusts is encouraged.

In Outcome 2, the learner will explain a range of abiotic and biotic factors that affect wildlife and be able to develop their understanding to indicate how these factors can influence wildlife populations. Inter-relationships between flora and fauna, consumer and grazers, prey and predators, and humans should be considered. Delivery is expected to be formal but should be complimented by practical activities, videos and case studies to encourage the learner to contextualise the factors covered. Current and topical issues in British wildlife management and conservation should be highlighted.

Outcome 3 enables the learner to engage in practical identification of flora and fauna, and to expand their practical identification, surveying and reporting skills. Delivery should incorporate field opportunities within a variety of habitats to identify British flora and fauna and undertake basic surveys. The learner should aim to develop the ability to relate surveys to population studies enabling identification of trends in numbers and speciation. A range of British habitats should be available for study and emphasis should be placed on exploration of sites of local interest to engage learners.

Outcome 4 considers methods employed in and the impact of habitat improvements. Learners should be encouraged to consider short, medium and long term implications of habitat improvements with reference to flora, fauna and human populations. A combination of formal and practical delivery is envisaged. Learners should be encouraged to actively participate in habitat improvements or conservation and develop their own management plans via a local project, conservation agency or through volunteering. This will enable the development of practical conservation and habitat improvement skills, and contextualise the principles under discussion. Topical issues in British (National and Local) conservation and habitat improvement strategies should be highlighted.

Learners working towards Level 2 may have some underpinning knowledge or have developed personal interest in aspects of this unit. It aims to build foundation knowledge of the biogeography of the British Isles and to uncover the wide variety of flora and fauna that inhabit them. Learners will be

exposed to historic and current issues that have shaped habitats and their populations, and will be given the opportunity to engage in habitat improvements. Equal emphasis should be placed on the development of practical skills and the necessary knowledge to be able to identify flora and fauna. It is important that the learner understands the influence of legislation, codes of practice, health and safety and the limitations of habitat improvements in respect of management plans and local and national conservation strategies. Centres are encouraged to introduce employers and specific professional from industry to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of habitats to add depth to the learner experience. It is accepted that some formal lectures will be necessary at Level 2 but for this unit it is necessary to compliment this with practical opportunities and recommended to introduce interactive sessions in a real environment.

References

Books

Brower JE., Jerrold HZ and Von Ende CN. 1997. *Field and laboratory methods for General Ecology (4th Edition).* McGraw-Hill Education. ISBN: 0-697-24358-3.

McGavin GC, Fletcher N, Hume R, Coombes A., Gibson C, Kibby G and Parker S. 2008. *RSPB Wildlife of Britain.* Dorling Kindersley. ISBN: 1-405-32932-7.

Collins Handbooks:

Sterry P. 2008. *Collins Complete Guide to British Wildlife: A Photographic Guide to Every Common Species*. Collins. ISBN: 0-007-23683-2.

Sterry P. 2008. *Collins Complete Guide to British Birds: A Photographic Guide to Every Common Species*. Collins. ISBN: 0-007-23686-7.

Sterry P. 2008. *Collins Complete Guide to British Wildflowers: A Photographic Guide to Every Common Species*. Collins. ISBN: 0-007-23684-0.

Sterry P. 2008. *Collins Complete Guide to British Trees: A Photographic Guide to Every Common Species*. Collins. ISBN: 0-007-23684-0.

Chinery M. 2009. *Collins Complete Guide to British Insects: A Photographic Guide to Every Common Species*. Collins. ISBN: 0-007-29899-4.

Journals

Nature
Wildlife
Forest Life
Birds
Shooting and Conservation
British Wildlife
Behavioural Ecology

Websites

www.wildlifetrust.org.uk	The Wildlife Trust
www.nationalparks.gov.uk	National Parks
www.rspb.org.uk	Royal Society for the Protection of Birds
www.wildaboutbritain.co.uk	Wild about Britain
www.woodlandtrust.com	The Woodland Trust
www.british-trees.com	The Woodland Trust
www.bbc.co.uk/nature	British Broadcasting Corporation
www.countrysideinfo.co.uk	Offwell Woodland and Wildlife Trust
www.habitat.org.uk	Habitat
www.naturescape.co.uk	Nature Escape

Unit 214 Introduction to Land-based Workshop Practice

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of land-based workshop practice and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will cover the basic work requirements within land-based workshops. They will understand the importance of Health and Safety as an integral topic. They will learn how to safely use hand and power tools and basic welding equipment commonly found in a land-based setting. The skills associated with these will be integrated with the development and use of basic maintenance and repair techniques.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to safely use commonly found hand and power tools for the maintenance and repair of land-based machinery and installations
2. Be able to safely use basic welding and cutting equipment
3. Be able to safely use basic maintenance and/or repair techniques on land-based machinery and installations
4. Understand land-based workshop health and safety requirements.

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU1 Maintain safe and effective working practices

CU27 Maintain equipment and machines

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 214 Introduction to Land-based Workshop Practice

Outcome 1 Be able to safely use commonly found hand and power tools for the maintenance and repair of land-based machinery and installations

Assessment Criteria

The learner can:

1. Select and safely use **hand** and **power tools** to meet given objectives **maintaining** or **repairing** land-based machinery or installations
2. State **reasons** for the hand and power tools selected

Range

All learning disciplines: hand held manually operated tools to carry out basic service, maintenance and component replacement tasks.

Unit content

Hand tools

Spanners, wrenches, socket sets, keys, gripping tools, drivers, punches, torque setting, pressure measurement, marking out tools, measuring devices

Power tools

Drills, metal cutters, battery/mains, electrical powered, pneumatic, hand held, bench mounted

Maintaining

Routine maintenance, periodic maintenance, wearing component replacement, tool maintenance

Repairing

Workshop based, emergency on work site, belts/pulleys, chains/sprockets, gears/shafts, bearings, bushes, seals

Reasons

Justification for selection, appropriateness, availability, safety

Unit 214 Introduction to Land-based Workshop Practice

Outcome 2 Be able to safely use basic welding and cutting equipment

Assessment Criteria

The learner can:

1. Safely use **basic welding equipment** and **materials** to produce a simple welded joint to meet given objectives
2. State reasons for the **basic welding equipment** and **materials** selected

Range

All learning disciplines: preparation and metal joining of materials up to 3mm thickness for oxy/ fuel welding and up to 8mm for MMA and MIG techniques. Lap, butt and fillet welds to a given standard, Personal Protection Equipment (PPE)

Unit content

Basic welding equipment

Oxygen, propane, acetylene gasses- canisters, bottles, safe handling and storage
Gauges, hoses and fittings- mixing torch and nozzle selection, flame types and pressures, rods, flux and techniques
Manual metal arc/inert gas welder design, input/output voltage settings, amperage settings, rods, coatings and techniques
Inert gasses/argon, wire diameter, speed, nozzles and shrouds, MIG techniques

Materials

Ferrous/ non ferrous material choices, melting temperatures, suitability for purpose

Unit 214 Introduction to Land-based Workshop Practice

Outcome 3 Be able to safely use basic maintenance and/or repair techniques on land-based machinery and installations

Assessment Criteria

The learner can:

1. Safely use **basic techniques** to **maintain** or **repair** land-based machinery or installations to meet given objectives
2. State reasons for the **basic techniques** selected

Range

All learning disciplines: carry out routine, periodic and unscheduled maintenance on machines typical to the individual's area of study for example those used for grass cutting/collection, ground preparation or cultivation, crop/materials transportation, fixed equipment/installations, PPE

Unit content

Basic maintenance techniques

Systematic routine maintenance, follow manufacturers' service charts, operator manual instructions- non routine/periodic maintenance tasks, wearing component adjustments- lubrication, pressures

Basic repair techniques

Component replacement, bearings bushes, seals, driveline components- remanufacture, brackets, guards

Unit 214 Introduction to Land-based Workshop Practice

Outcome 4 Understand land-based workshop health and safety requirements

Assessment Criteria

The learner can:

1. Explain the importance of **health and safety** in the **workshop**
2. Produce a suitable **risk assessment** for the use of hand and/or power tools to meet given objectives

Range

All learning disciplines: to be made aware of Health and Safety at Work etc Act 1974, Provision and Use of Work Equipment Regulations 1998 (PUWER), Lifting Operations and Lifting Equipment Regulations 1998 (LOLER), Control of Substances Hazardous to Health 2002 (COSHH), first aid procedures, minor injuries and burns, fire prevention and use of fire extinguishers, Personal Protective Equipment (PPE).

Unit content

Health and safety

Safe working areas, ventilation, lighting, PPE, correct storage, electrical testing procedures, safe lifting procedures

Workshop

Designated welding, grinding areas, fume extraction, service bays, work areas on site, environmental hazards

Risk assessment

Assessing risks prior to work, injury, damage to self, others and equipment-control measures identified-recording and storing information

Unit 214 Introduction to Land-based Workshop Practice

Notes for guidance

This unit is designed to provide the learner with the knowledge, understanding and practical skills required to maintain a range of machines and equipment used in land-based operations. The maintenance tasks may be scheduled as periodic- daily, weekly, monthly or yearly or routine, where it is expected the machine is inspected at regular intervals during work to ensure efficiencies. Unscheduled repairs may need to be carried out in the event of breakdowns. These repairs may have to be carried out on site. Emphasis will be on safe and efficient working practices throughout the unit.

Health and safety - Centres and tutors need to be aware of the need to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of equipment and machinery is involved. This unit requires the learner to undertake equipment and machinery operations under close supervision, and this is the same for any unit within the qualification that requires the learner to operate or use machinery. This is a largely practical-based unit which looks at the basic use and maintenance of hand and power tools and equipment and machinery. There is significant emphasis on safe practices throughout the unit. Throughout the unit the emphasis is on acceptable health and safety procedures and safe working practices. The guidance in this unit requires that Health and Safety must be strictly enforced and repeated throughout. The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

In Outcome 1, the learner will be required to identify appropriate tools needed to perform basic maintenance and repair techniques to meet given objectives. The learner should be able to demonstrate correct and safe use of chosen tools, explain limitations and suggest alternative strategies. Delivery should also include the care and maintenance of tools.

In Outcome 2, the learner will become familiar with a range of thermal metal joining techniques and equipment needed to carry out welding tasks to meet given objectives. It is anticipated that delivery of this unit will be largely practical. As part of this outcome, the learner should be able to recognise different materials and their properties and have an understanding of alternative welding/repair strategies. Welding is potentially dangerous so particular emphasis should be placed on safe working practices.

In Outcome 3, the learner will be required to demonstrate acceptable safe working practices whilst repairing and maintaining machines and equipment. A range of tasks should be covered to include both maintenance and repair techniques. A portfolio of records for each task should contribute towards assessment material. It is expected that some tasks may have several acceptable strategies and the learner will be expected to justify the chosen strategy.

Outcome 4 the learner is expected to demonstrate understanding of health and safety procedures in the workshop and carry out risk assessments. As part of this outcome the learner should carry out an inspection to the work premises and equipment to highlight any hazards, risks or discrepancies which may impair safe working practices. The risk assessments throughout this unit may contribute to the assessment evidence for this outcome.

References

Books

Gourd L,1995. *Principles of Welding Technology*, 3rd edition Butterworth-Heinemann ISBN 0340613998
Kenyon W, 1987. *Basic Welding and Fabrication*, 2nd edition, Longman ISBN 0582005361.

Websites

www.hse.gov.uk Health and Safety Executive

Unit 215 Introduction to the Principles of Land-based Machinery

Level: 2

Credit value: 5

Unit aim

This unit aims to provide learners with an understanding of the principles of land-based machinery and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to recognise the basic roles and functions of engines as the major power source for Land-based machines. It covers knowledge and skills including the working principles of engines and typical engine maintenance activities that may be carried out by the operator.

Learning outcomes

There are **three** learning outcomes to this unit. The learner will:

1. Know the working principles of combustion engines
2. Know the maintenance requirements of machines
3. Be able to maintain engines on land-based machines

Guided learning hours

It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU27 Maintain equipment and machines
L27.1 Use and maintenance of non-powered and hand held power tools and equipment
L27.2 Carry out routine maintenance to equipment and machinery

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SCC.

Assessment and grading

This unit will be assessed by:

- An assignment covering assessed practical competencies and underpinning knowledge

Unit 215 Introduction to the Principles of Land-based Machinery

Outcome 1 Know the working principles of combustion engines

Assessment Criteria

The learner can:

1. Describe the uses of **combustion engines** on a range of machines within a land-based industry
2. Describe the **working cycles of 2 stroke and 4 stroke engines**
3. State the **functions of component parts** of a combustion engine
4. Describe methods of **transmitting drive** from engines to the working parts of machines

Unit content

Combustion engines

Compression Ignition (CI), Spark Ignition (SI)

Working cycles of 2 stroke and 4 stroke engines

Otto cycle, 2 stroke cycle, air induction, exhaust emissions

Function of component parts

Crankshaft, pistons, connecting rods and bearings, piston rings, bore types, camshaft, valves and springs, oil pump, flywheel

Transmitting drive

Friction plate clutches centrifugal clutches, hydraulic clutches, belt and pulleys, chain and sprocket, gears, electrical generator, compressed air, hydraulics

Unit 215 Introduction to the Principles of Land-based Machinery

Outcome 2 Know the maintenance requirements of machines

Assessment Criteria

The learner can:

1. Describe **common hazards** associated with machine use and maintenance
2. State the purpose of common **workshop tools**

Range

All Learners: activities in maintenance workshop and on site, periodic maintenance, preventative maintenance, unscheduled maintenance

Unit content

Common hazards

Machine power isolation, machine stability and contamination from fuels/lubricants/chemicals/sharps/heat/pressure/fumes

Workshop tools

Spanners/sockets and wrenches, torque wrenches and multipliers, screwdrivers, hammers, punches, service gauges and measuring equipment, tool kit and on site tool kit

Unit 215 Introduction to the Principles of Land-based Machinery

Outcome 3 Be able to maintain engines on land-based machines

Assessment Criteria

The learner can:

1. Carry out a **risk assessment** for machine **maintenance activities**
2. Carry out **pre-start checks and starting procedures** on machines

Unit content

Risk assessment

Risks to self, risks to others, risk to environment, risk to machines and equipment

Pre-start checks and starting procedures

Fuel level, oil levels, coolant and cooling, safety guards and panels, fume extraction within buildings, safe operation distances, safety start devices, engine/turbocharger oil pressure

Maintenance activities

Machine preparation prior to routine/scheduled maintenance, unscheduled maintenance on site, safe use of tools, selection of correct replacement service components, preparation of service area, re-instatement of service area, post service inspection of machine

Also, need to cover:

Current Legislation

Health and Safety at Work etc Act1974 (HASWA), Provision and Use of Work Equipment Regulations 1998 (PUWER), Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)

Maintenance records

Maintenance check lists, job cards, inspection reports, recording machine details and work hours, records of repairs/replacement parts

Unit 215 Introduction to the Principles of Land-based Machinery

Notes for guidance

This unit is designed to provide learners with knowledge and understanding of basic working principles of Land-based powered equipment, requirements for regular service, maintenance and repair and safe practical experiences while undertaking maintenance tasks.

The range covered during delivery should include electric vehicles and machinery.

Health and safety - Centres and tutors need to be aware of the need to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of machinery is involved. This unit requires the learner to undertake machinery operations under close supervision, and this is the same for any unit within the qualification that requires the learner to operate or use machinery. This is a largely theory based unit, but Outcome 3 requires learners to be able to maintain engines on land-based machines. Throughout the unit the emphasis is on acceptable health and safety procedures and safe working practices. The guidance in this unit requires that Health and Safety must be strictly enforced and repeated throughout. The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

In Outcome 1 the learner will be required to investigate working principles of the range of engine types that power land-based vehicles and machines. It is essential that the learner understands the limitations of engine types and why manufacturers designate their use to different purpose. The learners should be encouraged to develop understanding of topical issues regarding available fuel types, environmental pollution and running costs.

Outcome 2 prepares the learner for the knowledge and understanding required prior to undertaking practical maintenance work on engines and powered machines. Emphasis should be directed to safe working practices, care of machines, tools and work areas. The learner should also be encouraged to plan for unscheduled maintenance tasks. Due to the complexity of land-based vehicles and machines it is essential that learners understand that maintenance of machines and vehicles must be carried out to manufacturers recommendations and that service documentation should be available and accurately followed when performing tasks.

In Outcome 3 the learner will be required to carry out risk assessments and put appropriate control measures in place before completing the practical activities. It is anticipated that delivery of this outcome will be predominantly practical, with learners gaining experience of carrying out pre-start checks. The learner must be aware of current legislation and safe working practices and be encouraged to adopt a clean, tidy and methodical approach to work ethic. The importance of accurate completion of maintenance and work records must be highlighted.

Throughout the unit the emphasis will be on safe, legal practices, working to manufacturers' recommended procedures and attention to detail when recording information.

References

Books

Bell B. 2005. *Farm Machiner. 5th e.* Old Bond Publishing. ISBN: 1-903-36668-2.

Hillier V and Coombes P. 2004. *Hillier's Fundamentals of Motor Vehicle Technolog. 5th ed.* Nelson Thornes. ISBN: 0-748-78082-3.

Manufacturer's service charts, operator manuals

Websites

www.howstuffworks.com	Discovery Communications
www.hse.gov.uk	Health and Safety Executive

Unit 216 Undertake Freshwater Sport Fishery Management

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of freshwater sport fishery management and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will cover the elementary methods of fish stock maintenance and improvement that are employed in both natural and commercial game and coarse fish fisheries. They will cover the management of sport fishery banks and related structures and the control of both aquatic and bank side vegetation. They will look at the most commonly used methods of catching fish within freshwater environments and look at the role of rules and legislation and the typical duties associated with working in the industry.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know elementary methods of fish stock maintenance and improvement
2. Be able to use suitable methods of bank maintenance and vegetation control
3. Be able to use commonly used legal methods of catching fish
4. Understand the use of rules and the duties of those employed in sport fisheries

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

n/a

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 216 Undertake Freshwater Sport Fishery Management

Outcome 1 Know elementary methods of fish stock maintenance and improvement

Assessment Criteria

The learner can:

1. Identify suitable **species**, **sizes, numbers and costs** of fish for a specified **coarse fishery** to meet given objectives
2. Identify suitable species, **sizes, numbers and costs** of fish for a specified **game fishery** to meet given objectives

Unit content

Coarse species

Barbel, Bream, Chub, Crucain Carp, Common Carp, Mirror Carp, Perch, Pike, Roach, Rudd and Tench

Coarse fishery

Commercial match fishery, commercial pleasure fishery, commercial carp fishery, river, canal, natural still water

Game species

Brown Trout, Blue Trout, Rainbow Trout, Triploid Trout, Landlocked Salmon

Game fishery

Put and take fishery, catch and release, commercial stillwater, reservoir, river, natural stillwater

Sizes

Fry, fingerlings

Numbers

Stocking densities appropriate to species and size, age, and location

Costs

Current commercial costs

Unit 216 Undertake Freshwater Sport Fishery Management

Outcome 2 Be able to use suitable methods of bank maintenance and vegetation control

Assessment Criteria

The learner can:

1. Correctly use **hand tools** whilst undertaking **bank or angling peg maintenance** to meet specified objectives
2. Correctly use **hand tools** whilst undertaking **vegetation control** to meet specified objectives

Unit content

Hand tools

Bow saw, pruning saw, panel saw, loppers, slasher, grass hook, claw hammer, lump hammer, sledge hammer, crome, fencing maul, rake, spade, fork, spirit level and other tools as appropriate to location and activity

Bank or angling peg maintenance

Faggots, revetment, board walk, steps, concrete angling peg, disabled angling pegs, jetties, slab pegs, stone peg, woodchip peg, wooden platforms

Vegetation

Bank side vegetation, marginal plants, aquatic plants, floating leaved plants, submerged plants, trees

Vegetation control

Raking, pulling, cutting, pruning, coppicing, pollarding

Unit 216 Undertake Freshwater Sport Fishery Management

Outcome 3 Be able to use commonly used legal methods of catching fish

Assessment Criteria

The learner can:

1. List the **equipment** required to undertake a fish capture operation
2. Carry out a **fish capture operation**

Unit content

Equipment

Boat, motor, life jacket, buoyancy aid, wading sticks, chest waders, throw ropes, seine net, electro fishing apparatus, angling equipment, fyke nets, fish traps, dip nets, keep cages, fish tubs, weigh slings, scales

Fish capture operation

Seine netting, electric fishing, angling, fyke netting, and traps

Unit 216 Undertake Freshwater Sport Fishery Management

Outcome 4 Understand the use of rules and the duties of those employed in sport fisheries

Assessment Criteria

The learner can:

1. Explain the requirement of the **rules** of a specified **coarse fishery**
2. Explain the requirement of the **rules** of a specified **game fishery**

Unit content

Coarse fishery

Commercial match fishery, commercial pleasure fishery, commercial carp fishery, river, canal, natural still water

Rules

General: Environment Agency rod licence, number of rods, no litter, no fires and no dogs

Fish welfare: barbless hooks, fish friendly nets, bait bans, unhooking mats and no keep nets

Game fishery

Put and take fishery, catch and release, commercial still water, reservoir, river, natural still water

Rules

General: no litter, no dogs, Environment Agency rod licence, fly limits/bans, catch limits

Fish Welfare: catch and release, dispatching fish

Unit 216 Undertake Freshwater Sport Fishery Management

Notes for guidance

This unit is designed to provide the learner with the knowledge and practical skills required for the management of coarse and game fisheries. The context of teaching will differ depending on the outcomes being delivered. It is expected that there will be a mixture of classroom sessions and real life practical's in order for the learners to acquire the knowledge and practical skills to work in the industry.

Throughout the unit, the emphasis should be on safe working. It is expected that learners will be aware of safe working practices and be familiar with accepted practices and behaviours within the context in which they are working, especially when this is in and around water.

In Outcome 1, the learner will be required to understand how coarse and game fisheries are stocked. This will involve some numerical work and research to work out costs and stocking densities. It is accepted that this outcome will require some formal delivery however, visits to fisheries and fish farms should also be encouraged. Learners should look at both coarse and game fisheries both commercial and natural with regard to the species, sizes, costs and densities.

Outcome 2 looks at the practical management of aquatic and bank side plants and the bank side maintenance and angling peg work undertaken on fisheries. It is anticipated that the delivery of this outcome will be through short theory sessions backed with lengthy practical's to allow learners to develop their practical skills. Learners should be involved in all aspects of risk assessment and safe working practices when undertaking the practical sessions. They should undertake a mixture of tasks to control bank side and aquatic plants and work on a range of angling pegs and bank side structures.

In Outcome 3, the learner will be required to use a method of fish capture. The emphasis should be on seine netting although other methods could be undertaken. Learners should be fully involved in risk assessments and safe working practices for the method of fish capture used. In addition fish welfare and environmental issues should be covered in detail. The outcome should be delivered practically with some theory sessions to allow the learners to develop their fish capture skills and knowledge.

In Outcome 4 the learner will be able to know the rules used in both coarse and game fisheries. The outcome will require some form of formal delivery but should use the knowledge and experiences gained by the learner's previous experiences. Visits to local fisheries are encouraged, as is internet research to gather up to date information.

Learners working towards level 2 are likely to have experience of fisheries through their angling experiences. This unit aims to extend the learners knowledge and skills involved in fishery management. Emphasis should be placed not only on 'doing', but also upon the importance of fish health and welfare and the environmental implications of the work undertaken. Learners should be made aware of how fisheries should be managed sustainably.

Centres are encouraged to introduce fishery managers, angling club officials, the Environment Agency and fish farmers from industry to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of fisheries to see current good practice.

It is accepted that some formal lectures will be necessary at level 2 but for this unit it is recommended that they are they are linked directly with interactive lessons in a real environment. Learners must be given the opportunity to work on a range of fisheries to be involved in current industry practice.

Reference

Books

Barnes R S K and Mann K H. 1991 *Fundamentals of Aquatic Ecology.* Blackwell. ISBN: 0-632-02983-8.

Brooks A and Agate E. 1997*. BTCV Waterways and Wetlands a practical handbook.* BTCV. ISBN: 0-950-16438-0.

Environment Agency Guides. *Environments for fish, Water plants their function and management, coarse fish biology and management, Fisheries habitat improvement.*

Maitland PS. 2004. *Keys to the Freshwater Fish of Britain and Ireland.* Freshwater Biological Association.

Seagrave C. 1988. *Aquatic Weed Control.* Fishing News Books. ISBN: 0-852-38152-2.

Templeton RG. 1995. *Freshwater Fisheries Management*. Fishing News Books. ISBN: 0-852-38209-X.

Websites

www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.environment-agency.gov.uk	The Environment Agency
www.ifm.org.uk	The Institute of Fisheries Management
www.anglingtrust.net	Angling Trust Organisation

Unit 217 Introduction to Game and Coarse Angling

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of game and coarse angling and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will look at the structure and diversity of angling in the United Kingdom and the angler's responsibilities to the environment, wildlife and fish. They will consider the commonly found equipment and methods used to catch game and coarse fish species and develop angling skills.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know the structure and diversity of angling in the United Kingdom
2. Understand the angler's responsibility to the environment, fish and wildlife
3. Be able to demonstrate game angling skills
4. Be able to demonstrate coarse angling skills

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

n/a

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 217 Introduction to Game and Coarse Angling

Outcome 1 Know the structure and diversity of angling in the United Kingdom

Assessment Criteria

The learner can:

1. Define **coarse, game** and **sea** angling
2. Describe the main **geographical locations** of coarse, game and sea angling in the United Kingdom

Range

Coarse, game and sea

Unit content

Coarse

Species angled for, location venues - rivers, canals, commercials, specimen, angling types- pole, carp, pike, match, and barbel

Game

Species angled for, location venues: reservoirs, rivers, commercials, angling types (fly, worm, spin, and prawn)

Sea

Species angled for, angling types (sea, estuary, from shore, boat and pier)

Geographical locations

Location in the UK, features of that location, type of angling practiced, type of fish angled, for example Scotland, fast flowing rivers, game.

Unit 217 Introduction to Game and Coarse Angling

Outcome 2 Understand the anglers' responsibility to the environment, fish and wildlife

Assessment Criteria

The learner can:

1. Explain the **anglers' responsibilities** towards **wildlife** and the **environment** in a specified sport fishery
2. Discuss the use of **close seasons.**

Unit content

Anglers' responsibilities

Correct disposal of nylon, hooks and other angling litter for example tins and bags, fishery rules, consideration of anglers and other water users, the countryside code

Wildlife

Awareness of aquatic wildlife and the impacts on these when angling at different times of the day and year, for example bird nesting seasons, habitat disturbance, night fishing, different venues and wildlife associated with these

Environment

Environmental impact of angling - positives e.g. habitat creation, erecting bird boxes, re-stocking, clean ups, working parties Negatives- litter and line, disturbance, trampling, bank side erosion

Close seasons

National Close season for coarse and non-migratory trout, Salmon and Sea Trout close season (national and regional), reasons why, areas affected for example Sites of Special Scientific Interest, rivers, the benefits to fish and wildlife, the impacts to fisheries

Unit 217 Introduction to Game and Coarse Angling

Outcome 3 Be able to demonstrate game angling skills

Assessment Criteria

The learner can:

1. List the **tackle** required to go **game angling**
2. Carry out **game angling techniques**

Unit content

Tackle for game angling

Fly rods, fly reels, fly lines, leader material, flies, fly boxes, clothing, glasses, hat, waistcoat, bag, landing net, priest, marrow spoon, bass bags

Game angling techniques

Assemble tackle, make leaders, angling knots, overhead cast, roll cast, shoot line, fish dry flies and wet flies, identify main game fish species and identify fish holding areas

Locations to game fish, health and safety, fish welfare

Unit 217 Introduction to Game and Coarse Angling

Outcome 4 Be able to demonstrate coarse angling skills

Assessment Criteria

The learner can:

1. List the **tackle** required to go **coarse angling**
2. Carry out **coarse angling techniques**

Unit content

Tackle for coarse angling

Rods, poles, reels, nylon, floats, hooks, weight, seat box, chairs, luggage, landing nets, keep nets

Coarse angling techniques

Rod and line fishing,(for example float, feeder, ledger), species specific (for example carp fishing, match fishing, pole fishing, pike fishing etc) assemble tackle, make terminal rigs, angling knots, overhead cast, identify main coarse fish species, identify fish holding areas

Locations/venues to coarse fish, costs involved, rules and legislation, health and safety, fish welfare

Unit 217 Introduction to Game and Coarse Angling

Notes for guidance

This unit is designed to provide the learner with an understanding of angling in the United Kingdom and the practical skills required to undertake coarse and game angling techniques. The teaching on this unit will involve short theory sessions with practical sessions to allow the learners to develop their angling skills. The unit should cover a range of angling techniques appropriate to the area of study.

Throughout the unit, the emphasis should be on safe working. It is expected that learners will be aware of safe working practices and become familiar with accepted practices and behaviours within the context in which they are working.

In Outcome 1, the learner will be required to understand angling in the United Kingdom. It is accepted that this outcome will require some formal delivery but learners should also be encouraged to take part in research and independent learning. Learners should be able to know the main types of angling, (coarse, game and sea) and where this is practiced across the United Kingdom. They should be familiar with the species angled for, the venues in which this takes place and the geographical distribution across the United Kingdom of the main types of angling.

Outcome 2 looks at the anglers responsibilities to wildlife, the environment and fish. It is anticipated that the delivery of this unit will be through formal lectures, research and group discussion using the learners own experiences. Regional and national close season should be researched using the internet to ensure learners are aware of the current legislation.

In Outcome 3, the learner will be required to develop their knowledge and practical skills in game angling. Short lectures and practical demonstrations should initially be used to allow the learners to gain a basic understanding of the tackle used, species to be caught and the techniques to be used. Learners should be given time to develop the practical skills required in order to make them competent game anglers. Health and safety when fly casting and fly fishing should be included in all practical sessions.

In Outcome 4, the learner will be required to develop their knowledge and practical skills in coarse angling. Short lectures and practical demonstrations should initially be used to allow the learners to gain a basic understanding of the tackle used, species to be caught and the techniques to be used. Learners should be given time to develop the practical skills required in order to make them competent coarse anglers. A range of venues and techniques should be undertaken by the learners. Health and safety and fish welfare should be included in all practical sessions.

Learners working towards level 2 are likely to have some angling experience. This unit aims to extend the learners knowledge and skills with a strong emphasis on health and safety and fish welfare. Emphasis should be placed not only on ‘doing’ but also upon the importance of planning angling sessions and the role angler’s play when out in the countryside.

Centres are encouraged to introduce angling coaches, fishery managers, Environment Agency Fishery Officers/Bailiffs to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of fisheries to add depth to the learner experience.

References

Books

Bingham C and Allen A C. 1999. *Fundamentals of Freshwater Fishing*. Swan Hill Press. ISBN: 1-853-10996-7.

Brown D. 2003. *A Field Guide to Anglers Knots for Freshwater and Stillwater Angling.* Wilderness Adventure Press. ISBN: 1-932-09803-8.

Falkus H and Buller F. 1998. *Freshwater Fishing*. Ebury Press. ISBN: 0-091-86451-8.

Greenhalgh M. 2001. *The pocket guide to Freshwater Fish of Britain and Europe.* Mitchell Beazley. ISBN: 1-842-15819-8.

Miles T, Ford M and Gathercole P. 2003. *The Complete Fisherman's Handbook.* Southwater. ISBN: 1-842-15819-8.

Journals

Anglers Mail
Anglers Times
Carp Talk
Improve your Coarse Fishing
Trout Fisherman Magazine
Total Fly Fisher

Websites

www.environment-agency.gov.uk	The Environment Agency
www.anglingtrust.net	The Angling Trust
www.salmon-trout.org	The Salmon and Trout Association

Unit 218 Introduction to Pest and Predator Control

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of pest and predator control and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The aim of this unit is to enable learners to identify the damage caused by pests and predators and to be able to utilise techniques for their control.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know the principal UK pest and predator species
2. Know the damage caused by pests and predators
3. Understand methods for controlling pests and predators
4. Be able to control the damage caused by pests and predators

Guided learning hours

It is recommended that 60 hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU46 Control vertebrate pests and predators using traps
CU47 Control vertebrate pests and predators by shooting
CU48 Control vertebrate pest populations using chemical means

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 218 Introduction to Pest and Predator Control

Outcome 1 Know the principal UK pest and predator species

Assessment Criteria

The learner can:

1. Define the **meaning of pest and predator** in the UK
2. Identify **common pests and predators** found in the UK

Unit content

Meaning of pest and predator

Characteristics of pest species (presence when not desired, damage to other species, damage to habitat, spread of disease, dangerous to livestock or humans): rapid reproduction, short generation times; loss of 'natural' control mechanisms

Predator/prey interactions: numerical and functional responses to high prey densities

Common pests and predators

Fox, Badger, Stoat, Weasel, Mink, Polecat, Pine Marten, Otter, Rat, Rabbit, House Mouse, Grey Squirrel, Cat (wild and feral), Crow (Carrion and Hooded), Rook, Magpie, Jackdaw, Jay, Raven, Buzzard, Sparrow Hawk, Tawny Owl, Hen Harrier, Goshawk, Peregrine Falcon, Woodpigeon, Canada Goose

The above species as pests: damage caused, reason for being classified as a pest

Unit 218 Introduction to Pest and Predator Control

Outcome 2 Know the damage caused by pests and predators

Assessment Criteria

The learner can:

1. Identify **evidence of damage** associated with a stated **pest**
2. Identify evidence of damage associated with a stated **predator**

Unit content

Common pests and predators

Fox, Badger, Stoat, Weasel, Mink, Polecat, Pine Marten, Otter, Rat, Rabbit, House Mouse, Grey Squirrel, Cat (wild and feral), Crow (Carrion & Hooded), Rook, Magpie, Jackdaw, Jay, Raven, Buzzard, Sparrow Hawk, Tawny Owl, Hen Harrier, Goshawk, Peregrine Falcon, Woodpigeon, Canada Goose

Evidence of damage

For example kills and injuries, feeding, holes, faeces, loss of wildlife

Match damage to each of the species listed.

Unit 218 Introduction to Pest and Predator Control

Outcome 3 Understand methods for controlling pests and predators

Assessment Criteria

The learner can:

1. Explain the **importance of controlling** pests and predators in the UK
2. Compare different **methods** for controlling pests and predators

Unit content

Importance of controlling

Reducing damage done, restore habitat balance, prevent spread of disease, cost implications due to loss or damage, limiting population growth of pest or predator, economic thresholds for control

Methods

Lethal and non-lethal, trapping, snaring, live catch, shooting, deterrents, poisoning

Effectiveness (short and long term), cost, risk of damage to other species, welfare and ethics, habitat disturbance

Unit 218 Introduction to Pest and Predator Control

Outcome 4 Be able to control the damage caused by pests and predators

Assessment Criteria

The learner can:

1. Perform the correct **method of deterring** a pest or predator using selected **non-lethal methods**
2. Assist in the safe control of a pest using selected **lethal methods**
3. Assist in the safe control of a predator using selected **lethal methods**

Unit content

Method of deterring

Exclusion, visual, auditory, olfactory, electrical

Non-lethal methods

Trapping, live catch, deterrents (for example bird scarer)

Lethal methods

Trapping, snaring, live catch, shooting, poisoning

Unit 218 Introduction to Pest and Predator Control

Notes for guidance

Throughout the unit, the emphasis should be on safe working. It is expected that learners will be aware of safe working practices and familiar with accepted practices and behaviours within the context in which they are working.

Outcome 1 covers the identification of the common vertebrate pests and predators likely to be encountered in the UK. These will include agricultural pests as well as those pests and predators related to game and wildlife management. The legal status of species is considered, together with the relevant legislation. Learners should be encouraged to develop their identification skills at every opportunity when out on practical's or visits.

Outcome 2 explores the damage caused by pests and predators so that learners can justify the control measures that are put in place. A major emphasis of this outcome should be the identification of tracks and signs in the field so that the correct pest/predator is implicated in the damage found. This outcome lends itself to a practical study on a large estate or various different habitats where there is evidence of a variety of pests and predators.

Outcome 3 compares the methods controlling pests/predators such that learners are equipped to choose the most appropriate method for a given situation. It could be linked to Outcome 4 where the learner is required to use each technique therefore this would give them a good opportunity to compare the effectiveness and practicality of a range of methods.

Outcome 4 covers the practical use of lethal and non-lethal techniques to prevent damage from pests and predators. It covers their use and related codes of practice and legislation. This outcome again lends itself to studying the practicalities of each control technique in the field, with the learners getting hands-on experience of the major techniques used in the UK.

References

Books

Bang P and Dahlstrom P.2001. *Animal Tracks and Signs*. Oxford: Oxford University Press. ISBN: 0199299978

Bateman J. 1982. *Animal Traps and Trapping.* Stackpole Books. ISBN: 1861268020

Bucknell R. 2001. *Foxing with Lamp and Rifle.* Foxearth Publishing. ISBN: 095402060X

Pepper H W. 1990. Grey squirrel control with warfarin. Forestry Commission. Forestry Commission.

Frain S. 2005. Rabbiting with ferret, dog, hawk and gun. The Crowood Press. ISBN:

Frain S. 2006. Fox Control. Shropshire: Quiller Publishing Ltd. ISBN: 1904057810

Game Conservancy. 1994. Predator Control. Game Conservancy Trust.

Game Conservancy. 2002. Hints for using Larsen Traps. Game Conservancy Trust.

Hogg G. 1998. Practical Pest Control in the Countryside. Coch-y-Bonddu. ISBN: 0952851083

Parkes C and Thornley J. 1994. Fair Game: The Law of Country Sports and the Protection of Wildlife, New Revised Edition. Pelham Books. ISBN: 0720720303

Roberts M. 1986. Modern Vermin Control, 3rd Edition. Gold Cockerel Series. ISBN: 0947870040

Stuttard R M. 1986. Predatory Mammals in Britain: A Code of Practice for their Management, 4th Edition. British Field Sports Society. ISBN: 0903537044

DVD

Caple S. 2002. Trapping Techniques: Part 1 — Moles, Squirrels, Rabbits and Mink. Countryman Pest Control

Websites

www.defra.gov	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.nationalgamekeepers.org.uk	National Gamekeepers Organisation
www.basc.org.uk	British Association of Shooting and Conservation
www.gct.org.uk	Game Conservancy Trust

Unit 219 Introduction to Practical Forestry Skills

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of practical forestry skills and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

Learner will develop their understanding of the management principles and practice for the establishment and growth of tree crop. They will be able to carry out practical tree establishment and felling. Develop their knowledge of health and safety in forestry operations. Environmental and waste issues are also considered.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to use a range of basic woodland establishment and maintenance techniques
2. Be able to carry out basic measurement of standing trees, timber products and woodland sites
3. Be able to carry out simple harvesting operations
4. Understand environmental and waste management issues associated with woodland operations

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

n/a

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 219 Introduction to Practical Forestry Skills

Outcome 1 Be able to use a range of basic woodland establishment and maintenance techniques

Assessment Criteria

The learner can:

1. **Prepare a site, handle, plant and maintain trees** to meet given **specifications** using **hand tools**
2. Outline the **factors** that **impact** the **establishment** of woodland
3. Describe the importance of managing woodlands for bio-diversity and conservation

Range

Soft and hard wood species, new planting or re-planting

Prepare a site, handle, plant and maintain tress

Ground preparation, clear vegetation, dispose of waste, assess suitability of planting site (for example soil condition, proximity to other trees, aspect), dig to appropriate depth, plant trees, aftercare (for example tree guards, watering)

Specification

Species, planting radius, compliance with legislation, Countryside and Rights of Way Act (2000)

Hand tools

Mattock, spade, clearance tools, shovel, hoe, rake, fork, billhook, shears as appropriate to site and activity

Factors that impact on establishment

Effectiveness of site preparation and tree handling, soil type, competition from vegetation, weather conditions, grazing, pests and disease

Unit 219 Introduction to Practical Forestry Skills

Outcome 2 Be able to carry out basic measurement of standing trees, timber products and woodland sites

Assessment Criteria

The learner can:

1. **Measure** specific standing single trees for height and diameter at breast height(DBH), wood products, site areas and perimeters

Range

Specific trees (single standing for height, diameter at breast height (DBH)
Timber (wood products)
Site areas
Site perimeters

Unit content

Measure

SI derived units: metres, cubic metres, square metres
Method of measuring: tape measure, paces, measuring wheel, measuring stick, measuring from scale map/drawing
Recording: accuracy, presentation, simple calculations, use of SI derived units

Unit 219 Introduction to Practical Forestry Skills

Outcome 3 Be able to carry out simple harvesting operations

Assessment Criteria

The learner can:

1. Select the choice of **extraction method** for a given situation
2. Fell small trees using **hand tools**, cut to specification, stack and extract **produce** from a given site

Range

Extraction of two trees
Felling of two small trees

Unit content

Extraction method
Manually, tractor unit, winch, horse

Hand tools
For example axe, bill hook, bow saw, chainsaw
Activities must be carried out in line with legislation and safe working practices

Produce
Hard wood or soft wood

Unit 219 Introduction to Practical Forestry Skills

Outcome 4 Understand environmental and waste management issues associated with woodland operations

Assessment Criteria

The learner can:

1. Discuss **possible impacts** of a **specified forest operation** on local wildlife and water courses
2. Explain how the **wastes and residues** from a specific forest operation should be managed.

Unit content

Possible impacts

Damage and disruption to habitats, trampling, noise pollution, vehicle damage, waste disposal

Specific forest operation

Planting, thinning, felling, extraction

Wastes and residues

Packaging, brash, tracks, oils, surface water run off

Unit 219 Introduction to Practical Forestry Skills

Notes for guidance

This unit will provide the learner with an introduction to the theory and practical skills of managing a commercial timber crop. This introduction will give the basis for the learner working with trees to produce as a sale item, but not how and where to sell. Although primarily focusing on conifers, it will also look at hard wood trees and their sustainable use. It will look at planting and establishment of trees, including protection of damage, how to measure saleable timber, either as a plot or by size and how to harvest the crop and minimise the environmental impact of forestry operations. The learner will also cover health and safety throughout the unit. Although the unit will be taught via formal lectures and guest speakers, field excursions will be valuable to show the commercial aspects. As this is a practical module access to suitable commercial woodland is expected.

In Outcome 1, the learner will learn about, and be able to research, planting methods and ages of trees for both conifers and hard woods and look at the influence of soil aspect, pests and diseases which could effect healthy establishment of a crop. Access to a commercial woodland is required to allow learners to demonstrate the correct planting and after care of trees using hand tools by following safe working practices.

To be able to sell timber it is important to know what quality and quantity you are selling. In Outcome 2, the theory of mathematical formulae will be explained during delivery with practical demonstrations in the field so learners can demonstrate this skill on their own, in both hard and soft woodlands.

For Outcome 3 access to a commercial woodland is required to show learners how harvesting is undertaken and the impact large machinery can make. Practical demonstrations of felling by hand tools will be followed by close supervision before learners demonstrate safe use of hand tool and harvesting methods. Chainsaw use is only permitted by certification of competence holders or if they are attending a recognised training event leading to a test of competence (the NPTC Level 2 Certificate of Competence in Chainsaw and Related Operations or Level 2 Award in Chainsaw or Related Operations).

In Outcome 4 learners will be drawing out what they have seen over the last three outcomes to understand how forestry operations affect the wildlife in the area and the changes it can have on many aboitic factors which influence wildlife. By carrying out an environmental impact assessment on various forestry operations a good practice method statement can be drawn up to minimise this detrimental impact and show positive ecological management.

At the end of the unit learners will not only have demonstrated the practical aspects of commercial forestry but how the tree cycle of life benefits biodiversity and sustainability.

References

Books

Forestry Commission.1991. *Forestry Practice*. Norwich: Stationery Books.
ISBN: 0117102811
Hibberd. B.G. 1988. *Farm Woodland Practice*. Norwich: Stationery Office Books. ISBN: 0117102651
Hibberd, B.G. 1989. *Urban forestry Practice*. London: HMSO. ISBN: 0117102736
Savill, P. 1998. *The Silviculture of Trees used in British Forestry*. Oxford: CABI Publishing. ISBN: 0851987392

Websites

www.forestry.gov.uk	The Forestry Commission
www.greenwoodcentre.org.uk	Greenwood Centre

Unit 220 Introduction to Urban Habitat Ecology

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of urban habitat ecology and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

This unit provides learners with an understanding of the formation and characteristics of urban habitats with a view to protect them.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Understand the influences that shape urban habitat formation
2. Know the ecological characteristics of urban habitats
3. Understand the source and effect of pollution on urban habitats
4. Be able to undertake an ecological survey

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

EC2 Survey and report on the condition of the environment

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 220 Introduction to Urban Habitat Ecology

Outcome 1 Understand the influences that shape urban habitat formation

Assessment Criteria

The learner can:

1. Explain how urbanisation has been **influenced** by humans over the last century
2. Assess **ecological characteristics** of a given urban habitat

Unit content

Urban habitats

Parks, gardens, cemeteries, canals, rivers, waste land, railways, towns, residential areas

Influences

Human factors: Industrial revolution, development of and changes to transport network (railways, roads, canals), town and country planning, Groundwork Trust, Wildlife Trusts

Ecological characteristics

Characteristics of habitats: location, climate, soil type, rainfall, temperature, flora and fauna, species interaction, ecosystems

Unit 220 Introduction to Urban Habitat Ecology

Outcome 2 Know the ecological characteristics of urban habitats

Assessment Criteria

The learner can:

1. Describe the **ecological characteristics** of a given urban habitat

Unit content

Ecological characteristics

Characteristics of habitats: location, climate, soil type, rainfall, temperature, flora and fauna, species interaction, ecosystems

Unit 220 Introduction to Urban Habitat Ecology

Outcome 3 Understand the source and effect of pollution on urban habitats

Assessment Criteria

The learner can:

1. Identify and explain the **sources of pollution** in a given urban habitat
2. Identify and explain the **effect of pollution** in a given urban habitat

Unit content

Sources of pollution

Sources: Human recreational and work activity, poor waste management practices, vehicle use, industrial activity

Types: noise, light, chemical (air water, solid), litter

Effect of pollution

Disturbance, loss or change of species, changes to species balance, injury, poisoning, changes to behaviour

Unit 220 Introduction to Urban Habitat Ecology

Outcome 4 Be able to undertake an ecological survey

Assessment Criteria

The learner can:

1. Plan the survey of a given urban habitat to identify **ecological zones**
2. Carry out the **survey** of a given urban habitat to identify ecological zones
3. **Present** the **results** of surveying carried out

Unit content

Ecological zones

Climate, substrate and vegetative communities

Survey techniques

Quantitative (for example quadrats and simple line transects) and qualitative (quality of habitat, species distribution), correlation of species and effects of abiotic factors

Risk assessment: Identification of potential risks and hazards, severity of potential injury (hazard), likelihood of harm (risk), control methods to minimise or avoid risk

Present

Present information from surveys in various forms (written, data and pictorial) graphs, pie chart, basic statistics

Unit 220 Introduction to Urban Habitat Ecology

Notes for guidance

This unit will provide the learner with knowledge of the importance of urban habitats in being the first contact that many people have with the wider countryside. These habitats are much more vulnerable being themselves cut off from the countryside, yet they are important refuges for wildlife, both migrating and resident. The range of habitats is similar to those found elsewhere but they are influenced by human intervention on a more regular basis.

The outcomes run together and allow the unit to have a holistic approach in delivery. Learners will learn though formal lectures and guest speakers from local urban conservation groups backed up with field trips looking at the influence and constraints (pollution) that urban habitats contend with. Learners will be able to demonstrate via a survey how specific pollutant(s) affect the wildlife in urban habitats.

Outcome1 will allow learners to reflect on the history of urban development and how urban habitats have been recognised as an important ecological and social resource. The learner will also reflect on the characteristics of urban habitats in comparison to similar types in the countryside, looking not only at the flora and fauna present but the differences in abiotic factors, temperature, artificial light, safety management as well as pollution in its chemical state.

Outcome 2 expands on outcome 1, but concentrates on just one specific habitat chosen by the learner to fully investigate its biotic and abiotic characteristics and explain whether it is unique to the location or is typical of all similar habitats. This can be done by cross referring to outcomes 3 and 4.

Outcome 3 allows the learner to look closely on sources of pollution within the urban landscape and how these pollutants have both positive and negative effects on habitats and the wildlife in them. For example, noise from traffic can reduce song bird pairs as the females can not hear the males' song.

Outcome 4 requires the leaner to carry out an ecological survey which demonstrates the influence of human activity on urban habitats and the presentation of the results explaining the relationship, ideally with suggestion s for better management. Once completed the learner will be able to review town and country planning and how urban habitats are important for a more sustainable future.

Delivery of this unit will constitute some formal lectures, although learners will benefit from a range of alternative activities such as visits, guest lectures, and guided research.

References

Books

Rydin. Y. 2003. *Urban & Environmental Planning in the UK*. Hampshire: Palgrave Macmillan. ISBN: 0333961988
Wheater. C. P. 1999. *Urban habitats.* Oxfordshire: Routledge. ISBN: 0415162654
Agate, E. 2000. *Urban Hand Book and Practical Guide to Environmental Work.* Doncaster: BTCV.
Rydin, Y. 2003. *Urban & Environmental planning in the UK.* Oxford: Palgrave Macmillan.

Websites

www.urbanecology.org	Trust for Urban Ecology
www.wildlifetrusts.org	The Wildlife Trusts
www.naturalengland.org.uk	Natural England

Unit 221 Introduction to Waste and Pollution Control and Management

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of waste and pollution control and management and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will explore issues surrounding waste and pollution management generated by an enterprise that is appropriate to their course of study. They will be provided with a practical way to understand the environmental issues that are a potential result of ineffective enterprise management. They will also identify different types of waste and explore the problems that waste can cause in terms of both economics and the environment.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know types of waste generated by a given enterprise
2. Understand the need to control and manage waste in the environment
3. Be able to undertake waste management tasks appropriate for a specified enterprise
4. Know the consequences of, and methods used to control, pollution

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

n/a

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 221 Introduction to Waste and Pollution Control and Management

Outcome 1 Know types of waste generated by a given enterprise

Assessment Criteria

The learner can:

1. Identify the **sources of waste materials** that are generated by a given enterprise
2. Describe the differences between **organic and non-organic wastes**

Unit content

Sources of waste materials

Waste from agricultural and horticultural enterprises, for example manure, pesticides, herbicides, baler twine. Waste from processes including packaging, off-cuts, rejects, liquids; production, spillage, by-products, washings. Household/domestic waste, industrial, retail, hospital, confidential

Organic and non-organic wastes

Organic: paper, cardboard, food, wood, oil, soil, vegetation/plant material, animal waste, dust
Non-organic: plastics, glass, metal, rubber, inert wastes (brick rubble)
Agricultural and horticultural waste, pesticides, herbicides, manure

Unit 221 Introduction to Waste and Pollution Control and Management

Outcome 2 Understand the need to control and manage waste in the environment

Assessment Criteria

The learner can:

1. Explain **reasons for controlling and managing waste in the environment**
2. Outline **waste produced by a given enterprise**
3. Recommend **improvements to waste control** in a given situation.

Unit content

Reasons for controlling and managing waste in the environment

Lack of space for disposal (landfill), environmental damage, habitat loss, use of resources, raw materials, energy efficiency, cost effectiveness, avoidance of penalties, pollution, waste as a resource/commodity, hygiene, health and safety, pests and disease, legislation, security

Waste produced by a given enterprise

Examples might include: agricultural and horticultural waste, pesticides, herbicides, manure, paper, plastics, cardboard, glass, green, clinical/medial, food, grey water, hazardous, human, inert, brick rubble, soil, litter, sewage and chemical

Improvements to waste control

The ‘3 R’s (reduce, re-use and recycle), energy efficiency, cost-saving, reduce environmental impact, improve hygiene and health and safety, improve labour efficiency

Unit 221 Introduction to Waste and Pollution Control and Management

Outcome 3 Be able to undertake waste management tasks appropriate for a specified enterprise

Assessment Criteria

The learner can:

1. Safely undertake a **waste control task** in a specified enterprise to meet **given objectives**
2. Describe the **waste control task** undertaken

Unit content

Waste control task

Measurement of amount and types, physical separation of wastes, waste reduction, re-use, recycling, composting, compacting, decontamination, dilution, incineration, application of manure to land

Given objectives

For example reduce amount of waste, use of recycling materials, safe storage or disposal, use of correct timescales

Unit 221 Introduction to Waste and Pollution Control and Management

Outcome 4 Know the consequences of, and methods used to control pollution

Assessment Criteria

The learner can:

1. Identify **the effects of** a specified **pollutant on the natural environment**
2. Describe **how the effects** of a specified pollutant **may be controlled**
3. Outline **measures to control a specified pollutant**.

Unit content

The effects of a pollutant on the natural environment

Air, water and soil quality/contamination, direct and consequential impact on land, wildlife (flora and fauna) and humans

How the effects may be controlled

Storage, containment, safe and timely disposal, decontamination, filters and baffles, reduction, maintenance and cleaning (for example of machinery), adequate ventilation, take remedial action for example cleaning oil contaminated birds

Measures to control a specified pollutant

Planning, measuring, managing, evaluating

Unit 221 Introduction to Waste and Pollution Control and Management

Notes for guidance

This unit is designed to provide the learner with the knowledge and skills required to control waste and pollution in a specified enterprise.

Throughout the unit, the emphasis should be on safe working. It is expected that learners will be aware of safe working practices and familiar with the accepted practices and behaviours within the context in which they are working.

In Outcome 1, learners will identify the types of waste that are produced by an enterprise. They will also determine where these are from and how they are produced and to be able to distinguish between organic and non-organic wastes. It is expected that learners can list waste types from an enterprise with which they are familiar, ideally in a practical setting. Care should be taken to ensure that safe working practices are implemented including the use of appropriate Personal Protective Equipment (PPE) and other relevant health and safety measures.

Outcome 2 requires learners to gain an understanding of the reasons for control and management of wastes in the environment. In order to do this they must be able to identify the wastes from a specific enterprise and suggest ways that the management of these may be improved. Emphasis should be on measuring to manage and the importance of waste reduction, re-use and recycling as controlling factors. Learners would benefit from direct observation of these factors in a realistic setting.

Outcome 3 is concerned with the practical control and management of wastes for a specific enterprise. Learners are required to carry out a waste control task and describe what they have done. Safe working practices must be observed and risk assessments carried out prior to any practical activity which involves handling, treatment and disposal of waste.

For Outcome 4 learners should develop an understanding of the effects of pollution on the natural environment and how this can be controlled. They are expected to identify these effects, describe how they may be controlled and suggest measures for improvement in a specified enterprise. An emphasis should be placed on the importance of management planning for pollution control as well as the practical elements of doing this.

Delivery will constitute some formal lectures although learners will benefit from a range of alternative activities such as site visits, guest lectures and interactive tasks.

References

Journals

Defra. 2007. The Waste Strategy for England. London: Department for Environment, Food and Rural Affairs.

Websites

www.defra.gov.uk	The Department for the Environment, Food and Rural Affairs (Defra)
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.ciwm.co.uk	The Chartered Institute of Wastes Management (CIWM).
www.environment-agency.org.uk	The Environment Agency
www.wrap.org.uk	The Waste and Resources Action Programme (WRAP)

Unit 222 Introduction to Animal and Plant Husbandry

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of animal and plant husbandry and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will understand the husbandry requirements of plants and animals used in land-based production. They will learn about the welfare of farm livestock and monitoring of livestock food, water and general health.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Understand the requirements needed to maintain the health and welfare of farm animals
2. Be able to provide food and water to production farm animals
3. Understand the annual production cycles of locally important crops
4. Know the requirements for maintaining the healthy growth of locally important crops

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

LP7.1 Prepare feed and water supplies for livestock

LP7.2 Monitor and maintain the supply of feed and water to livestock

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SCC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 222 Introduction to Animal and Plant Husbandry

Outcome 1 Understand the requirements needed to maintain the health and welfare of farm animals

Assessment Criteria

The learner can:

1. Explain **requirements needed to maintain the health and welfare** of a specified farmed mammal and a specified farmed bird
2. Assess the **health and welfare** of a specified farmed mammal or a specified farmed bird

Range

Farmed mammal: any from cattle, sheep, goat or pig

Farmed bird: any from chicken, duck, goose, turkey, pheasant

Unit content

Requirements needed to maintain the health and welfare

Food, water, housing, bedding, ventilation, space/ stocking ratios, preventative health treatments (worming, vaccination)

Health and welfare

Signs of health (appearance, temperature, respiration), animal behaviour, posture, movement, welfare in relation to the 'five animal needs', routine and non-routine health checks

Unit 222 Introduction to Animal and Plant Husbandry

Outcome 2 Be able to provide food and water to production farm animals

Assessment Criteria

The learner can:

1. Follow a **plan for providing food and water** to a given species of farmed animal
2. **Safely** carry out **routine feeding and watering tasks** for a given species of farm animal

Range

Farm animal: any from cow, sheep, goat or pig

Unit content

Plan for providing food and water

Purpose of a plan (growth/ maintenance/ milk production/ breeding), record keeping requirements, report to supervisor

Safely

Use of appropriate Personal Protective Equipment (PPE), completion of basic risk assessment, compliance with health and safety guidance and legislation

Routine feeding and watering tasks

Methods of feeding and providing water, feed types, select feeding equipment, prepare food for animals, feed animals, provide water to animals, monitor feeding and drinking of animals, clean feeding equipment, grazing management, seasonal factors

Unit 222 Introduction to Animal and Plant Husbandry

Outcome 3 Understand the annual production cycles of locally important crops

Assessment Criteria

The learner can:

1. Explain the **annual production cycles** of specified crops
2. State **factors that may change the growth and yield of a specified crop**

Range

Locally important crops

At least three production crops commonly grown in the local area

Unit content

Annual production cycles

Soil preparation, methods and timing of planting, growth patterns, harvest timing and methods, storage of crops

Factors that may change the growth and yield of a specified crop

Weather, soil type, structure and drainage, use and timing of fertilisers, weeds, pests and diseases, crop protection methods, previous cropping

Unit 222 Introduction to Animal and Plant Husbandry

Outcome 4 Know the requirements for maintaining the healthy growth of locally important crops

Assessment Criteria

The learner can:

1. Identify the **nutrient requirements** of a crop species at a given site
2. Describe the **common pests, weeds and diseases** of a crop species at a given site

Range

Locally important crops

At least three production crops commonly grown in the local area

Unit content

Nutrient requirements

Major and minor nutrient requirements (nitrogen, phosphorous, potassium, trace elements)

Common weeds

As appropriate to site, for example grass weeds (annual meadow grass, chickweed, Yorkshire fog, brome), broadleaved weeds (fat hen, couch, shepherds purse, brome, black grass, wild oats, cleavers, thistle, mayweed, black nightshade, field pansy, charlock, knotgrass, redshank)

Common pests

As appropriate to site, for example insects (aphids, beetles, leatherjackets, wireworm, black fly, pollen beetle), slugs, vermin (pigeons, starlings, rabbits, mice, rats)

Common diseases

As appropriate to site, for example cereal diseases (mildew, eyespot, septoria, gout-fly, yellow rust, phoma, chocolate spot, blight, canker)

Unit 222 Introduction to Animal and Plant Husbandry

Notes for guidance

This unit aims to provide learners with an understanding of the husbandry requirements of animals and plants used in agricultural production systems, and an opportunity to develop some livestock husbandry skills.

As learners will be engaged in practical activity there should be an emphasis on safe working practices, including the use of appropriate personal protective equipment (PPE), and appropriate risk assessments should be undertaken.

In Outcome 1 the focus is on the health and welfare of selected farmed animals and birds. There is a requirement for practical skill development in assessing the health and welfare of animals and birds, and in practical observation of animal and bird requirements, particularly of the “five animal needs”. Learners should also have the opportunity to witness the implementation of preventative health measures, such as vaccination, worming and grassland management. In understanding the importance of health and welfare it is helpful to explore the consequences of poor health and welfare. As any visits or placements should be to those establishments showing due regard to animal health and welfare, consequences of poor health and welfare would be best covered through classroom based activity using library pictures and guest speakers.

In Outcome 2 it is anticipated that delivery will include consideration of the feeding and watering requirements for animals kept for different purposes and at different life and production stages. The unit has a practical focus, and learners need to carry out routine feeding and watering tasks in a working environment. It is important that tutors stress the requirements for health and safety, animal welfare, and the importance of timeliness and hygiene.

In Outcome 3 learners need to gain a holistic view of crop production from pre-planting activity to post harvest storage considerations. It is anticipated that delivery will include consideration of the time of year for different activities for both spring and winter sown crops. It is possible that learners will not be able to observe the full production cycle due to the timing of their college or school terms, and so visits will need to be supplemented with classroom based activity. This outcome also includes an understanding of the different factors which affect crop growth and yield, and classroom delivery would be usefully supplemented by practical activity such as site visits and crop walking.

In Outcome 4 learners will need to access a site where production crops are grown, as well as some formal input on the nature of nutrient requirements, pests, weeds and diseases. It will be helpful if, where possible, learners can see examples of common pests and weeds.

At level 2 it is likely that there will be differences in learners’ prior experience, knowledge and confidence, and practical activity is likely to require a differentiated approach to ensure all learners progress appropriately. This unit enables learners to study production animals and crops that are of particular relevance to their local area. This maximises the opportunity for learning through visits, practical activity and work experience.

References

Books

Bateman H, Curtis S and McAdam K. 2006. *Dictionary of Agriculture*. A&C Black Publishers Ltd. ISBN: 0-713-67778-3.
Bazeley K. 2007. *Practical Cattle Farming*. The Crowood Press Ltd. ISBN: 1-861-26975-7.
Bland D. 1996. *Practical Poultry Keeping*. The Crowood Press Ltd. ISBN: 1-861-26010-5.
Cardell K. 1998. *Practical Sheep Keeping*. The Crowood Press Ltd. ISBN: 1-861-26163-2.
Lockhart J and Wiseman A. 2002. *Lockhart and Wiseman's Crop Husbandry*. Woodhead Publishing Ltd. ISBN: 1-855-73549-0.
Soffe RJ and McConnell P. 2003. *The Agricultural Notebook*. Wiley Blackwell. ISBN: 0-632-05829-3.
Smith P. 2001. *Practical Pig Keeping*. The Crowood Press Ltd. ISBN: 1-861-26388-0.

Websites

www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.fawc.org.uk	Farm Animal Welfare Council
www.iah.ac.uk	Institute for Animal Health
www.lantra.co.uk	Lantra (Sector Skills Council)
www.nfuonline.com	National Farmers' Union

Unit 223 Introduction to Land-Based Machinery Operations

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of land-based machinery operations and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop the skills and knowledge to select, prepare, operate, and maintain a range of land- based equipment and machines appropriate to their area of study. The learner will also cover the health and safety requirements associated with the use and maintenance of machines.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Understand safe working principles when using equipment and machinery
2. Be able to prepare land-based equipment and machinery for use
3. Be able to operate land-based equipment and machinery
4. Be able to maintain land-based equipment and machinery

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU27 Maintain equipment and machines

L27 Use and maintain non-powered and hand held powered tools and equipment.

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 223 Introduction to Land-based Machinery Operations

Outcome 1 Understand safe working principles when using equipment and machinery

Assessment Criteria

The learner can:

1. Select **appropriate equipment** for land-based tasks
2. Explain why **manufacturers' instructions** should be followed when working with land-based equipment and machines
3. Explain the **legal and environmental requirements** associated with specific machines
4. Identify the **controls/devices/instruments** and other health and safety requirements for machinery and equipment

Range

Agriculture

As appropriate from:
Types: powered and powered machines, tractor mounted, trailed or self propelled, seeding/ planting equipment
Purposes: seedbed preparation, crop harvesting, materials application, liquids, solids, granules, powders

Horticulture/Landscape

As appropriate from:
Types: non powered tools and equipment, hand held power tools, pedestrian controlled machines, ride on machines
Purposes: ground preparation, grass cutting and collection, materials application, liquids, granules, powders, pelleting, chipping, shredding

Unit content

Appropriate equipment

As outlined above, selection, fit for purpose, ground conditions, suitability for scale of work, training/certification requirements

Manufacturers' instruction

Dealer installation process, operator instruction manuals, manufacturer web sites

Legal and environmental requirements

Health and Safety at Work etc Act 1974 (HASWA), Provision and Use of Work Equipment Regulations 1998 (PUWER), Lifting Operations and Lifting Equipment Regulations 1998 (LOLER Control of Substances Hazardous to Health Regulations (2002) (COSHH),
Control of Pesticides Regulations 1986 (COPR), Environmental contamination, Personal Protective equipment (PPE)

Controls/devices/instruments

Operator controls, power unit controls, manual, hydraulic, electronic, machine adjustment/performance settings - safe start devices, clutches, performance/load limiters, seat occupation switches, guards – warning lights, analogue/digital information

Unit 223 Introduction to Land-Based Machinery Operations

Outcome 2 Be able to prepare land-based equipment and machinery for use

Assessment Criteria

The learner can:

1. Carry out **adjustments** on land-based equipment and machines to meet specific requirements prior to use
2. Explain the **benefits** of correct adjustment of equipment and machines
3. Carry out **pre-start checks,** including **fuelling**

Range

Agriculture
As appropriate from:
Types: powered and powered machines, tractor mounted, trailed or self propelled, seeding/ planting equipment
Purposes: seedbed preparation, crop harvesting, materials application, liquids, solids, granules, powders

Horticulture/Landscape
As appropriate from:
Types: non powered tools and equipment, hand held power tools, pedestrian controlled machines, ride on machines
Purposes: ground preparation, grass cutting and collection, materials application, liquids, granules, powders, pelleting, chipping, shredding

Unit content

Adjustments
Operator fit, working height/depth/speed/calibration/tilth/work rate

Benefits
Specific work rates/outputs achieved, power/fuel consumption, risk of premature wear/damage to equipment, operator fatigue

Pre-start checks
Lubricants, cooling, fuel level, wheel equipment, safety guards, road legal, machine/vehicle security, PPE

Fuelling
Fuel types, fuel contamination checks, correct storage, machine power isolation, ventilation, spillage, safe areas, fire hazards, PPE

Unit 223 Introduction to Land-Based Machinery Operations

Outcome 3 Be able to operate land-based equipment and machinery

Assessment Criteria

The learner can:

1. **Operate** equipment and machines safely and **efficiently** for different land-based activities
2. Carry out activities to achieve the **desired results** when operating land-based equipment and machines

Range

Agriculture

As appropriate from:
Types: powered and powered machines, tractor mounted, trailed or self propelled, seeding/ planting equipment
Purposes: seedbed preparation, crop harvesting, materials application, liquids, solids, granules, powders

Horticulture/Landscape

As appropriate from:
Types: non powered tools and equipment, hand held power tools, pedestrian controlled machines, ride on machines
Purposes: ground preparation, grass cutting and collection, materials application, liquids, granules, powders, pelleting, chipping, shredding

Unit content

Operate

Attachment to power unit, engagement of power, assess test runs and re-adjust, site assessment for hazards/risks, continuous monitoring of performance, over/under lapping

Efficiency

Acceptable work rates, back up power availability, economy of fuel, wearing component lifespan

Desired results

All area covered, correct application rates/tilth of seedbed, quality of cut, avoid undesirable results (compaction of soil, wheel marks in seedbed)

Unit 223 Introduction to Land-Based Machinery Operations

Outcome 4 Be able to maintain land-based equipment and machinery

Assessment Criteria

The learner can:

1. Identify **routine maintenance** for land-based equipment and machines using manufacturers' instructions
2. Identify **hazards** and comply with risk assessments **during maintenance activities**
3. Carry out different **routine maintenance activities** safely on a range of equipment and machines
4. **Record maintenance activities** in an **appropriate format**

Range

Agriculture

As appropriate from:
Types: powered and powered machines, tractor mounted, trailed or self propelled, seeding/ planting equipment
Purposes: seedbed preparation, crop harvesting, materials application, liquids, solids, granules, powders

Horticulture/Landscape

As appropriate from:
Types: non powered tools and equipment, hand held power tools, pedestrian controlled machines, ride on machines
Purposes: ground preparation, grass cutting and collection, materials application, liquids, granules, powders, pelleting, chipping, shredding

Unit content

Routine maintenance

Pre-work assessment of machine condition, routine/periodic maintenance, adjustments for wear, lubrication, replacement components, preparation for storage, cleaning, lubrication and protection

Hazards during maintenance activities

Identify hazards according to operations

Record maintenance activities

Complete maintenance record sheet/job cards, record service/maintenance interval/date/work done, record replacement of wearing components, working life

Appropriate format

Manufacturers documentation, service record book, service record charts, company procedures, electronic record storage, service interval label on machine

Unit 223 Introduction to Land-based Machinery Operations

Notes for guidance

This unit is designed for learners who will be given responsibility for field/groundwork using machines typical to their area of study. The unit will provide learners with knowledge and understanding, operational skills and service procedures to prepare, use, maintain and store machines and equipment. Throughout the unit the emphasis will be on acceptable health and safety procedures and safe working practices. It is expected that where tractor mounted machines are to be utilised, prior learning on tractor operations will have been assessed to ensure the learner has reached an acceptable level of skills and knowledge.

The range covered during delivery should include electric vehicles and machinery.

Health and safety - Centres and tutors aware of the need to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of machinery is involved. This unit requires the learner to undertake machinery operations under close supervision, and this is the same for any unit within the qualification that requires the learner to operate or use machinery. This is a largely practical-based unit which looks at the basic preparation, operation and maintenance of equipment and machinery. There is significant emphasis on safe practices throughout the unit and reference to risk assessment in learning outcome 4. Throughout the unit the emphasis is on acceptable health and safety procedures and safe working practices. The guidance in this unit requires that Health and Safety must be strictly enforced and repeated throughout. The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

In Outcome 1 the learner will be able to select a suitable item of equipment to perform a range of land-based tasks to achieve given outcomes. The learner will be able to understand basic working principles of the equipment and any environmental and legal issues relating to the machines' use. Manufacturers' instructions are to be followed at all times to interpret operator controls and instrumentation information.

In Outcome 2 the learner is expected to demonstrate skills in the use of machines and equipment used in the area of their study. This may entail operator set up, connection to power source and initial setting prior to moving on site. Where tractor trailed, mounted or self propelled equipment is to be used an understanding of safe fuelling and transportation must be demonstrated. With ever-increasing costs on fuel, wearing components and operator time, an understanding of the benefits of correct operating procedures, setting linked to work rate targets must be understood.

In Outcome 3 the learner needs to be aware of a range of machine capabilities to achieve specified performance criteria. These may be work rate targets, quality of work, height/depth of work or delivery rates. Field/site procedures need to be correctly chosen where subsequent operations are to follow. Seeding requires a specific depth of seedbed, a fineness of tilth to suit seed type, minimum seedbed compaction with no wheel marks evident.

In Outcome 4 the learner must be able to identify from the manufacturers' instructions, and demonstrate maintenance requirements and procedures. Where power sources are used, maintenance of those sources will need to be identified. Risks of injury/damage to self, others, the environment or equipment need to be identified by the learner and control measures put in place prior to commencement of any maintenance tasks. To enable evaluations and costings to be done an accurate record of work, maintenance and replacement parts must be recorded. This may also be of benefit where warranty procedures are to be implemented to recoup costs of breakdowns.

References

Books

Bell B. 2005. *Farm Machinery.* Old Pond Publishing. ISBN: 1-903-36668-2.
Culpin C. 1992. *Farm Machinery, 12th edition.* Blackwell Scientific. ISBN: 0-632-03159-X.

Journals

Horticultural Weekly
Profi International
Manufacturers publications and manuals
Lubrication charts and data sheets

Websites

www.bagma.com British Agricultural and Garden Machinery Association
www.defra.gov.uk Dept for Environment, Food and Rural Affairs
www.wales.gov.uk Welsh Assembly Government
www.scotland.gov.uk Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk Department of Agriculture and Rural Affairs (Northern Ireland)
www.hse.gov.uk Health and Safety Executive

Unit 224 Understand the Basic Principles of Plant Science

Level: 2

Credit value: 5

Unit aim

This unit aims to provide learners with an understanding of the basic principles of plant science. It is unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop knowledge relating to the structure of plants by identifying their external features, develop an understanding of how plants function. They will also develop an understanding of the development and physiology of plants, inclusive of growth and development, plant processes, reproduction, life cycles and stages.

Learning outcomes

There are **two** learning outcomes to this unit. The learner will:

1. Know the physical structure of plants
2. Understand the development and physiology of plants

Guided learning hours

It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

n/a

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 224 Understand the Basic Principles of Plant Science

Outcome 1 Know the physical structure of plants

Assessment Criteria

The learner can:

1. Identify the **organs of plants**
2. Describe the main **tissues of plants**
3. Identify the **functions of** leaves, stems, roots and flowers

Unit content

Organs of plants

Roots (fibrous, tap and tuberous), leaves (petiole, lamina, midrib, veins), cotyledons, stems (woody and non-woody), buds, flowers (petals, sepals, anthers, filament, style, stigma, ovary, bract)

Tissues of plants

Main tissues of stems, roots and leaves, inclusive of cell structure, vascular tissues, xylem, phloem and cambium, root hairs: stomata and guard cells, cuticle, epidermis and endodermis

Functions

Leaves: produce food by photosynthesis, carry out transpiration, natural vegetative reproduction i.e. foliar embryos
Stems: provide support for the leaves, flowers and fruit, provide a transport system around the plant for water, nutrients and food, on occasions have a climbing and protective function
Roots: anchor the plant in the soil, absorb water and nutrients from the soil, food storage and reproduction
Flowers: pollination, fertilisation and seed and fruit formation

Unit 224 Understand the Basic Principles of Plant Science

Outcome 2 Understand the development and physiology of plants

Assessment Criteria

The learner can:

1. Summarise the **processes involved in growth and development**
2. Summarise the **processes involved in plant reproduction**
3. Define the terms **ephemeral, annual, biennial, perennial** as they relate to plant life cycles
4. Describe the characteristics of **stages of plant growth**

Unit content

Processes involved in growth and development

Photosynthesis, respiration, osmosis, transpiration and translocation: definitions and descriptions/ use simple formulae, tropisms, environmental factors affecting each process, including light, dark, water, temperature, nutrient, carbon dioxide and oxygen

Processes involved in plant reproduction

Sexual reproduction (pollination, fertilisation) stages of seed germination and types (epigeal and hypogeal), environmental requirements for successful germination (moisture, warmth etc), asexual reproduction by natural vegetative means e.g. corms, bulbs, tubers and stolons

Ephemeral, annual, biennial, perennial

Definition as they relate to plant life cycles

Stages of plant growth

Juvenile, adult, senescent

Unit 224 Understand the Basic Principles of Plant Science

Notes for guidance

The learner will be able to develop the knowledge required to understand how plants function, reproduce, grow and develop. The unit presents an opportunity for learners to consider factors which influence plant production and growth and provides supporting knowledge, understanding and decision making skills necessary for units/subjects associated with propagation, crop production, planting and aftercare.

In Outcome 1, learners develop knowledge of plant structures. They should be able to describe the external structure of plants and the function of tissues within the plant. Though not essential, it would be helpful to introduce them to the internal structure of plants in the laboratory.

In Outcome 2, learners will develop knowledge of the physiological processes that take place in the plant, including photosynthesis, respiration, osmosis, transpiration and translocation. They should appreciate the effects of environmental factors on each of these, both in terms of excesses and deficiencies and then be able to apply this knowledge to horticultural situations, including propagating plants by seed and vegetative means, growing on, planting, weed control and harvesting.

The unit may be delivered by a wide range of techniques, including lectures, supervised practical work, experimentation, investigations using microscope slides and sections, discussions, video, site visits and research. The delivery of this unit may be integrated with the delivery of other units where this is feasible and every opportunity should be taken to show how the knowledge acquired in this unit may be applied to practical horticultural tasks. All methods should reinforce the importance of health and safety and environmental issues. Risk assessments must be undertaken prior to practical activities.

References

Books

Adams CR. 2008. *Principles of Horticulture*. Oxford: Butterworth-Heinemann ISBN: 9-780-75068-694-5.

Brown L. 2002*. Applied Principles of Horticultural Science*. 2nd ed. Oxford: Butterworth-Heinemann. ISBN: 9-780-75068-702-7.

Dawson P. 2006. A *Handbook for Horticultural Students*. Rushden: Dawson. ISBN: 0-9525911-11.

Ingram DS, et al. 2008. *Science and the Garden: the scientific basis of horticulture practice.* 2nd ed. Sussex: Wiley Pulishing. ISBN-13: 978-1-4051-6063-6

Roberts M. 1986. *Biology, a functional approach fourth edition*. 4th ed. Cheltenham: Nelson Thornes.

Salisbury FB and Ross C. 1991. *Plant physiology.* 4th ed. Florence: Brooks Cole.

Dutta A C. 1997. *Botany for Degree Students.* 6th ed. New Delhi: OUP India

Unit 225 Understand the Basic Principles of Soil Science

Level: 2

Credit value: 5

Unit aim

This unit aims to provide learners with an understanding of the basic principles of soil science. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to develop the knowledge required to understand the physical and chemical properties of soils and relate this to the growth of plants in the wild and in cultivation. They will also develop the skills to assess soils in order to inform soil management decisions, including the selection of appropriate fertilisers in order to encourage the desired plant growth.

Learning outcomes

There are **three** learning outcomes to this unit. The learner will:

1. Be able to assess the physical and chemical characteristics of soils
2. Understand the physical properties of soils
3. Understand the chemical properties of soils and fertilisers

Guided learning hours

It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

There are no relevant NOS for this unit

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 225 Understand the Basic Principles of Soil Science

Outcome 1 Be able to assess the physical and chemical characteristics of soils

Assessment Criteria

The learner can:

1. Identify the **horizons in a soil profile**
2. Analyse samples of soil to determine:
   - **textural class**
   - **pH**

Unit content

Horizons in a soil profile

Organic layer, top-soil, sub-soil, parent material
O - organic layer, A - topsoil, B - subsoil, C – (parent material) bedrock, winter water table, drainage characteristics
Soil profile pit, extending to sufficient depth to expose soil profiles O, A, B, and C

Textural class

Components of soils, clay, silt, sand, loam; use of field and laboratory textural analysis methods

pH

Soils: neutral, acid, alkali
Collection and preparation of samples: testing with a colorimetric testing kit to determine relative alkalinity/acidity

Unit 225 Understand the Basic Principles of Soil Science

Outcome 2 Understand the chemical properties of soils and fertilisers

Assessment Criteria

The learner can:

1. Describe the **formation, characteristics, texture and component parts of soils**
2. Explain how soil structure and the balance of soil air and water affect the **growth of plants**
3. Explain **factors relating to soil water;** sources, availability, effects on various soil types and terms associated with the water balance
4. Explain how organic matter and soil organisms contribute to **soil structure and fertility**

Unit content

Formation

Weathering agents, transporting agent, parent material, bedrock
Definition of soil structure and soil texture

Characteristics, texture and component parts of soils

Sandy, loam, clay and organic soils
Components: sand, gravel, loam, clay, organic matter, soil organisms, air and water, importance of air in the soil, contribution of soil organisms to fertility

Growth of plants

Individual components of soils, anchorage, balance and availability of soil air, water and nutrients, drainage, soil temperature, compaction/aeration, workability of soils

Factors relating to soil water

Sources, availability, effects on various soil types and terms associated with the water balance
Definition of: saturation, soil moisture deficit, permanent wilting point, available and unavailable water, field capacity, capillary, gravitational water, water table, drainage and irrigation
Water-holding capacity of sands, silts, clays and organic soil

Soil structure and fertility

Organic matter/humus content, amount of decay, diversity and quantity of soil organisms (invertebrates, vertebrates, fungi, bacteria), contributions made by each

Unit 225 Understand the Basic Principles of Soil Science

Outcome 3 Understand the chemical properties of soils and fertilisers

Assessment Criteria

The learner can:

3. State the **nutrient** requirements of plants and their individual effects on growth:
   - **Micro-nutrients**
   - **Macro-nutrients**
4. State the typical symptoms of nutrient deficiencies in plants:
   - **Micro-nutrients**
   - **Macro-nutrients**
5. Explain **how pH affects plant growth** and methods of adjusting the pH to meet specific requirements
6. Explain the principles of cation and anion **exchange capacity** in the soil and their relationship to texture and organic matter
7. Explain the **categories** and terminology **used to describe fertilisers**
8. **Define the terms** Plant Nutrient Ratio and Nutrient Weight Analysis.

Unit content

Nutrient

Nitrogen, phosphorus and potassium, requirements for growth and photosynthesis, growth stage requirements, availability, uptake and interaction

Micro-nutrients

Functions of : Copper, Sodium, Zinc, Iron, Boron, Manganese, Molybdenum
Main fertilisers and their nutrient content relating to a specific sector of horticulture

Macro-nutrients

Functions of primary (Nitrogen, Phosphorus, Potassium) and secondary (Magnesium, Calcium, Sulphur)

Main fertilisers and their nutrient content relating to a specific sector of horticulture

How pH affects plant growth

Availability of nutrients, specific nutritional disorders related to pH, calcicole and calcifuge, lowering and raising the pH, relationship between plat nutrition and development

Exchange capacity

Cation (positive charged ion), anion (negatively charge ion), nutrient/chemical reactions
Exchange of cations held by soil, effect on nutrient uptake, soils capacity to hold nutrients, Cation Exchange Capacity (CEC) determined by amount of clay/humus a soil contains, a measure of soils fertility, role of soil water, texture, organic matter, content of soils

Categories used to describe fertilisers

Straight, mixture, compound, complete, inorganic, organic, controlled release, granules, liquid, solid, prill, pelleted

Define the terms

Plant Nutrient Ratio and Nutrient Weight Analysis, nutrient content of packaged fertilisers
Nutrient balance, competition between nutrients for uptake, nutrient content/quantities of feeds/fertilisers

Unit 225 Understand the Basic Principles of Soil Science

Notes for guidance

The learner will be able to develop the knowledge required to understand the physical and chemical properties of soils and relate this to the growth of plants in the wild and in cultivation. They will also develop the skills to assess soils in order to inform soil management decisions.

In Outcome 1, learners will develop skills in assessing the physical and chemical properties of soils. They will require access to suitable laboratory facilities for this. Laboratory and field methods should be practised, including collection of soil samples, soil textural analysis in the hand by the 'feel method' (range to include sand, silt, clay and loam) and pH determination using the colorimetric method. Learners will be required to dig a soil profile pit, record and examine the four main horizons and characteristics of the soil.

In Outcome 2, learners will develop an understanding of the physical aspects of soils, including soil formation, soil constituents, texture and structure, pore space, soil water and soil air and factors affecting the health of the plant, including how organic matter and soil organisms contribute to soil structure and fertility. Learners will be required to explain how the structure of a given soil, including its balance of air, water, organic matter, organisms and nutrient availability may affect the growth of plants.

In Outcome 3, learners will further develop their understanding of the chemical aspects of soils, including being able to name the main macronutrients and micronutrients and their individual effects on plant growth. Learners will be able to explain the basic principles of cation and anion exchange, relating that knowledge to the plants potential for growth and development. They will know how the pH of a soil or growing media affects plant growth, including nutritional disorders and the categorisation of plants into the calcifuges and calcicole groups. Knowledge of the categories to describe fertilisers will enhance the learner's ability to select the appropriate feed and method of application. The ability to interpret nutrient content of packaged fertilisers will assist the learner in making informed decisions regarding choice of feeds to encourage desired plant growth.

The unit may be delivered by a wide range of techniques, including lectures, supervised practical work, experimentation, investigations using microscope slides and sections, discussions, video, site visits and research. The delivery of this unit may be integrated with the delivery of other units where this is feasible and every opportunity should be taken to show how the knowledge acquired in this unit may be applied to practical horticultural tasks. All methods should reinforce the importance of health and safety and environmental issues. Risk assessments must be undertaken prior to practical activities.

References

Books

Adams CR. 2008. *Principles of Horticulture*. Oxford: Butterworth-Heinemann ISBN: 9-780-75068-694-5.

Brown L. 2002. *Applied Principles of Horticultural Science*. 2nd ed. Oxford: Butterworth-Heinemann. ISBN: 9-780-75068-702-7.

Dawson P. 2006. A *Handbook for Horticultural Students*. Rushden: Dawson. ISBN: 0-9525911-11.

Dutta A C. 1997. *Botany for Degree Students.* 6th ed. New Delhi: OUP India.

Ellis S and Mellor A. 1995. *Soils and Environment.* Oxon: Routledge. ISBN 0-415-06887-8(hbk) or ISBN 0-415-06888-6 (pbk)

Ingram DS, et al. 2008. *Science and the Garden: the scientific basis of horticulture practice.* 2nd ed. Sussex: Wiley Pulishing. ISBN-13: 978-1-4051-6063-6

Roberts M. 1986. *Biology, a functional approach fourth edition*. 4th ed. Cheltenham: Nelson Thornes.
Salisbury FB and Ross C. 1991. *Plant physiology.* 4th ed. Florence: Brooks Cole.
Stamp D. 2008. *Britain's Structure and Scenery.* Hammersmith: Harper Collins.

Unit 226 Establish and Maintain Plants Outdoors

Level: **2**

Credit value: **10**

Unit aim

This unit aims to provide learners with an understanding of how to establish and maintain plants outdoors, and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or to further education and training.

The learner will be able to prepare ground and plants and maintain woody and herbaceous plants outdoors, promoting establishment and healthy development.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to prepare ground to receive plants
2. Be able to plant woody and herbaceous plants
3. Be able to maintain the health of plants outdoors
4. Know how to maintain the health of plants outdoors

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

L2 Establish plants outdoors

PH3.3 Maintain plant development

CU76.1 Maintain the health of plants outdoors

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 226 Establish and Maintain Plants Outdoors

Outcome 1 Be able to prepare ground to receive plants

Assessment Criteria

The learner can:

1. Assess a site to determine the **preparation** required and **identify hazards**
2. **Prepare land** for planting safely by hand cultivation methods
3. Prepare land for planting **safely using pedestrian operated machines**
4. Explain how **tilth, soil structure, depth of preparation and seasonality and timing of cultivations** affect the establishment of plants

Unit content

Preparation

Basic site analysis carried out to determine the ground preparation required: this should include identifying the need for and requirement of initial site clearance of unwanted plant material and general debris. Determine soil type e.g. clay loam, sandy loam, to ascertain preparation techniques and soil improvement needs. Soil texture, structure, pH and ground conditions of the planting site should be ascertained to influence decision making process

Identify hazards

Permanent hazards such as overhead power lines and underground services, access routes, machine related hazards

Check for temporary/site specific hazards, such as those brought on by inclement weather and possible site contamination. Site hazards to be identified for the avoidance of planting and establishment problems and to ensure safe working

Prepare land

Primary and secondary hand cultivation, weed control and removal, single and double digging as appropriate raking, treading, levelling and tilth production, soil amelioration, incorporation of organic matter and application of appropriate fertilisers

Safely using pedestrian operated machines

The learner is required to demonstrate the use of pedestrian operated machines (rotary cultivator) for secondary cultivation, in a safe and appropriate manner, adhering to manufacturer's instructions

Tilth, soil structure, depth of preparation and seasonality and timing of cultivations

Explanation of the effect of these on the establishment of plants

Methods of tilth production and consolidation

Effects of soil type, structure, drainage and condition on site preparation methods

Potential health and safety concerns inherent in site preparation and planting on outdoor sites

Unit 226 Establish and Maintain Plants Outdoors

Outcome 2 Be able to plant woody and herbaceous plants

Assessment Criteria

The learner can:

1. Select plant material in an **appropriate condition** for planting
2. Plant a range of **woody and herbaceous** plants
3. Provide **immediate aftercare** for new plantings
4. Explain why **planting depth and firming** have a significant affect on establishment

Unit content

Appropriate condition

Moist roots/root-ball, free from pests and diseases, physical damage, containerised and container grown plants, firm in the pot but not root-bound, correct size /even grade/ typical features (reference to British Standards – Nursery Stock categories)

Woody and herbaceous

Trees and shrubs, herbaceous perennials and seasonal bedding, depth of cultivation/planting, correct techniques used (pit planting, supporting/staking) and required firming for different plant types, application of appropriate fertiliser to aid establishment if required
Possible planting through weed suppressant geotextile material

Immediate aftercare

Watering, supporting/staking, mulching, labelling, weed control as appropriate to requirements, soil conditions and time of year

Planting depth and firming

Techniques and benefits to be identified e.g. are tree/shrubs planted at same depth as in nursery, keep top soil separate from sub soil when taking out planting pit, top soil to be returned around the roots first, firm soil around plants to ensure roots are in contact with the surrounding soil, firming also helps to secure plant in the ground, graft union to finish above ground level, planting too shallowly may result in weak and unstable plant, (depends on type) prone to drying out, firm planting also may prevent birds disturbing/loosening small plants

Unit 226 Establish and Maintain Plants Outdoors

Outcome 3 Be able to maintain the health of plants outdoors

Assessment Criteria

The learner can:

1. **Maintain plants** in a way which complies with environmental and health and safety legislation and codes of practice
2. Identify a range of **threats** to plant health:
   - pests
   - diseases
   - disorders
   - unfavourable conditions
   - weeds
3. Promote and maintain **healthy growth** using all of the following methods:
   - feeding
   - watering
   - surface cultivation
   - mulching
4. **Prune plants** using appropriate techniques, according to species, time of year, stage of development.

Unit content

Maintain plants

Ensure maintenance complies with environmental and health and safety legislation and codes of practice: removal and dispose of debris in an environmentally responsible way; avoidance of chemical spray drift; avoidance of damage to site and plant material

Legislation includes Food and Environment Protection Act 1990 (as amended 1995) (FEPA), Control of Substances Hazardous to Health Regulations (2002) (COSHH), Health and Safety at Work etc Act (1974)

Threats

Named pests, diseases, disorders unfavourable weather conditions (drought, wet conditions, frost, high winds) and weeds as relevant to the area of study; relevant legislation

Healthy growth

At least, feeding, watering, surface cultivation and mulching must be covered, but other specific operations should be covered as relevant to the plants being maintained e.g. fertiliser application, pest and disease control and prevention

Prune plants

Shrubs: flowering on current season's growth, flowering on previous season's growth and those grown for winter stems and summer foliage, using clean secateurs and pruning saws as appropriate
Trees: removal of small branches from the ground with non-powered equipment (pruning saws)
Hedges: annual pruning, formal and informal, using secateurs and powered hedge trimmers, correct positioning of pruning cuts should be emphasised, correct time of year for operations, reasons for pruning

Unit 226 Establish and Maintain Plants Outdoors

Outcome 4 Know how to maintain the health of plants outdoors

Assessment Criteria

The learner can:

1. Describe how to recognise **signs of damage or threats** to plant health and the appropriate method of control
2. State how seasonal weather conditions and soil condition affect **plant growth and health**
3. Describe methods used to **maintain/control plant growth**
4. Explain the relationship between **pruning and plant species** to include
   - timing of pruning
   - types of material for removal
   - method of pruning
   - positioning of cuts

Unit content

Signs of damage or threats

Signs of damage to leaves, roots, stems, flowers, yield/vigour, by physical means, pest and disease infestation, identify appropriate prevention and/or control methods.
Environmental threats: frost, drought, water logging, humidity, heat, light/shade, chemical spray drift
Nutritional deficiency/excess

Plant growth and health

Effects of seasonal weather conditions, effects of soil conditions, soil compaction and different soil types (e.g. clay), reasons for feeding, mulching, irrigation and support of established plantings, powered and non-powered maintenance equipment. Increase/decrease of pest and/or disease infestations, inappropriate soil pH levels for plants present

Maintain/control plant growth

To include: pruning, pinching/stopping, irrigation, feeding, pest and disease control, staking, tying, training, grafting, budding, providing frost protection and shade as necessary

Pruning and plant species

Reasons for pruning, timing of pruning, types of material for removal, including suckers, reverted shoots, dead heading, dead, damaged, weak or diseased, method of pruning, positioning of cuts, formative and routine pruning, regenerative pruning
Correct pruning techniques used to ensure required plant growth responses, shrubs- flowering on current season's growth, flowering on previous season's growth and those grown for winter stems and summer foliage

Unit 226 Establish and Maintain Plants Outdoors

Notes for guidance

This unit deals with the principles of planting and maintaining hardy plants, including trees, shrubs, and herbaceous plants in a range of situations. Preparation of the site is covered. The knowledge and understanding within this unit is applicable to plant establishment and maintenance in amenity and commercial situations and is essential to people working as practitioners in most horticultural workplaces.

In Outcome 1, learners are expected to be able to assess the soil texture, structure, pH and soil conditions to determine the preparation required for planting a range of hardy plants. They should be able to identify any specific hazards on site and carry out ground preparation for planting of woody and herbaceous plants and understand how the various cultivation operations affect the establishment of plants.

In Outcome 2, learners are expected to be able to plant bare-root and containerised trees and shrubs and herbaceous plants such as bedding plants or herbaceous perennials. This will include immediate aftercare, such as support, labelling, watering mulching and an understanding of the significance of planting depth and firming.

In Outcome 3, learners will carry out maintenance activities on a shrub or mixed border. They should understand the general needs of plants such as watering feeding, surface cultivation and mulching, but also the additional needs of specific plants, such as support or training. They should be able to identify the border plants and carry out pruning to promote the decorative characteristics of plants.

In Outcome 4, learners are expected to be able to assess a mixed border, identify specific pests, diseases, weeds and other threats to health, to assess the maintenance needs of the plants in the border and specify the different pruning needs of specific plants. They should understand how seasonal weather conditions and soil conditions affect plant growth, health and maintenance activities.

The unit may be delivered by a wide range of techniques, including lectures, supervised practical work, discussions, site visits and research. The delivery of this unit may be integrated with the delivery of other units where this is feasible. All methods should reinforce the importance of health and safety and environmental issues. Risk assessments must be undertaken prior to practical activities and learners should not be asked to undertake physical tasks beyond their physical capabilities.

Learners should have access to areas for preparation and planting, and established borders for practical lessons and assessment. Where resources at the centre are limited, visits to demonstration gardens/ historic gardens would be useful to complement lessons at the centre. All tasks should be undertaken at the correct time of the year and in appropriate weather conditions.

References

Books

Adams C R and Early M P. 2004. *Principles of Horticulture.* 4th ed. Oxford: Butterworth-Heineman. ISBN: 0-7506-6088-0.

Brickell C. 2007. *The RHS Encyclopaedia of Gardening.* 2nd ed. Surrey: Dorling Kindersley Publishers. ISBN: 1405322270

Brickell C and Joyce D. 2006. *RHS Pruning and Training.* Surrey: Dorling Kindersley Publishers. ISBN: 1405315265

Hessayon D G. 1999. *The Tree and Shrub Expert.* London: Transworld Publishers. ISBN: 0903505178

Hillier J and Coombes A J. 2007. *The Hillier Manual of Trees and Shrubs.* 3rd ed. Devon: David and Charles. ISBN: 07015326640

Websites

www.rhs.org.uk Royal Horticultural Society

Unit 227 Presentation and Service for Retailing in the Land-based Sector

Level: 2

Credit value: 10

Unit aim

This unit has been specifically developed for 14-19 year old learners in full-time education acquiring additional knowledge of retailing.

The learner will be able to plan the layout of a land-based retail outlet. They will know the products and services offered by a given land-based retail outlet, along with how they are stocked. Practical skills of how to display the products will also be demonstrated. Health and safety considerations of the store will be discussed. The learner will also demonstrate appropriate customer care skills.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to design a suitable layout for a land-based retail outlet
2. Understand the products and services provided by a land-based retail outlet
3. Be able to prepare and display products for sale
4. Be able to demonstrate appropriate customer care skills.

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

n/a

Endorsement of the unit by a sector or other appropriate body

Skillsmart Retail has approved this unit to be used within Edexcel BTEC and City & Guilds NPTC qualifications only

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 227 Presentation and Service for Retailing in the Land-based Sector

Outcome 1 Be able to design a suitable layout for a land-based retail outlet

Assessment Criteria

The learner can:

1. Plan the **layout** for a land-based retail outlet
2. Report on the **health and safety** and **legislative** requirements of a retail outlet
3. Justify the design and layout of a land-based retail outlet

Range

The retail outlets which can be used for this unit need to be appropriate to the context in which the learner is studying.

Unit content

Layout

Purpose of retail outlet, location of exit and entrance, storage areas/shelving, sectioned areas for grouped items, customer service area, customer facilities, tills, collection points and disabled access

Health and safety

Risk assessments, risks to staff and customers, hazards which could affect staff and customers, storage of chemicals and carry out practical risk assessment

Legislation

Health and Safety at Work etc Act 1974, Control of Substances Hazardous to Health (2002) (COSHH), Reporting of Injures Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR), Disabilities Discrimination Act 1995 (DDA)

Unit 227 Presentation and Service for Retailing in the Land-Based Sector

Outcome 2 Understand the products and services provided by a land-based retail outlet

Assessment Criteria

The learner can:

1. Review **products** and/or **services** in a given land-based outlet
2. Evaluate **factors influencing choice** of products and services for a given land-based retail outlet
3. Describe the **stocking** requirements of products being sold in a given land-based retail outlet

Range

The retail outlets which can be used for this unit need to be appropriate to the context in which the learner is studying

Unit content

Products

Range of products, list/group those available and ensure relevance

Services

Make relevant to the business, list those that link directly to the business for example; delivery service, personal shopper service

Factors influencing choice

Cost, price, quality, prominence/location of product in the outlet, proximity to other products, offers, discounts

Stocking

Space available, position of stock areas, amounts of stock required, who is in charge of ordering stock, health and safety considerations for example; location of stock and lifting stock

Unit 227 Presentation and Service for Retailing in the Land-Based Sector

Outcome 3 Be able to prepare and display products for sale

Assessment Criteria

The learner can:

1. **Prepare** products for sale
2. **Display** products for sale
3. **Maintain** displays within a given land-based retail outlet

Range

The retail outlets which can be used for this unit need to be appropriate to the context in which the learner is studying.

Unit content

Prepare

Checking stock for sell by date, checking for damage, ensure stock is required

Display

Suitability of location of display, prepare display to receive goods, product placement for example; in order of size and grouped accordingly

Maintain

Checking stock for damage, checking sell by dates, product placement, stock rotation, regular cleaning of shelves and display units

Unit 227 Presentation and Service for Retailing in the Land-Based Sector

Outcome 4 Be able to demonstrate appropriate customer care skills

Assessment Criteria

The learner can:

1. Perform **customer care** related activities
    - **processing payments**
    - dealing with customers
    - **customer satisfaction**
2. Describe the importance of customer care in land-based retail outlets

Range

The retail outlets which can be used for this unit need to be appropriate to the context in which the learner is studying

Unit content

Customer care

Open and closed body language, speaking clearly, language, staff presentation, dealing with complaints and difficult customers

Processing payments

Using electronic tills, manual working out of items, using card machines, receiving cash payments and processing cheques

Customer satisfaction

Quality of service provided, quality of goods supplied, dealing with customer enquiries in store and over the telephone and replacing damaged stock

Unit 227 Presentation and Service for Retailing in the Land-Based Sector

Notes for guidance

This unit is designed to provide the learner with an introduction to the knowledge and skills required to work in land-based retail.

Throughout the unit, the emphasis should be on safe working. It is expected that the learners will be aware of safe working practices and behaviours within the context in which they are working.

In Outcome 1, the learners are required to plan the layout of a land-based retail outlet of their choice. To accompany this full justification for the design needs to be given. The relevant health and safety legislative regulations also need to be identified and discussed. This could be investigated by the tutor taking the learners to land-based retail outlets, with prior arrangement and devising a blank plan that the learners could fill out when they go there to note the layout. Several different organisations could be visited, such as small, family run retail outlet or farm shop and a large chain store. This would give learners a good range of outlets to look at and base their ideas and justifications on.

Outcome 2 requires the learner to review the products and services which are offered by a chosen land-based outlet. An evaluation should be carried out relating to both the products and services provided to customers. Learners should also be encouraged to think innovatively when it comes to making suggestions and stocking decisions for products or services that are not currently provided by the outlets.

In Outcome 3, the learner is required to practically prepare and display the products sold within a land-based outlet. Some theory sessions may be required to accompany the practical aspects. Learners can complete this outcome on work placement or in a simulated assessment set up by the tutor. The learners should be able to give a full account of why they have chosen the particular preparation and displays, and could use their experience of visits to outlets to justify their decisions.

Outcome 4 focuses on customer care and the learners are required to demonstrate customer care practices. This task can be completed on work placement, or in a simulated assessment. Customer care is of importance when working in retail, and learners should be encouraged to understand the implications of not providing good customer care and service. This could be done by discussing bad experiences the learners have had in a retail environment or through role play with the rest of the group. This can be delivered interactively, and there are some excellent online materials that can be used to assist with delivery of this unit.

Centres are encouraged to introduce employees and professionals from industry to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of establishments to add depth to the learner experience.

It is expected that the learners will be aware of safe working practices and behaviours within the context in which they are working.

References

Books

Pfahl, PB., Behe B.K.1994. *The Retail Florist Business (5TH Ed).* Illinois: Interstate Printers and Publishers. ISBN: 0813429670
Business Strategies Limited. 1999. *Skills in the Land-based sector.*
Warwickshire Careers Service.1996. *Careers in the Land-based sector.*

Websites

www.hse.gov.uk Health and Safety Executive

DVD's

Signposts for Health and Safety (2008) HSE

Unit 228 Introductory Deer Management

Level: 2

Credit value: 5

Unit aim
This unit aims to provide an introduction to the native and non-native species of deer living in the UK, and covers basic ecology, related legislation and management. The unit is designed primarily for learners in a centre-based setting looking to progress into the sector or onto further education.

Learning outcomes
There are **three** learning outcomes to this unit. The learners will:

1. Know deer species in the UK
2. Know the signs of typical deer damage
3. Be able to carry out legal management operations

Guided learning hours
It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards
Ga23 Contribute to deer management planning

Endorsement of the unit by a sector or other appropriate body
This unit is endorsed by Lantra SSC.

Assessment and grading
This unit will be assessed by:
- An assignment covering practical skills and underpinning knowledge.

Unit 228 Introductory Deer Management

Outcome 1 Know deer species in the UK

Assessment Criteria

The learner can:

1. **Identify** male and female adults and young living wild in the UK
2. Describe **seasonal changes and characteristics**
3. Describe **life cycles** of two species of deer living wild in the UK
4. Describe the **general biology** and **behaviour features** of a deer species living wild in the UK.

Range

UK wild deer species: red deer, fallow deer, sika deer, roe deer, muntjac and Chinese water deer

Unit content

Identify

Distinguishing features of species e.g. size (height, weight), coat (texture, colour, spotting, markings), facial characteristics (e.g. size of ears, eyes), body shape, presence/absence of antlers, tail, distinguishing features of age and sex e.g. size, antlers (presence, size, characteristics)

Seasonal changes and characteristics

Changes to coat colour and characteristics, antler growth, fraying and shedding, seasonal behaviour patterns e.g. wallowing, rutting, herding, calving, patterns of habitat use

Life cycle

Birth, maturity, reproduction, ageing, death

General biology

Nutrition (feeding behaviour, nutritional needs, habitat preferences), reproduction (timing, fecundity, number of young born), development, distribution throughout the UK

Behaviour features

Social behaviour (solitary/herd), doe behaviour (care of young, pecking order, herd behaviour), stag behaviour (rutting, challenge for dominance, territorial fighting and marking)

Unit 228 Introductory Deer Management

Outcome 2 Know the signs of typical deer damage

Assessment Criteria

The learner can:

1. In two given **habitats** describe the **typical signs of deer** living wild in the UK.

Range

UK wild deer species: red deer, fallow deer, sika deer, roe deer, muntjac and Chinese water deer

Unit content

Habitats

Woodland (coniferous forests, broadleaved woodland, coppice woodland), farmed habitats (e.g. agricultural crops, farmed grassland), heathland, moorland

Typical signs of deer

Deer faeces, slots and racks, browsing, fraying, bark stripping and trampling damage, methods of distinguishing between damage caused by deer and other animals e.g. rabbit, hare and squirrel, characteristic bite patterns, height of damage, habitats/crops affected by different deer species

Unit 228 Introductory Deer Management

Outcome 3 Be able to carry out legal management operations

Assessment Criteria

The learner can:

1. Safely assist in a specified **deer management task**
2. State the influence of **legislation** on **deer management.**

Range

UK wild deer species: red deer, fallow deer, sika deer, roe deer, muntjac and Chinese water deer

Unit content

Safely

In line with Health and Safety at Work Act 1974, completion of risk assessment, awareness of Lyme Disease, use of Personal Protective Equipment (PPE)

Deer management task

Examples include assisting in deer population monitoring, high seat maintenance, constructing or maintaining deer fencing, assessing damage due to deer presence, placing tree guards and shelters

Legislation

Current legislation e.g. the Deer Act 1991, the Wildlife and Countryside Act 1981, the Wild Mammals (Protection) Act 1996, the Deer (Scotland) Act 1959 (as amended 1996), the Firearms Act 1968 (as amended 1997), statutory Close seasons

Deer management

Management operations throughout the year e.g. population estimation, deer stalking techniques, cull planning, legal methods of culling, carcass retrieval, habitat protection (e.g. fencing, chemical repellents, use of tree guards), safety procedures e.g. use of hill phone system in Scotland

Unit 228 Introductory Deer Management

Notes for guidance

This unit is designed to provide learners with an introduction to the principles of deer management, including deer identification, types of deer damage and the management operations that take place for wild deer in the UK. As learners will be engaged in practical activity there should be an emphasis on safe working practices, including the use of appropriate personal protective equipment (PPE), and appropriate risk assessments should be undertaken. Sustainability concepts should also be demonstrated where possible, and practical activities should be planned to minimise disruption to deer and other species within the habitat.

For Outcome 1 delivery is likely to include classroom based delivery using high quality audio visual materials to assist learners in recognising the different deer species and their distinguishing characteristics. It would also be particularly useful for learners to be able to observe one or two deer species, although it is likely that a visit to a deer park may provide better opportunities for observation than in their natural habitat.

For Outcome 2 learners need to gain an understanding of types of damage associated with deer in general, and with different deer species. Delivery is likely to include some classroom based activity and research in understanding the types of damage and their importance, and a guest speaker who can talk about the impact of deer damage may be of particular interest. It will be important to supplement this with visits, enabling learners to see at first hand the types of deer damage most commonly seen.

For Outcome 3 delivery is likely to include a significant element of supervised practical activity. It will be particularly important that all aspects of health and safety are stressed, including the use of risk assessments and PPE. As the focus of this unit is on the management of wild deer, it is not anticipated that learners will handle deer. Examples of practical tasks would be those connected with habitat protection and/or deer population monitoring and management. Delivery is also likely to encompass classroom based sessions to include an overview of the relevant legislation and how it affects deer management.

References

Books

Carne P., 2000. *Deer of Britain and Ireland: Their History and Distribution* Swan Hill Press, ISBN 1840370912

De Nahlik A J., 1992. *Management of Deer and Their Habitat: Principles and Methods*, Coch-y-Bonddu Books, ISBN 0907519016

Downing G., 2008. *The Deer Stalking Handbook* Quiller Press, ISBN 9781846890482

English Nature., 1997. *Deer Management and Woodland Conservation in England* English Nature, ISBN 1857162579

Putman, R., 2003. *The Deer Manager's Companion* Swan Hill Press, ISBN 1904057039

Whitehead G K., 2003. *The Whitehead Encyclopaedia of Deer*, Swan Hill Press, ISBN 1904057195

Websites

www.basc.org.uk	British Association for Shooting and Conservation
www.bds.org.uk	The British Deer Society
www.dcs.gov.uk	Deer Commission for Scotland
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government

www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.environment-agency.gov.uk	Environment Agency
www.forestry.gov.uk	The Forestry Commission
www.naturalengland.org.uk	Natural England
www.thedeerinitiative.co.uk	The Deer Initiative

Unit 229 Undertake Tree Felling Operations

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the tree felling operations and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to carry out the tasks required during tree felling operations. They will be able to maintain chainsaws and felling aids. The learner will also be able to comply with health and safety codes of practice and legislation relevant to tree felling operations. Forestry specific elements will also be examined. The learner will be able to safely fell and sned/de-limb small trees.

This unit will **not** directly lead to certification of competence in the Level 2 Award in Chainsaw and Related Operations. This unit could be used to contribute towards preparative training for the Level 2 Award in Chainsaw and Related Operations.

Chainsaws and young people

Chainsaws should not be operated by anyone under minimum school leaving age (MSLA), which is on, or near the age of 16 years, depending on when the last day of the school year falls. Employers of young people (i.e. above MSLA but under 18 years old) will need to ensure:

- they have the physical capacity to operate the chainsaw safely;
- particular account is taken of their inexperience, immaturity and lack of awareness of relevant risks;
- they are supervised by a person competent in the use of a chainsaw for the work being done by the trainee and who, where appropriate, holds the relevant competence certificate or award.

Please refer to the HSE website: **http://www.hse.gov.uk/pubns/indg317.pdf** (the HSE leaflet INDG317 (rev1) 'Chainsaws at Work')

Learning outcomes

There are **three** learning outcomes to this unit. The learner will:

1. Be able to carry out routine operator maintenance on a chainsaw
2. Be able to comply with legislation and codes of practice relevant to tree felling operations
3. Be able to fell small trees using a chainsaw and felling aids

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

TW10 Fell small trees using a chainsaw

TW15 Fell trees mechanically

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 229 Undertake Tree Felling Operations

Outcome 1 Be able to carry out routine operator maintenance on a chainsaw

Assessment Criteria

The learner can:

1. Identify **standard safety features of common chainsaws**
2. Carry out **appropriate daily and weekly maintenance and pre-start checks**
3. **Identify and rectify common faults with chainsaws**

Unit content

Standard safety features of common chainsaws

Standard safety features: working on-off switch, statutory warning labels, front hand guard or inertia chain break, chain catcher, safety throttle, anti-vibration mounts, guide bar and chain combination, rear hand guard, exhaust directing fumes away from the operator, chain cover, optional heated handles

Appropriate daily and weekly maintenance and pre-start checks

Maintenance: replacement and adjustment of operator serviceable components as per manufacturers' guidance and operator's manual, clean chainsaw and inspect for damage, sharpen and maintain chain, maintain guide bar, maintain air filter, maintain chain break, inspect and maintain sprocket, service recoil starting mechanism, service spark plug, inspect and maintain fuel and oil filters

Pre-start checks: chain tension checked, safety features checked and condition assessed, external nuts and bolts checked for security, sufficient fuel and chain oil

Identify and rectify common faults with chainsaws

Common faults: incorrect fuel mix, uneven and excessive guide bar and chain wear, saw not cutting in a straight line, excessive vibration, chain creep at tick over, bar and chain overheating, chain oil mechanism not working, blocked filters, engine stalls and will not tick over

Use of manufacturers' part numbers

Unit 229 Undertake Tree Felling Operations

Outcome 2 Be able to comply with legislation and codes of practice relevant to tree felling operations

Assessment Criteria

The learner can:

1. Identify **legislation relevant to tree felling operations**
2. **Carry out a risk assessment appropriate to tree felling operations**
3. Identify and use **appropriate Personal Protective Equipment (PPE)**

Unit content

Legislation relevant to tree felling operations

Provision and Use of Work Equipment Regulations 1998 (PUWER), Health and Safety at Work etc Act 1974, Management of Health and Safety at Work Regulations 1992 (as amended 1999), Environmental Protection Act 1990 (as amended 1995), Forestry Act 1967 (as amended 1991)
Health and safety: risk assessment, need for training and certification, requirement for Personal Protective Equipment (PPE), statutory warning notices
Felling controls: felling licenses and Tree Preservation Orders (TPOs)
Environmental considerations: oil and fuel spillage and storage, nesting and breeding seasons, protected species, waste disposal, watercourses and noise

Carry out a risk assessment appropriate to tree felling operations

Identification of appropriate hazards and risks: site and ground conditions, tree condition, weather conditions, operator, work colleagues, machine and task, public access and rights of way/highways, power lines, noise levels
Risk control and reduction: establishment of safety zones, emergency procedures, refuelling sites, PPE Arboriculture and Forestry Advisory Group (AFAG) Safety Guides

Appropriate Personal Protective Equipment (PPE)

Personal Protective Equipment: boots, trousers/leggings, gloves jacket, helmet with visor and ear protection
Legislation and suitability: all approved for chainsaw use, CE marked and within time limits for approved use, correct size

Unit 229 Undertake Tree Felling Operations

Outcome 3 Be able to fell small trees using a chainsaw and felling aids

Assessment Criteria

The learner can:

1. Carry out **felling operations safely using appropriate felling methods**

Range

Tree with diameter at felling height between 200 mm and 380mm

Unit content

Felling operations safely using appropriate felling methods

Identification of problem trees, prepare and inspect the site, adherence to industry safety guidance and operator's manual, selection of felling direction, safe and efficient chainsaw operation, appropriate PPE worn, appropriate work positioning, monitoring of chainsaw performance, effective communications, awareness of hazards and escape routes, safe working distances, use of felling aids, first aid provision, worksite left in a safe and tidy condition

Unit 229 Undertake Tree Felling Operations

Notes for guidance

This unit is designed to provide the learner with knowledge and the skills required to fell small trees. The unit should cover as wide a range of felling opportunities as possible, appropriate to the woodland sites available to the learner.

Throughout the unit, the emphasis should be on safe working. It is expected that the learner may be unaware of basic safe working practices with a chainsaw but is likely to be familiar with accepted practices and behaviours within the context in which they are working. It is a requirement for the learner to operate machinery therefore health and safety issues relevant to the operation of the machinery used must be stressed and regularly reinforced. The learner should be actively involved in comprehensive risk assessments.

Any legal permission required to fell trees must be obtained and equipment/machinery being used must comply with relevant requirements of the Provision and Use of Work Equipment Regulations (PUWER) 1998. Adequate PPE appropriate to the learner, the machinery and the task must be provided and worn in accordance with the associated risk assessment, industry guidance and operator's manual.

In Outcome 1 the learner will be required to carry out routine maintenance on chainsaws. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. It is expected that the learner will be given access to appropriate workshop facilities and tools to maintain and service the chainsaw. It is essential that the manufacturers' manuals are available to undertake this work. The learner should be able to service and maintain the chainsaw to be operated in a realistic industrial environment. The learner should be encouraged to experience a range of chainsaw makes and models as well as to obtain and review manufacturers' information.

In Outcome 2 the learner will be required to comply with legislation and codes of practice relevant to tree felling operations. This outcome should be undertaken in conjunction with Outcome 3.

In Outcome 3, the learner will be required to fell small trees in a woodland situation. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. The trees to be felled should have a diameter at felling height between 200mm and380mm, and the maximum recommended guide bar length is 380mm. The learner must not be required to fell trees on a windthrown or other high risk forestry site. In addition, the operations of chainsaws off the ground and of polesaws are excluded from this unit.

This unit will **not** directly lead to certification of competence in the Level 2 Award in Chainsaw and Related Operations. This unit could be used to contribute towards preparative training for the Level 2 Award in Chainsaw and Related Operations.

If learners want to achieve the Level 2 Award in Chainsaw and Related Operations they will need to register and take the assessment separately through City & Guilds .

A learner working towards level 2 is likely to have some experience of practical forestry activities. This unit aims to develop the learner's knowledge and skills involved with the safe use of chainsaws and the felling of small trees. Emphasis should be placed upon 'doing' and developing practical experience, the learner should be given appropriate time to develop their skills. It is important that the learner

understands the importance of maintaining an awareness of current legislation and Codes of Practice in relation to tree felling operations.

Centres are encouraged to introduce employers and specific professionals from the forestry industry, such as specialised machinery suppliers and dealers, or felling contractors to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of working sites and trade shows to add depth to the learner experience by studying machinery in operation. The unit should be delivered throughout the year, with consideration given to appropriate seasonal aspects of forest and woodland work and the impact of weather extremes on operations.

It is accepted that some formal lectures may be necessary at level 2 but for this unit it is recommended that they are they are linked directly with interactive practical lessons in a real environment. The learner should be given the opportunity to undertake a range of felling activities on different sites and situations which reflects current industry practice.

References

Books

Arboricultural Association. 2005. *Arboricultural Association Health and Safety Package*. Cheltenham: Arboricultural Association. ISBN 0900978406.

Ireland, D. 2004. *Winching Operations in Forestry: Tree Takedown and Vehicle Debogging.* Surrey: Forestry Commission. ISBN 085538638X

Kestel, B. 2009. *Chainsaw Operator's Manual: The Safe Use of Chainsaws.* 7th ed. Australia: Landlinks Press. ISBN 0643090282

Journals

Forestry and British Timber

Arboriculture and Forestry Advisory Group (AFAG) Safety Guides

Unit 230 Undertake Tree Climbing and Pruning Operations

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the tree pruning operations and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to carry out the tasks required during tree pruning operations. They will be able to maintain chainsaws, hand tools and climbing equipment. The learner will also be able to comply with health and safety codes of practice and legislation relevant to tree pruning operations. The learner will also be able to describe theory behind pruning operations in relation to tree biology and seasonality.

This unit will **not** directly lead to certification of competence in the Level 2 Award in Chainsaw and Related Operations. This unit could be used to contribute towards preparative training for the Level 2 Award in Chainsaw and Related Operations.

Chainsaws and young people

Chainsaws should not be operated by anyone under minimum school leaving age (MSLA), which is on, or near the age of 16 years, depending on when the last day of the school year falls. Employers of young people (i.e. above MSLA but under 18 years old) will need to ensure:

- they have the physical capacity to operate the chainsaw safely;
- particular account is taken of their inexperience, immaturity and lack of awareness of relevant risks;
- they are supervised by a person competent in the use of a chainsaw for the work being done by the trainee and who, where appropriate, holds the relevant competence certificate or award.

Please refer to the HSE website: **http://www.hse.gov.uk/pubns/indg317.pdf** (the HSE leaflet INDG317 (rev1) 'Chainsaws at Work')

Learning outcomes

There are **three** learning outcomes to this unit. The learner will:

1. Be able to access trees safely
2. Be able to carry out pruning operations
3. Be able to comply with legislation and best practice relevant to tree pruning operations

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

T26 Support colleagues undertaking off ground arboricultural operations

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 230 Undertake Tree Climbing and Pruning Operations

Outcome 1 Be able to access trees safely

Assessment Criteria

The learner can:

1. Carry out a **pre climb hazard inspection**
2. Carry out **appropriate inspection procedures for climbing equipment**
3. Access a tree using **safe and appropriate techniques**
4. Demonstrate **installation of climbing anchor point**
5. Demonstrate **safe work positioning within the tree canopy**

Unit content

Pre climb hazard inspection

Identification of hazards and risk levels: Site and ground conditions, weather conditions, tree condition, task, public access and rights of way/highways, power lines, noise levels,
Risk control and reduction: establishment of safety zones, emergency procedures, rescue equipment, first aid provision, refuelling site, Personal Protection Equipment (PPE),
Arboriculture and Forestry Advisory Group (AFAG) Safety Guides

Appropriate inspection procedures for climbing equipment

Equipment appropriate to selected working methods, definition and status of a 'competent person', requirements for independence, Certificates of Conformity, categories of equipment, appropriate examination intervals, marking of individual items of equipment, wear patterns and types of damage, wear limits and tolerances

Safe and appropriate techniques

Safe access methods: ladders, Mobile Elevated Work Platforms (MEWPs), ropes and harness, throwlines, climbing irons

Installation of climbing anchor point

Selection of appropriate anchor points for operation, use of cambium savers

Safe work positioning within the tree canopy

Selection of appropriate anchor points and supplementary anchor points, use of cambium savers, changing of anchor points, ropes organisation, branch walking, controlled descent

Unit 230 Undertake Tree Climbing and Pruning Operations

Outcome 2 Be able to carry out pruning operations

Assessment Criteria

The learner can:

1. Carry out **tree pruning operations using hand tools safely**
2. Demonstrate knowledge of appropriate **tree pruning methods**
3. Demonstrate knowledge of **target pruning**

Unit content

Tree pruning operations using hand tools safely

Adherence to industry safety guidance, appropriate work positioning, effective communications, awareness of hazards and escape routes, safe working distances, correct pruning techniques, correct operation of equipment, safe working practices, safe use of ancillary equipment, first aid provision, appropriate disposal of waste, prevention of pollution, minimise environmental impact, leave the worksite in a safe and tidy condition

Tree pruning methods

British Standard 3998, crown thinning, crown reduction, crown reshaping and formative pruning, crown lifting, deadwooding, brashing, pollarding, coppicing

Target pruning

Timing of operations, branch collars, branch bark ridge, British Standard 3998

Unit 230 Undertake Tree Climbing and Pruning Operations

Outcome 3 Be able to comply with legislation and best practice relevant to tree pruning operations

Assessment Criteria

The learner can:

1. Identify **legislation relevant to tree pruning operations**
2. Describe **legal and environmental considerations when dealing with arisings** resulting from tree pruning operations
3. Carry out a **risk assessment appropriate to tree pruning operations**

Unit content

Legislation relevant to tree pruning operations

Provision and Use of Work Equipment Regulations 1998 (PUWER), Lifting operations and Lifting Equipment Regulations 1998 (LOLER), Work at Height Regulations 2005
Health and Safety at Work etc Act 1974, Management of Health and Safety at Work Regulations 1992 (as amended 1999), Town and Country Planning Act 1961 (as amended 1990), Town and Country Planning (Trees) Regulations 1999

Legal and environmental considerations when dealing with arisings

Environment Protection Act 1990 (as amended 1995), Environmental Protection (Duty of Care) Regulations 1991 (as amended 2003), Waste Management Licensing Regulations 1994 (as amended 1997), Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991 (as amended 1998)
Registered professional collector and/or dealer of waste (agricultural waste only), registered waste carrier or broker, register with Environment Agency (or equivalent), Waste Transfer Notes (WTNs) and record keeping

Risk assessment appropriate to tree pruning operations

Identification of appropriate hazards and risk levels: site and ground conditions, weather conditions, tree condition, operator, machine and task, public access and rights of way/highways, power lines, noise levels
Risk control and reduction: establishment of safety zones, emergency procedures, rescue equipment, first aid provision, refuelling site, PPE
Arboriculture and Forestry Advisory Group (AFAG) Safety Guides, The Arboricultural Association Technical Guides

Unit 230 Undertake Tree Climbing and Pruning Operations

Notes for guidance

This unit is designed to provide the learner with knowledge and practical skills associated with the requirement to prune trees. The unit should cover a range trees, as well as techniques and equipment such as polesaws. Consideration should be given to the seasonal nature and timing of tree pruning, as well as when signs and symptoms associated with causes of potential failure (e.g. pathogens) may be easily observed.

Throughout the unit, the emphasis should be on safe working. It is expected that the learner will be aware of basic safe working practices in chainsaw and aerial treework, as well as familiar with accepted practices and behaviours within the context in which they are working. It is a requirement for the learner to operate machinery and climb trees, therefore health and safety issues relevant to the operation of the machinery used and aerial treework must be stressed and regularly reinforced. The learner should be actively involved in comprehensive risk assessments.

Any legal permission required to prune trees must be obtained and equipment/machinery being used must comply with relevant requirements of the Provision and Use of Work Equipment Regulations (PUWER) 1998 and Lifting operations and Lifting Equipment Regulations 1998 (LOLER). Adequate Personal Protective Equipment (PPE) appropriate to the learner, the machinery and the task must be provided and worn in accordance with the associated risk assessment, industry guidance and operator's manual.

In Outcomes 1 and 2 the learner will be required to access and work in trees. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. It is expected that the learner will be given access to appropriate climbing and access equipment to undertake this outcome and to have received sufficient preparatory training in safe tree climbing and work positioning techniques. It is important that the learner must cover a good range of pruning methods however it is not expected that every method listed must be covered. The learner should be encouraged to work in trees in a variety of situations and meet with arboricultural contractors and statutory undertakers to discuss real case studies of the need for tree pruning. The learner must not be required to work on hazardous trees or work sites where the level of risk is deemed to be unacceptable.

In Outcome 3, the learner will be required to carry out pruning operations within tree canopies. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. It is necessary for the learner to be given access to appropriate climbing and access equipment to undertake this outcome and to have received sufficient preparatory training in the safe use of tree climbing, pruning equipment and work positioning. It is also necessary for the learner to be given the opportunity to undertake a range of types of pruning work in realistic working environments. The learner must not be required to work on hazardous trees or work sites where the level of risk is deemed to be unacceptable.

This unit will **not** directly lead to certification of competence in the Certificates of Competence in Chainsaw and Related Operations. This unit could be used to contribute towards preparative training for the Certificates of Competence in Chainsaw Related Operations or the Level 3 Certificate of Competence in the Thorough Examination of Arboricultural Equipment.

If learners want to achieve the Certificates of Competence in in Chainsaw and Related Operations they will need to register and take the assessment separately through City & Guilds .

A learner working towards level 2 is likely to have some experience of practical forestry and arboricultural activities. This unit aims to develop the learner's knowledge and skills involved with the safe use of chainsaws and tree climbing. Emphasis should be placed upon 'doing' and developing practical experience, the learner should be given appropriate time to develop their skills. It is important that the learner understands the importance of maintaining an awareness of current legislation and Codes of Practice in relation to tree pruning operations.

Centres are encouraged to introduce employers and specific professionals from the arboricultural industry, such as specialised machinery suppliers and dealers, or arboricultural contractors to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of working sites and trade shows to add depth to the learner experience by studying treework in operation. The unit should be delivered throughout the year, with consideration given to appropriate seasonal aspects of treework and the impact of weather extremes on operations.

It is accepted that some formal lectures may be necessary at level 2 but for this unit it is recommended that they are linked directly with interactive practical lessons in a real environment. The learner should be given the opportunity to undertake a range of tree pruning on different sites and situations which reflects current industry practice.

References

Books

Arboricultural Association. 1994. *A Guide to Tree Pruning*. Cheltenham: Arboricultural Association. ISBN 090097821X.

Arboricultural Association. 2005. *Arboricultural Association Health and Safety Package*. Cheltenham: Arboricultural Association. ISBN 0900978406.

British Standards Association. 1966. *BS 3998: Recommendations for Tree Work.* British Standards Institute. ISBN 0580171701.

British Standards Association. 1966. *BS 3998: Recommendations for Tree Work.* British Standards Institute. ISBN 0580171701.

Brown, G., Kirkham, T. 2009. *The Pruning of Trees, Shrubs and Conifers.* Portland: Timber Press. 2004. ISBN 0881926132.

Cottam, M., McKeown, L., White, C. 2006. *A Guide to Good Climbing Practice.* Cheltenham: Arboricultural Association. ISBN 0900978392.

Donzelli, P.S., Lilly, S.J. 2001. *The Art and Science of Practical Rigging*. Canada: International Society of Arboriculture.

Jepson, J. 2000. *The Tree Climber's Companion: A Reference And Training Manual For Professional Tree Climbers.* Springfield: Access Publishing Inc.. ISBN 0615112900.

Mynors, C. 2010. *The Law of Trees, Forests and Hedgerows.* 2nd ed. London: Sweet and Maxwell. ISBN 0421590408.

Shigo, A.L. 1989. *Tree Pruning: A Worldwide Photo Guide.* Snohomish: Shigo and Trees Associates. ISBN 0943563089

Journals

Arboricultural Advisory Information Service publications

Arboricultural Association newsletter

Forestry and British Timber

Journal of Arboriculture

Quarterly Journal of Forestry

Arboriculture and Forestry Advisory Group (AFAG) Safety Guides

Arboriculture Association Technical Guides

Unit 231 Carry Out Ground-based Arboricultural Operations

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of ground based arboricultural operations and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will be able to carry out the daily tasks required to support ground-based operations. They will be able to maintain and implement a range of machinery and hand tools relevant to arboriculture. Legal and health and safety requirements will also be examined. The learner will also be able to fell and process small trees as well as operate and carry out basic maintenance on powered equipment and deal with tree stumps.

This unit will **not** directly lead to certification of competence in the Level 2 Award in Chainsaw and Related Operations. This unit could be used to contribute towards preparative training for the Level 2 Award in Chainsaw and Related Operations.

Chainsaws and young people

Chainsaws should not be operated by anyone under minimum school leaving age (MSLA), which is on, or near the age of 16 years, depending on when the last day of the school year falls. Employers of young people (i.e. above MSLA but under 18 years old) will need to ensure:

- they have the physical capacity to operate the chainsaw safely;
- particular account is taken of their inexperience, immaturity and lack of awareness of relevant risks;
- they are supervised by a person competent in the use of a chainsaw for the work being done by the trainee and who, where appropriate, holds the relevant competence certificate or award.

Please refer to the HSE website: **http://www.hse.gov.uk/pubns/indg317.pdf** (the HSE leaflet INDG317 (rev1) 'Chainsaws at Work')

Learning outcomes

There are **two** learning outcomes to this unit. The learner will:

1. Be able to carry out maintenance on a range of powered equipment and hand tools
2. Be able to set out the job site

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

TW25 Support arboricultural operations

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 231 Carry Out Ground-based Arboricultural Operations

Outcome 1 Be able to carry out maintenance on a range of powered equipment and hand tools

Assessment Criteria

The learner can:

1. Carry out **daily maintenance** tasks safely on chainsaws and hand tools
2. Carry out **operator maintenance** on relevant powered equipment safely

Scope

Chainsaws: at least 2 different models or chainsaw manufacturers
Felling Aids: all of wedges, felling leavers/turning hooks, pulp hooks, timber tongs, winches (at least 2 different models) and associated cables, strops and shackles
Hand Tools: secateurs, pruning saws, saws, axes, sledgehammers, files, hammers
Brushwood Chipper: machine above 100mm diameter feed capability

Unit content

Daily maintenance

Cleaning, inspection, fault diagnosis, sharpening, full preparation and testing
Knowledge and understanding of the requirements Provision and Use of Work Equipment Regulations 1998 (PUWER) regulations for operators

Operator maintenance

Cleaning, inspection and full preparation and testing of machine in accordance with manufacturer's handbook
Reasons for operator maintenance and timescales

Unit 231 Carry Out Ground-based Arboricultural Operations

Outcome 2 Be able to set out the job site

Assessment Criteria

The learner can:

1. Describe **legal and environmental requirements** when carrying out work on trees
2. **Set out and put away equipment** and resources relevant to operations and to meet the requirements of the job
3. **Carry out risk assessment**
4. Ensure the work site is left **clean and tidy**

Scope

Urban tree work in small or large gardens. Arboricultural operations on farm land, public parks, open fields or work adjacent to public footpaths, farm tracks or low traffic public roads

Unit content

Legal and environmental requirements

Health and safety at Work etc Act 1974, Provision and Use of Work Equipment Regulations 1998 (PUWER), Management of Health and Safety at Work regulations 1999, Environmental Protection Act 1990 (as amended 1995), Town and Country Planning Act 1961 (as amended 1990 Conservation Areas, Areas of Outstanding Natural Beauty, Site of Special Scientific Interest. Hedgerows Regulations

Set out and put away equipment and resources

Signage/barrier tape/set up communications/pedestrian control, placement of machinery, stacking of arising, environmental/wildlife considerations

Risk Assessment

Risk assessment relates to site, operator, task and machines in use, hazards, risks, control measures, emergency action plans, Ordnance Survey (OS) grid referencing, communicating and abiding with control measures

Clean and tidy

All signs, tools and equipment removed, litter, wood residues, waste products removed, damage repaired, agreed remains stacked as required, ground made good

Unit 231 Carry Out Ground-based Arboricultural Operations

Notes for guidance

This unit is designed to provide the learner with the sound knowledge and the skills required to safely undertake ground-based arboricultural operations. Consideration should be given to the seasons and timing of the work.

Throughout the unit, emphasis should be on safe working. It is expected that the learner will be aware of basic safe working practices in chainsaw and tree work, as well as be familiar with accepted practices and behaviours within the context in which they are working. It is a requirement for the learner to operate machinery therefore health and safety issues relevant to the operation of the machinery used and aerial tree work must be stressed and regularly reinforced. The learner should be actively involved in comprehensive risk assessments.

Any legal permission required to fell trees must be obtained and equipment/machinery being used must comply with relevant requirements of the Provision and Use of Work Equipment Regulations (PUWER) 1998. Adequate Personal Protective Equipment (PPE) appropriate to the learner, the equipment and the task must be provided and worn in accordance with the associated risk assessment, industry guidance and operator's manual.

In Outcome 1 the learner will be required to carry out routine maintenance on chainsaws and felling aids. It is anticipated that the delivery of this outcome will be delivered through supervised practical training and the learner able to consolidate operational skills within realistic working environments. It is expected that the learner will be given access to appropriate workshop facilities and tools to maintain and service the chainsaw. It is essential that the manufacturers' manuals are available to undertake this work. The learner should be able to service and maintain the chainsaw to be operated in a realistic working environment. The learner should be encouraged to use a range of chainsaw makes and models as well as to obtain and review manufacturers' information.

Outcome 2 covers how to set out the job site, including the relevant legislation. A requirement of this outcome is that the learner can set out the appropriate equipment in accordance with plans of work and after the operation put the equipment away in a suitable manner. The learner will know the requirements of, and be able to carry out, a risk assessment.

This unit will **not** directly lead to certification of competence in the Level 2 Award in Chainsaw and Related Operations. This unit could be used to contribute towards preparative training for the Level 2 Award in Chainsaw and Related Operations.

If learners want to achieve the Level 2 Award in Chainsaw and Related Operations they will need to register and take the assessment separately through City & Guilds.

Centres are encouraged to introduce employers and specific professionals from the arboricultural industry, such as contractors and consultants to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of working sites and trade shows to add depth to the learner experience. The unit should be delivered throughout the year, with consideration given to appropriate seasonal aspects of aerial arboricultural work and the impact of weather extremes on operations.

It is accepted that formal lectures are necessary at level 2 but for this unit it is recommended that they are they are linked directly with interactive practical lessons in a real environment. The learner should

be given the opportunity to undertake a range of arboricultural operations on different sites and situations which reflects current industry practice.

References

Books

James, N.D, G.1990. *The Arboriculturalist's Companion: A Guide to the Care of Trees*. Sussex: Wiley Publishing.
Kestel, B. 2009. *Chainsaw Operator's Manual: The Safe Use of Chainsaws*. 7th ed. Australia: Landlinks Press.
Mynors, C. 2010. *The Law of Trees, Forests and Hedgerows. 2nd ed*. London: Sweet and Maxwell.

Journals

Arboricultural Advisory Information Service publications
Arboricultural Association newsletter
Journal of Arboriculture
Arboriculture Forestry Advisory Group (AFAG) leaflets
Machining Operators Manuals

Unit 232 INTRODUCTION TO FISH BIOLOGY

Level: 2

Credit value: 5

Unit aim

This unit aims to introduce learners to the skills and knowledge needed for fish biology and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training. A sound understanding of fish biology is essential for anyone working in fish related industries such as fishery management and fish farming.

Learners will cover basic fish biology and physiology as well as techniques used to identify a range of fish species. They will develop skills used to examine and dissect fish as well as identification techniques. This unit also covers basic behaviour of fish including reproduction and signs of ill health and stress.

Learning outcomes

There are **two** learning outcomes to this unit. The learner will be able to:

1. Know freshwater fish identification
2. Understand elementary fish biology

Guided learning hours

It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards This unit links to the Fisheries Management National Occupational Standards.

Endorsement of the unit by a sector or other appropriate body (if required, otherwise omit)

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- A centre-devised assignment covering practical skills and underpinning knowledge.

Unit 232 INTRODUCTION TO FISH BIOLOGY

Outcome 1 Know freshwater fish identification

Assessment Criteria

The learner can:

1. Recognise the **external body features** of specified coarse and game fish
2. Identify specified **game and coarse fish**

Unit content

External body features

Name, location and function of external body features including, eyes, lateral line, urino-genital pore, all fins, scales and position of mouth parts

Game and coarse fish

Identification of common fish species based on external features including similar fish species and use of keys. Indentifying hybrids and common areas of confusion

Different characteristics depending of life stages of fish

Common and scientific names of game and coarse fish species e.g. Roach (*Rutilus rutilus*) Brown Trout (*Salmo trutta*)

Unit 232 INTRODUCTION TO FISH BIOLOGY

Outcome 2 Understand elementary fish biology

Assessment Criteria

The learner can:

1. Explain the **position and function** of the **sensory**, **skeletal**, **respiratory**, **circulatory**, **digestive**, **excretory** and **reproductive** systems in a specified fish species

Unit content

Position and function

Name, location and function of all body systems for specified fish species

Sensory

Sight, smell, taste, touch, sounds, pressure waves, electrical reception

Skeletal

Skull, verterbrae, opercula, fin rays, etc

Circulatory

Heart, arteries, veins, capillaries

Reproductive

Male: Testes, spawning tubercles,
Female: Ovaries

Digestive

Mouth, pharyngeal, stomach, intestines etc. Differences between herbivorous, piscivorous and omnivorous

Excretory systems

Gills, kidneys etc. osmoregulation in fish

Unit 232 INTRODUCTION TO FISH BIOLOGY

Notes for guidance

This unit is designed to provide the learner with the knowledge of fish biology and what factors influence fish health. The majority of the unit will be delivered through lectures with practicals included to reinforce theories learnt in a classroom setting. Fish species that are encountered during practical's can be used to aid identification. Learners should have access to fish where behaviour can be observed or noted whether in wild or captivity.

Outcome 1 looks at the external anatomy of game and coarse fish and how species may be identified. It will be mostly theory based with some laboratory sessions to reinforce relevant areas. Key external features should be highlighted and how they are used in identification. Identification of fish using pictures and biological specimens can be carried out both in the classroom and field. The use of keys should be explained and made clear in the identification of species.

Outcome 2 looks at the function of key body systems and the organs that make these up. It will again expected that delivery will be in the form of formal lectures with plenty of opportunity to incorporate laboratory sessions in order the aid the understanding of body systems. Access the live fish is beneficial so that behaviour can be observed. Student research can be carried out when looking into the life cycle and reproductive behaviour of fish.

Learners working towards level 2 are likely to have some basic understanding of fish biology including identification and reproduction. This unit looks to extend this basic knowledge and skills relating to fish biology.

Unit 233 INTRODUCTION TO FISH HEALTH

Level: 2

Credit value: 5

Unit aim

This unit aims to provide learners with the knowledge and skills needed to monitor and maintain fish health. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will cover basic methods of examining fish health and condition including aging methods and records data. They will look at the most common fish pathogens and their symptoms as well as basic treatment methods. Learners will also cover how fish health is maintained including biosecurity methods.

Learning outcomes

There are **two** learning outcomes to this unit. The learner will be able to:

1. Be able to perform the routine examination of fish and collect key data
2. Know how fish health can be maintained

Guided learning hours

It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

This unit links to the Fishery Management National Occupational Standards.

Endorsement of the unit by a sector or other appropriate body (if required, otherwise omit)

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- A centre-devised assignment covering practical skills and underpinning knowledge.

Unit 233 INTRODUCTION TO FISH HEALTH

Outcome 1 Be able to perform the routine examination of fish and collect key data

Assessment Criteria

The learner can:

1. Externally **examine** a specified fish and **record data**, including species, weight, length, gender and any abnormalities

Unit content

Examine

Identify all external features, dissection techniques, observation of abnormalities, deformities, macro-parasites

Record data

Collect data: obtaining data, length weight of fish, fish ageing, removing and storing scales. Scale reading and other methods used to age fish. Assessing growth of fish against growth rate.

Record data: written (e.g. lists, table form), drawn (e.g. graphs)

Unit 233 INTRODUCTION TO FISH HEALTH

Outcome 2 Know how fish health can be maintained

Assessment Criteria

The learner can:

1. Identify specified common **fish parasites**
2. Identify specified common **fish predators**

Unit content

Fish parasites

Identification of common internal and external fish parasites including life cycles e.g. costia, whitespot, ligula, eye fluke.

Symptoms of viral, bacterial and fungal pathogens e.g. KHV, furunculosis, saprolegnia

Basic treatment methods of common fish pathogens

Fish predators

Identification of common fish predators and methods used to legally deter and control them e.g. cormorants, otters, heron

Biosecurity and simple disease control methods

Unit 233 INTRODUCTION TO FISH HEALTH

Notes for guidance

This unit is designed to provide the learner with the knowledge and practical skills required for the maintenance and monitoring of fish health. It is expected that delivery will involve a mixture of classroom, practical and laboratory sessions in order for the learners to acquire the knowledge and practical skills to work in the industry.

Ideally learners should be allowed some responsibility in the keeping of fish in aquariums for example, to enable them to gain firsthand experience of maintaining healthy stock.

Throughout the unit, the emphasis should be on safe working. It is expected that learners will be aware of safe working practices and be familiar with accepted practices and behaviours within the context in which they are working, especially when this is in and around water.

Outcome 1 should be delivered in a practical manner to enable learners to gain hands on experience. It is expected that some classroom theory session and included to reinforce practical sessions. Access to a laboratory is essential for learners to carry out simple dissections where animal welfare and health and safety issues should be addressed.

Outcome 2 covers methods used to maintain fish health and a range of practical and theory sessions should be used in delivery. Field trips and guest speakers should also be utilised to emphasise the importance of fish health. For example Cefas may give a talk on their work and current UK disease issues. Laboratory sessions can be used to examine fish and identify common parasites. Learners should have access to facilities to enable the monitoring of water quality.

Learners working towards level 2 are likely to have experience of fish health through keeping ornamental fish at home. This unit aims to extend the learners knowledge and skills involved in maintaining fish health. Emphasis should be placed on ‘the importance of fish health and welfare and the environmental impacts on the health of fish. Learners should be made aware of why the maintenance of fish health is vital and the implications if it is not maintained.

It is accepted that some formal lectures will be necessary at level 2 but for this unit it is recommended that they are they are linked directly with interactive lessons in a real environment. Learners must be given the opportunity to gain a range of practical skill relating to all areas of the unit.

Unit 234 INTRODUCTION TO AGRICULTURE AND CONSERVATION

Level: 2

Credit value: 10

Unit aim

This unit aims to introduce learners to the skills and knowledge needed for understanding how agriculture and conservation interact 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.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will be able to:

1. Know changes in agricultural practices and the effects on habitat and wildlife
2. Know support available to land owners for adopting environmentally friendly practices
3. Know wildlife conservation strategies
4. Be able to recommend wildlife conservation strategies

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

This unit links to the Environmental Conversation National Occupational Standards.

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- A centre-devised assignment covering practical skills and underpinning knowledge.

Unit 234 INTRODUCTION TO AGRICULTURE AND CONSERVATION

Outcome 1 Know changes in agricultural practices and the effects on habitat and wildlife

Assessment Criteria

The learner can:

1. Describe the changes in agricultural practices with the introduction of mechanisation, intensification, use of herbicides, pesticides and fertilisers
2. Outline the effect on habitat and wildlife of intensive farming practices identify

Unit 234 INTRODUCTION TO AGRICULTURE AND CONSERVATION

Outcome 2 Know support available to land owners for adopting environmentally friendly practices

Assessment Criteria

The learner can:

1. Outline grants available to land owners adopting environmentally friendly practices
2. Describe uses of grant aid for adopting environmentally friendly practices
3. State sources of advice available to farmers

Unit 234 INTRODUCTION TO AGRICULTURE AND CONSERVATION

Outcome 3 Know wildlife conservation strategies

Assessment Criteria

The learner can:

1. identify sites suitable for conservation
2. List the features to look for when surveying a site
3. Describe options for restoring or re-creating given habitats

Unit 234 INTRODUCTION TO AGRICULTURE AND CONSERVATION

Outcome 4 Error! No text of specified style in document.

Assessment Criteria

The learner can:

1. Be able to recommend wildlife conservation strategies
2. survey site for its conservation value
3. recommend a wildlife strategy
4. describe a wildlife conservation strategy

Relationships to other qualifications

Literacy, language, numeracy and ICT skills development

These qualifications include opportunities to develop and practise many of the skills and techniques required for success in the following qualifications:

- Functional Skills (England) – see **www.cityandguilds.com/functionalskills**
- Essential Skills (Northern Ireland) – see **www.cityandguilds.com/essentialskillsni**
- Essential Skills Wales - **www.cityandguilds.com/esw**

There might also be opportunities to develop skills and/or portfolio evidence if learners are completing any Key Skills alongside these qualifications.

Appendix 1 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on **www.cityandguilds.com**.

Providing City & Guilds qualifications – a guide to centre and qualification approval contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification. Specifically, the document includes sections on:

- The centre and qualification approval process and forms
- Assessment, verification and examination roles at the centre
- Registration and certification of learners
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Frequently asked questions.

Ensuring quality contains updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document contains information on:

- Management systems
- Maintaining records
- Assessment
- Internal verification and quality assurance
- External verification.

Access to Assessment & Qualifications provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for learners who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information such as:

- ***Walled Garden***
  Find out how to register and certificate learners on line
- ***Events***
  Contains dates and information on the latest Centre events
- ***Online assessment***
  Contains information on how to register for GOLA assessments

Useful contacts

Type	Contact	Query
UK learners	T: +44 (0)84 4543 0033 E: learnersupport@cityandguilds.com	• General qualification information
Centres	T: +44 (0)84 4543 0000 F: +44 (0)20 7294 2413 E: centresupport@cityandguilds.com	• Exam entries • Registrations/enrolment • Certificates • Invoices • Missing or late exam materials • Nominal roll reports • Results
Walled Garden	T: +44 (0)84 4543 0000 F: +44 (0)20 7294 2405 E: walledgarden@cityandguilds.com	• Re-issue of password or username • Technical problems • Entries • Results • GOLA • Navigation • User/menu option problems
Employer	T: +44 (0)121 503 8993 E: business_unit@cityandguilds.com	• Employer solutions • Mapping • Accreditation • Development Skills • Consultancy

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