

SPICe Briefing

Wild Deer in Scotland

8 November 2013

13/74

Tom Edwards and Wendy Kenyon



Clockwise from top left (iStockphoto image credits in brackets): Red deer stag (Martin McCarthy), roe buck and doe (Balazs Poloskei), fallow buck (Benjamin Jessop), sika stag (Danny Hampton)



CONTENTS

EXECUTIVE SUMMARY	3
INTRODUCTION	6
DEER NUMBERS.....	7
LAW	12
THE DEER (SCOTLAND) ACT 1996.....	12
<i>Part 1 - The role of SNH</i>	12
<i>Part 2 – Close seasons, and control schemes and agreements</i>	13
<i>Part 3 – Protection of deer</i>	14
<i>Part 4 - Enforcement</i>	15
THE WILDLIFE AND NATURAL ENVIRONMENT (SCOTLAND) ACT 2011	15
POLICY	15
HOW DEER ARE MANAGED	17
DEER MANAGEMENT GROUPS	19
DEER IMPACTS / ISSUES	21
SPORTING ASSETS.....	21
THE RURAL ECONOMY	21
VENISON SALES.....	22
ECOLOGICAL IMPACTS	22
<i>Damage to designated sites</i>	23
WILDLIFE TOURISM	24
SOCIAL BENEFITS.....	24
CULTURAL BENEFITS.....	24
IMPACTS ON FORESTRY	24
IMPACTS TO AGRICULTURE.....	25
ROAD SAFETY	25
DEER IN URBAN AREAS	26
SOURCES	27

EXECUTIVE SUMMARY

There are four species of wild deer established in Scotland: two native species, roe deer and red deer; and two introduced species sika and fallow deer. A fifth species, also introduced, the muntjac, has been reported but has not been confirmed as being resident in Scotland.

The most recent population estimates for Scotland suggest overall numbers of between 360,000-400,000 red deer, 200,000-350,000 roe deer, 25,000 sika deer and an estimated 2,000 fallow deer. Red deer numbers on the open hill have increased substantially (around a 75-80% increase) since the 1960s, but more recently numbers have stabilised and the most recent count data show a small decline of around 5%. The relationship between wild deer and other herbivores (especially hill sheep), both in terms of numbers and distribution, is complex with a great deal of spatial variation even within single geographical areas. Sheep numbers in many parts of the uplands have fallen substantially in the last ten years and the reduction in grazing pressure from sheep may have been greater than the increase from higher numbers of red deer. Although deer management decisions are still based on count data, habitat monitoring is increasingly used to assess deer impacts and guide management decisions.

The Public Services Reform (Scotland) Act 2010, transferred the functions of the Deer Commission for Scotland to Scottish Natural Heritage (SNH). Under the Deer (Scotland) Act 1996 SNH is now responsible for securing the conservation and sustainable management of deer in Scotland. The 1996 Act remains the principal statute. It also sets close seasons for male and female deer of each species. Where deer are impacting on agriculture, forestry, the natural heritage or other public interests the Act provides a mechanism for SNH to negotiate a control agreement with landowners. There are ten control agreements currently in force, all of which relate to protection of habitats on sites designated for nature conservation. The Act also provides backstop powers for SNH to implement a control scheme, including for SNH to carry out deer control, and recover costs. These powers have not been used.

Part 3 of the Wildlife and Natural Environment (Scotland) Act 2011 made amendments to the 1996 Act. It required SNH to draw up a code of conduct on sustainable deer management. It provides powers for SNH to introduce a competence test for deer hunters by regulation, if the voluntary approach to securing this does not work, and it made minor amendments to SNH's powers to make control agreements and control schemes.

Wild Deer a National Approach is a strategy produced in 2008 which sets out guiding principles, objectives, key actions and tools for deer management. The Strategy will be reviewed by SNH in 2014. It is supplemented by the Code of Practice on Deer Management, which came into place in 2012. The Code explains what the public interests in sustainable deer management are. It defines what land managers must, should and could do to deliver sustainable deer management.

Wild deer, particularly red deer on the open hill, range freely over wide areas. There are no effective natural predators of deer in Scotland. If deer numbers are not controlled by man, they will expand until they reach the carrying capacity of the available habitat, and will fluctuate depending on the severity of winter weather. Most wild deer populations are subject to some degree of management by man. This takes two forms, hunting or "stalking" by shooting with

high velocity rifles, or fencing, either to keep deer in or out. Male deer are prized as trophy animals for their antlers by hunters, and the stalking of male deer is often let out commercially. Culling of female deer is let less often (but is a growing market) and the majority of female deer are culled by professional stalkers. Around 100,000 deer are culled each year in Scotland. Since the mid-1990s the number of deer culled each year has remained relatively constant. Deer fencing is used widely to manage deer densities and movements. As well as impacting on deer movements fencing can impact on wider habitat management as well as the landscape and public access.

Deer Management Groups (DMGs) have been established over the last 30 years to coordinate deer management between neighbouring landowners, and to manage conflicts which can arise where different land uses require different densities of deer. There are currently 49 groups, 42 which cover upland areas and 7 which cover lowland areas. Deer Management Groups are voluntary and are run by representatives of the landholdings in the group's area.

Wild deer play an important part in Scotland's rural economy, are integral to biodiversity and provide food and recreational opportunities. However, they can also have impacts on the natural environment, forestry and agriculture, and road safety.

A study carried out in 2006 estimated that deer stalking was worth £105 million per year to the Scottish economy, and supports the equivalent of 2520 paid full time jobs. These jobs are often in fragile and remote communities. Scotland currently produces in the region of 3,500 tonnes of venison, of which 3,450 tonnes come from wild deer. The annual value of venison sales is approximately £2 million and processing of downstream products may be worth a further £8 million. Wild deer are also an important species for wildlife tourism in Scotland. It has been estimated that income from deer watching is worth around £100,000 per annum.

The social benefits of deer management are more difficult to quantify but include deer management developing transferable rural skills and local emergency response teams relying on support from professional rangers and stalkers.

Red and roe deer are an important part of the natural heritage and are "iconic mammals". Deer grazing can have both positive and negative ecological impacts, e.g. it can maintain open areas in woodland and species rich grasslands, but it can also prevent woodland regeneration, and damage habitats such as blanket bogs by grazing and trampling. Data provided by SNH shows that 356 (15.8%) of the 2250 features that could potentially be impacted by deer on designated sites are currently in unfavourable condition, and 146 (6.5%) which are currently in unfavourable condition and potentially being impacted by deer are on the "Delivering Favourable Condition" priority list. That means that management must be agreed to move the features into favourable or favourable recovering status in the next 3 years.

Browsing and bark stripping by of wild deer on commercial forestry may reduce tree growth, kill a proportion of planted trees or reduce stem quality and value. Damage may also occur through bark stripping. Forestry Commission Scotland manages around one-third of forests and woodland in Scotland. In 2009/10 the net cost of forest protection in Scotland to FCS (predominantly deer management) was £9.4m. There are very few data available on the impacts of deer on agriculture in Scotland, but studies from England provide an illustration of the likely impacts - damage may be caused to arable crops and roots crops, but impacts may also be on grass crops grown for hay or silage. Roe deer may also damage orchards and soft fruit crops, which may be of high value at a farm level.

Traffic accidents involving deer or Deer Vehicle Collisions (DVCs) have been highlighted as a growing problem in Scotland for many years. , SNH research has estimated that there are likely to be in the region of 7,000 – 10,000 DVCs in Scotland each year. Out of these, there are on

average 65 recorded incidents involving human injury each year, the cost of which is estimated to be in the order of £5 million per annum.

Deer (especially Roe deer) are increasingly expanding into urban areas. Particular issues include damage to gardens, parks and community woodlands; public safety issues around poaching; and the difficulty and public acceptability of control measures. There are also positive benefits such as the enjoyment from seeing deer.

INTRODUCTION

There are four species of wild deer established in Scotland: roe deer (*Capreolus capreolus*), red deer (*Cervus elaphus*), sika (*Cervus nipon*) and fallow deer (*Dama dama*). A fifth species, muntjac (*Muntiacus reevesi*), has been reported but has not been confirmed as being resident in Scotland. Muntjac deer are classified as invasive non-native species under the Wildlife and Natural Environment Act (Scotland) 2011. Roe deer and red deer are native species; sika and fallow deer have both become established following introduction. Effectively there are no natural predators of deer in Scotland.¹

[Red deer](#) are the largest native land mammal in the UK and are found both in the open hill range characteristic of much of upland Scotland, and in woodlands and plantations. Red deer are closely related to Sika deer and hybridisation can occur. In order to conserve some red deer populations as free from sika genes as possible, islands off the west coast of Scotland have been designated as red deer refugia under the Wildlife and Countryside Act 1981. As part of the 2013 Year of Natural Scotland celebrations the red deer has been named as one of Scotland's "Big 5" wildlife attractions.

[Roe deer](#) are the most widely distributed species across Scotland. Roe deer are mainly woodland dwelling and are found throughout mainland Scotland, including increasingly around urban centres. Roe deer are at their highest density in lowland areas.

[Fallow deer](#) were introduced from continental Europe to the UK during the 11th or 12th centuries. In Scotland they are the least numerous of the four established deer species and have a limited range occurring in isolated populations mainly around the areas they were originally kept in captivity.

[Sika deer](#) are native to Asia and were brought to UK deer parks as an ornamental species in the 19th century. Following escapes from deer parks in the 19th and early 20th century sika have now become established on mainland Scotland. Sika deer inhabit dense woodland, and are elusive. This makes controlling them, and reducing their range expansion, a particular challenge.

¹ Foxes and eagles may occasionally take newborn deer calves and there have been sightings of eagles swooping at adult deer, but the impact of such predation is negligible.

Figure 1 Deer species in Scotland



Clockwise from top left (iStockphoto image credits in brackets): Red deer stag (Martin McCarthy), roe buck and doe (Balazs Poloskei), fallow buck (Benjamin Jessop), sika stag (Danny Hampton)

DEER NUMBERS

Deer are mobile animals, living on the open hill and woodland, therefore obtaining an accurate estimate of populations across the whole of Scotland is complex and very costly.

The Red Deer Commission (RDC) and its successor the Deer Commission for Scotland (DCS) have been counting red deer (*Cervus elaphus*) in Scotland since the 1960s. Initially counting was done on foot whereby teams of counters covered the ground in a line using binoculars or telescopes to spot deer. More recently helicopters and digital cameras have been used which reduces disturbance to deer, and potentially improves the accuracy of the counts

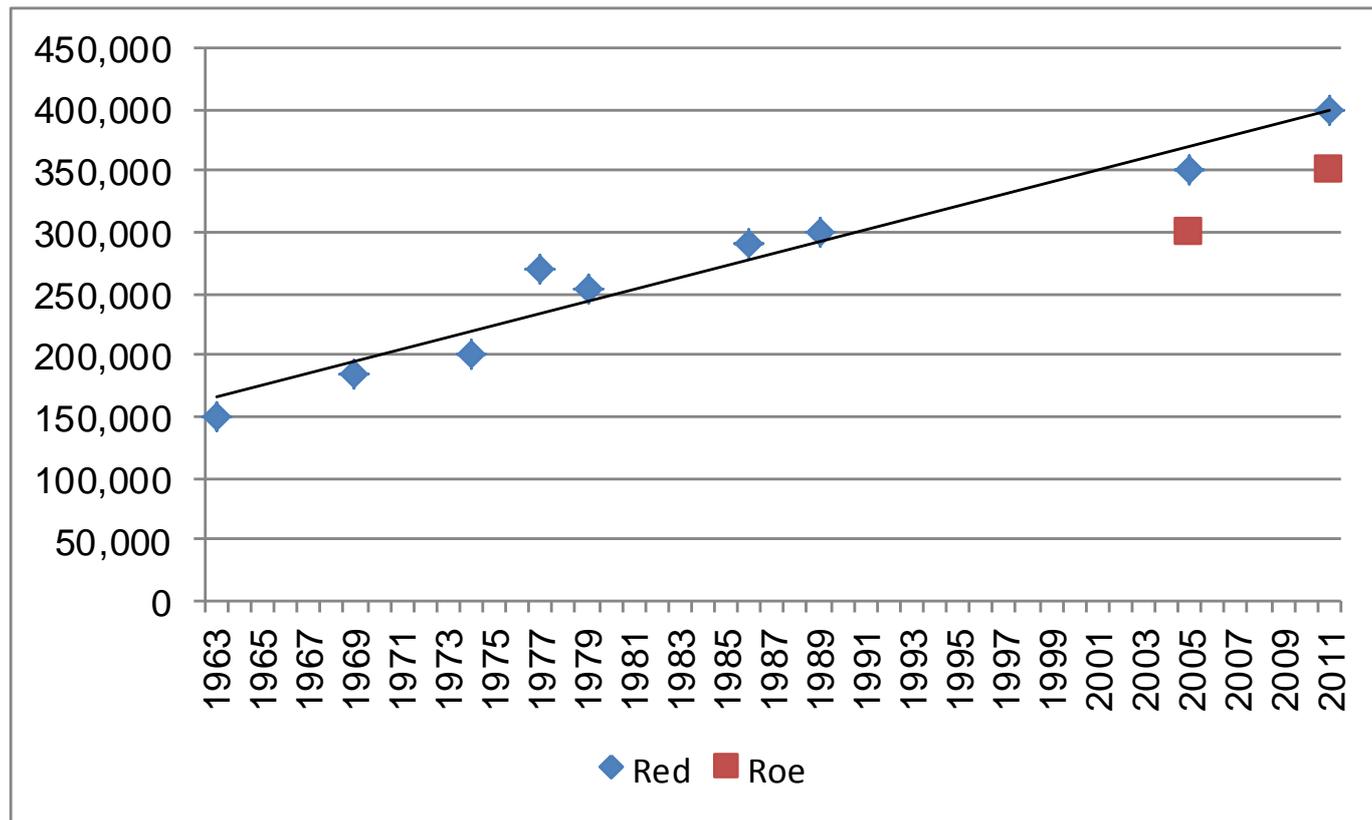
Analysis of this deer count data has shown that the open hill population of red deer increased from 197,600 (+/- 35,000) in 1967 to 350,900 (+/- 33,300) in 2000 (Clutton Brock et.al 2004).

It is more difficult to estimate abundance of deer in forest environments and this has increasingly led to the use of indirect survey methods e.g. dung counting. Indirect census methods give less precise estimates of numbers which explains the greater errors margins attached to recent national population estimates. What does remain clear though is that the range of all four species of deer in Scotland has been increasing.

The most recent population estimates for Scotland suggest overall numbers of between 360,000-400,000 red deer, 200,000-350,000 roe deer, 25,000 sika deer and an estimated 2,000 fallow deer (Scottish Parliament 2013b).

Numbers of all four species have increased in recent decades. Previous population estimates are available for red and roe deer and these are shown in the figure below.

Figure 2 Estimates of red and roe deer numbers in Scotland



Source: John Muir Trust (2013) using figures from Red Deer Commission and Deer Commission for Scotland annual reports. Red deer numbers with trendline fitted.

The table overleaf shows data from recent DCS/SNH deer counts, and includes historical comparisons, where these are available.

Table 1 – Red deer counts in selected areas

DMG	Area (ha)	Historic count (where available)	Number	Previous count	Number	Most recent count	Number	% change between most recent count and historic count	% change between two most recent counts	Density per 100ha based on most recent count
North Uist	30,016			1996	670	2000	869		30%	2.9
Harris & Lewis	109,468			1993	2,690	2000	4,248		58%	3.9
South Uist	30,765			1983	38	2000	374		884%	1.2
Skye	174,730			1997	903	2003	1,175		30%	0.7
Rum	10,731			2011	838	2013	1,063		27%	9.9
Northern	180,963			2006	10,403	2013	9,332		-10%	5.2
Gairloch Conservation Group	42,600			1991	1,061	1996	961		-9%	2.3
West Ross	113,493	1975	8,267	1998	11,823	2009	12,528	52%	6%	11
West Sutherland	149,344	1976	8,342	1999	12,034	2006	10,348	24%	-14%	6.9
North Ross	148,432	1962	10,285	2002	13,814	2008	15,101	47%	9%	10.2
North West Sutherland	169,975	1988	7,552	1997	8,019	2012	7,649	1%	-5%	4.5
East Ross	20,476			2006	1,032	2008	1,778		72%	8.7
East Sutherland	127,141	1964	7,622	1999	12,023	2008	14,349	88%	19%	11.3
South West Ross	64,434			1997	3,687	2008	4,006		9%	6.2
South Ross	222,475	1969	19,494	2003	26,330	2009	30,814	58%	17%	13.9

DMG	Area (ha)	Historic count (where available)	Number	Previous count	Number	Most recent count	Number	% change between most recent count and historic count	% change between two most recent counts	Density per 100ha based on most recent count
Glenelg	38,394			1999	6,651	2003	4,862		-27%	12.7
Knoydart	77,416			1996	8,206	2003	6,041	-19%	-26%	7.8
West Lochaber	51,937			1996	6,659	2002	5,528		-17%	10.6
Moidart	22,010			1994	2,507	2000	2,477		-1%	11.3
East Loch Shiel	47,972			1995	3,150	2002	3,238		3%	6.7
Morven	48,607			1994	3,501	2001	4,337		24%	8.9
Ardnamurchan	22,827			1997	1,655	2003	1,450		-12%	6.4
Mull	88,171			2004	6,560	2011	6,764		3%	7.7
Jura	36,505	1969	5,435	1994	5,083	2001	5,949	9%	17%	16.3
Islay	14,081			1994	4,203	2002	3,900		-7%	27.7
Arran	21,832			1998	1,862	2002	1,461		-22%	6.7
Monadhliaths	175,734	1968	11,988	2004	21,977	2013	19,744	65%	-10%	11.2
Cairngorm/ Speyside	104,493			2005	7,538	2010	4,103		-46%	3.9
Mid West Association	109,602			2006	10,717	2011	11,045		3%	10.1
West Grampians	80,852			2005	17,860	2010	18,936		6%	23.4
East Grampians	263,586	1966	10,031	2005	27,817	2010	21,326	113%	-23%	8.1
Blackmount	112,533			1995	5,954	2000	6,326		6%	5.6

DMG	Area (ha)	Historic count (where available)	Number	Previous count	Number	Most recent count	Number	% change between most recent count and historic count	% change between two most recent counts	Density per 100ha based on most recent count
East Loch Ericht	35,261	1972	5,642	2003	6,277	2007	5,492	-3%	-13%	15.6
Breadalbane	95,135	1999	14,596	2008	13,875	2011	11,467	-21%	-17%	12.1
Strathtay	17,324			1999	1,847	2000	2,019		9%	11.7
South Perthshire	76,910			2001	5,359	2009	4,856		-9%	6.3
Inveraray & Tyndrum	56,982			1993	2,214	2002	2,801		27%	4.9
Balquhidder	46,172			2002	2,212	2010	2,761		25%	6
Glenartney	20,063			1993	4,668	2000	3,901		-16%	19.4
Total	3,259,442				283,717		270,858		-5%	8.3

Source SNH (2013a)

The data in the table shows a varied picture of changing red deer numbers across Scotland. When comparing the most recent DCS/SNH counts, just over half of these upland areas show an increase in red deer numbers and just under half show a reduction in numbers. While the uncertainty attached to the estimates means some of these variations may not be statistically significant, the data does demonstrate a slight downward trend overall in absolute numbers across Scotland since the 1990s. Looking over the longer term, most of the areas where figures are available show an increase. This is not surprising given the abovementioned longer-term trends in the population of hill red deer.

Red deer are not the only large herbivores in the uplands of Scotland. Declines in the hill sheep flock in response to changing agricultural policy have been well-documented (e.g. SAC 2008). The relationship between wild deer and other herbivores, especially hill sheep, both in terms of numbers and distribution, is complex with a great deal of spatial variation even within single geographical areas. In many areas the reduction in grazing pressure from sheep may have been greater than the increase from higher numbers of red deer. The reduction in sheep has created an opportunity for red deer to increase their range, and may lead to a further increase in numbers. Research has shown that deer densities are higher in areas where sheep have been removed (de Gabriel et al 2011) with deer benefitting from the grass patches created by sheep in upland heath habitats.

Although deer managers in Scotland still rely on deer counts to inform management decisions, in recent years SNH has moved away from advising on management based purely on numbers, towards measurement of deer impacts. Habitat condition assessment is a standard methodology used to assess grazing impacts in designated areas (SSSIs, SACs etc.) and is promoted as best practice for managing deer in the wider countryside (areas outside designated areas). This does not give counts or density estimates but is an index of grazing pressure. The data is used to guide culling targets. ([Best Practice Guidance](#) and SNH 2013).

LAW

As wild animals, deer belong to no-one until they are killed or captured². The right to shoot deer generally goes with ownership of land. Landowners can give permission to others to shoot or take deer (i.e. sporting tenants, managing agents, paying hunters, employees). In some circumstances the law also allows certain other occupiers of land such as farm tenants the right to take or kill deer for specific reasons (e.g. the protection of crops).

THE DEER (SCOTLAND) ACT 1996

The principal statute protecting and regulating wild deer in Scotland is the Deer (Scotland) Act 1996 (c. 44) as amended by the Wildlife and Natural Environment (Scotland) Act 2011 (asp 6). The 1996 Act consolidated and replaced the Deer (Scotland) Act 1959 (c.40).

Part 1 - The role of SNH

The Red Deer Commission was established by the Deer (Scotland) Act 1959. It had a remit to further the conservation and control of red deer. The Deer Commission for Scotland was constituted by part 1 of the Deer (Scotland) Act 1996, as the successor to the Red Deer Commission with wider responsibilities of furthering the conservation, control and sustainable

² In legal parlance they are described as *Res nullius*.

management of all wild deer in Scotland, and keeping under review all matters relating to wild deer.

The Public Service Reform (Scotland) Act 2010 transferred the functions of the Deer Commission to Scottish Natural Heritage (SNH), such that SNH now has the functions and powers set out within the Deer (Scotland) Act 1996 to secure the conservation and sustainable management of deer in Scotland, and to keep their welfare under review.

Part 2 – Close seasons, and control schemes and agreements

Part 2 of the 1996 Act requires Scottish Ministers to set a close season for the shooting of female deer, and provides an enabling power to set close seasons for male deer. The close seasons in force in Scotland are shown in the table below.

It is an offence to kill deer during the close season without the permission of SNH. Control of deer in the close season to protect crops etc. is now subject to the terms of a general licence (see below).

Table 2 - Close seasons for deer in Scotland

Species	Male	Female
Red deer, Sika deer and Red/Sika hybrids	October 21 st – June 30 th	Feb 16 th – October 20 th
Fallow deer	May 1 st – July 31 st	Feb 16 th – October 20 th
Roe deer	October 21 st – March 31 st	April 1 st – October 20 th

Note: All dates are inclusive. Close seasons for Sika, Sika/red hybrid, Fallow and Roe are set by the Deer (Close Seasons) (Scotland) Order 1984. The close seasons for Red deer are set by para. 2, Schedule 6 of the Deer (Scotland) Act 1996.

Sections 7 and 8 of the Deer (Scotland) Act 1996 set out a process for SNH to negotiate with landowners to agree or impose measures to manage deer. Section 7 relates to voluntary “control agreements”. It provides that having had regard to the code of practice on deer management, where SNH is satisfied that deer “have caused or are likely to cause damage to woodland, agricultural production,... or the natural heritage or damage to public interests of a social, economic or environmental nature; or have become a danger or a potential danger to public safety, it shall consult with those owners or occupiers, to secure agreement on deer management.” Control agreements usually set a target for reducing deer numbers, usually expressed as a density of deer per unit area. They may also provide for other measures, such as fencing, to manage deer impacts.

Section 8 relates to compulsory control schemes, where it has not been possible to secure a control agreement. This section provides that SNH “shall make a scheme (a “control scheme”) for the carrying out of such measures as it considers necessary for those purposes [reducing or preventing damage caused by wild deer]”. Section 8(7) states that “Where any control scheme has been confirmed, every owner or occupier shall take such measures as the scheme may require of him in accordance with its provisions.

Section 9 of the Act relates to the recovery of expenses incurred by SNH in the performance of its duty under section 8 from the owner or occupier concerned, if the owner or occupier fails to comply with the control scheme.

A recent PQ response indicates that no compulsory control schemes have been implemented since the introduction of the Deer (Scotland) Act 1996 or prior to 1996, when the Red Deer Commission operated voluntary control schemes under the Deer (Scotland) Act 1959 (Scottish Parliament 2013e).

There are currently ten control agreements in place (Scottish Parliament 2013a). These have been negotiated between SNH (or the Deer Commission Scotland prior to 2010) and landowners, and contain binding targets relating to deer numbers and habitat impacts. Control agreements are usually associated with a designated area but may involve management of deer on land adjacent to the designated area because deer range freely across the landscape. The current agreements are shown in the table below.

Table 3 – Current Deer Control Agreements

	Area (ha)	Reason
Ardvar	5,444	To prevent damage to Ardvar Woodlands SAC
Beinn Dearg SAC	46,427	To support implementation of an upland habitats management plan and protect SAC
Ben Wyvis SAC	11,146	To support implementation of an upland habitats management plan and protect SAC
Breadalbane	99,932	To reduce deer numbers to protect designated sites within the control agreement area
Caenlochan	25,338	To reduce deer numbers to prevent damage to upland habitats on designated sites
Fannichs SAC	30,019	To support implementation of an upland habitats management plan and protect SAC
Inverpolly SAC	11,649	To prevent damage to upland woodland in SAC
Kinveachy	5,335	To prevent damage to Caledonian pinewood including an SAC
Mar Lodge	29,322	To underpin a deer management plan to protect features of designated sites including Caledonian pinewoods and upland habitats
Glen Prosen Agreement Area (Caenlochan Extension)	8,407	To reduce deer numbers to prevent damage to upland habitats on designated sites
Total	273,019	

Source: Scottish Parliament (2013a, and SNH 2013)

Part 3 – Protection of deer

Part 3 of the 1996 Act contains a number of provisions to protect deer from poaching and to protect their welfare. These provide that it is an offence to kill deer without legal right or permission. It is also an offence to kill deer at night, or to use vehicles for driving deer without the permission of SNH. It is an offence to kill deer otherwise than by shooting. The Act provides a power for Scottish Ministers to specify the types of firearms that can be used for shooting different types of deer.³

³ The current requirements are set out in the Deer (Firearms etc.) (Scotland) Order 1985 which was made under the 1959 Act.

Part 4 - Enforcement

Part 4 of the Act provides enforcement powers for the police and the courts. It also provides for the penalties for offences committed under the Act, which can include forfeiture of deer and cancellation of firearm and shotgun certificates, in addition to fines and imprisonment. Part 4 of the Act also provides powers for local authorities to issue licences to sell venison, and requires venison dealers to report returns on their activities to SNH. SNH can also request information from landowners on the numbers of deer killed on their land.

THE WILDLIFE AND NATURAL ENVIRONMENT (SCOTLAND) ACT 2011

Part 3 of the Wildlife and Natural Environment (Scotland) Act 2011 made amendments to the 1996 Act. The main changes introduced by the 2011 Act were:

- SNH is required to draw up a code of conduct on sustainable deer management, which makes recommendations for best practice in sustainable deer management and collaboration in deer management. The code is subject to Ministerial and Parliamentary approval (see section on policy below). SNH must monitor compliance with the code, have regard to it in exercising its functions in relation to deer, and keep it under review.
- SNH was given a new function in relation to the management of urban deer.
- The Act makes some minor changes to SNH's powers to negotiate control schemes or impose a control order. These amendments were based on a legal analysis of the existing powers and were designed to make the use of these powers more straightforward.
- In many countries hunters must undertake training and be tested before they are allowed to hunt large game animals such as deer. In developing proposals for the 2011 Act the Deer Commission advised the Government that the right to shoot deer in Scotland should also be subject to a competence requirement. The Government's policy is that all people who hunt deer in Scotland should either hold a deer management qualification or be accompanied by a qualified hunter. Rather than enforce this requirement through regulations the Government decided to take a voluntary approach, and allow training and certification to be delivered through shooting organisations and rural colleges. Training and assessment is carried out in accordance with a common standard called the [Deer Management Qualification](#). The 2011 Act contains backstop powers for Scottish Ministers to introduce a competence requirement through legislation. If these powers are not used by April 2014, it requires SNH to review the voluntary approach to training and assessing competence.
- Owner-occupiers rights' to shoot deer to protect farmland / forestry subject are now subject to a general licence. The [licence](#) has been issued by SNH for 2013-14 and does not allow the culling of female deer, over 1 year old, of any species between the period of the 1st April to the 31st August, without a separate specific authorisation. It requires those operating under the licence to carry out culling in accordance with best practice.

POLICY

The first [long term vision for wild deer](#) was published in 2000 by the Deer Commission for Scotland (2000). A strategy setting out how that vision would be achieved was published in 2001. [Scotland's Wild Deer a National Approach](#) (WDNA, Deer Commission for Scotland, Forestry Commission Scotland and Scottish Natural Heritage 2008) replaces that vision and strategy and directs SNH's approach to deer management.

The WDNA sets out guiding principles, objectives, key actions and tools for implementation of the approach. In recognition that the practical day to day deer management is delivered predominately through the private sector the strategy was developed in close collaboration with all sections of the deer sector and is set to be reviewed every five years with the first review being due in 2014. The 2014 review will set out where the strategic priorities lie over the following 5 years. In doing so the review will consider how well the needs of the environment, economy and society have been integrated; whether any changes in legislation, policy or society have had an impact on the WDNA; and how public and private interests have worked together to deliver actions.

Table 4 Structure of the Wild Deer a National Approach

Vision	<p>In 20 years time:</p> <ol style="list-style-type: none"> 1. There will be widespread understanding and achievement of 'sustainable deer management' - the conservation, control and use of all species of deer so as to contribute to: <ul style="list-style-type: none"> • A high quality, robust and adaptable environment. • Sustainable economic development • Social well-being 2. Effective mechanisms will be in place to: <ul style="list-style-type: none"> - assess the management interventions required to achieve the best combination of these outcomes in any area at a given time; and - ensure that these interventions are carried out effectively, in good time and in accordance with best practice. 		
Principles	<p>Wild deer should be managed throughout their range in a way that -</p> <ol style="list-style-type: none"> 1. integrates deer management and other land-use objectives 2. uses collaboration to achieve the management objectives 3. uses a geographical scale and timescale best suited to achieving the management objectives 4. engages and communicates with all relevant interests 5. uses sound science and the best available evidence 6. promotes deer welfare 		
Outcomes	<p>Management of all species of wild deer will contribute to:</p>		
	A high quality, robust & adaptable environment	Sustainable economic development	Social well-being
Objectives	<ol style="list-style-type: none"> a) Safeguard the welfare of all species of wild deer. b) Minimise further spread of non-native deer species in Scotland. c) Secure the favourable condition of features in designated sites. d) Conserve and enhance biodiversity in the wider countryside. e) Maintain the integrity of natural processes. f) Help tackle and adapt to the effects of climate change. g) Conserve and enhance the cultural and historic environment. 	<ol style="list-style-type: none"> a) Increase the economic opportunities associated with wild deer. b) Minimise economic costs attributable to wild deer. c) Develop the market and supply chain for venison. d) Contribute to the social and economic development of communities. e) Ensure the skills and knowledge required to manage deer as an integral part of Scotland's natural resources. 	<ol style="list-style-type: none"> a) Increase participation in management and enjoyment of wild deer. b) Contribute to a safe and healthy environment for people. c) Manage the impacts of wild deer in and around communities. d) Integrate opportunities for outdoor recreation. e) Promote venison as a healthy food.

Source: SNH (2013b).

Scotland's Wild Deer a National Approach (WDNA) is delivered through a series of three year rolling actions plans which co-ordinate activity across the deer sector. [The fifth Action Plan](#) is currently being delivered for 2013-2016. Action plans set out what actions are required from whom to deliver the WDNA, sets priorities for the coming years and reports on progress.

The [Code of Practice on Deer Management](#) was introduced by section 27 of the Wildlife and Natural Environment (Scotland) Act 2011 (WANE Act, SNH 2011). The WANE Act inserted a new section, section 5A, into the Deer (Scotland) Act 1996. It required SNH to draw up a code of good practice which would:

- a) Set out recommended practice for sustainable deer management;
- b) Make provision about collaboration in deer management;
- c) Set out examples of circumstances in which SNH may seek to secure a control agreement or make a control scheme;
- d) Make different provisions for different cases and, in particular, for different circumstances, different times of the year or different areas.”

The Code of Practice is primarily aimed at the land manager and explains for the first time what the public interests in sustainable deer management are. It further defines what land managers must, should and could do to deliver sustainable deer management.

In order to assist practitioners in following best practice under the code, the [best practice guides](#) have been produced by DCS and SNH, in partnership with stakeholders to highlight legal requirements and issues relating to public safety, food safety and deer welfare.

HOW DEER ARE MANAGED

Wild deer, particularly red deer on the open hill, range freely over wide areas. There are no effective natural predators of deer in Scotland.⁴ If deer numbers are not controlled by man, they will expand until they reach the carrying capacity of the available habitat. Increasing deer numbers can lead to change in plant species composition and loss of habitats that are sensitive to grazing. Experiments on the island of Rum where deer culling ceased in the 1970s on the “North block” of the island showed that deer numbers increased with natural mortality then varying depending on the severity of winter weather ([Isle of Rum Red Deer Project](#)).

It is considered publically and morally unacceptable to allow deer numbers to increase to such levels that they are subject to large natural mortalities in winter. Deer are a valuable resource – hunters will pay to stalk them; their venison can be sold and the opportunity to see deer brings in tourists - supporting rural economies. For these reasons (and because of the lack of predators) most wild deer populations are subject to some degree of management by man. This takes two forms, hunting or “stalking” by shooting with high velocity rifles, or fencing, either to keep deer in or out.

Deer are managed at different densities depending on the land management objectives for a particular landholding. If grazing by deer is too heavy it can impact on the condition of blanket bog, dwarf shrub heath, tree regeneration/establishment and agricultural crops. If densities are reduced, hunting opportunities and deer related tourism may suffer. For example, an estate that focusses on deer stalking activities may aim to maintain a population of around 16 per km²

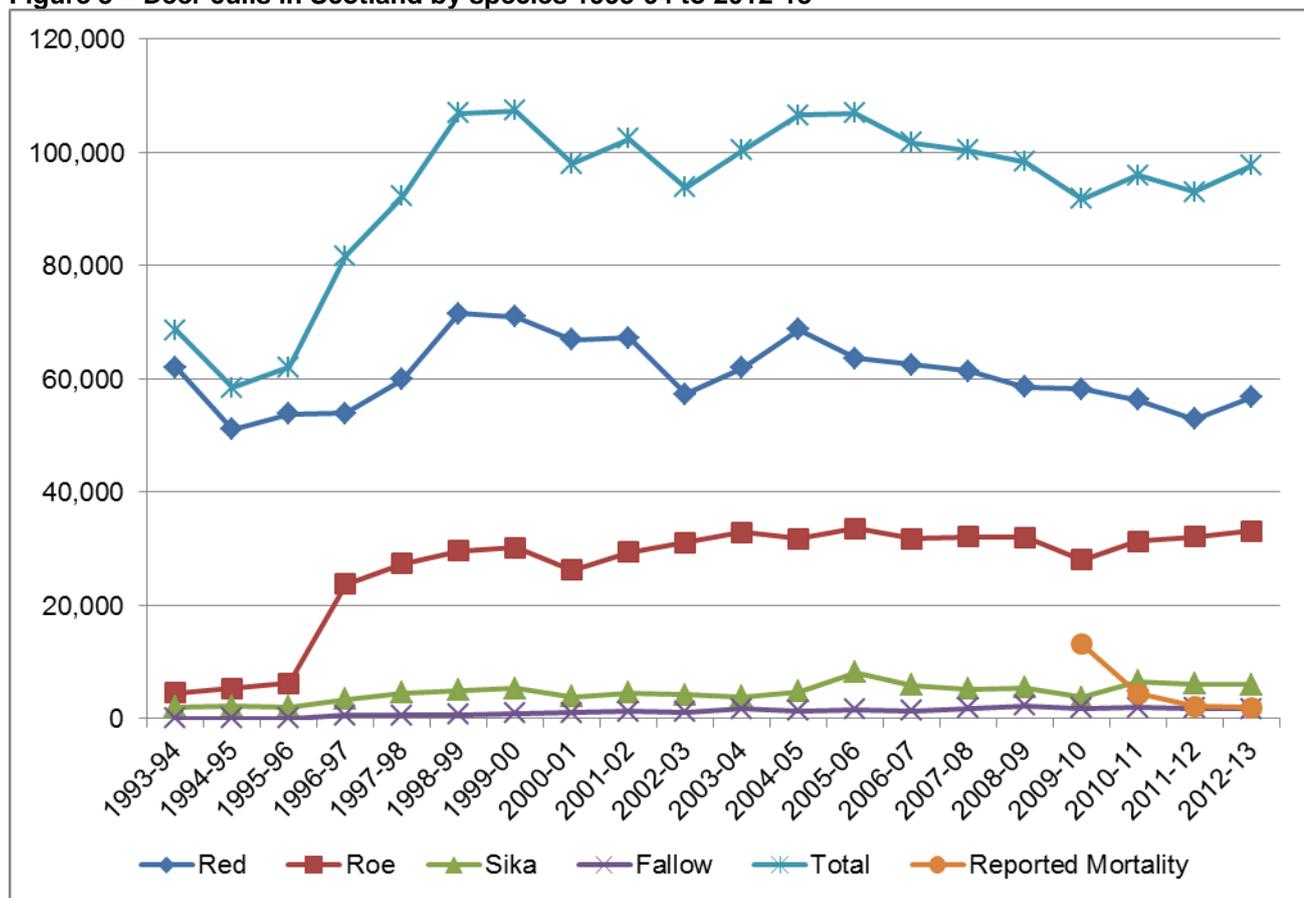
⁴ Foxes and eagles may occasionally take newborn deer calves and there have been sightings of eagles swooping at adult deer, but the impact of such predation is negligible.

whereas a neighbour focussing on tree regeneration may aim for around 6 deer per km². Because deer can move freely, high deer numbers moving from a stalking estate to a woodland estate may cause damage to browsing young trees and conversely, reductions of deer on woodland estates may affect sporting opportunities on the stalking estate.

Male deer are prized as trophy animals for their antlers by hunters, and the stalking of male deer is often let out commercially. Stalking of red deer stags in particular is let out to paying guests, often with accommodation, and although the season for stags begins in July, the majority of stags are shot during the “rut” in September and October. As red deer are a forest animal in continental Europe, stalking on the open hill habitats of upland Scotland is a unique experience, and is carried out quite differently from in Europe (where hunters wait in position in forest clearing for deer to emerge from cover), in Scotland stalkers scan the open hill to locate deer and select a target animal, which they approach within range by stealth. Typically paying guests are accompanied by a professional stalker who selects the animal to be shot and helps to guide the guest into position. Stalking of red deer in woodland and for other species may be carried out by guests accompanied by a stalker, or experienced hunters may be able to let out blocks of land in which they can manage the stalking themselves, or it may be carried out by professional stalkers to manage numbers.⁵

Culling of female red deer on the open hill is let less often (but is a growing market) and the majority of female deer are culled by professional stalkers. They will select deer based on their condition and appearance to remove weaker animals that are less likely to survive the winter. Females in woodland are culled by a mixture of paid employees; day let guests or more usually a syndicate that has taken a sporting lease of the woodland. The figure below shows the numbers of deer culled in Scotland in recent years.

Figure 3 – Deer culls in Scotland by species 1993-94 to 2012-13



⁵ Under the competency requirements described above, a paying guest would not require to have passed the training as long as the professional stalker who accompanied them had, but it would be required for them to stalk unaccompanied.

Source: SNH (2013a) and Scottish Parliament (2013b)

The figures show that for the last fifteen years the total number of deer culled has remained relatively constant. The figures show an increase in culling in the mid-1990s due to an increase in the cull of roe deer. However as prior to 1996 the Red Deer Commission only collected data on red deer culls with limited information on other species this may be due to under-reporting of the roe deer cull in those years, rather than an increase in actual culling. The cull of red deer has fluctuated over this period, rising in the late 1990s, and falling back since 2003-04. Data on reported natural mortality are only available for the last four years. These show the impact of the severe winter of 2009-10, with a reduction in mortality to lower levels since.

In Scotland deer fencing is used widely to manage deer densities and movements. As well as impacting on deer movements fencing can impact on wider habitat management as well as the landscape and public access. [Guidance](#) is available which sets out best practice on the use of deer fencing. A particular issue regarding fencing occurs when an area of land used by deer in winter is fenced to exclude deer for woodland establishment or regeneration. The guidance indicates that management should consider a reduction in the population of deer to take account of the loss of a key area of deer range in order (to take account of the reduced winter carrying capacity). In addition fencing can be used to reduce deer access to roads in an attempt to reduce deer – vehicle collisions however, careful fence placement is needed to avoid fences funnelling deer onto roads elsewhere.

DEER MANAGEMENT GROUPS

Deer Management Groups (DMGs) have been established over the last 30 years to coordinate deer management between neighbouring landowners, and to manage conflicts which can arise where different land uses require different densities of deer. Initially groups were formed to cover the open hill range of red deer, but have more recently been formed in lowland areas and are concerned with the management of all species of deer. Groups cover areas where there are distinct herds of deer and may range in size from 20,000 to 200,000 hectares. They can include as few as 3 or as many as 30 different landholdings. Groups are often subdivided into sub-groups for practical purposes ([ADMG](#)).

There are currently 49 groups, 42 which cover upland areas⁶ and 7 which cover lowland areas. Recently, a specific organisation, the [Lowland Deer Network Scotland](#) was set up to promote collaborative deer management in lowland and urban areas. The figure overleaf shows the areas covered by DMGs and the Lowland Deer Network.

⁶ Two of the “upland” groups - Cowal and West Loch Lomond – no longer function.

tourism and public recreation, and which makes a contribution to the local economy. The annual cull is agreed among members of each DMG.

Many groups have developed Deer Management Plans. These provide a framework for the integrated management of deer along with other land uses.

A written answer has stated that of the 40 upland deer management groups, 16 currently have deer management plans in place, 13 have plans in development or which require review, and 11 groups have no current deer management plan (Scottish Parliament 2013c).

DEER IMPACTS / ISSUES

Wild deer play an important part in Scotland's rural economy, are integral to biodiversity and provide food and recreational opportunities. However, they can also have impacts on the natural environment, forestry and agriculture, and road safety.

SPORTING ASSETS

Red deer in particular and more recently sika stags are valuable sporting assets. The pressure to reduce deer densities in order to secure environmental benefit can lead to a reduction in the number of stags on some estates, which in turn may reduce the income from letting stags. PACEC (2006) considered the total value of stalking to the Scottish economy to be of the order of £105 million per year and that an estimated £70.4 million remains in Scotland.

Red deer can also be important in terms of their contribution to the capital value of sporting estates. Part of the value of a stalking estate depends on the average number of stags shot per year, usually expressed as a five or ten year average. The Deer Commission for Scotland (DCS) estimated that the capital value of each stag in the annual average was approximately £22,000, and £2,200 per hind. Based on average annual cull figures of around 50,000 over the last 10 years, and an average stag to hind ratio of 1:1.9 (17,000: 33,000), the capital value of red deer managed for sport in Scotland in 2000 was therefore in the region of £450 million (DCS, 2000 reported in Putman, 2012).

THE RURAL ECONOMY

The Scottish Game Keepers Association (2012) argue that red deer are vital to the economy of remote rural communities in Scotland. Deer stalking has direct impact on the economy creating jobs in stalking and gamekeeping, and associated multiplier effects. These include "hoteliers and B&B owners, farriers, tweed companies, ATV retailers, vehicle dealerships, wildlife photographers and tour operators, venison processors, cooks and restaurateurs to countless others who have a role in the relatively unknown culture of rural Scotland."

This view is supported by a study by Public and Corporate Economic Consultants (PACEC, 2006) who found that deer management supports the equivalent of 2520 paid full time jobs in Scotland. Putman (2012) argues that these jobs are often in fragile and remote communities and therefore help "to sustain the viability and social structure of the entire community."

Analysis carried out by the Scottish Gamekeepers Association (2012) indicates that estate owners subsidise deer management activities (costs are higher than income) and state that "through deer activities and investment, owners are providing substantial financial support to remote rural economies. Certainly no public sector business could support such year on year

losses and such sustained financial commitment to the sector is extremely significant in an area like Sutherland.”

VENISON SALES

Based on the work of MacMillan et al. (2008), Putman (2012) estimates the annual value of venison sales is approximately £2 million (based on an average carcass weight of 40 kg priced at £1/kg). Processing of downstream products may be worth a further £8 million. Putnam (2012) also suggests that there may be an annual income to estates of approximately £40k from other carcass related products (such as antlers).

The Scottish Venison Partnership (2013) states that the UK venison market is growing by up to 20 per cent per annum and that Scotland currently produces in the region of 3,500 tonnes of venison, of which 3,450 tonnes come from wild deer. However, the Scottish Venison Partnership argue that Scotland’s share of the venison market is reducing because of a “static annual wild red deer cull and not having developed new deer farming enterprises on a scale to input significant volumes into this market.” (Scottish Venison Partnership, 2013). Analysis suggests that the increased demand for venison in the UK would merit an expansion of venison production by 1200 tonnes and because wild venison production does not have the capacity to provide this, there is a need to encourage farmers to take up deer farming to supply the shortfall. The Scottish Government is funding the development of demonstration deer farms to promote deer husbandry and marketing to interested farmers.

ECOLOGICAL IMPACTS

According to the Scottish Environment LINK Deer Task Force (2013a) deer grazing can have positive ecological impacts in some areas such as “maintaining open sward in both woodland and open habitats.” They also explain that in large parts of Scotland deer provide the only form of grazing and that “where grazing is required for habitat management, deer may prove more cost effective than reintroduction of domestic livestock. The importance of this service is likely to increase in the future.”

Maintaining open areas within forests and other habitats is an important management practice for a number of species. For example, the narrow-headed ant (*Formica exsecta*) along with all mound-building red wood ant species are threatened by “degradation of forest habitat and fragmentation as a result from increased forest cover caused by low levels of grazing, deer culling and encroachment by scrub and bracken.” The narrow-headed ant is a UK Biodiversity Action Plan Priority Species and is included on both the Scottish Biodiversity List and the UK Red Data Book (Question S4W-12482: Jamie McGrigor, Highlands and Islands, Scottish Conservative and Unionist Party, Date Lodged: 23/01/2013).

The LINK Deer Task Force (2013b) also summarise the negative ecological impacts that deer grazing can have:

- suppression of tree and shrub regeneration, leading to eventual loss of woodlands.
- eradication of tall herb, scrub and shrub communities and replacement with grasses.
- loss of species’ diversity in the ground layer of many habitats including woodland and species rich grassland.

- locally severe physical poaching by trampling of deer to mires, fens and flushes; increased rates of soil erosion, particularly on blanket mires; increased runoff rates; decreased water quality; and increased downstream flooding risk.
- loss of woodland grouse species through deer fence strikes erected to manage high deer populations and protect natural heritage assets from deer damage.
- habitat compartmentalisation and fragmentation resulting from the erection of deer enclosures.
- reduction of natural processes in woodlands, such as low level browsing and disturbance when deer are excluded by fencing.

They highlight a report produced by SNH in 1994 which made recommendations for tackling the ecological impacts of deer which LINK argue have not been acted upon:

In Red Deer and the Natural Heritage it is stated that “SNH has pressed for new legislation which acknowledges unequivocally that management for red deer populations for the protection and enhancement of the natural heritage is a legitimate and necessary provision, equal in weight, and not unrelated to, the need to protect agricultural and forestry interests”. This same report made a series of recommendations to better manage Scotland’s rising deer populations, yet many of these recommendations, including proposals to reduce the red deer population at that time by 100,000 animals have yet to be implemented. Indeed, in 2013 red deer and roe deer populations have risen and the natural heritage problems identified by SNH in 1994 have got even worse.

Whilst much emphasis is put on the impact of deer on natural environment, sheep inhabit the same range as deer and whilst their numbers have been reduced in many areas, their impacts must be taken into account when looking at the causes of grazing impact. Research by Albon et al (2007) showed that the presence of sheep was associated with the largest increase in grazing and trampling impact of all herbivores studied (including sheep, cattle, red deer and other mammals).

Natural mortality of deer is also part of the ecosystem and provides food for scavenger and predator populations.

Damage to designated sites

Deer can have an impact on designated sites such as Sites of Special Scientific Interest (SSSIs) and Special Areas of Conservation (SACs). Impacts range from heavy grazing pressure leading to plants not flowering, lack of woodland regeneration, and changes to woodland floor plant communities through grazing and browsing (SNH, undated). There are a total of 1881 designated sites in Scotland, although their boundaries sometimes overlap, which host a total of 5437 designated natural features. Information provided by SNH based on data from January 2013 indicates the condition of 2250 (42%) of Scotland’s assessed designated features that could potentially be impacted by deer (SNH 2013a). Of those 2250, 1894 (84.2%) features are considered to be in favourable or in recovering condition due to management. Of those 1894 designated features:

- 1423 (63.2%) have been assessed to be in favourable condition
- 226 (10%) are considered by SNH Area staff to be recovering due to management being agreed

- 245 (11%) have site condition monitoring (SCM) targets that are being met

The data provided by SNH (2013a) shows that 356 (15.8%) of the 2250 features that could potentially be impacted by deer are currently in unfavourable condition, and 146 (6.5%) which are currently in unfavourable condition and potentially being impacted by deer are on the “Delivering Favourable Condition” priority list. That means that management must be agreed to move the features into favourable or favourable recovering status in the next 3 years.

The SNH website has a [list](#) of sites with features in unfavourable condition either due to deer grazing, or deer grazing in combination with other herbivores.

WILDLIFE TOURISM

Wild deer are an important species for wildlife tourism in Scotland. Putnam (2012) estimates that revenue generated by enterprises offering deer watching activities is approximately £107,000-113,000 annually, based on work published in 2009.

SOCIAL BENEFITS

Putman (2012) highlights social benefits that are difficult to quantify such as deer management bringing transferable rural skills and a valuable knowledge base to the local community and wider social benefit such as local emergency response teams relying on support from professional rangers and stalkers.

CULTURAL BENEFITS

The Scottish Environment LINK deer task force (2013a) state that red and roe deer are an important part of the natural heritage and are “iconic mammals”; red deer are the celebrated “Monarchs of the Glen”. These deer may be considered to have cultural benefits in Scotland. An illustration of the cultural value of wild deer is the inclusion of the red deer as one of “Scotland’s Big 5” promoted and voted on as part of the 2013 Year of Natural Scotland celebrations. In public perception surveys conducted for SNH over the last four years ca 70% of respondents said that deer were the wildlife that they most associated with Scotland (SNH 2013a).

IMPACTS ON FORESTRY

Browsing and bark stripping by of wild deer on commercial forestry may reduce tree growth, kill a proportion of planted trees or reduce stem quality and value. Damage may also occur through bark stripping. In forestry systems which depend on natural regeneration, deer may have a substantial impact on seed reserves by preventing establishment and recruitment of new trees through browsing and also have negative impacts on rates of subsequent recruitment of trees. Putman (2012) suggests that deer management will always be a net cost for forest management in Scotland, although was unable to present a headline figure for the estimated total cost for damage to forestry caused by deer in Scotland due to the paucity and age of data available.

As an illustration of the costs involved in preventing damage by deer to forests Putman (2012, p 6) states that the “Forestry Commission Scotland currently manages approximately 660,000 ha

of forestry of which only 17% (105,600 ha) is native woodland. In 2009/10 the cost of forest protection in Scotland (predominantly deer management) was £10.5m with an income of £1.1m (Forestry Commission Annual Report 2009/10). This gives a net cost of £9.4m.”

In response to a recent PQ the government stated that “no figures are available for the overall cost of deer damage to the forestry sector, however surveys on the national forest estate indicate that 15-20% of young trees have suffered some deer damage.”(Scottish Parliament 2013d)

The Scottish Environment LINK Deer Task Force (2013a) point to “a growing body of scientific evidence from England to [also] support the case that excessive deer browsing in native woodlands (particularly where muntjac are present), can reduce tree and shrub diversity, with impacts on the populations of some declining bird species (e.g. willow tit, wood warbler).” However, there is little evidence from Scotland that muntjac deer are present in any numbers to date.

IMPACTS TO AGRICULTURE

There is some concern that deer may impact on agriculture and commercial horticulture (Forest Research, 2009). Putman (2012) found there are very few data available on the actual impacts of deer on agriculture in Scotland, but that some studies from England provide an illustration of the likely impacts. Putman argues that damage may be caused to arable crops and roots crops, but impacts may also be on grass crops grown for hay or silage. Roe deer may also damage orchards and soft fruit crops, which may be of high value at a farm level. In response to a recent parliamentary question the Scottish Government stated that there are no figures for the overall cost of deer damage to agricultural production in Scotland (Scottish Parliament 2013c). Putman (2012, citing Wilson, 2003b, p9) concludes that in England “deer might be responsible for actual damage to the level of £4.3 million per year, with £1 million each in east and southwest England” but does add that it is “difficult to extract from this possible damage costs specific to Scotland”.

ROAD SAFETY

Traffic accidents involving deer or Deer Vehicle Collisions (DVCs) have been highlighted as a growing problem in Scotland for many years. With reported increases in both the numbers and distribution of several deer species in Scotland, combined with a continuing rise in traffic volumes, it seems likely that this problem is likely to continue to grow.

Dandy et al (2009) have stated that road-traffic accidents involving wild deer are widely considered to be one of the most important negative interactions between deer and people. ‘Deer-vehicle collisions’, can result in significant damage to vehicles, high repair costs, injury or death of deer and, in some instances, injury or death of vehicle drivers and passengers.

The Deer Commission for Scotland (DCS) and subsequently Scottish Natural Heritage (SNH) have undertaken research into the frequency of DVCs from 2003 to date with data available for analysis up to December 2012. The purpose of this research has been to:

- Build a database of DVCs in Scotland
- Assess the distribution and scale of the issue
- Identify potential blackspots

In addition they have looked in some depth at several locations to examine and better understand the contributing factors and potential options for mitigation. The potential solutions

range from increasing driver awareness, influencing driver behaviour, improving and managing roadside vegetation through to fencing and targeted deer reduction where required.

In summary, SNH research has estimated that there are likely to be in the region of 7,000 – 10,000 DVCs in Scotland each year. Out of these, there are on average 65 recorded incidents involving human injury each year, the cost of which is estimated to be in the order of £5 million per annum (SNH 2013a).

DEER IN URBAN AREAS

Recent research suggests that the expansion of wild deer (especially Roe deer) into urban areas has the potential to increase the volume and range of impact of wild deer. Dandy et al (2009) found a number of positive and negative people-deer interactions in the peri-urban environment. There are set out in Table 5 below.

Many of the interactions are similar to those associated with rural deer. The cultural value of deer relates to importance of deer as a symbol of Scotland and Scottish national identity. Ecological services relate to activities such as browsing, disturbance, and seed dispersal, which it is argued may be particularly important in a fragmented habitat lacking other herbivores and large mammals. This research also highlights the link between wild deer populations and the maintenance of tick populations, arguing that there is widespread concern regarding the transmission of tick-borne diseases such as Lyme disease – both to humans and other animals.

The issues around urban deer are outlined in Table 5 but of particular importance is damage to gardens, community woodlands and the public safety issues around poaching (firearms in public areas and welfare of deer shot or trapped illegally in urban areas).

Table 5 - Key people-deer interaction in the peri-urban environment

Positive Interactions	Negative interactions
<ul style="list-style-type: none"> • Cultural value • Ecological services • Seeing deer (aesthetic value) • Economic value through recreational stalking • Economic value as a tourist attraction • Venison consumption 	<ul style="list-style-type: none"> • Agricultural and commercial horticultural damage • Economic damage to woodlands • Damage to the woodland natural heritage • Private garden damage • Road-traffic accidents • Acts of cruelty towards deer • Disease transmission • Damage to publically important sites such as parks, golf courses, graveyards

Source: Dandy et al (2009, p13)

SOURCES

Albon, S.D.; Brewer, M.J.; Nolan, A.J.; Cope, D., (2007) *Quantifying the grazing impacts associated with different herbivores on rangelands*, Journal of Applied Ecology, 44, 1176-1187.

Association of Deer Management Groups. *Deer Management Groups*. Available at: <http://www.deer-management.co.uk/dmgs/deer-management-groups/> [Accessed 7 November 2013].

Association of Deer Management Groups. *Lowland Deer Network for Scotland*. Available at: <http://www.deer-management.co.uk/ldns/> [Accessed 7 November 2013].

Best Practice Guides: Available at: <http://www.bestpracticeguides.org.uk/> [Accessed 7 November 2013].

Clutton-Brock, T.H., Coulson, T., & Milner, J.M. (2004) *Red deer stocks in the Highlands of Scotland*. Nature, 429 261-262.

Dandy, N., bllantyne, S., Moseley, D., Gill, R.,and Quine, C (2009) *The management of roe deer in peri-urban Scotland*, Forest Research. Available at: [http://www.forestry.gov.uk/pdf/Management_of_roe_deer_in_peri-urban_Scotland_final_report_May_2009.pdf/\\$FILE/Management_of_roe_deer_in_peri-urban_Scotland_final_report_May_2009.pdf](http://www.forestry.gov.uk/pdf/Management_of_roe_deer_in_peri-urban_Scotland_final_report_May_2009.pdf/$FILE/Management_of_roe_deer_in_peri-urban_Scotland_final_report_May_2009.pdf) [Accessed 7 November 2013].

Deer (Scotland) Act 1959 (c.40).

Deer (Scotland) Act 1996 (c. 44)

Deer Commission for Scotland. (2000). *Wild deer in Scotland: A long-term vision*. Available at: <http://www.dcs.gov.uk/downloads/Vision%20Statement.pdf> [Accessed 7 November 2013].

Deer Commission for Scotland, Forestry Commission Scotland and Scottish Natural Heritage. (2008) *Scotland's Wild Deer a National Approach*. Available at: <http://www.snh.gov.uk/docs/C249895.pdf> [Accessed 7 November 2013].

Deer Management Qualifications. Available at: <http://www.dmq.org.uk/> [Accessed 7 November 2013].

DeGabriel JL, Albon SD, Fielding DA, Riach DJ, Westaway S, Irvine RJ, (2011) *Sheep removal leads to greater impacts by deer on heather and reductions in plant diversity*, Journal of Applied Ecology, vol. 48, pp 1269-1277

Isle of Rum Red Deer Project. Available at: <http://rumdeer.biology.ed.ac.uk/> [Accessed 7 November 2013].

John Muir Trust. (2013) *Personal Communication*. [Unpublished].

Putman, R. (2012). *Scoping the economic benefits and costs of wild deer and their management in Scotland*. Scottish Natural Heritage Commissioned Report No. 526. http://www.snh.org.uk/pdfs/publications/commissioned_reports/526.pdf [Accessed 7 November 2013].

Public and Corporate Economic Consultants (PACEC, 2006) *The Contribution of Deer Management to the Scottish Economy*. PACEC: London.

Scottish Agricultural College. (2008) *Farming's Retreat from the Hills*. Available at: http://www.sruc.ac.uk/downloads/file/28/farming_s_retreat_from_the_hills-full_report [Accessed 7 November 2013].

Scottish Environment LINK Deer Task Force (2013a) *Context and Policy Statement on Deer Management in Scotland*. Available at: <http://www.scotlink.org/files/policy/PositionPapers/LINKDeerTFPolicyAug13FINAL.pdf> [Accessed 7 November 2013].

Scottish Environment LINK Deer Task Force. (2013b) *Evidence to the RACCE Committee of the Scottish Parliament*. Available at: <http://www.scotlink.org/files/policy/ConsultationResponses/LINKDeerTFEvidenceOct13.pdf> [Accessed 7 November 2013].

Scottish Gamekeepers Association (2012) *The economic importance of red deer to Scotland's rural economy and the political threat now facing the country's iconic species*. Available at: <http://www.scottishgamekeepers.co.uk/content/online-version-deer-study-published-march-2012> [Accessed 7 November 2013].

Scottish Natural Heritage (2011) *Code of Practice on Deer Management*. Available at: <http://www.snh.gov.uk/docs/B949709.pdf> [Accessed 7 November 2013].

Scottish Natural Heritage. (2013a) *Personal Communication*. [Unpublished].

Scottish Natural Heritage. (2013b) *Scotland's Wild Deer a National Approach: Action Plan 2013-16 and Report 2012/13*. Available at: <http://www.snh.gov.uk/docs/A975182.pdf> [Accessed 7 November 2013].

Scottish Natural Heritage (undated) *Condition of Designated Sites*. Available at: <http://www.snh.gov.uk/docs/B686627.pdf> [Accessed 7 November 2013].

Scottish Parliament. (2013a) *Daily Written Answers Wednesday 25 September 2013, S4W-17127*. Available at: http://www.scottish.parliament.uk/S4_ChamberDesk/WA20130925.pdf [Accessed 7 November 2013].

Scottish Parliament. (2013b) *Daily Written Answers Wednesday 2 October 2013, S4W-17132*. Available at: http://www.scottish.parliament.uk/S4_ChamberDesk/WA20131002.pdf [Accessed 7 November 2013].

Scottish Parliament. (2013c) *Daily Written Answers Wednesday 25 September 2013, S4W-17130*. Available at: http://www.scottish.parliament.uk/S4_ChamberDesk/WA20130925.pdf [Accessed 7 November 2013].

Scottish Parliament. (2013d) *Daily Written Answers Wednesday 25 September 2013, S4W-17137*. Available at: http://www.scottish.parliament.uk/S4_ChamberDesk/WA20130925.pdf [Accessed 7 November 2013].

Scottish Parliament. (2013e). *Daily Written Answers Wednesday 25 September 2013, S4W-17128*. Available at: http://www.scottish.parliament.uk/S4_ChamberDesk/WA20130925.pdf [Accessed 7 November 2013].

Scottish Parliament Rural Affairs and Environment Committee. (2009a) *Official Report 21st meeting 2009, Session 3, 16 September 2009*. Edinburgh: Scottish Parliament. Available at:

<http://www.scottish.parliament.uk/s3/committees/rae/or-09/ru09-2102.htm#Col1923> [Accessed 7 November 2013].

Scottish Venison Partnership, (2013) *News: Skills Development Scheme funding a welcome boost for Scottish venison sector*, September 2013. Available at: <http://www.scottish-venison.info/index.php?page=news-2> [Accessed 7 November 2013].

Waber, K. Spencer, J. & Dolman, P. (2012) *Achieving Landscape-Scale Deer Management for Biodiversity Conservation: The Need to Consider Sources and Sinks*. *Journal of Wildlife Management*. Volume 77, Issue 4, pp 726-36.

Wildlife and Natural Environment (Scotland) Act 2011 (asp 6).



SPICe

The Information Centre

Scottish Parliament Information Centre (SPICe) Briefings are compiled for the benefit of the Members of the Parliament and their personal staff. Authors are available to discuss the contents of these papers with MSPs and their staff who should contact Tom Edwards on extension 85198 or Wendy Kenyon on extension 85379 or email tom.edwards@scottish.parliament.uk or wendy.kenyon@scottish.parliament.uk. Members of the public or external organisations may comment on this briefing by emailing us at SPICe@scottish.parliament.uk. However, researchers are unable to enter into personal discussion in relation to SPICe Briefing Papers. If you have any general questions about the work of the Parliament you can email the Parliament's Public Information Service at sp.info@scottish.parliament.uk.

Every effort is made to ensure that the information contained in SPICe briefings is correct at the time of publication. Readers should be aware however that briefings are not necessarily updated or otherwise amended to reflect subsequent changes.

www.scottish.parliament.uk