

# Unit 40: Understand Deer Population Monitoring and Management Plans

<b>Unit code:</b>	<b>M/600/9824</b>
<b>QCF Level 3:</b>	<b>BTEC National</b>
<b>Credit value:</b>	<b>10</b>
<b>Guided learning hours:</b>	<b>60</b>

## ● Aim and purpose

This unit aims to introduce learners to deer monitoring and management skills and knowledge 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.

## ● Unit introduction

Deer are the UK's largest wild, land mammals and, in general, the range and number of deer are increasing. This continuing growth in deer numbers means that it is more important than ever to understand deer and how their populations change with time.

Those employed in managing deer must be able to predict changes in deer populations and understand the effects these changes will have. Deer managers must be able to formulate management plans that allow deer to fulfil their role as an important component of our countryside, but at the same time prevent conflict with human interests.

This unit provides the knowledge and skills required to generate baseline data for deer populations, to observe, analyse and predict change and to formulate action plans. Learners will also take part in data collection work in the field, where they will develop the practical skills of deer surveying to supplement their knowledge and understanding.

## ● Learning outcomes

**On completion of this unit a learner should:**

- 1 Understand appropriate census methods for deer
- 2 Be able to carry out deer census techniques
- 3 Understand how deer impact on habitats
- 4 Understand the requirements of a deer management plan.

# Unit content

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## 1 Understand appropriate census methods for deer

*Uses of census data:* population totals or minima; deer density; population structure (male/female, female/young ratios, age structure); recruitment; mortality

*Census methods:* total counts; sample counts; direct (open hill count, vantage point, spotlight, thermal imaging, distance sampling); indirect (dung counts, both standing crop and clearance types); mortality data (cohort analysis); deer impacts; applicability in specific situations; census technique advantages and disadvantages

*Equipment required:* as appropriate to census type eg binoculars, telescope, orienteering compass, transect line, thermal imaging cameras

*Record keeping:* importance of accuracy; importance of timely recording methods; records of direct and indirect counts

## 2 Be able to carry out deer census techniques

*Planning and conducting census:* logistical planning; witnessing and recording data; data integrity (double counts, misidentification, 'unknown' individuals); health and safety

*Data analysis:* reliability of data; total numbers indicated; minimum deer density; male:female and female:young ratios where available; potential minimum recruitment; age structure in broad age ranges if available

*Direct methods:* open hill count; vantage point; spotlight; thermal imaging; distance sampling; observations from transects or block searches; method of estimation; advantages; disadvantages

*Indirect methods:* dung counts, both standing crop and clearance types; method of estimation; use of indices; advantages; disadvantages

*Survey records presentation:* quantitative (eg tables, charts, scatter graphs, histograms, pie charts), qualitative (eg annotated map, diagram, written report)

## 3 Understand how deer impact on habitats

*Deer habitats:* preferred environments; laying-up areas; feeding areas; plant species (typical, vulnerable); habitat protection (damage perception, effect of damage, methods of protection); use of maps for landscape scale habitat description, woodland/forest design; health and safety; risk assessment; personal protective equipment (PPE)

*Deer impacts:* damage to agricultural crops; damage within woodlands; susceptibility of tree and crop types to damage; tracks and trails; browsing and browse line; fraying; thrashing, bole scoring; scrapes; wallows; couches; dung; natural regeneration of vegetation; effect on other species; economic consequences of damage

*Habitat protection:* chemical repellents; barrier/whole site fencing (permanent, temporary, fencing specifications); deer creeps and downfalls; tree guards and shelters; reductions to deer populations; behaviour manipulation eg diversionary feeding, use of food supplements, changes in woodland management

## 4 Understand the requirements of a deer management plan

*Legal requirements:* current legislation eg Deer Act 1991, Wildlife and Countryside Act 1981, Wild Mammals (Protection) Act 1995, the Wild Game Meat (Hygiene and Inspection) Regulation 1995, the Deer (Scotland) Act 1996, Firearms Act 1968 (and amendments); statutory Close seasons

*Codes of practice:* relevant codes of practice eg BASC Code of Good Shooting Practice, BASC Code of Practice for Deer Stalking, Deer Initiative and Deer Commission for Scotland Best Practice Guides

*Population modelling:* concepts of population dynamics home range and territoriality; carrying capacity; reproduction; mortality; immigration; emigration; factors limiting or inducing population growth

*Deer management plan:* location; site description, habitat type; designated areas; history of management; species present; future management objectives and strategies; responsibilities; population (dynamics, annual turnover) and estimation; stalking; cull planning; cull data (weight, fecundity of female, body condition, age); carcass (retrieval, handling); landowner objectives; damage assessment; mapping; logistics; legislation; health and safety; SMART objectives; problem solving and management planning

*Sources of advice and information:* government and non-government organisations eg Defra, Countryside Alliance, Game and Wildlife Conservation Trust, British Deer Society, Deer Initiative, Deer Commission for Scotland; information books and other publications; websites

## Assessment and grading criteria

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

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
<b>P1</b> describe the direct methods commonly used to survey deer populations	<b>M1</b> explain the reasons for surveying deer populations	<b>D1</b> evaluate direct and indirect census techniques applicable to given deer management situations
<b>P2</b> describe the indirect methods commonly used to survey deer populations		
<b>P3</b> list equipment require to carry out a deer survey		
<b>P4</b> specify the information and calculations required to estimate a deer population [CT]		
<b>P5</b> identify the types of records required and the importance of accurate record keeping		
<b>P6</b> carry out direct methods commonly used to survey deer populations [TW, EP]	<b>M2</b> plan and carry out deer surveys using appropriate techniques, presenting detailed and accurate data and information	
<b>P7</b> carry out indirect methods commonly used to survey deer populations [TW, EP, SM]		
<b>P8</b> analyse the information and calculate the deer population for a given area		
<b>P9</b> present the survey records required for a deer management plan		

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
<b>P10</b> describe how deer impact on differing habitats	<b>M3</b> plan and carry out a deer habitat impact assessment, accurately report the results, and recommend action to prevent further habitat damage	<b>D2</b> discuss how data collection, including habitat impact assessment, can inform deer management planning.
<b>P11</b> explain the techniques used to assess the impact of deer on different habitats		
<b>P12</b> carry out a deer habitat impact assessment on a given area [TW, EP]		
<b>P13</b> identify the types of records required and the importance of accurate record keeping		
<b>P14</b> identify methods of protecting habitats from the impact of deer		
<b>P15</b> explain the principles of deer management	<b>M4</b> suggest a deer management plan for a given situation.	
<b>P16</b> identify the types of records required and the importance of accurate record keeping		
<b>P17</b> explain deer population modelling as required for a management plan		
<b>P18</b> explain the management plan requirements of objectives for: <ul style="list-style-type: none"> <li>◇ the short term</li> <li>◇ the long term</li> <li>◇ population management</li> <li>◇ habitat management</li> </ul>		
<b>P19</b> specify the sources of advice and information that are available to support the management of deer populations.		

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

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

# Essential guidance for tutors

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## Delivery

Tutors delivering and assessing this unit should use as wide a range of techniques as possible. Lectures, discussions, seminar presentations, site visits, supervised deer-related practicals, research using the internet and/or library resources and personal and/or industrial experience could all be used. It is expected that wherever possible practical methods will be used.

Visiting expert speakers could add to the relevance of the subject. For example, a deer manager or deer initiative/deer commission officer could talk about their work, the situations they face and the methods they use.

Whichever delivery methods are used, it is essential that tutors stress the importance of animal welfare, sound environmental management and the need to manage the resource using legal methods. Health and safety issues relating to working in an outdoor environment and handling animal material must be stressed and reinforced regularly, and risk assessments must be undertaken before practical activities. Adequate PPE must be provided and used following the production of suitable risk assessments.

Learning outcome 1 covers census methods used to count deer. This is likely to be delivered through classroom-based activities, discussions, site visits and supervised practical sessions and independent learner research. Learners will study the methods and associated activities commonly used to identify deer and use their knowledge of ecology to inform management decisions.

Learning outcome 2 develops learners' census techniques. This is likely to be delivered in the main by supervised practical sessions, supplemented by classroom based activities and learner research. Health and safety and the use of appropriate PPE should be emphasised prior to fieldwork activities.

Learning outcome 3 focuses on the impact of deer on habitats and includes carrying out an impact assessment. Delivery is likely to include visits to observe habitats where deer are present and to assess the impact of their presence. Classroom-based activities, including the use of case study material, will also be appropriate, and guest speakers may add relevance and interest. For example, a countryside ranger could explain measures they use to protect habitats from deer.

Learning outcome 4 covers deer management and the use of data, information and advice to support management activities. Delivery may include classroom-based activities, discussions, site visits and learner research. A guest speaker may also be relevant, for example explaining how records are used within a deer management role.

## Outline learning plan

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

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

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

## Topic and suggested assignments/activities and/assessment

Introduction and overview of the unit.

### **Assignment 1: Deer Census Techniques** (P1, P2, P3, P4, P5, M1)

Tutor introduces assignment brief.

Classroom activities: Census techniques used to estimate population size. Theory behind each technique, and equipment required, planning surveys.

Classroom activities: calculating deer populations, information required, calculation methods.

Classroom activities: record keeping – methods and importance.

Learner research and assessment completion.

### **Assignment 2: Deer Surveying** (P6, P7, P8, P9, M2, D1)

Tutor introduces assignment brief.

Practical activities: carry out surveying using direct and indirect techniques.

Classroom activities: presenting results from deer surveys, use in management plans.

Practical assessment: survey completion.

Learner assessment completion and write up.

### **Assignment 3: The Impact of Deer** (P10, P11, P12, P13, P14, M3)

Tutor introduces assignment brief.

Classroom-based activities and case studies: deer impact on habitats: by species and landscape, current research/issues.

Visit to observe deer impact, and carry out impact assessment.

Techniques to reduce the impact of deer on local and landscape scales.

Learner research and assessment completion.

### **Assignment 4: Deer Management Plan** (P15, P16, P17, P18, P19, M4, D2).

Tutor introduces assignment brief.

Classroom activities: management planning, putting a plan together, case studies of local estates that are actively managing their deer populations and minimising impacts.

Guest speaker explaining deer management and use of data.

Learner research and presentation: sources of advice and information.

Learner research and assessment completion.

## Assessment

For P1 and P2, learners must describe census methods that are applicable to deer. This includes direct (P1) and indirect (P2) methods, and should include those shown in the unit content. Evidence for this could take the form of a pictorial presentation with notes (possibly using appropriate software or an overhead projector), an annotated poster or a project.

P3 requires learners to create a list of equipment required to carry out a deer survey. This should include equipment needed for a direct and indirect survey. Assessment may be linked to P1 and P2 and take the same form.

For P4, learners need to specify the information and calculations required to estimate a deer population. Assessment may be linked to P1, P2 and P3 and take the same form.

For P5, learners are required to identify the types of records required and the importance of accurate record keeping. This should be in relation to deer surveying using both direct and indirect methods. Evidence may be a written or verbal report, an article, leaflet or poster.

P6 and P7 require learners to carry out a deer census and collate information to ensure integrity of the data. Learners need to use at least two direct methods (P6) and two indirect methods (P7). They should consider the possibility of data being unreliable or corrupted and develop strategies to deal with that. Evidence would ideally be presented as part of a project.

P8 and P9 require learners to analyse the information collected for P6 and P7 to calculate the deer population for an area (P8) and present the results (P9). Evidence may be presented in a variety of formats as appropriate to the results collected and may include use of computer spreadsheets.

Assessment of P10, P11 and P12 may be linked. For P10, learners need to describe how deer impact on different habitats, for P11 explain how to assess impact and for P12 carry out an impact assessment for an area. The area selected may be chosen by the tutor or agreed through discussion with the learner. Evidence may be a written impact assessment, with additional explanations to cover P10 and P11.

For P13, learners need to identify records required and the importance of accurate record keeping relevant to habitat impact assessment. Evidence may be a written or verbal report, an article, leaflet or poster.

For P14, learners need to identify at least three methods of protecting habitats from the impact of deer. Evidence may take the same form as for P13.

For P15, learners need to provide an explanation of the principles of deer management, covering the major aspects shown in the unit content. Evidence may be a written or verbal report or presentation.

For P16, learners need to identify records required and the importance of accurate record keeping relevant to deer management. Evidence may be written or verbal report, an article, leaflet or poster.

P17 requires learners to explain how deer population modelling is used to inform management plans. Evidence may be in the same format as for P16.

P18 requires learners to suggest reasons for objectives for the short term, long term, population management and habitat management. Learners should include at least two examples of suitable objectives for each category. Evidence may be a verbal presentation, written report or article, leaflet or handout.

P19 requires learners to specify at least three sources of information and advice for deer management, including the types of advice or information from each source. Evidence may be in the same format as for P16.

For M1, learners are required to explain the reasons for surveying deer populations. This could be linked to P1 and P2, and evidence could be presented in the same format.

M2 is likely to be an extension of work completed for P6, P7, P8 and P9, requiring learners to plan the surveys as well as carrying them out, presenting detailed and accurate data and information. Evidence may be presented in the same format as for the P criteria.

For M3, learners are required to extend work completed for P11, P12 and P14, demonstrating planning of the habitat impact assessment as well as recommending action to prevent further damage to habitats. Evidence may be presented in the same format as for the P criteria.

M4 requires learners to suggest a deer management plan for a given situation. The particular scenario may be one supplied by the tutor or agreed through discussion with learners. Evidence may be a written plan, incorporating the key aspects from the unit content.

For DI, learners are required to evaluate direct and indirect census techniques applicable to given deer management situations, which may be supplied by the tutor or agreed through discussion with learners. The evaluation should include the accuracy and fitness for purpose of the techniques, as well as the cost, time, area, season and practicality of implementation.

A minimum of three census techniques should be evaluated and evidence may be a verbal or written report.

For D2, learners need to discuss how data collection can inform deer management planning. Learners should include examples of types of data and how they can be used in management. Evidence may be a verbal or written report.

### Programme of suggested assignments

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

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, P4, P5, M1	Deer Census Techniques	A large estate has asked for some management advice on deer surveying. Create a written guide which includes an explanation of the reasons for carrying out surveying, and describes direct and indirect methods. Include the equipment required, information needed to estimate a deer population, the types of record required and the importance of accurate record keeping.	Written report.
P6, P7, P8, P9, M2, D1	Deer Surveying	The estate has asked if you will plan and carry out a deer survey. Include direct and indirect methods, analyse the information to calculate the deer population and present the survey records.	Observation records. Survey report.
P10, P11, P12, P13, P14, M3	The Impact of Deer	The estate manager is worried about the impact of the deer on parts of the habitat. Plan and carry out a deer habitat impact assessment and produce a report that assesses the level of impact and suggests actions to minimise further damage. Include a description of how deer impact on differing habitats, and an explanation of the methods you have used, including record keeping.	Practical observation and written report.
P15, P16, P17, P18, P19, M4, D2	Deer Management Plan	As a recognised deer expert, the estate has asked you to suggest a management plan. To help them in their future plans, include a report explaining the deer management principles on which your plan is based, record keeping requirements, deer population modelling, and the use of objectives. Include sources of information and advice that can help them in the future, and how data collection can help their future management planning.	Written report.

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

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

Level 2	Level 3
Introductory Deer Management	Understanding Captive Deer Herd Management

### Essential resources

Learners will need access to a sizeable area of land holding wild deer and suitable transport to this area. The area must include a large part of the typical home range of the species of deer present. Learners will also need access to binoculars and/or spotting scopes, survey equipment as appropriate and computer facilities.

Tutors delivering this unit should be competent and experienced deer managers. Ideally they should have recent industrial experience within deer management or show evidence of regular contact with the industry and/or technical updating.

### Employer engagement and vocational contexts

The deer census and impact surveys could be undertaken on local estates to provide a direct link with and valuable service to local employers.

## Indicative reading for learners

### Textbooks

Clutton-Brock T – *Red Deer: The Behaviour and Ecology of Two Sexes* (Edinburgh University Press, 1985)  
ISBN 0852244479

De Nahlik A – *Management of Deer and their Habitat: Principles and Methods* (Wilson Hunt, 1992)  
ISBN 0907519024

Forestry Commission – *Muntjac Deer* (Forestry Commission, 1996) ISBN 0855383356

Mayle B, Peace A and Gill R – *How Many Deer?: A Field Guide to Estimating Deer Population Size* (Forestry Commission, 1999) ISBN 0855384050

Milner J, Alexander J and Griffin C – *A Highland Red Deer Herd and its Habitat* (Red Lion House, 2002)  
ISBN 0951263153

Prior R – *Deer Management in Small Woodlands* (British Deer Society, 1987) ASIN: B003U99P8Q

Prior R – *Deer Watch: Watching Wild Deer in Britain* (Swan-Hill Press, 1993) ISBN 978-1853104275

Prior R – *Trees and Deer: How to Cope with Deer in Forest, Field and Garden* (Swan-Hill Press, 1994)  
ISBN 1853104329

Ratcliffe P – *Roe Deer Biology and Management* (HMSO, 1992) ISBN 0117103101

Ratcliffe P – *The Management of Red Deer in Upland Forests* (The Stationery Office Books, 1987)  
ISBN 0117102105

### Websites

[www.basc.org.uk](http://www.basc.org.uk)

British Association for Shooting and Conservation

[www.bds.org.uk](http://www.bds.org.uk)

The British Deer Society

[www.dcs.gov.uk](http://www.dcs.gov.uk)

Deer Commission for Scotland

[www.defra.gov.uk](http://www.defra.gov.uk)

Department for Environment, Food and Rural Affairs

[www.forestry.gov.uk](http://www.forestry.gov.uk)

The Forestry Commission

[www.thedeerinitiative.co.uk](http://www.thedeerinitiative.co.uk)

The Deer Initiative

## Delivery of personal, learning and thinking skills (PLTS)

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

Skill	When learners are ...
<b>Creative thinkers</b>	producing a deer management plan for a selected area
<b>Team workers</b>	carrying out deer census and impact surveys
<b>Self-managers</b>	producing a deer management plan for a selected area
<b>Effective participators</b>	carrying out deer census and impact surveys.

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

Skill	When learners are ...
<b>Independent enquirers</b>	researching possible census techniques
<b>Reflective learners</b>	considering different methods of minimising the impact of deer.

## ● Functional Skills – Level 2

Skill	When learners are ...
<b>ICT – Use ICT systems</b>	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	designing a deer survey designing written guide on deer surveying
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	
Manage information storage to enable efficient retrieval	
Follow and understand the need for safety and security practices	
<b>ICT – Find and select information</b>	
Select and use a variety of sources of information independently for a complex task	researching the principles of deer management
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	
<b>ICT – Develop, present and communicate information</b>	
Enter, develop and format information independently to suit its meaning and purpose including: <ul style="list-style-type: none"> <li>• text and tables</li> <li>• images</li> <li>• numbers</li> <li>• records</li> </ul>	designing a presentation of survey results
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	

Skill	When learners are ...
<b>Mathematics</b>	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	
Identify the situation or problem and the mathematical methods needed to tackle it	analysing deer survey results
Select and apply a range of skills to find solutions	calculating deer populations
Use appropriate checking procedures and evaluate their effectiveness at each stage	
Draw conclusions and provide mathematical justifications	analysing deer survey results
<b>English</b>	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting results of the deer survey
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	producing a report on the principles of deer management producing a guide on deer surveying.