Forestry Commission
231 Corstorphine Road
Edinburgh
EH12 7AT
http://www.forestry.gov.uk

Managing Deer in the Countryside

PRACTICE NOTE

BY BRENDA MAYLE OF FOREST RESEARCH

JULY 1999

INTRODUCTION

Six species of deer live wild in Britain today with a total population of around one million. Most species are increasing in numbers and range, notably in lowland regions. Deer live mainly in woodland but use farmland and gardens, and red deer have adapted to live on moorlands.

Deer are an important part of our wildlife, and are attractive animals which people enjoy seeing in our countryside. However, they must be managed to keep them in balance with their habitat and prevent serious damage to woodlands, trees, crops, gardens and other wildlife.

This Note is mainly for people who are not familiar with deer or their management but own or manage woods, farmland, nature reserves, parks or gardens where deer may live now or colonise in the future.

It provides information on:

- identifying whether there are deer present and of which species
- deciding whether deer are causing damage
- ways in which deer problems can be prevented
- knowing where to go for more advice.

The focus is mainly on lowland regions, particularly in England and Wales, but the principles can be applied elsewhere.

THE NEED TO MANAGE DEER

Too many deer can lead to:

- damage to trees, woodland flora and wildlife habitats
- damage to farm crops and gardens
- more traffic accidents
- poor health for the deer themselves if their numbers are greater than the habitat can support.

Roe deer browsing on young spruce trees.

Woodland clearance and over-hunting reduced deer in historic times but during the 20th century our native deer species have re-colonised both ancient and new woodlands over much of their former range. Man exterminated wolves and other animals which once helped to control deer numbers naturally and has also introduced four species (fallow, sika, muntjac and chinese water deer) three of which are now spreading rapidly. For these reasons deer and their habitats need to be managed to prevent problems.

The following information can be used to identify which deer species are present on a piece of land now or might be expected to colonise in the future.

Fallow bucks at woodland edge.

Roe deer

HEIGHT: Up to 75 cm at shoulder
Browses to 1.1 m, frays to 50 cm

BREEDING: One or two kids each year

ORIGIN: Native

DIET: Herbs, bramble, woody browse, grass, crops

HABITS:
- Solitary or in small groups in woodland
- Sometimes feeds in fields
- Often damages trees, sometimes arable crops

STATUS:

Spreading, e.g. within Midlands and into Wales

Fallow deer

HEIGHT: Up to 1 m at shoulder
Browses to 1.8 m, frays to 80 cm

BREEDING: One fawn each year

ORIGIN: Introduced by the Normans to parks and estates from France

DIET: Grass, crops, herbs, woody browse, acorns and mast

HABITS:
- Groups or herds; often shelter in woods and feed on fields
- Damage to farm crops, woodland shrubs and ground flora can be locally severe

STATUS:

Spreading in some areas, e.g. Midlands & East Anglia

Droppings and tracks (slots) are illustrated at half natural size.

Deer illustrations: Neil McReddie

Muntjac deer

HEIGHT: Up to 50 cm at shoulder
Browses to 1.1 m, frays to 40 cm

BREEDING: All year round; 1–2 fawns each year

ORIGIN: Introduced to Bedfordshire in early 1900s from China

DIET: Bramble, herbs, nuts and fruits, coppice shoots, flowers

HABITS:
- Solitary, in dense woodland cover
- Often feeds in gardens.
- Damages trees, farm crops, woodland shrubs and ground flora.

STATUS:

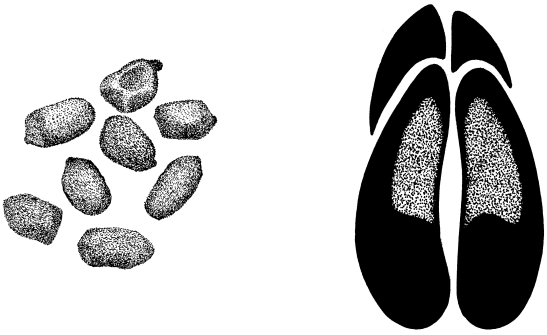
Spreading fast in England and into Wales

Red deer

HEIGHT: Up to 1.2 m at shoulder
Browses to 1.8 m, frays to 1.8 m

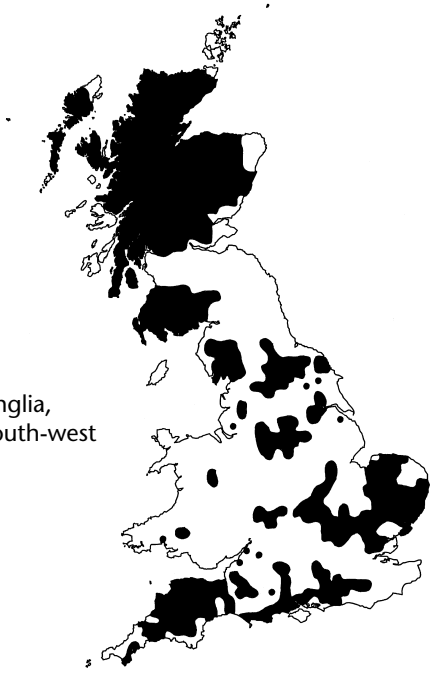
BREEDING: One calf each year. Hybridises with sika deer

ORIGIN: Native



DIET: Grass, crops, heather, trees and shrubs

HABITS:
- Groups (herds on moorland)
- Ranges widely and can cause serious damage to trees, woodlands and farm crops



STATUS:

Spreading in East Anglia, Yorkshire and the south-west

Droppings and tracks (slots) are illustrated at half natural size.

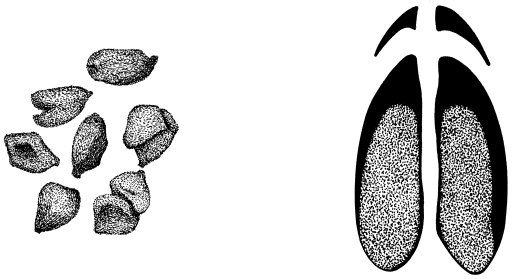
Deer illustrations: Neil McReddie

Sika deer

HEIGHT: Up to 85 cm at shoulder
Browses to 1.8 m, frays to 1.6 m

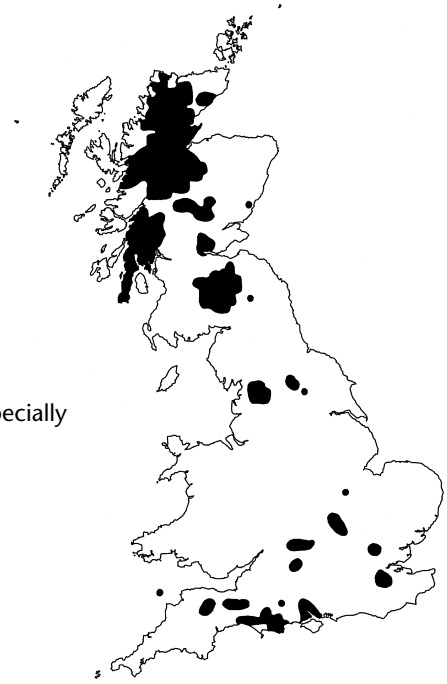
BREEDING: One calf each year. Hybridises with red deer

ORIGIN: Introduced to deer parks from Japan during 1860s



DIET: Grass, heather, trees, shrubs and herbs

HABITS:
- Groups in dense woodland with mixed fields or glades
- Can cause serious damage to woodlands and sometimes crops



STATUS:

Spreading fast, especially in Scotland

Chinese water deer

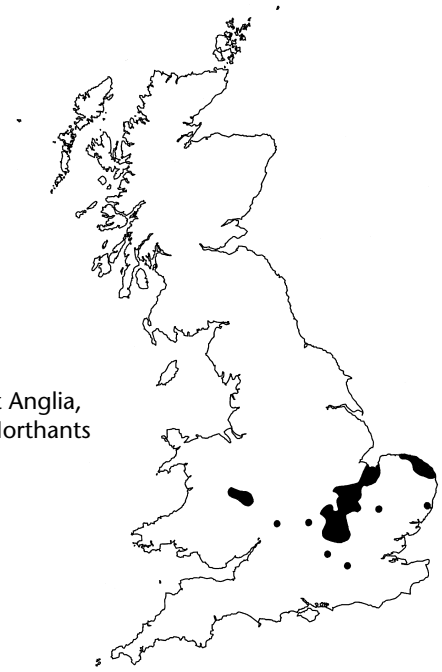
HEIGHT: Up to 60 cm at shoulder
Browses to 90 cm

BREEDING: Two or three fawns each year

ORIGIN: Introduced to Woburn in early 1900s from China

DIET: Grass, sedges, bramble, herbs, crops

HABITS:
- Solitary in wet woods and reed beds next to fields
- Damage to trees, shrubs and crops is slight
- Males have tusks, not antlers



STATUS:

Slow spread to East Anglia, Bedfordshire and Northants

Droppings and tracks (slots) are illustrated at half natural size.

Deer illustrations: Neil McReddie

RECOGNISING DEER DAMAGE

Browsing

All species of deer eat tender tree and plant shoots and leaves. Most trees are eaten but broadleaves, especially cherry, ash, willow, hazel and rowan are strongly preferred. A ragged end to a shoot suggests deer or sheep; a clean, angled cut is produced by hares or rabbits. The height of browsing helps to identify which deer species is responsible[1]. (See pages 2–4.)

Browsing damage by roe and red deer.

Muntjac damage coppice shoots by nipping through the stem about 1 metre from the ground so that it bends over (as in the photograph). Alternatively, to reach tasty foliage at the ends of coppice stems above their browse height, they will walk over the top of a bendy stem running it through their mouth to remove the leaves.

Courtesy of Arnold Cooke

Coppice stems broken by muntjac deer.

Bark stripping

Red, sika and fallow deer will peel and eat bark. Smooth-barked species such as Norway spruce, lodgepole pine, larch, ash, willow, and beech are favoured. As deer have no upper incisor teeth they leave broad teeth marks running up the peeled stem with torn or broken bark hanging at the top. Similar damage by domestic stock leaves diagonal teeth marks. Squirrels, rabbits and voles also remove bark but their teeth marks are much narrower.

Bark stripping by deer.

Bark stripping by sheep.

Tree fraying

Male deer mark their territories and clean the velvet off their newly-grown antlers by rubbing or fraying them on young, whippy trees. This may damage the bark or even kill the tree. Roe usually fray in spring or summer whereas red, fallow, sika and mature muntjac deer usually do this in the autumn. Fallow and muntjac both fray treeshelters, muntjac with their tusks, fallow with their antlers.

Fallow deer fraying of tree-shelter.

Roe deer fraying of young spruce tree. Velvet still attached.

Farm crops

A few deer grazing on cereals or grassland do little damage to the final crop, and are often feeding on weeds or herbs within the crop. However, large numbers of deer can cause damage; especially to rape, kale and high value crops such as turnips, carrots and beans. Ripening corn may be eaten or trampled down by deer which often lie up in it by day.

Courtesy of Nigel Straw

This field of rape has been heavily grazed by muntjac deer.

Woodland flora and wildlife habitat

Deer can influence the variety of wildlife in woodlands and other habitats by altering structural and plant species diversity. Low densities may be beneficial; deer browsing helps to control dense shrubs and brambles and their selective feeding creates a mosaic of vegetation, providing niches for a variety of wildlife. High densities, particularly in the presence of domestic stock, prevent woodland regeneration and destroy the shrub layer (especially freshly cut coppice) and flowering plants. Some deer, particularly muntjac, feed selectively on important woodland flowers such as oxlips (above).

Courtesy of Arnold Cooke

Effect of muntjac feeding on bluebells (above, left of fence) and oxlips (below).

Courtesy of Fred Currie

Gardens and orchards

Gardeners, market gardeners and commercial fruit growers may experience expensive damage, as vegetables, soft fruit and flowering plants are very attractive food for deer. Roses are particularly favoured by roe and muntjac.

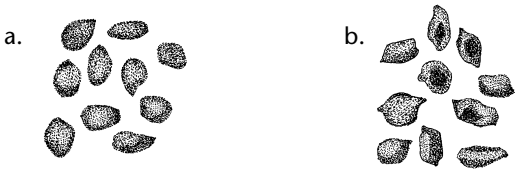
Roses browsed by roe deer.

SIGNS: COMPARISON WITH OTHER ANIMALS

Droppings

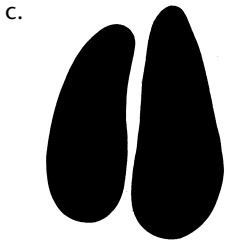
Deer droppings (or pellets) tend to be short, cylindrical or almost spherical and often have a small point at one end. They have a smooth surface compared with rabbit and hare pellets and when fresh are usually black and covered in a thin layer of shiny mucus which quickly dries. Rabbit and hare droppings are much more rounded and fibrous than those of deer, whilst sheep droppings tend to be less cylindrical and more angled in shape. The size and shape of pellets varies between species and with sex- and age-class of the animal although there is some overlap between similar sized deer. With experience it is possible to identify the deer species present merely from their droppings. Counts of deer droppings can be used to provide an index of deer presence and to indicate favoured areas.

Fresh deer pellets.

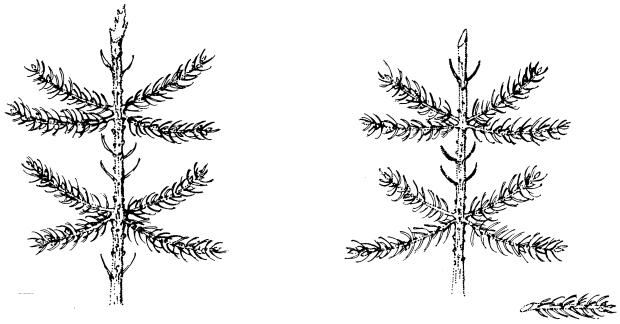


a. Rabbit and hare droppings* are more rounded and fibrous than those of deer.

b. sheep droppings* tend to be less cylindrical and more angled in shape.



c. Sheep slots* are broader and more rectangular than those of deer, with rounded tips.



a. Deer/sheep browsing. b. Rabbit/hare browsing.

Browsing

Deer browsing leaves ragged ends and the shoots are always eaten. Rabbits and hares leave diagonal cuts and the shoots are often left lying. If you can see for some distance into a wood at 0.5–1.5 m from the ground, but not above this height, then a clear 'browse line' is present. This, plus little if any bramble or woody foliage and few regenerating seedlings, indicates that deer densities are high.

Pathways

Deer use regular routes or pathways when leaving or entering a woodland, and deer slots can often be seen where there is little ground vegetation present. These tend to be more pointed at the front than sheep slots which are generally broader and more rectangular, with rounded tips. The number of deer pathways crossing a woodland boundary can be used to provide an index of deer presence. Where there is no effective barrier to deer (such as a dense hedge plus stock fence, a deer fence or a 2 m wall) the number of deer pathways crossing a measured (paced) woodland perimeter should be counted. Where the average number of pathways per 100 m is below two the deer density is probably low, between two and six suggests medium density and above six suggests high density.

Browse line along woodland ride edge (indicated by arrows) and a clear view into the woodland suggests high deer numbers.

*Droppings and tracks (slots) are illustrated at half natural size.

Deer pathway through hedge. Slot marks will often be visible in the bare soil.

DEER MANAGEMENT PRINCIPLES

- **Management should aim to maintain healthy deer populations in balance with their environment.**

- **Prevention of deer problems should be the aim.** Planning for the arrival and management of deer in new woodlands is important. The current rate of range expansion suggests that deer will eventually spread into all areas of lowland England and Wales with suitable habitat. Without appropriate management the problems associated with too many deer will also spread. It may be desirable to prevent the spread of deer into new areas, or to 'restrict' the colonisation of native species to former ranges.

- **Co-operation amongst neighbouring landowners is important to achieve effective management.** Deer pay no heed to ownership boundaries and can range over wide areas, especially red, fallow and sika deer.

- Management of deer problems requires a combination of three approaches:

  - **design and management of the habitat, especially woodlands;**
  - **physical protection of vulnerable areas or individual trees;**
  - **humane culling of deer over reasonably large areas to reduce and then maintain numbers at an acceptable level.**

Sometimes protective measures such as fencing may be enough to prevent problems in the short term, e.g. for gardens, but usually a combination of approaches will be needed.

MANAGEMENT METHODS

Design of the habitat

The design of any new woodland should consider the risk of damage and the future need to cull deer safely and efficiently. New planting next to mature woodland will be at greater risk, particularly if favoured tree species are planted (see Browsing). Vulnerable crops such as carrots, planted next to a wood are also more likely to be damaged. Wide sunny rides with willow and rowan along the edges will attract deer, and sunny glades will be used for resting. Such areas should be left unplanted with access routes for stalking. In larger woodlands sudden large habitat changes, such as felling a large part of the wood at once, can lead to damage problems and large fluctuations in the deer population. Where a good spread of tree ages is maintained throughout the wood the deer population will fluctuate less.

Protection

Mesh fences

These can be used to protect young trees, crops or gardens. They protect wildlife habitats, as well as trees, from heavy browsing and grazing by deer. In upland areas fences can sometimes be a danger to grouse, which fly into them. Local advice should be sought. Fences must be higher than for stock or rabbits, and with a mesh size sufficiently small to stop them jumping through (see Table 1)[2]. As muntjac will always try to push under a fence netting should be lapped 150 mm on the ground and pegged or turfed as for rabbit fencing. Line-wire fences are not deer-proof.

Deer can jump over the standard agricultural stock mesh fence topped with one or more plain or barbed line wires (fly wires), but occasionally they may drop a hind leg which becomes entangled. Fallow and roe deer appear particularly prone to this during late spring when heavily pregnant does attempt to return to their woodland shelter after feeding on fields. This problem can be avoided on new fences by using a wider mesh where the additional height is required. On existing fences the fly wires should be removed and a top rail added at regular deer crossing places or 'hot spots'. The use of barbed wire on woodland boundary fences should be avoided where deer are present.

Permanent fencing[3] is recommended where protection is required for 10–15 years. In woodland areas of less than

Figure 1 Planning new woodlands to allow good deer management

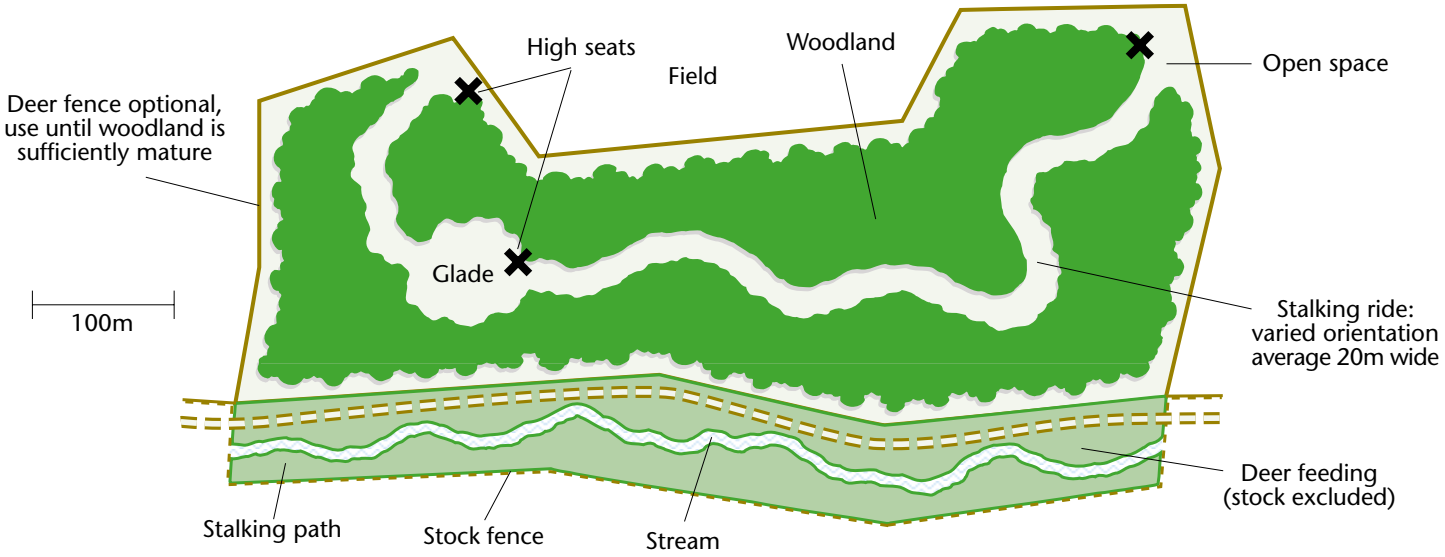


Table 1 Maximum mesh size and minimum height for deer fencing[2]

	Mesh size (mm)	Height (m)
Muntjac	75x75*	1.5
Roe areas <2.5 ha	200x150	1.2
areas >2.5 ha	200x150	1.5
Fallow	220x200	1.5
Red and sika	220x300	1.8

*Although muntjac cannot pass through 100x100 mm mesh, males may pass their head through and then be unable to withdraw due to antlers snagging.

about 2–3 hectares individual guards or treeshelters are cheaper, but these will not protect ground flora and shrubby vegetation. The larger the fenced area the more difficult it will be to ensure that no deer, particularly roe or muntjac, are fenced in. The maximum individual area of woodland fenced should be no more than 10–15 ha. Whole woods should not be fenced.

New lightweight materials including high tensile plastic netting, recycled plastic posts and metal box strainers and intermediate posts have reduced the costs of fencing (£0.75–1.50 per metre for materials compared to £3–5 for permanent fencing) and are also suitable for use as temporary and reusable fences[2]. New coppice shoots should be beyond browse height in 3 years in lowland woods.

First season's coppice growth protected with temporary/reusable fencing. Unprotected coppice stools (arrowed) are heavily browsed.

Electric fences

These are commonly used for stock fencing by farmers but are much less effective against deer. Roe, fallow and muntjac are generally undeterred by them. Although they may provide short-term protection they need regular checking making low cost, temporary mesh fencing a better alternative.

Plastic netting tree guards and treeshelters[4,5]

These protect young trees against deer, rabbits and hares but plastic spiral guards are ineffective against deer. It is essential to use a strong stake and the correct height for

This shelter is too short. The sapling has been severely browsed by fallow deer.

the largest deer species present: 1.8 m for red, fallow and sika; 1.2m for roe, muntjac and water deer. Guards give longer protection against fraying than most treeshelters.

Brushwood hedges

Hedges made of cut branches can be effective against the larger deer species for up to 18 months in small areas of newly cut coppice. They are ineffective against muntjac which generally push through the bottom. As brushwood fences are laborious to erect costs are similar to those for lightweight reusable fences. Piling brushwood onto coppice stumps is not effective and causes forked, poor quality coppice stems.

Deer deterrents[6]

Some substances sold as deterrents to browsing deer provide temporary protection to small numbers of trees or garden plants. They need to be renewed regularly and are not suitable for large-scale use. The use of ultrasound has not been shown to be effective in trials.

Deer culling

Culling together with good design and protection measures will normally be needed. To prevent a deer population from increasing, around 20–25% of the adults would need to be shot each year. Culling should concentrate on mature females to control populations. There is no single recommended population level to aim for; an acceptable deer population is that which the area can sustain without unacceptable damage to local interests.

It is important for local landowners and managers to co-operate to share information, discuss objectives and organise deer management. Where serious damage occurs expert advice should be sought. Culling must be carried out safely, legally and humanely. There are strict laws covering deer shooting and the use of firearms; the laws in Scotland are different from those in England and Wales.

Who can carry out deer culling?

Landowners normally have rights to shoot wild deer on their land. In Scotland tenants have the right to shoot deer which are causing damage to enclosed woodlands, crops or grassland. In England and Wales tenants rights are more variable; tenants should check their leases, etc., and seek advice. Legal close seasons when deer may not normally be shot vary between species, sexes and countries. If you own or occupy land but have little or no experience of deer, it is best to seek expert advice and help with culling and deer management. Competent trained stalkers are essential especially in highly populated areas. Several bodies give training and award certificates to stalkers. Local offices of the Forestry Commission, Agricultural Development and Advisory Service (in England and Wales), the British Deer Society (BDS) and the British Association for Shooting and Conservation (BASC) may be able to advise you of qualified stalkers in your area.

CO-OPERATING WITH NEIGHBOURS

A co-operative approach to local deer management is vital for success.

The benefits include:

- co-ordination of effort and information
- management across the whole range of a deer population
- sharing of costs and specialist expertise
- more effective marketing of deer carcasses (venison).

Co-operation may be achieved by setting up a Deer Management Group (DMG) with an informal constitution. Those who hold the shooting rights, together with other local land-using interests affected by deer, should form the Group and agree its policy. Advisers and stalkers can be engaged to monitor deer populations and damage and to carry out culling to a high standard. There may already be a DMG in your area for you to join. Ask your local Forestry Commission office, the British Deer Society, BASC, or in Scotland, the Deer Commission for Scotland.

ADVICE

Other sources of advice are:

In England & Wales

- Agricultural Development & Advisory Service
  MAFF
  157-197 Buckingham Palace Road
  Victoria
  London
  SW1W 9SP

  Tel: 0207 798 7359
  Fax: 0207 798 7085

- English Nature
  Northminster House
  Northminster Road
  Peterborough
  Cambridgeshire
  PE1 1UA

  Tel: 01733 455000
  Fax: 01733 568834

- Countryside Council for Wales
  Plas Penrhos
  Penrhos Road
  Bangor
  Gwynedd
  LL57 2LQ

  Tel: 01248 370444
  Fax: 01248 355782

- Chairman
  The Deer Initiative
  Forestry Commission
  National Office for England
  Great Eastern House
  Tenison Road
  Cambridge
  CB1 2DU

  Tel: 01223 314546
  Fax: 01223 460699

- Chairman
  The Deer Initiative
  Forestry Commission
  National Office for Wales
  Victoria Terrace
  Aberystwyth
  Ceredigion
  SY23 2DQ

  Tel: 01970 625866
  Fax: 01970 626177

In Scotland

- Deer Commission for Scotland (DCS)
  Knowsley
  82 Fairfield Road
  Inverness
  IV3 5LH

  Tel: 01463 231751
  Fax: 01463 712931

- Association of Deer Management Groups
  (contact via DCS as above)

- Scottish Natural Heritage
  (for advice on nature conservation matters)
  2/5 Anderson Place
  Edinburgh
  EH6 5MP

  Tel: 0131 554 9797
  Fax: 0131 446 2405

Throughout Britain

The following organisations will give you advice on deer management, including Deer Management Groups.

- The British Deer Society
  Burgate Manor
  Fordingbridge
  Hampshire
  SP6 1EF

  Tel: 01425 655434
  Fax: 01425 655433

- British Association for Shooting and Conservation
  Marford Mill
  Rossett
  Wrexham
  Clwyd
  LL12 0HL

  Tel: 01244 573000
  Fax: 01244 573001

REFERENCES

1. HODGE, S. and PEPPER, H. (1998)
   The prevention of mammal damage to trees in woodland.
   Forestry Commission Practice Note 3.
   Forestry Commission, Edinburgh

2. PEPPER, H. W. (1999)
   Deer fencing: new recommendations for fallow, roe and muntjac – and proposals for temporary and reusable fencing.
   Forestry Commission Information Note (In prep).
   Forestry Commission, Edinburgh.

3. PEPPER, H. W. (1992)
   Forest fencing.
   Forestry Commission Bulletin 102. HMSO, London.

4. PEPPER, H. W. (1987)
   Plastic mesh tree guards.
   Arboriculture Research Note 5. Arboricultural Advisory and Information Service, Farnham, Surrey.

5. POTTER, M. J. (1991)
   Treeshelters.
   Forestry Commission Handbook 7.
   HMSO, London.

6. PEPPER, H., NEIL D. and HEMMINGS, J. (1996)
   Application of the chemical repellant Aaprotect to prevent winter browsing.
   Forestry Commission Research Information Note 289.
   Forestry Commission, Edinburgh.

Enquiries relating to this publication should be addressed to:

Brenda Mayle
Forest Research
Alice Holt Lodge
Wrecclesham
Farnham
Surrey
GU10 4LH

Tel: 01420 22255
Fax: 01420 23653

E-mail: b.mayle@forestry.gov.uk

Photographs: FOREST RESEARCH photo library 01420 22255
& FOREST LIFE picture library 0131 334 0303

ISSN 1460-3810
ISBN 0-85538-501-4

FPD9/34-IH(ECD)-HNP/7.5K-JUL99