



# postnote

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## WILD DEER

Wild deer populations are increasing in number and geographic range in the UK. Deer are a valuable natural resource if managed sustainably, but when occurring at excessive densities, they can have negative effects on biodiversity, the rural economy, human health and safety, and animal welfare. This POSTnote examines the current status of wild deer in the UK, their ecological, economic and social impacts and legislation on their management.

### Deer Species and Populations in the UK

Six species of deer exist in the wild in the UK: red and roe deer are the only native species; fallow deer are long established; and sika, muntjac, and Chinese water deer were introduced in the past 150 years. These six species differ in their geographic distribution<sup>1</sup>, abundance, population growth rate<sup>2</sup>, behaviour, and impacts (Box 1).

Government agencies, NGOs, and academics believe that deer are more abundant and widespread now than at any time in the past 1,000 years. However, quantification of deer numbers is very difficult<sup>3</sup>: they are secretive animals and roam freely. For the purposes of sustainable management, knowledge of local densities is important but often lacking. In addition, in England and Wales, there is no statutory reporting of the number of deer culled, thereby leaving estimates open to challenge. Evidence for increasing deer numbers comes from the expansion of their geographic range<sup>1</sup>.

The rapid increase in deer numbers occurring in recent decades is due to several possible factors, including:

- increased woodland cover;
- milder winters leading to improved deer fecundity;
- changes to agriculture, such as an increased area of winter crops;
- escape from parks and farms;
- greater connectivity between green space in urban areas (see POSTnote 300).

Adult deer have no natural predators in the UK, so populations are managed by culling. An estimated

#### Box 1. Deer Species in the UK

Estimates of deer population (Pop)<sup>4</sup> and annual population growth rate (GR)<sup>2</sup> are approximate and contentious, but given below to give an indication of relative population sizes and trends for different species. Distribution maps for each species in 2000 and 2007 can be found at the British Deer Society website<sup>1</sup>.

##### Native species

**Red deer:** Pop >350,000; GR ~0.3%. Found in GB and NI. Iconic species of the Scottish Highlands. Largest wild land mammal in the UK

**Roe deer:** Pop >800,000; GR ~2.3%. Found in GB. Most frequent cause of deer-vehicle collisions in Scotland<sup>5</sup>. Increasingly common in urban areas (Box 2).

##### Non-native species

**Fallow deer:** Pop 150-200,000; GR ~1.8%. Found in GB and NI. Introduced from the Mediterranean in 11<sup>th</sup> C or earlier. Most frequent cause of deer-vehicle collisions in England<sup>5</sup>. Can cause damage to ancient woodland. Can devastate root crops locally.

**Muntjac deer:** Pop >150,000; GR ~8.2%. Introduced from China in early 20<sup>th</sup> C. Found mainly in England; spreading into Wales; occasional sightings in Scotland and NI. Able to breach deer fences. Smallest deer species in UK. Can cause damage to ancient woodland. May displace native roe deer by competition for food. Increasingly common in urban areas

**Sika deer:** Pop ~35,000; GR ~5.3%. Introduced from Far East in 1860. Found in GB and NI. Particular problem in forestry, where can reach high densities and cause extensive damage by bark-stripping.

**Chinese water deer:** Pop <10,000, GR ~2%. Introduced from China in early 20<sup>th</sup> C. Mainly confined to E England, but notable range increase since 2000<sup>2</sup>. Listed as 'Vulnerable' species in native range by the IUCN 2008 Red List: UK has about 10 % of world population.

350,000 deer are culled each year<sup>4</sup>. Other major causes of deer mortality are road accidents, disease, and severe weather. Despite this, their populations are continuing to increase in size and range<sup>1</sup>. Therefore, it appears that total mortality is not high enough to prevent a further rise in deer populations.

**Box 2. Urban Deer**

Movement of deer into urban areas appears to be increasing. Most commonly sighted are Roe and Muntjac deer. Both are territorial species attracted into urban areas by an increased availability of green space and a steady rise in deer populations in the wider countryside. The presence of deer in parks and gardens is often welcomed by the public, but there are a number of emergent problems:

- Road traffic accidents<sup>5</sup>;
- Damage to gardens, allotments, botanic gardens, and parks;
- Attacks on pets by Muntjac deer and vice versa;
- Deer trapped in railings or canals and waterways, requiring emergency service assistance;
- Violent attacks on deer by humans;
- Illegal deer coursing and poaching in the urban fringe.

Deer populations in urban areas are likely to grow in the future, and the usual method of deer management by culling is often not appropriate in areas of dense habitation. However, there is no requirement to consider the effects of deer in the planning process for road or urban development (although discussions between local authorities and the Deer Commission for Scotland have begun).

**Wild Deer as a Resource**

Wild deer are a natural economic and social resource. They and their management contributes directly and indirectly to the economy through professional and recreational stalking, the supply of products such as rifles and fencing, the venison trade, and benefits to tourism. The importance of deer as a resource varies across the UK. In Scotland, sustaining wild deer for sport is a primary management objective across much of the Highlands, and is estimated to contribute over £170 million to the economy<sup>6</sup>. Deer management provides the equivalent of over 2,500 full-time jobs in Scotland<sup>6</sup>, which are an important component of rural employment. In England, Wales and Northern Ireland, deer are rarely a primary management objective.

**Venison Industry**

The venison industry is a product of deer management and recreational stalking. Current venison prices are low and stand, in real terms, at about 50% of the price in 1980 (although the trend of declining prices has now reversed). Therefore, the sale of venison tends only to defray the costs of deer management, rather than to drive it. Despite the fact that wild venison is a very low-fat, free-range meat, demand amongst UK consumers is low. For example, up to 70% of venison produced is exported from Scotland at certain times of year. Academics researching the socio-economics of deer believe that an important factor limiting the venison market is a prevailing negative attitude towards game meat among the general public.

**Issues Associated with Wild Deer****Road Traffic Accidents**

Rising deer populations are associated with an increase in road traffic accidents due to deer-vehicle collisions (DVCs) (Box 3). A nationwide survey from 2000-2005 collected reports of over 30,500 DVCs, of which 1,150

**Box 3. Deer-Vehicle Collision (DVC) Hotspots**

DVCs are not equally distributed around the country, but occur mainly in 'hotspots'. In general, these are on roads running through woodland with high deer density, high traffic volume, and high traffic speed.

DVCs are most common in SE England. Hotspots in which more than 75 DVCs per 5km<sup>2</sup> were reported from 2003-5 include Southampton and Portsmouth, Ashdown Forest, the Forest of Dean, Ashridge Woods, Thetford Forest, and Cannock Chase<sup>5</sup>. Little detailed study of DVCs has been conducted in Wales. In Scotland, DVCs are not as numerous as in England, but this is a function of traffic volume and DVCs are twice as likely to occur per traffic-hour<sup>5</sup>.

resulted in human injury, and 20 in human fatality<sup>5</sup>. The survey emphasises that collected records are likely to be significantly fewer than the actual numbers of DVCs. They are predicted to increase in the future, especially in urban areas (Box 2).

Strategies to reduce DVCs, such as roadside optical sensors and other warning devices have been largely ineffective when trialled in the UK. Fencing can help to funnel deer to a safe crossing point, but is expensive to install and maintain, unsightly, and may trap deer on the roadside. The Highways Agency states that deer are at nearly 'insupportable levels' in some areas (Box 3), and that the most effective strategy to reduce DVCs in hotspots is to increase the deer cull and to raise driver awareness. The former option requires the co-operation of surrounding landowners which is not always forthcoming.

**Biodiversity**

Red and roe deer are natural components of the British landscape, and fallow are a long-standing naturalised species. However, many habitats prized for their conservation value today developed over the past thousand years in the presence of lower numbers of deer. The Joint Nature Conservation Committee (JNCC), Natural England, and Scottish Natural Heritage all regard excessive deer densities as a serious threat to a significant portion of National Nature Reserves (NNRs) and Sites of Special Scientific Interest (SSSIs). Lowland ancient woodland, upland heath and blanket bog can suffer particularly from deer over-grazing, excessive browsing and trampling. These include Biodiversity Action Plan (BAP) priority habitats, which the government is committed to protect under the Convention on Biological Diversity.

Impacts of over-grazing and browsing in ancient woodland can include<sup>7</sup>:

- decline and loss of characteristic plant species including oxlip and bluebell;
- declines in characteristic woodland bird species such as nightingales due to the loss of plant structural diversity and food supply;
- declines in invertebrate abundance and diversity;
- prevention of adequate levels of tree regeneration and traditional coppicing management

In England, attainment of the government Public Service Agreement (PSA) target to achieve good condition in 95% of SSSIs by 2010 is compromised by deer impacts. For example, 4,000 hectares (about 4%) of woodland with SSSI status is currently in 'unfavourable' condition due to deer impacts, while a further 4,000 hectares is 'recovering' after the implementation of a deer management plan. This is likely to represent a fraction of the wider issue, as only around 15% of ancient woodland has SSSI status. The time-scale of habitat recovery after severe deer browsing is unknown.

## Rural Economy

### Forestry

Deer can cause significant damage to forestry by reducing tree regeneration, browsing saplings, and bark-stripping. Economic losses in forestry due to deer are hard to quantify, but their management costs are more readily assessed. For the Forestry Commission Scotland alone these amount to around £4.5 M net per year. The economic cost of deer to forestry is likely to remain high or to rise in future due to a range of factors including:

- expansion of broad-leaved woodland which is less resilient to deer impacts than conifer woodland
- increasing desire to avoid deer fencing as a primary management tool due to a range of disbenefits
- increasing use of lower impact silvicultural systems as a potential climate change adaptation measure with a greater reliance on natural regeneration

### Agriculture

Deer can have an economic impact on farms through the browsing, grazing and trampling of crops, and damage to fencing. However, damage to agriculture tends to be significant only in localised areas. In 2003, Defra estimated the cost of deer to agriculture in England as ~£4.3 million, with the greatest damage inflicted on cereal crops in East and SW England<sup>8</sup>. The National Farmers' Union reports that regional offices have received increasing numbers of complaints and queries concerning deer over the past five years and that they are rising on the farming agenda.

### Disease transmission to humans and livestock

Another issue is disease transmission from deer to humans and livestock. Deer are likely to be a contributing factor in the current increase and spread of ticks. These can carry diseases that infect humans, such as tick-borne encephalitis, which are predicted to become more prevalent in coming years due to climate change. However, although formerly implicated in the increasing incidence of tick-borne Lyme Disease in the UK, scientists now believe deer are unlikely to be a major cause of its spread.

Deer can suffer from, or carry, many diseases that also infect livestock (Box 4). The risk and cost of deer-to-livestock disease transmission is largely unknown, but these are likely to rise as local deer densities increase. At present, there is particular concern amongst veterinary experts about the role of deer in the spread of bluetongue (Box 4). Another concern is the lack of surveillance to

### Box 4. Deer and Disease

Diseases carried by deer include internal parasites such as liverflukes, lung worms, and bowel worms; bovine tuberculosis, foot-and-mouth disease, bluetongue, red water fever, and Johne's disease. The potential for deer to transmit these diseases to livestock depends on the species of deer and the disease in question. For example, fallow deer pose the greatest risk of disease transmission because they graze in pasture and congregate in feeding sites.

Deer are believed to be of low risk in the spread of bovine tuberculosis and foot and mouth disease. However, they may aid the spread of bluetongue by acting as a reservoir in which the virus can over-winter, and in which new viral strains can establish. In Belgium, the incidence of red deer exposed to bluetongue has risen from 0.2% to 40% in the past 5 years<sup>9</sup>. The presence of bluetongue in wild deer in the UK would alter the proportion of livestock requiring vaccination to ensure a successful control programme. However, Defra has not yet arranged the testing of wild deer for bluetongue.

provide an early warning system for emergent diseases that could infect humans and livestock. Notifiable diseases that must be reported to the government, such as bovine tuberculosis, are well monitored in wild deer. However, the Veterinary Laboratories Agency (VLA) reports that surveillance for non-notifiable diseases in wild deer is currently haphazard due to the small amount of funding available (POSTnote 307).

### Animal welfare

Deer health and condition are lower in localities with high population densities due to competition for food and increased disease incidence. Other welfare problems result from deer living in proximity to humans in urban areas (Box 2). For example, in 2006 alone, over 3,500 live deer casualties from road accidents were reported<sup>6</sup>.

### Poaching

The Country Land and Business Association and British Deer Society report that deer poaching has increased significantly in the past five years. This is likely to be in response to high populations in localities and a recent increase in venison price. Poaching is an animal welfare and human safety issue. For example, it is often associated with the possession of illegal firearms, and may be a precursor to other forms of rural crime such as theft and property damage.

### Public perception and awareness

Many stakeholders, including the Forestry Commission, Natural England and the NFU, believe that there is a widespread lack of awareness about deer which can hinder sustainable management. For example, some landowners are not aware that deer exist on their land, while concern about public attitudes towards deer culling may prevent some charitable landowners from openly discussing deer management requirements with their membership.

### Deer Management and Legislation

In the UK, wild deer are owned by no-one, and their management could be considered less regulated than in

any other European country<sup>10</sup>. Landowners, or those who possess stalking rights, can authorise the shooting of deer on their land, and the carcass becomes the landowner's possession. Current deer legislation aims to ensure high standards of animal welfare, safeguard the public, and allow actions to protect other land-uses. Deer management is a devolved issue and legislative details, such as close seasons and firearms requirements, differ within the UK.

#### Scotland

The Deer Commission for Scotland (DCS) advises Scottish Ministers on deer issues and regulation via the Deer Act (Scotland) 1996. The DCS develops and disseminates 'best practice guides', collates deer census data, and conducts monitoring to ensure deer management does not conflict with other land-uses or compromise public safety and animal welfare. Where significant conflict is revealed, the DCS has the statutory power to recommend a deer cull, and enforce the cull if it is not carried out. These powers have sometimes caused controversy among landowners and the general public. However, the DCS model is admired by other European countries<sup>10</sup>. The DCS is due to merge with Scottish Natural Heritage in 2010, and views among government agencies differ as to whether this will be a positive change for sustainable deer management in Scotland. The Scottish Government has recently published a national strategy for wild deer management<sup>11</sup>.

#### England and Wales

There is no single government body responsible for deer issues in England or Wales, nor any statutory right, as possessed by the DCS, to impose a deer cull. However, Natural England and the Welsh Assembly can issue licences to allow killing of deer in the close season or at night, if this is deemed necessary to prevent serious damage or to preserve human health and safety. There is a non-statutory partnership organisation called the Deer Initiative (DI), established in 1998 with the aim of improving deer management in England and Wales through:

- supervision of projects in key areas to mitigate local problems and establish exemplars of good deer management practice;
- facilitation of discussion and collaboration between many deer-related bodies including government agencies, NGOs, and the deer industry;
- action as an efficient communication channel from the government to interested parties and vice-versa, particularly important in times of crisis;
- development of best practice guides

Amongst government agencies and NGOs there is generally strong support for the efficacy of the DI. However, there is some concern that its core staffing and budget are not large enough adequately to promote sustainable deer management across England and Wales. The DI receives funding associated with specific projects, but its continued existence is dependent on core funding from Defra, Natural England, and the Forestry Commission.

#### Deer Management Groups

Deer impacts such as crop damage and road traffic accidents are often highly localised. However, sustainable deer management must operate at a landscape scale because deer roam and do not observe property boundaries. Landscape management requires co-operation between multiple landowners, and Deer Management Groups (DMGs) are one approach that may facilitate this. DMGs are regional voluntary bodies to encourage landowners to discuss management objectives and develop a deer management plan. Government agencies and NGOs both report that the effectiveness of DMGs is highly variable. They have some success in the Highlands, but face a range of problems in England and lowland Scotland, including:

- highly fragmented patterns of landownership requiring agreement between numerous people;
- stalking rights being sometimes owned independently of the land;
- management objectives and attitudes towards deer differing significantly between landowners;
- landscape-level management plans being hindered through lack of participation of key landowners because DMGs are not obligatory.

#### Overview

- Wild deer populations are the highest they have been for 1000 years, and continue to increase.
- Deer are a valuable economic and social resource.
- High deer densities may be a hazard on the road, can be a serious economic drain on forestry, and can cause serious damage to conservation sites.
- Deer in urban areas are likely to create significant issues in the future.
- Sustainable deer management requires co-operation between landowners which is often hard to achieve.

#### Endnotes

- 1 [http://www.bds.org.uk/deer\\_distribution.html](http://www.bds.org.uk/deer_distribution.html)
- 2 Ward, A. (2005) *Mammal Review* **35**: 165-173
- 3 Smart et al. (2004) *Mammal Review* **34**: 99-114
- 4 Deer Initiative, personal communication
- 5 *Deer on our Roads. Counting the Cost*. Deer Initiative (2007)
- 6 *Contribution of deer management to Scottish economy* PACEC (2006)
- 7 *Impact of deer on woodland biodiversity* Forestry Commission (2000)
- 8 *Current and Future Deer Management Options* Defra (2003)
- 9 Linden et al (2008) *Veterinary Record* **162**: 459
- 10 *Ungulate Management in Europe; Problems and Practices*. Apollonio, Putman and Andersen (2009) in press, CUP
- 11 *Scotland's Wild Deer A National Approach*. Scottish Government (2008)

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