Appendices

Environmental Baseline for the Strategic Environmental Assessment (SEA)

of the Joint Agency

Draft Strategy for Wild Deer in Scotland

November 2007

Appendix 1:

Summary of Consultation Authority Scoping Report Responses

Appendix 1: Responses to the Scoping Report

Note: This table summarises the main points made by the three Consultation Authorities on the SEA Scoping Report, then, details how they have been taken into account in developing the approach to the SEA process.

Summary of Response or Recommended Changes from the three Consultation Authorities	How the approach to the SEA has taken on board responses
Scottish Environmental Protection Agency (SEPA)	
General comments	
Suggest to be clearer about what part of the strategy will be assessed and what level of detail will apply e.g. specific location where deer management is a significant issue or land management activity.	Clarified in Environmental Report.
Section 3 - Background to Strategy	
Suggest more comment on how PPS are relevant to the strategy. Add cross border RBMP document.	Included summary descriptions of most relevant PPS in the Environmental Report - table 4.4a.
Section 7 - Issues	
Question whether effects on air are likely to be significant.	Effects on air were found not to be signficant.
Section 8 - Methodology	
Suggest amending figure 8.1 of the scoping report, which depicts key stages in development of the strategy and the SEA, to make the interaction of SEA clearer.	Amended and included in the Environmental Report.
Section 8 - Methodology	
Suggest reconsidering some of the high level objectives which the strategy has very little influence over (e.g. reduce traffic volumes) and make them more meaningful to the strategy.	Reviewed SEA objectives and amended where relevant.
Section 8 - Methodology	
Emphasise the need to clearly set out alternative scenarios and their environmental consequences.	Accepted.
Section 9 - Monitoring	
Emphasise need to consider a summary of actions (with leads and timescales) to be taken to mitigate any adverse effects that may arise.	Considered and incorporated where relevant. Strategy Actions are set at high strategic level therefore do not have leads and timescales set. Detailed mitigation measures will be set at operational level plans. Recommended actions for mitigation measures aim to inform approach to lower level mitigation measures.
Historic Scotland (HS)	
General Comments	
Suggest additional relevant PPS: Scottish Historic Environment Policy 1: Scotland's Historic Environment, 2007	Accepted and included.
Q11. Are there other issues you think should be considered in developing the strategy?	
Suggest including Scheduled Ancient Monuments (SAMs) as a separate category.	Considered SAMs in baseline and assessment of effects where relevant.
Noted that HS is currently preparing a policy for the protection of battlefields in Scotland, which includes proposals to create a battlefields inventory.	Noted in the Environmental Report
Suggest including World Heritage Sites as part of baseline	Accepted and included.
Noted that in the future HS is likely to request that historic landscapes are taken into consideration. Historic Land-Use Assessment (HLA) can add information on the historic dimension of landscape character assessment.	Noted in the Environmental Report.
Emphasised that historic environment issues should be considered as part of any integrated approach to land management.	Accepted and noted in the Environmental Report.
Q12. Do you have suggestions for further issues to be considered in the assessment of the effects of the strategy on the environment, society and the economy?	
Suggested additional issue: The effects of fencing and tree guards which have the potential to damage archaeological sites and affect the setting of scheduled ancient monuments or wider historic landscapes.	Accepted and included.
Suggested additional key issue: The continued survival of the many archaeological sites is linked to an appropriate level of grazing. Deer grazing can contribute to the management of archaeological sites by helping to keep them free from natural regeneration, however, excessive grazing may cause damage through trampling.	Accepted and included.
Q13. Do you have any comments on the proposed methodology for developing the strategy?	
Mentioned that HS is currently advising RAs to provide details of impacts rather than merely recording' negative impacts'-	Noted and detailed where possible.
Emphasised the need to describe any changes made to the strategy as a result of the environmental assessment, and to clearly set out any expectations/recommendations for lower level plans or projects.	Considered and incorporated where relevant.
Emphasised need to identify who will be responsible for ensuring that the mitigation measures are taken forward	Considered and noted. DCS will have co-ordinating role for implementing the strategy and monitoring framework. A number of parties will be responsible for mitigation at a practical level.
Q14. Do you have any comments on the proposed methodology for carrying out the SEA?	
Suggested amendment to SEA objective: 'conserve archaeological sites and their settings…'	Accepted and amended.
Suggested additional SEA objective: Protect the landscape/townscape setting of historic environment features such as battlefields or areas with recognised historic value e.g. Conservation Areas.	Accepted and included.
Q19. Do you have any suggestions of key aspects/indicators to monitor to ensure effective delivery/early warning of potential negative effects?	
Noted that the key aspect that should be monitored is the effect of deer management activities on archaeological sites and their settings.	Considered and included in monitoring recommendations.
Suggested that at strategic level, might be appropriate to monitor the degree of integration of historic environment issues into lower level management plans, rather than the baseline data, with the expectation that baseline data may be gathered through plans lower in the hierarchy.	Considered and included in monitoring recommendations.
Scottish Natural Heritage (SNH)	

Suggested additional consultees	
The Local Enterprise Companies	Noted and recommended to DCS.
UHI policy web	Noted and recommended to DCS.
Scottish Council Voluntary organisations	Noted and recommended to DCS.
1. Context for Strategy	
Suggested additional changes to context since 2000	Considered and recommended to DCS. Considered in the No Strategy Vs. New Strategy scenarios.
Suggested describing the inter-relationships between relevant PPSs and the draft Strategy and assessing the role that the Joint Agency Deer Strategy will play in these plans and strategies and vice versa.	Basic description of PPSs considered sufficient.
Suggested further relevant PPS including: • Enjoying the Outdoors – SNH policy statement http://www.snh.org.uk/strategy/pd-review_rp.asp • Landscape Policy Framework (SNH 2005) and the work on economic benefits in development thought the Scottish Landscape Forum (2006). • Natural Heritage Futures. • References to relevant NPPGs and PANs.	Considered and included.
2. Relevant Baseline Information	
Suggested including the environmental characteristics of the geographic area to be covered by the Strategy in the ER.	Included in Environmental Report and Appendices
Noted that the inclusion of the effects on deer welfare, while a valid part of the DCS remit and Strategy, does not sit neatly within the SEA assessment process.	Excluded.
2. Relevant Baseline Information - additional data sets	
Suggested additional baseline information including: - New Native Woodland Survey for Scotland is being developed by FCS - Scottish Recreation Survey - useful to collate information about the number of people participating in hill walking and climbing activities, and perhaps also information about major outdoor events such as the Wateraid Munro Challenge -appropriate to provide information about the prevalence and appropriateness of deer stalking signage for the public, though information sources on this topic are less obvious. - Some general information about problems encountered by access takers is available from the Scottish Recreation Survey	Considered and incorporated where relevant.
3. Scoping in and out of issues to be considered	
Suggested clarifying which issues the Environmental Report will explore in more detail, their relationship to the developing Strategy and their inter-relationships.	Clarified in Environmental Report.
Suggested re-classifying the Biodiversity, Flora and Fauna issues as their organisation was confusing.	Considered and clarified.
Mentioned that should explore opportunities for enhancement across a broad range of issues in the consideration of alternatives.	Accepted.
Noted that care is required to ensure the appropriate Natura tests are applied: impacts are either significant or not and then adverse or not; there is not an option for minimising adverse impacts.	Noted.
Noted that the inclusion of the effects on deer welfare, while a valid part of the DCS remit and Strategy, does not sit neatly within the SEA assessment process.	Excluded.
Suggested an additional issue: The effect of the policy on non-native deer on the genetic composition of native deer and the consequences for habitat impacts.	Accepted and included.
Suggested an additional issue under Access: The effect of communications strategies to promote responsible access provision and behaviour.	Considered and incorporated where relevant.
Suggested an additional issue under Soil: including the role of deer in providing carrion and dung.	Considered and included.
Suggested an additional issue under Material Assets: something to do with the recognition of the professional standards of deer managers and the relationship with a the demand for careers in land management.	Considered and incorporated where relevant.
Suggested an additional issue under Landscape: The effects of hill and ATV tracks for managing deer on the landscape.	Accepted and included.
4. Identifying reasonable alternatives	
Suggested the inclusion of a number of alternative challenging scenarios including: • The use of regulation as opposed to incentives with respect to; the longevity of solutions to grazing and trampling impacts on the natural heritage; to the risk of deterioration and the cost to the public purse. • Potential effects of changes in legislation versus the status quo. • The energy implications of deer management options in relation to the associated impacts and staff/time efficiencies; particularly with reference to the use of helicopters. • Minimising disturbance to high altitude blanket bog whilst managing deer impacts and promoting responsible outdoor access. • The challenge of balancing public and private interests are referred to, this could perhaps be expanded to highlight the potential conflicts posed by managing for native woodlands, landscape and wildland objectives alongside sport shooting at a landscape scale, particularly with regard to the use of deer fencing.	Considered and incorporated where relevant
5. Intended approach to the assessment	
Suggest compiling a distillation of objectives of the SEA which can be used to consider the environmental performance of the plan through its lifetime.	Headline SEA objective considered sufficient to structure recommendations for monitoring.
Suggested additional SEA objectives including: • Reduce diffuse impacts of deer on natural heritage interests (not just HAPs and SAPs?) • Under access: - increase opportunities for outdoor recreation and the quality of the experience? • Minimise conflict between land managers and recreational interests	Considered and incorporated where relevant.

Appendix 2:

Full list of plans, programmes & strategies considered

Appendix 2: Plans, programmes and strategies (PPSs) relevant to the Strategy for Wild Deer

Note: This is a table of all the relevant plans, programmes and strategies that were considered as part of the SEA process. Those of most relevance are highlighted in bold and described either in the Environmental Report at table 4.4a or in the strategy document in Annex 3 as indicated.

Geographic scale at which PPS is implemented	Title of Plan, Programme, Strategy, Policy, or Legislation	Comments
SEA Topic:	**General (cross-cutting themes)**	
National (UK)	Securing the Future: the UK Government Sustainable Development Strateg	
National (Scotland)	**Choosing our Future Scotland's Sustainable Development Strategy**	*Description in Strategy annex No.3*
National (Scotland)	**Framework for Economic Development in Scotland**	*Description in Strategy annex No.3*
National (Scotland)	Rural Development Regulation (EC) No. 1257/1999 – Rural Development Plan for Scotland (amended February 2005)	
National (Scotland)	**Rural Development Plan for Scotland**	*Description in Strategy annex No.3*
National (Scotland)	Rural Development Programme 2007 - 2013	
Regional - National Park	Cairngorms National Park Plan 2007	
Regional - National Park	Loch Lomond & The Trossachs National Park Authority National Park Plan 2007	
National (Scotland)	**Land Reform (Scotland) Act 2003**	*Description in Environmental Report Table 4.4a*
National (Scotland)	**Nature Conservation (Scotland) Act (2004)**	*Description in Environmental Report Table 4.4a*
SEA Topic:	**Climate Factors**	
National (Scotland)	**Changing Our Ways: Scotland's Climate Change Programme**	*Description in Strategy annex No.3*
National (Scotland)	Climate Change Mitigation Strategy for Scotland	
National (Scotland)	**Potential Adaptation Strategies for Climate Change in Scotland**	*Description in Environmental Report Table 4.4a*
National (Scotland)	Scottish Climate Change Programme (SE/2000/208)	
National (UK)	**Draft Climate Change Bill (2007)**	*Description in Environmental Report Table 4.4a*
SEA Topic:	**Soil**	
European Union	**Thematic Strategy for Soil Protection**	*Description in Environmental Report Table 4.4a*
National (Scotland)	**A Forward Strategy for Scottish Agriculture**	*Description in Strategy annex No.3*
National (Scotland)	A Forward Strategy for Scottish Agriculture: Next Steps	
SEA Topic:	**Population and Human Health**	
National (Scotland)	**Improving Health in Scotland - The Challenge**	*Description in Strategy annex No.3*
National (Scotland)	**Towards a Healthier Scotland - A white paper on Health**	*Description in Environmental Report Table 4.4a*
National (Scotland)	Our National Health (ONH): a plan for action, a plan for change	
SEA Topic:	**Water**	
National (UK)	**Directing the flow: Priorities for future water policy**	*Description in Environmental Report Table 4.4a*
National (Scotland)	**Groundwater Protection Policy for Scotland (SEPA Policy No.19)**	*Description in Environmental Report Table 4.4a*
National (Scotland)	**River Basin Planning Strategy for the Scotland River Basin District**	*Description in Environmental Report Table 4.4a*
National (Scotland)	**A Strategic Framework for Scottish Aquaculture**	*Description in Strategy annex No.3*
National (Scotland)	**Flood Risk Assessment Strategy (SEPA Policy No.22)**	*Description in Environmental Report Table 4.4a*
SEA Topic:	**Biodiversity, flora and fauna**	
International	**Ramsar Convention on Wetlands 1971**	*Description in Environmental Report Table 4.4a*
European Union	**Conservation of Natural Habitats of Wild Fauna and Flora (1992)**	*Description in Environmental Report Table 4.4a*
European Union	**Conservation of Wild Birds Directive (1979)**	*Description in Environmental Report Table 4.4a*
UK-wide	The UK Forestry Standard: The Government's Approach to Sustainable Forestry	
UK-wide	**UK Biodiversity Action Plan**	*Description in Strategy annex No.3*
National (Scotland)	**Scotland's Biodiversity: it's in your hands - a strategy for the conservation and enhancement of biodiversity in Scotland.**	*Description in Strategy annex No.3*
National (Scotland)	Scotland's Biodiversity: It's In Your Hands – Strategy Implementation Plans 2005 – 2007	
National (Scotland)	**Scottish Forestry Strategy**	*Description in Strategy annex No.3*
National (Scotland)	**Strategy for Implementing Actions under the UK Biodiversity Action Plan (SEPA Policy No.21)**	*Description in Environmental Report Table 4.4a*
National (Scotland)	**Regional Biodiversity Plans (18 in total across Scotland)**	*Description in Environmental Report Table 4.4a*
National (Scotland)	A Five Year Species Action Framework	
National (Scotland)	Protection of Wild Mammals (Scotland) Act 2002	
National (Scotland)	**Nature Conservation (Scotland) Act (2004)**	*Description in Environmental Report Table 4.4a*
National (Scotland)	**Natural Heritage Futures, SNH**	*Description in Environmental Report Table 4.4a*
National (Scotland)	Enjoying the Outdoors, SNH	
SEA Topic:	**Air and Transport**	
National (UK)	The Future of Transport: a network for 2030	
National (UK)	The Air Quality Strategy for England, Scotland, Wales and Northern Ireland	
National (Scotland)	**National Transport Strategy**	*Description in Strategy annex No.3*
SEA Topic:	**Landscape**	
National (Scotland)	**Land Reform (Scotland) Act 2003**	*Description in Environmental Report Table 4.4a*
National (Scotland)	**National Trust for Scotland and SNH Countryside Management Strategy**	*Description in Environmental Report Table 4.4a*
National (Scotland)	Rural Scotland: A New Approach	
National (Scotland)	Rural Scotland: Taking Stock	
National (Scotland)	**Landscape Policy Framework, SNH (2005)**	*Description in Environmental Report Table 4.4a*
SEA Topic:	**Cultural Heritage**	
National (Scotland)	**Passed to the Future: Historic Scotland's Policy for the Sustainable Management of the Historic Environment**	*Description in Strategy annex No.3*
National (Scotland)	Scotland's National Cultural Strategy 'Creating our future…Minding our past	
National (Scotland)	**Scottish Historic Environment Policy 1: Scotland's Historic Environment**	*Description in Environmental Report Table 4.4a*
SEA Topic:	**Materials Assets**	
National (Scotland)	**A Smart, Successful Scotland: Ambitions for the Enterprise Networks**	*Description in Strategy annex No.3*
National (Scotland)	**Tourism Framework for Action 2002:2005**	*Description in Environmental Report Table 4.4a*
National (Scotland)	**Environment Act 1995 - Schedule 16 Prohibition Notices and Discharges Exempt from Consent (SEPA Policy No.1)**	*Description in Strategy annex No.3*

Appendix 3:

Environmental baseline information

Appendix 3: Baseline Data

1 Scotland's Environment 3
2 SEA Topic: Biodiversity, Habitats, Flora and Fauna 3
2.1 Habitats 3
2.2 Protected Species 6
2.3 Deer 8
2.4 Designated Sites 10
3 SEA Topic: Population & Health 13
3.1 Road & sport shooting accidents 13
3.2 Recreation & Access 14
3.3 Disease transmission 15
3.4 Venison quality 15
4 SEA Topic: Water 17
4.1 Freshwater bodies 17
4.2 Water quality 17
4.3 Flooding 18
5 SEA Topic: Soil 20
5.1 Soil Resources (including agricultural soils, quality, stability & erosion) 20
6 SEA Topic: Air (including transport) 23
6.1 Air quality 23
7 SEA Topic: Climate Factors (including energy) 24
7.1 Temperature & rainfall records 24
7.2 Greenhouse gas (GHG) emissions by sector 24
7.3 Carbon sinks 26
7.4 Species & habitats likely to thrive or be vulnerable to climate change 27
7.5 Impacts of climate change on insects & disease (e.g. ticks) 28
8 SEA Topic: Material Assets 29
8.1 Plantation / forest & agricultural resources 29
8.2 Tourism resources 30
8.3 Deer resources 32
8.4 Employment in deer sector 33
8.5 Deer sector waste 33
9 SEA Topic: Cultural Heritage 34
9.1 Historic Environment features 34
10 SEA Topic: Landscape 36
10.1 Land use & land use change 36
10.2 Landscape designations 38
10.3 Sporting estates 39

Figure 2.1.a: Status of UKBAP Habitats 2005 4
Figure 2.1.b: Broad Habitat Change 1990-1998 5

Figure 2.1.c: Geographical pattern of change in semi-natural habitats..... 6
Figure 2.2.a: Status of UKBAP Species 2005 7
Figure 2.4.a: Designated Areas - 1991-2007 11
Figure 2.4.b: Natura 2000 Sites, SACs, SPAs & Ramsar sites and national inventory of woodland and trees 12
Figure 4.2.a: Length of poor and seriously polluted rivers in Scotland 1999-2006 ... 18
Figure 7.2.a: Contribution of each sector to Scottish GHG emission in 2003..... 25
Figure 7.2.b: Changes in GHG emission in Scotland 1990-2003 26
Figure 8.1.a: Net change in the woodland area in Scotland between 1940 and 1980. 30
Figure 10.1.a: The land cover of Scotland, 1988 37

Table 2.2.a: Groups adversely affected by deer..... 7
Table 2.3.a: Estimated Number of Wild Deer in Scotland 8
Table 2.3.b: Cull and venison returns for all species of deer in Scotland between 2003 and 2006 9
Table 2.3.c: Compound expansion rate of deer ranges in the UK in 10km squares between 1972 and 2002..... 9
Table 2.4.a: Selected Designated Sites in Scotland..... 10
Table 2.4.b: Proportion of features assessed as favourable or unfavourable recovering 11
Table 5.1.a: Regional extent of erosion in upland Scotland..... 21
Table 8.2.a: Activities undertaken by tourists in Scotland, 2005 31
Table 10.2.a: Designated Areas, 2005..... 38

1 Scotland's Environment

For its size, Scotland has the most varied geology and natural landscapes of any country on the planet (SNH, 2002). Its varied upland, lowland and island landscapes include habitats and species of significant conservation value.

In the past few decades, many aspects of Scotland's natural heritage, including its diversity, condition and the way in which it is exploited, have changed substantially (SNH, 2001). The current status, past trends and key environmental issues of the Scottish environment are considered below under the main topics identified in the Environmental Assessment (Scotland) Act (2005), and those relevant to the Management Strategy for Wild Deer.

The following sections are structured around the nine SEA topics listed below.

1. Biodiversity, Habitats, Flora and Fauna
2. Population and Human Health
3. Water
4. Soil
5. Air (including Transport)
6. Climate Factors (including Energy)
7. Material Assets (including Waste and Resource Management)
8. Cultural Heritage
9. Landscape

2 SEA Topic: Biodiversity, Habitats, Flora and Fauna

Deer are an important part of Scotland's biodiversity and can have both positive and negative effects on habitats and other species. Biodiversity aspects relevant to the Strategy include the status of Scotland's diverse habitats and species, deer populations, and designated sites.

2.1 Habitats

Current situation

Scotland has a high proportion of semi-natural habitats covering over 50% of the land area. Action plans had been developed for 45 habitats in the UK. Of these, 41 BAP priority habitats occur in, or have recently been lost from Scotland. As of 2005, 33% of these habitats were considered stable or increasing, while 29% were in decline (see figure 2.1a).[1]

[1] Scottish Environment statistics Online (October, 2007)
http://www.scotland.gov.uk/Topics/Statistics/Browse/Environment/seso

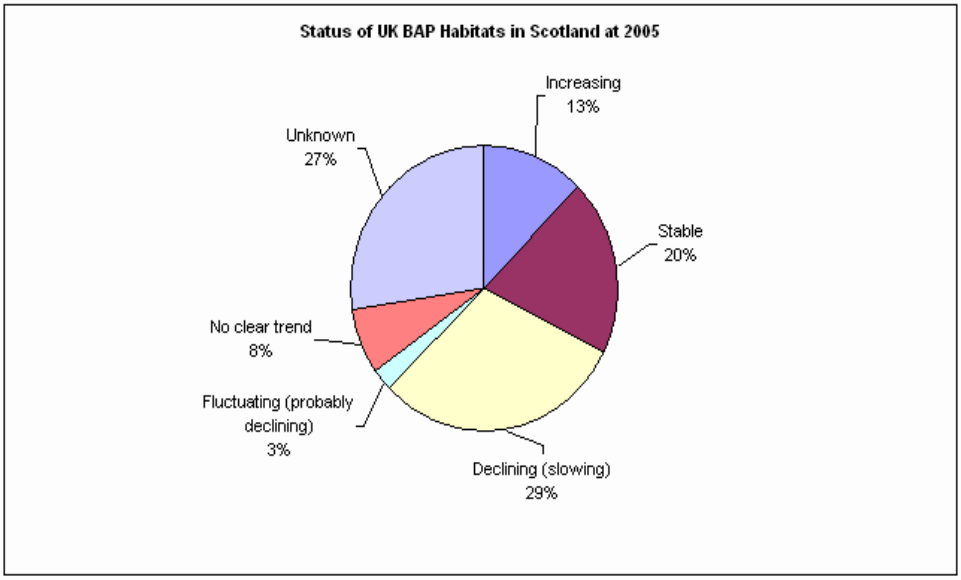

Figure 2.1.a: Status of UKBAP Habitats 2005
(Source: Scottish Environment Statistics Online, 2007)

Past & possible future trends

Figure 2.1.b highlights changes in the major broad habitats of Scotland between 1990 and 1998. The greatest change in this period was the loss of semi-natural (grasslands, bogs and bracken) habitats, which declined by nearly 900,000 hectares, or 2%. However, while some habitats within the broad habitat type decreased, such as dwarf shrubs and grassland, there was a 20% increase in fens, marshes and swamps. Woodland, developed habitats and land used for intensive agriculture all increased by 2.4% (323, 000 hectares), 12% (194,000 hectares) and 2.2% (367,000 hectares) respectively. Broad leaved, mixed and yew woodland decreased across Scotland by 9% due to expansion of mainly grassland.[2] Figure 2.1.c highlights geographical pattern of change in semi-natural habitats

[2] Natural Heritage Trends Scotland (2001)

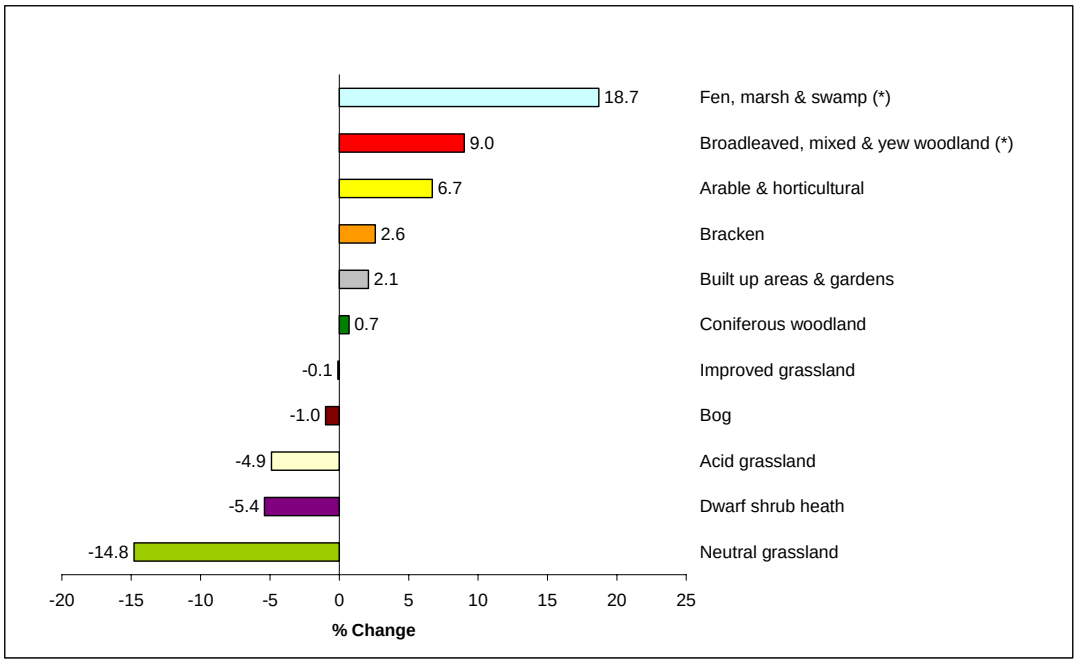

Figure 2.1.b: Broad Habitat Change 1990-1998
(Source: Scottish Natural Heritage, 2007)

Key issues

1. The negative effects of deer on habitats

   Deer can impact habitats in a number of ways as a result of their grazing, browsing (removal of foliage and shoots from woody plants), bark stripping, trampling and dunging. The potential effects of increasing intensity of deer presence are:

   - Prevention of tree and shrub regeneration
   - Increased rates of soil erosion and slower re- vegetation after erosion
   - Conversion of dwarf-shrub vegetation (e.g. heather moorland) to grassland
   - Replacement of moss cover by grasses in montane moss heaths
   - Poaching of flushes and bogs by trampling
   - Loss of tall herb communities
   - Increase in moss cover coupled with loss of herb species in species-rich grassland

2. The negative effects of deer on native woodland

3. The negative effects of deer fencing on habitats

   Deer fencing can change grazing and trampling pressure (either increasing or decreasing) on areas either side of the fence. This is of particular concern when the biodiversity interests affected have been formally recognised at the international and national level through SACs, SPAs, SSSIs, BAPs and Ramsar sites. The ecological/ conservation value of many sites is linked to an appropriate level of grazing and browsing. Increased grazing and trampling can cause loss of habitats and erosion while

reduced grazing pressure can result in a build up of dead and decaying vegetation and increase tree regeneration to the detriment of other habitats[3].

4. Managing deer as part of an ecosystem-scale context rather a species-specific context

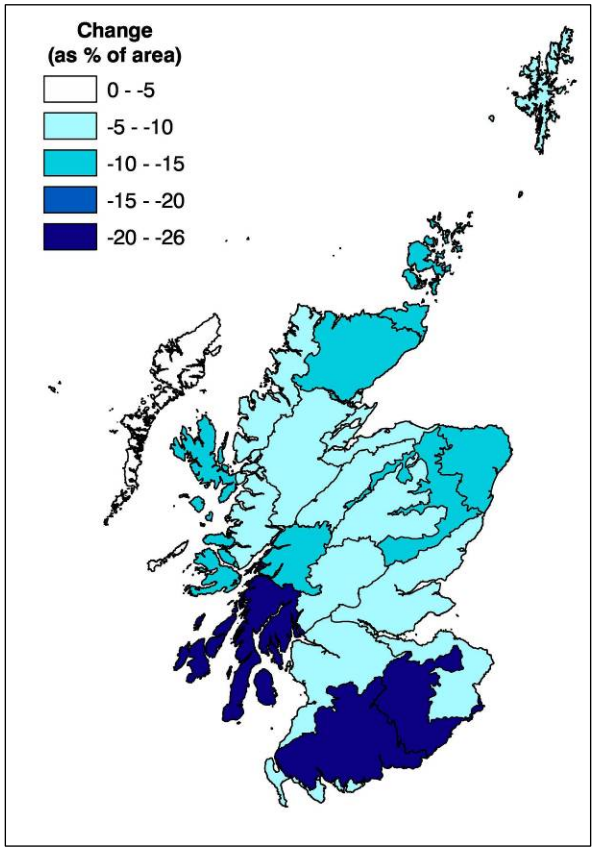

Figure 2.1.c: Geographical pattern of change in semi-natural habitats
(Source: Scottish Natural Heritage, 2007)

2.2 Protected Species

Current situation

Action plans have been developed for 391 species in the UK. Of these, 261 species either occur in, or have recently been lost from Scotland. As of 2005, 32% of the species for which action plans had been developed were stable or increasing, while 14% were in decline (see Figure 2.2.a). All 16 species that are listed as 'lost' are believed to have had that status before the implementation of the UKBAP programme.

[3] Hunt, J F. Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland (August 2003)

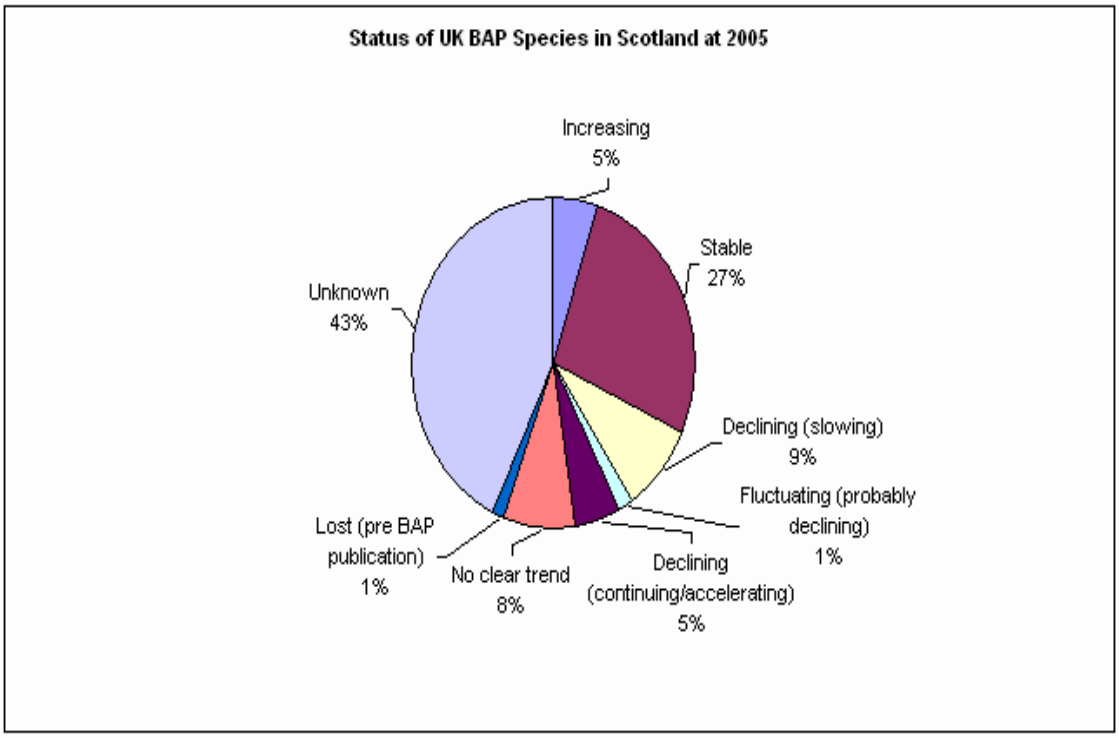

Figure 2.2.a: Status of UKBAP Species 2005
(Source: Scottish Environment Statistics Online, 2007)

Past & possible future trends

Within the timescales available for collecting baseline information, it was not possible to collect information on past and possible future trends of species in Scotland. However, information on this is available, e.g. in Natural Heritage Trends (SNH, 2001).

Key issues

1. Negative effects of on other species

The negative effects of deer on other species are outlined below in table 2.2a.

Table 2.2.a: Groups adversely affected by deer

Group	Effect of Deer
Invertebrates	Deer browsing typically reduces both plant species richness, as well as simplifying vegetation structure, reducing the range of invertebrate diversity likely to be present.
Woodland species	Deer activity can reduce tree species richness and the height of the shrub understorey.
Birds	Deer reduce tree species richness and the height of the shrub understorey, which can be expected to reduce the suitability of woodlands for many bird species.
Small mammals	The reduction in vegetation cover brought about by grazing can be detrimental to small mammal populations (e.g. mice, bankvoles, shrews).

2. Species adversely affected by deer fencing (e.g. birdstrike of capercaillie and black grouse)

   Research has highlighted fence collisions, particularly with respect to deer fences, as a major source of mortality to black grouse and capercaillie, but particularly for the rarer capercaillie[4].

3. Managing combined effects of deer and other grazing animals

2.3 Deer

Current situation

There are currently six species of deer occurring in the wild in the UK, only two of which (red and roe) are native. It is estimated that there are currently about 567,050 to 767,050 deer in Scotland, see Table 2.3.a below.[5]

Table 2.3.a: Estimated Number of Wild Deer in Scotland
(Source: DCS, 2000 & Mammal Tracing Partnership, 2005)

Deer Species	Species number estimate
Red deer;	About 350,000
Roe deer	Between 200,000 and 400,000
Sika deer;	About 9000
Fallow deer;	About 8000
Muntjac deer	Less than 50
Chinese water deer	0

Deer density varies widely between regions. The highest deer densities, of more than 20 deer per square kilometre, are found in the Central Highlands and some of the islands off the west coast while the lowest deer densities (of between 5.0 and 10.0 deer per square kilometre) are found around the edge of the deer range to the south and east. Both differences in habitat quality and differences in management regimes contribute to variation in deer density. High densities of deer occur where deer have access to low ground or woodland, while low densities occur where sheep density or culling rates are high. Stag density (but not hind density) declines in areas where snow cover is usually prolonged, stag density declines by approximately 1 stag per square kilometre. Hind density (but not stag density) declines with increasing sheep numbers[6].

The increase in deer numbers has brought them into urban areas where conflicts with people in the form of garden damage to and road traffic accidents are common. The most problematic of the five deer species in this sense for Scotland, are roe and fallow deer.[7]

The amendment to the Wildlife and Countryside Act made it an offence to release sika deer, their hybrids or deer of the genus *Cervus* on to any of the following Scottish islands: Outer Hebrides, Arran, Islay, Jura and Rum. This followed advice from Joint Nature Conservation Committee (JNCC) in 1998 based on the results of research in Argyll and the Great Glen which had concluded that "…*the genetic integrity of the Scottish mainland red deer [was] at risk from the*

[4] Hunt, J F. Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland (August 2003)
[5] DCS, 2000 & Mammal Tracing Partnership (2005)
[6] Hunt, J F. Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland (August 2003)
[7] http://www.defra.gov.uk/rds/publications/technical/tan_37.pdf (October, 2007)

invasion of sika[8]**.** Subsequent work (published after the establishment of the refugia) weakened some of the original conclusions, finding instead that "…*there [was] only a low rate of hybridization*" in red deer on the mainland[9].

The number of culls and venison returns for all deer species in Scotland have stayed relatively stable between 2003-2007 (see Table 2.3.b below).

Table 2.3.b: Cull and venison returns for all species of deer in Scotland between 2003 and 2006
(Source: DCS, 2007) [10]

Species	Cull returns			Venison returns		
	2003/04	**2004/05**	**2005/06***	**2003/04**	**2004/05**	**2005/06****
Red	61,957	68,610	63,568	43,224	53,741	39,552
Roe	32,913	32,264	33,542	26,057	25,914	22,852
Sika	3,900	4,773	5,093	2,856	2,820	2,996
Fallow	1,645	1,199	1,634	717	661	986

*2006 figures are subject to revision due to late returns
**figures likely to be affected by one venison dealer going out of business prior to returns being submitted

Past & possible future trends

The ranges of all wild and feral native and non-native deer in the UK and Scotland have expanded between 1972 and 2002 (see Table 2.3c). Each deer species is expected to expand its range further for the foreseeable future. The most widespread species, roe deer, is predicted to be present within 79% of all 10 km squares in mainland Britain within 10 years[11]

Table 2.3.c: Compound expansion rate of deer ranges in the UK in 10km squares between 1972 and 2002
(Source: Alastair I. Ward, 2005) [12]

Deer Species	Compound Expansion Rate per Year
Red deer	0.3%
Fallow deer	1.8%,
Chinese water deer	2.0%
Roe deer	2.3%,
Sika deer	5.3%
Reeves' muntjac	8.2%.

Key issues

1. The establishment of non-native deer species (e.g. muntjac) and spread of sika
2. Red deer and sika deer hybridisations

[8] Abernethy, K. (1994). The establishment of a hybrid zone between red and sika deer (genus *Cervus*). Molecular Ecology 3: 551-562
[9] Goodman, S.J., Barton, N.H. et al 1999
[10] http://www.dcs.gov.uk/downloads/DEER%20COMM%20REPORT%20PDF%20MASTER.pdf (October, 2007)
[11] Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland, August 2003, prepared by John F Hunt
[12] Alastair I. Ward. (2005). Expanding ranges of wild and feral deer in Great Britain. *Mammal Review* 35 (2), 165–173.

Red deer are hybridising with sika deer in some areas and their offspring are difficult to identify visually. Hybridisation may be occurring unnoticed in many areas.[13]

3. Effect of the policy on non-native deer on the genetic composition of native deer and the consequences for habitat impacts.
4. The effect of the open season's timing and length on deer population levels
5. The effect of culling activities on deer population levels
6. Defining sustainable deer management.

2.4 Designated Sites

Current situation

In Scotland protected areas form some 20% of the land area (see Figure 2.4.a below). Table 2.4a below presents selected protected area designations in Scotland[14]:

Table 2.4.a: Selected Designated Sites in Scotland
(Source: SNH, 2007)

Designated Site	Number	Area Ha
Sites of Special Scientific Interest (SSSI): Exemplary places in Scotland for nature conservation. They are special for their plants or animals or habitat, their rocks or landforms or a combination of these. Designation is a legal process Nature Conservation (Scotland) Act 2004.	1,455	1,034,000 (12.9% of Scotland)
Ramsar sites: Wetlands of International Importance protecting wildfowl habitat	51	313,000
Special Areas of Conservations (SAC): Areas of European importance for Wild Fauna and Flora. They range from sand dunes and forest to bogs and heath land.*	103	372,261
Special Protection Areas (SPA): Areas of European importance for Wild Birds.*	128	643,484
National Nature Reserves (NNR): Sites are important nationally for nature, they are also designated SSSIs.	71	114, 277
Local Nature Reserves (LNR): Places with special local natural interest, set up to protect nature, and for people to enjoy and appreciate.	29	9,297

Note: A site may be protected by more than one designation. For example, about two thirds of the area of SACs and 80% of SPAs and Ramsar sites also have SSSI designations. Care required to ensure the appropriate Natura tests are applied: impacts are either significant or not and then adverse or not; there is not an option for minimising adverse impacts.

The first cycle of a site condition monitoring system for designated sites in Scotland (developed by SNH) monitored 88% of all features on designated sites between 1998-2005. The sites were assigned to one of three main categories - **favourable** (maintained or recovered); **unfavourable** (recovering); and **other unfavourable** (no change or declining) and **destroyed** (partially or totally). Seventy one percent of all features monitored are in favourable condition or unfavourable recovering, see Table 2.4.b below.

[13] Hunt, J F. Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland (August, 2003)
[14] http://www.snh.org.uk/about/ab-pa00.asp

Table 2.4.b: Proportion of features assessed as favourable or unfavourable recovering
(Source: SNH, 2007)

Designation	Favourable (%)	Unfavourable recovering (%)	Other favourable (and destroyed (%))
SSS9	67	4	29
SAC	61	7	32
SPA	76	2	22
Ramsar	80	4	16
Total	67	4	29

Past & possible future trends

Then number of designated sites has increased significantly since 1991 (See Figure 2.4.a).

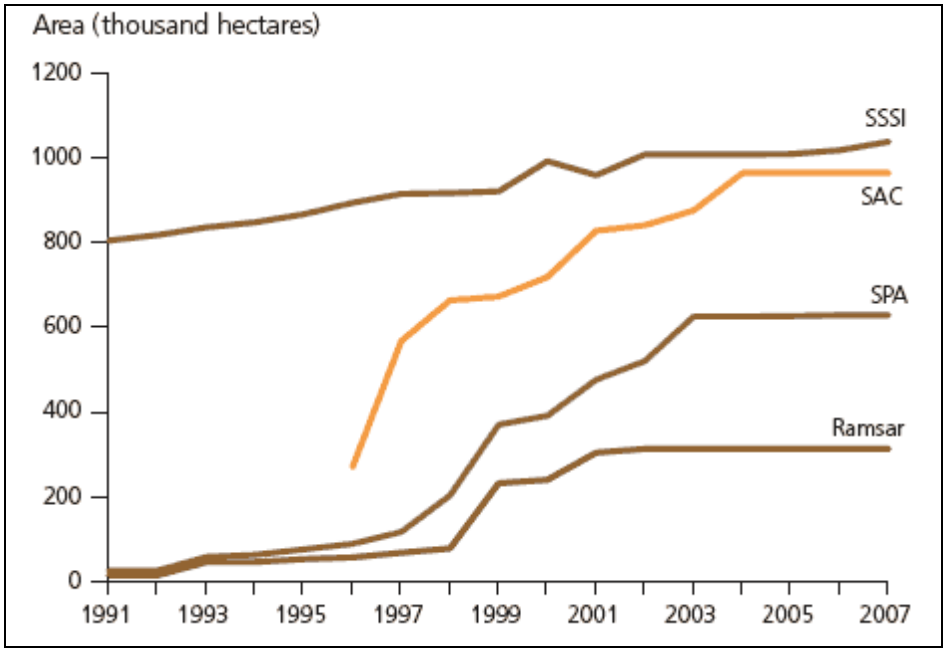

Figure 2.4.a: Designated Areas - 1991-2007
(Source: Scottish Environment Statistics Online, 2007**)**

Key issues

1. Grazing and trampling damage to designated sites.

   Damage to the most important of the SSSIs, the Natura 2000 sites which have European designation as Special Areas of Conservation (SACs) or Special Protection Areas (SPAs), is of particular concern. The government is legally obliged to ensure the conservation of these sites and achieving this with regard to deer impacts poses a special difficulty. Current legislation safeguards protected areas such as SSSIs, SPAs, SACs and Ramsar sites from certain forms of damaging activity, but grazing by deer is not one of them. For many SSSIs (particularly woodland and upland sites) grazing by sheep and deer (mainly red deer) is adversely affecting the designated interest. In some cases deer are the sole or main grazing animal.

2. Biodiversity management in the wider countryside affecting designated sites.

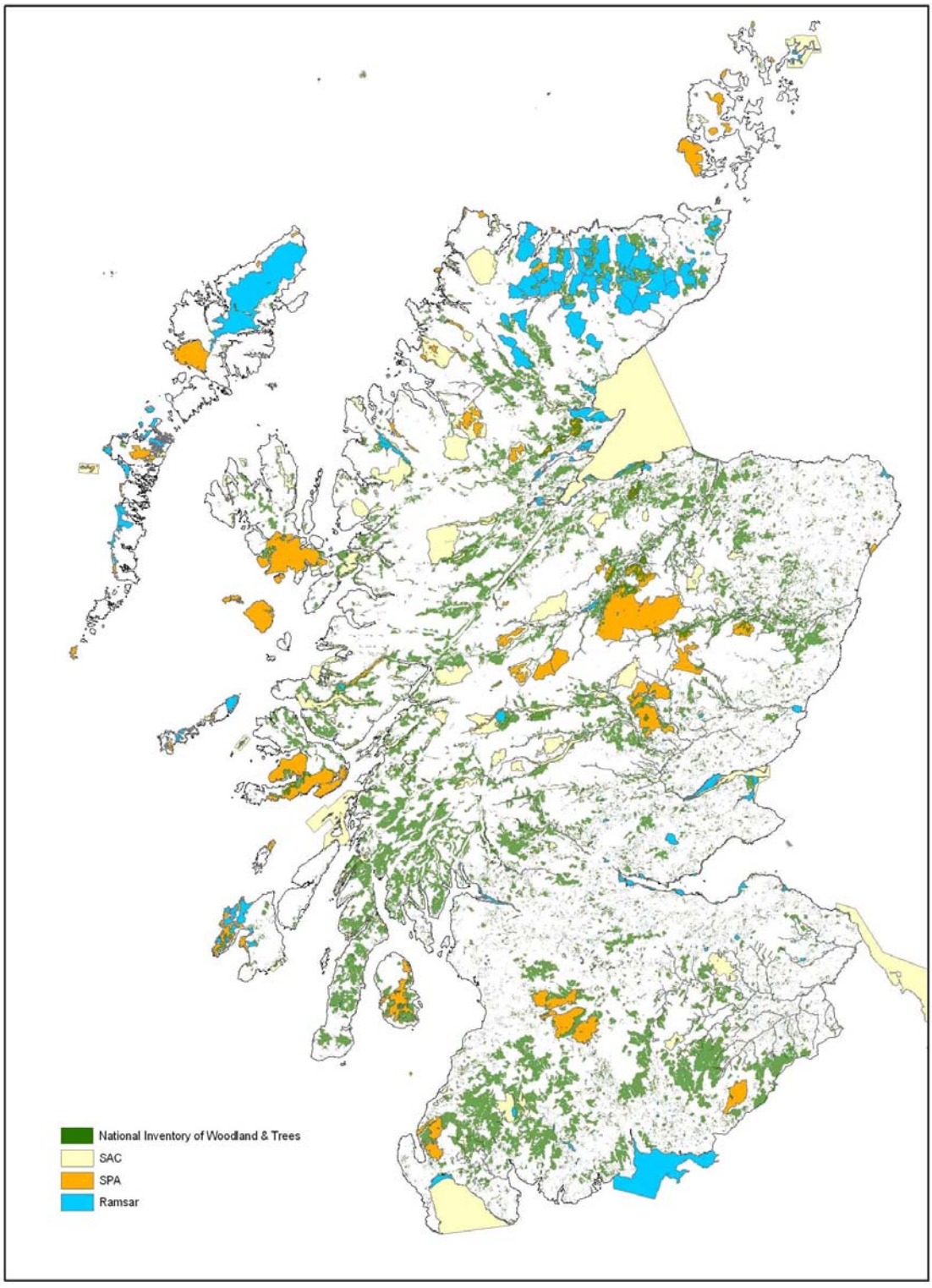

Figure 2.4.b: Natura 2000 Sites, SACs, SPAs & Ramsar sites and national inventory of woodland and trees
(Source: Scottish Forestry Strategy SEA Environmental Report, 2006)

3 SEA Topic: Population & Health

Deer populations and deer management have an important influence on the well-being and health of human populations. Deer are central to sport and nature tourism, provide venison, but also sometimes cause road accidents and transmit infections including Lyme disease. Population and human health aspects relevant to the Strategy include the status of road and sport shooting accidents, recreation and access, disease transmission and venison quality.

3.1 Road & sport shooting accidents[15]

Current situation

The incidence of deer-vehicle collisions is highest in the north and north-east of Scotland, but there is a risk of collisions on roads across the country. These tend to be more frequent in areas with high deer densities and high volumes of traffic including the M90 and M9 motorways, the A9, A90, A82, A93, A835, A980, A830, B979 and the B9077[16].

While no figures on sport shooting accidents in Scotland were found**,** more than a million people take part in shooting sports every year in the UK including; clay pigeon shooting, deer management, game shooting, pest control, rough shooting, target shooting, and wildfowling[17]. There have been major reviews of the firearm laws in 1968, 1988 and 1997, and shooting seasons and legitimate quarry species are also strictly specified in law. Training and education within shooting have resulted in an exemplary safety record for the sport. Shooting has the lowest incidence of accidental injuries of all sports[18].

Past & possible future trends

Between 2003 and 2005 there were 74 injuries to drivers and passengers as a result of deer-vehicle collisions in Scotland, including an estimated 16 serious injuries. Between 7000 and 10,000 deer are estimated to die every year on Scottish roads. No past trends are available for shooting accidents.[19]

Road traffic accidents are expected to rise further with the urbanisation of some deer species, the increase in urban fringe woodlands and greater access to the countryside taking more people into deer-occupied areas. DCS are currently looking at a small number of “black spots” with a view to possible mitigation measures.

Key issues

- The effect of deer population management close to urban areas on the frequency of road accidents.

  Researchers estimate the economic cost of preventing human injuries associated with deer-vehicle collisions as £4.5million.

- The effect of habitat creation on road traffic safety and deer welfare (e.g. roadsides, central Scotland forest habitat network).

[15] http://www.deercollisions.co.uk/ftp/Scotpressrel.pdf (October, 2007)
[16] http://www.deercollisions.co.uk/ftp/Scotpressrel.pdf (October, 2007)
[17] http://www.basc.org.uk/content/shooting (October, 2007)
[18] Home Accident Surveillance Survey, DTi (1995)
[19] http://www.deercollisions.co.uk/ftp/Scotpressrel.pdf (October, 2007)

- The effect of hunting practice regulation and education on the safety of hunters and the general public.

3.2 Recreation & Access

Current situation

There are an estimated 50,000km of paths and tracks in Scotland. SNH have developed a Scottish Paths Record as a planning, monitoring and management tool for local authorities. About 15,000km are recorded as rights of way; however, 84% of these routes are "claimed" rights of way, in that their status is uncertain. The Land Reform (Scotland) Act 2003 establishes a statutory right of responsible access to land and inland waters for:

- outdoor recreation;
- crossing land; and
- some educational and commercial purposes.

Over a quarter of all Scottish adults take part in open-air recreation at least once a week. Recent surveys of use and demand have shown that most people are motivated by the desire to exercise and enjoy the fresh air, and that walking is by far the most popular activity[20].

Recreational activities relating to deer include, deer watching and stalking in forests, woods and open hills. The stag stalking season runs from 1 July to 20 October and the hind season from 21 October to 15 February, but for the majority of estates the peak stalking time is from August to October.

No data was available at the time of writing on the number of deer management fences affecting public access.

Past & possible future trends

Within the timescales available for collecting baseline information, it was not possible to collect information on past and possible future trends of recreation and access in Scotland. However, information on this is available, e.g. through Visit Scotland.

Key issues

- The effect of sport shooting and culling activities, and safety concerns linked to these, on public access to rural and protected areas.

- The impact of deer-related habitat/landscape degradation on the recreational value of countryside

  It is unlikely that deer have any direct impact on the numbers of hill walkers and climbers. However, excessive deer numbers affect regeneration of woodland and scrub, and forestry grants have encouraged ever more deer fences with their associated drawbacks[21].

[20] http://www.outdooraccess-scotland.com/default.asp?nPageID=303 (October, 2007)
[21] http://www.ramblers.org.uk/scotland/ (October, 2007)

- The effect of communications strategies to promote responsible access provision and behaviour.

- The effect of deer fencing on public access to rural and protected areas.

3.3 Disease transmission

Current situation

Deer act as a vector for the sheep tick *Ixodes ricinus*, which is the principal vector for Lyme disease (caused by the *Borrelia burgdorferi* bacterium). There is at least some correlative evidence indicating that deer play a role in increasing the risk of transmission of Lyme disease to humans, although other mammals and birds are also involved in the epidemiology of the disease. Sufferers can get flu-like symptoms such as tiredness and aches, and more serious problems such as chronic arthritis.

Past & possible future trends

In Scotland, the number of Lyme disease sufferers went up 35% between 2003 to 2004. In England and Wales there were 97 cases 10 years ago, and, this rose to 320 cases in 2003. Health experts have warned of increases in cases of Lyme disease, with the real number thought to be much higher than those reported.[22]

Key issues

- Prevalence of infectious disease transmission (e.g. Lyme disease).

- The effect of deer density/ distribution/ species mix on the risk of disease transmission to livestock (e.g. Bovine Tuberculosis) and the quality/safety of meat and other animal products.

3.4 Venison quality

Current situation

A venison quality assurance scheme was published in 2002 (Scottish Quality Wild Venison Limited). Currently, the Department for Environment, Food, and Rural Affairs are conducting a study entitled *'Improved venison quality for sustainable deer farming',* which is to be completed by 2009. The objectives of this study include:

- To develop a suite of quality measurements for venison to allow full characterisation of venison products and systems;
- To gain an improved understanding of consumer perceptions of venison and the associated purchase decision process;
- To investigate the effects of packaging on shelf life and other quality parameters of venison;
- To investigate the effects of slaughter systems, including animal welfare, on venison quality; and

22 Ross, J. *The Scotsman* Concern as sheep-tick disease cases soar Tue 31 May 2005, http://thescotsman.scotsman.com/index.cfm?id=594082005

- To promote the scientific findings to the deer/venison industry through promotional events and literature.

Past & possible future trends

Information on past and possible future trends of venison production and consumption in Scotland was not available at the time of writing.

Key issues

- The effect of access to venison on nutrition and human health.

4 SEA Topic: Water

Deer populations and deer management have some minor implications for water quality, flooding and the quality of rivers and lakes. Water aspects relevant to the Strategy include morphological alterations to freshwater bodies, water quality and flooding.

4.1 Freshwater bodies

Current situation

Morphological alterations of water bodies can be caused by agricultural and forestry activities, as well as by hydropower energy generation and recreational activities. Morphological alterations also result naturally over time as a result of natural flow regimes in fast flowing watercourses and coastlines with strong wave action, currents and coastal processes.

The Scotland River Basin Summary Report estimates that the morphology of 341 river and 25 lochs in Scotland was considered was negatively impacted upon by agricultural and forestry activities (from a total of 667 river, 120 loch, 16 transitional and 43 coastal water bodies being affected by morphological alteration).

In addition, morphological alterations can result from cattle, other stock or deer poaching (the erosion of river and burn banks by cattle trampling at watering areas). This can result in alterations to flow regimes and damage or loss of habitats (in extreme situations).[23]

Past & possible future trends

Within the timescales available for collecting baseline information, it was not possible to collect information on past and possible future trends relating to freshwater bodies in Scotland. However, information on this is available, e.g. through SEPA.

Key issues

- The impact of deer on morphological change in freshwater bodies.
- The impact of deer on vegetation root depth, which affects groundwater levels,

4.2 Water quality

Current situation

Low standards of river water quality may threaten the aquatic environment, drinking water quality and recreational water use. Sewage, industry, urban development and agriculture are some of the factors that may affect river water quality.

The Scottish Executive is aiming to achieve and maintain good ecological quality in Scotland's rivers, lochs and coastal waters by the year 2015, in line with the targets of the Water Framework Directive.

Past & possible future trends

The Scottish Environment Protection Agency (SEPA) has established a Digitised River Network (DRN) to classify about 25,000 km of the approximately 100,000 km of rivers and burns in Scotland. Rivers are classified as '*excellent', 'good', 'fair', 'poor' or 'seriously polluted'* according to

[23] The Scotland River Basin District**:** Characterisation and impacts analyses required by Article 5 of the Water Framework Directive, Summary Report - www.sepa.org.uk (October, 2007)

measures of chemical, biological, nutrient and aesthetic quality. Between 1999 and 2006, the length of poor and seriously polluted rivers in Scotland fell by 37% to 734 km (see Figure 4.2.a). Poor biological and nutrient quality are the most frequent reasons for classifying rivers as poor or seriously polluted.

The Scotland River Basin District Summary Report indicates that a total of 488 river, 57 loch, 18 transitional, 59 coastal and 21 groundwater water bodies are affected by diffuse source pollution pressures stemming from agriculture, forestry, urban development and acidification from the production of power, and transport.[24]

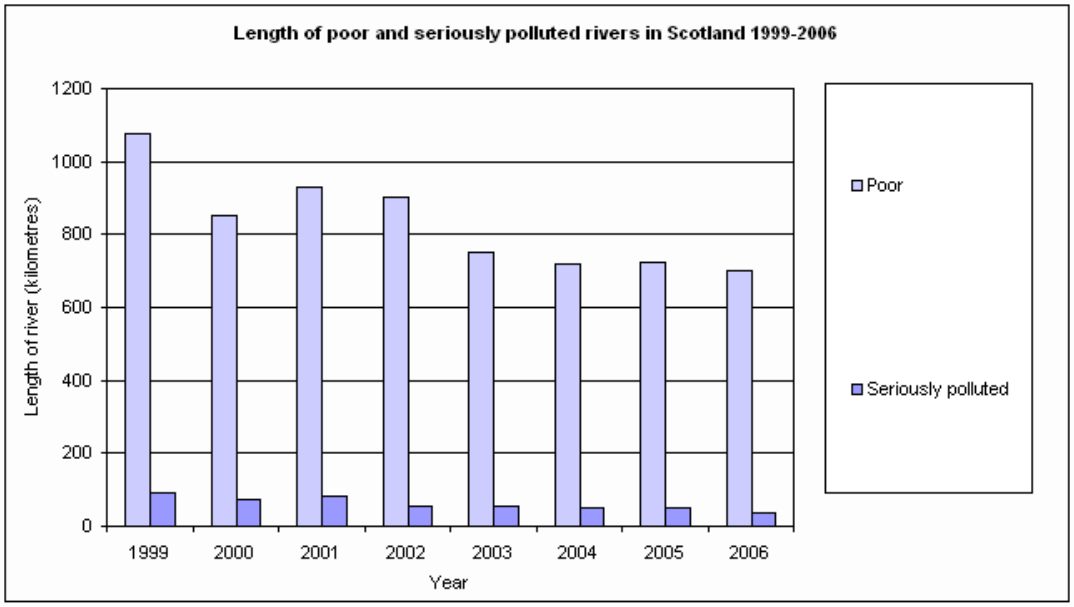

Figure 4.2.a: Length of poor and seriously polluted rivers in Scotland 1999-2006
(Source: Scottish Environment Protection Agency, 2006)

Key issues

- The effect of deer and other grazing animals on riparian habitats and the filtering and buffering capacity of vegetation

  Heavy grazing in the immediate riparian zone (up to 30m from a watercourse) can adversely affect water quality as well as causing erosion of river banks leading to unnaturally wide and shallow water courses [25]

4.3 Flooding

Current situation

Rainfall patterns have been changing in two ways which exacerbate the risk of flooding. Winter rainfall is increasing in volume. However, rain is also increasingly falling in more concentrated periods, creating greater volumes of water which lead to flooding. These trends are expected to

[24] Scotland's State of the Environment, SEPA (2006)
[25] Hunt, J F. Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland. (August, 2003),

continue as a result of climate change. Flood risk is likely to be an issue in the context of specific physical developments[26].

Past & possible future trends

Within the timescales available for collecting baseline information, it was not possible to collect information on past and possible future trends of flooding in Scotland. However, information on this is available, e.g. through SEPA.

Key issues

- Land use change in fluvial flood plains related to deer management activities
- The effect of deer management on flood risk (e.g. resulting from vegetation cover loss, compaction and erosion of soil).

> At times of high rainfall rivers systems lacking natural woodlands are more "flashy" with increasing run off leading to greater risk of flooding down stream. Reductions in deer numbers in these areas would allow scrub and tree regenerations, though often that will need to be accompanied by sheep reductions.[27]

[26]Scotland's State of the Environment, SEPA (2006)

[27] Hunt, J F. Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland. (August 2003)

5 SEA Topic: Soil

Soil is a resource that renews itself extremely slowly and is central to basic ecosystem processes as well as agriculture and forestry. Deer populations and deer management have some effects on soil resource quality. Soil aspects relevant to the Strategy include the status of soil erosion and compaction and loss of organic matter from Scottish soils.

5.1 Soil Resources (including agricultural soils, quality, stability & erosion)

Current situation

Soil is essentially a non-renewable resource and is one of Scotland's most important assets. Scotland's soils are diverse and differ markedly from those in the remainder of the UK. The majority have acidic and organic-rich surface layers including large areas of blanket bog up to 8 metres thick. Such soils are often not managed intensively and play important roles in nature conservation, biodiversity and carbon storage and make a highly significant contribution to landscape value. In contrast, soils suitable for arable cropping are limited largely to eastern Scotland. Although relatively small in extent this land has produced some of the highest yields of wheat and barley in the world. Lowland soils in the west of Scotland support very productive pastures and a successful dairy industry.

Based on existing information, Scottish soils are generally of good quality**.** Only a few soils have high levels of contamination and levels in the remainder are generally low. There is little evidence to suggest that serious soil erosion, compaction or other problems related to land management are occurring widely. Although compaction and structural degradation does occur on cultivated soils the incidence is localised and there is no clear evidence that these pose serious threats to soil quality nationally. In most circumstances the problem can be readily reversed. [28]

Although soil erosion does occur on cultivated mineral soils and the impacts can be very visible and damaging, single events are confined to small areas. There is no clear evidence that it poses serious threats to soil quality and can be readily rectified. Erosion of organic soils is more evident and potentially could increase in frequency and severity under certain climate change scenarios.[29] Erosion may vary from region to region as a result of different intensities of farming and differing climates. The Highland areas in Scotland are particularly susceptible to soil erosion, see Table 5.1.a below for rates of soil erosion in different Highland locations.

[28] State of the Environment: Soil Quality Report, SEPA (2001)

[29] Scotland's Soil Resource: Current State and Threats. Report for the Scottish Executive on the current state and threats to Scotland's soil resource (September, 2006)

Table 3.1

Regional extent of erosion in upland Scotland

Region	extent of area eroded %
Southern Uplands (east)	3.5
Southern Uplands (west)	1.1
Midland Valley	3.9
Trossachs	7.0
Lochaber	3.2
Central Highlands	5.8
Cairngorms	1.5
Eastern Grampians	8.1
Monadhliath	20.0
North west Highlands (south)	1.5
North west Highlands (central)	8.2
Easter Ross	10.1
Wester Ross	6.9
Caithness	0.5
North west Highlands (north)	6.8
Western Isles	6.0

Source: Grieve et al, 1996[73]

Table 5.1.a: Regional extent of erosion in upland Scotland
(Source: Natural Heritage Trends, 2001)

There is some evidence that levels of organic matter in Scottish soils may be declining. This could represent a very significant reduction in the UK stock of terrestrial carbon. It is very difficult to predict what might happen to our soils given the uncertainty attached to climate models. The effects might range from direct impacts on key soil properties, for example soil organic matter content, to indirect ones that affect soil management.

Past & possible future trends

SEPA have identified three main pressures affecting soils: industry; agriculture and forestry, with agriculture and forestry accounting for 80% and 13% respectively of the land area in Scotland. Negative impacts from agriculture include soil erosion, and the use of inorganic fertiliser and pesticide application. Agricultural soil is the largest source of nitrous oxide in the UK, contributing to over 49% of the total source strength. Rates of nitrogen application to crops are approximately 40% lower in Scotland than in England and Wales due to differences in cropping practices. Most agricultural land in the UK is oversupplied with phosphorus by an estimated 16 kg P/ha/y91. This has led to a build-up of phosphorus in soils and to the transport of dissolved, as well as particulate, phosphorus into surface and ground waters.[30]

[30] State of the Environment: Soil Quality Report SEPA (2001)

Key issues

- The impact of deer population densities in vulnerable areas on nutrient loss through excessive grazing and trampling.
- The effect of deer density/ species mix on the organic carbon content of soil.
- The effect of compaction and erosion due to deer trampling and poaching.
- The effect of deer density/ species mix on levels of soil erosion (e.g. through excessive grazing and trampling).

6 SEA Topic: Air (including transport)

Deer populations and deer management have extremely minor effects on air quality. Air quality is not expected to be significantly affected by the Strategy

6.1 Air quality

Current situation

Air quality in Scotland is generally considered to be good. The most dramatic improvements in air quality have been observed in urban areas although urban areas still have poorer (but still considered acceptable) air quality than rural areas of Scotland. These improvements in air quality have resulted from changes in legislation and technology and the difference between air quality in rural and urban areas is attributed to motor traffic emissions.[31]

Past & possible future trends

Within the timescales available for collecting baseline information, it was not possible to collect information on past and possible future trends related to air quality in Scotland. However, information on this is available, e.g. through Scotland's State of the Environment Report, 2006, SEPA.

Key issues

Air quality is not expected to be significantly affected by the strategy.

[31] State of the Environment – Air Quality Report, SEPA (1999)

7 SEA Topic: Climate Factors (including energy)

Climate change is a global issue with short and long-term local effects. Deer populations and deer management have tangible implications for reducing the contribution towards, and adapting to, climate change. Climate change aspects relevant to the Strategy include the status of greenhouse gas emissions per sector, carbon sinks, species and habitats vulnerable to climate change and the effects of climate change on disease transmission.

7.1 Temperature & rainfall records

Current situation

Whilst the global impacts of climate change are considerable, there are also wide-ranging implications for Scotland on flood risk, water resources, agriculture, tourism and health, which are all of economic, social and environmental importance. Under the provisions of the Kyoto Protocol (1997) legally binding targets for the reduction in greenhouse gas emissions were set for the UK as a whole and Scotland contributes to the meeting of this target.[32]

Past & possible future trends

By 2100, temperatures in Scotland are predicted to rise by 3.5 °C during the summer months, and around 2.5°C during the winter months[33]. The UK Climate Impacts Programme climate scenarios indicate that rainfall patterns in Scotland will change to wetter winters and drier summers. It is estimated that by 2100 winters will be up to 30% wetter in some places, while summers will be up to 50% drier. Precipitation changes have several implications for Scotland, affecting water resources, flood and drought risk, and habitat loss.[34]

More detailed information on actual past trends in Scotland is available from a recent research report by SNIFFER. The implications from this report are that the UK Climate Impacts Programme scenarios for Scotland predictions on increased wet and dry periods may be too low.

Key issues:

No key issues relevant to temperature and rainfall were identified

7.2 Greenhouse gas (GHG) emissions by sector

Current situation

GHGs include any gas in the atmosphere that can absorb infrared radiation or heat. Carbon dioxide is the main contributor to greenhouse gas emissions. The UK contributes about 2% to total global carbon dioxide emissions. Other natural greenhouse gases include water vapour, carbon dioxide, methane, nitrous oxide and even ozone, which is more commonly associated with the ozone layer and ultraviolet radiation. The amounts of all these gases in the atmosphere are now increasing as a result of man-made processes, such as fossil fuel burning and deforestation.

[32] Changing our ways: Scotland's Climate change Programme, Scottish Executive (2006)
[33] Changing our ways: Scotland's Climate change Programme, Scottish Executive (2006)
[34] Changing our ways: Scotland's Climate change Programme, Scottish Executive (2006)

The atmospheric concentration of carbon dioxide, for example, has increased by 30% since the 18th century, whilst levels of methane have more than doubled.[35] See Figure 7.2.a below for the contributions of each sector to Scottish greenhouse gas emissions in 2003. Of the emissions generated, some 16% are removed (via our carbon sink) primarily due to Land Use Change and Forestry. Energy supply is an important sector for carbon dioxide emissions in Scotland; primarily from the combustion of fossil fuels. Carbon dioxide emissions from the energy supply sector have decreased by 2.5% since 1990.

In Scotland, the Land Use Change and Forestry sector, taken as a whole, currently acts as a carbon sink, absorbing more carbon dioxide than it releases. However, estimates of emissions and removals from this sector are particularly uncertain since they depend, critically, on assumptions made on the rate of loss or gain of carbon in Scotland's carbon-rich soils.[36]

No data was available at the time of writing on green house gas emissions from the deer sector.

Figure 4.6: Contribution of each sector to Scottish GHG Emissions of GHGs in 2003 (MtC)[21]

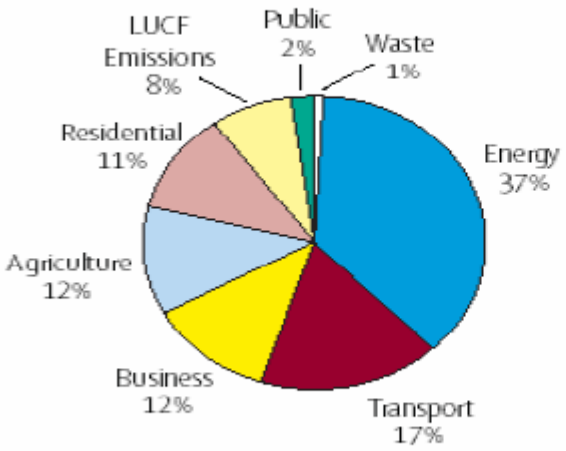

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Figure 7.2.a: Contribution of each sector to Scottish GHG emission in 2003
(Source: Scottish Environment Statistics Online, 2007)

Past & possible future trends

Figure 7.2.b below shows how the emissions (and removals) by sector, have changed over the period 1990 – 2003. Total net emissions have decreased and total net removals increased in that time.

[35] National Atmospheric Emissions Inventory, www.naei.org.uk
[36] http://www.scotland.gov.uk/Publications/2007/08/20165714/11

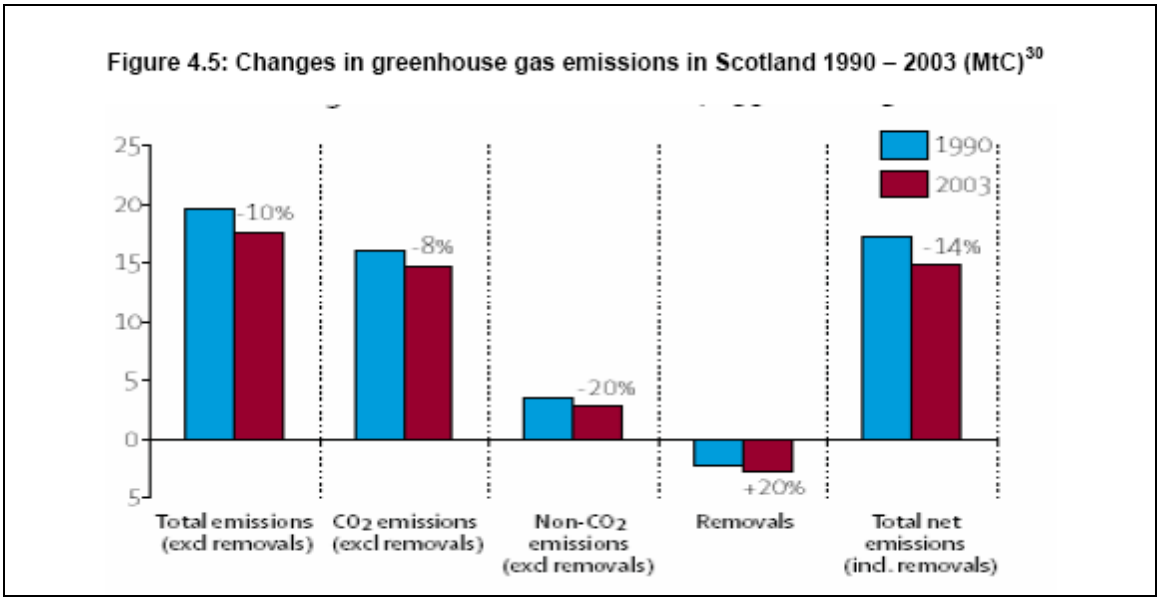


Figure 7.2.b: Changes in GHG emission in Scotland 1990-2003
Source: (Scottish Environment Statistics Online, 2007)

Key issues

- The effect of deer population densities on the productivity or reinstatement of forests.
- The impact of deer management on the loss of carbon rich soils from peat uplands.
- Methane emission levels of deer population (generated during digestion).

7.3 Carbon sinks

Current situation

Soil carbon can be lost either through climate change or as a consequence of inappropriate land management (e.g. drainage of deep peats and grazing/ trampling pressures from herbivores including deer). Either would have major effects in relation to added greenhouse gas emissions. Only 0.1% of the soil carbon store in Scotland would need to be released for to the atmosphere through inappropriate land management practice for Scotland's current official carbon dioxide emissions to double. [37]

Scotland's soils contain the bulk of the UK soil carbon pool. It is estimated that 13.6% (>1 m ha) of Scotland's land surface is overlain by deep peat soils. This represents three-quarters of the estimated 22 billion tonnes of total soil carbon for all of the UK. Taken together, the carbon stored in the deep peats and the shallower peaty soils of Scotland is about 170 times more than stored in all the vegetation of Scotland.

Organic soils behave very differently from mineral soils. This is primarily due to the properties of organic matter and the conditions which favour the accumulation of plant debris.[38] Soil organic matter decomposes more rapidly under warmer conditions, and if the Scottish climate warms further, then there may be implications for soil organic matter levels. Periodic drought conditions,

[37] State of the Environment: Soil Quality Report (SEPA, 2001)
[38] ECOSSE: Estimating Carbon in Organic Soils - Sequestration and Emissions: Final Report (2007)-http://www.scotland.gov.uk/Publications/2007/03/16170508/0

which themselves are a function of temperature or rainfall interactions, may also be a cause of carbon loss from peaty soils and could be more serious than a temperature increase alone.

Past & possible future trends

Within the timescales available for collecting baseline information, it was not possible to collect information on past and possible future trends relating to carbon sinks in Scotland. However, information on this is available, e.g. through the State of the Environment: Soil Quality Report (SEPA, 2001).

Key issue

- The impact of deer densities on the condition of carbon sinks

7.4 Species & habitats likely to thrive or be vulnerable to climate change

Current situation

Regardless of any reductions achieved in emissions, some climate change will occur due to the level of gases that have already accumulated in the atmosphere[39]. Whilst there is still some uncertainty about the detailed climate response, it is expected that this climate change will have a significant effect on species and habitats in the UK. Ultimately, not adjusting conservation policy and management to take account of climate change may lead to a loss of species and habitats for which a site has been designated.[40]

The research has suggested that the UK BAP habitats most sensitive to climate change effects are:

- Montane habitats (vulnerable to loss of suitable climatic conditions);
- Raised bogs (vulnerable to loss of suitable climatic conditions);
- Soft coastal (supra littoral sediments) habitats (vulnerable to changes in coastal defences in response to climate change); and
- Chalk rivers (vulnerable to changes in water use and agriculture in response to climate change).

Other habitats vulnerable to significant changes in species distributions and community composition are native pinewoods, calcareous grasslands and mesotrophic lakes. [41]

Past & possible future trends

Within the timescales available for collecting baseline information, it was not possible to collect information on past and possible future trends relating species or habitats likely to thrive or be

[39] Met Office/DETR, 1999

[40] DEFRA - Climate Change and UK Nature Conservation: A Review of the Impact of Climate Change on UK Species and Habitat Conservation Policy; http://www.defra.gov.uk/wildlifecountryside/climatechange/nature/execsum.htm (October, 2007)

41 DEFRA - Climate Change and UK Nature Conservation: A Review of the Impact of Climate Change on UK Species and Habitat Conservation Policy, http://www.defra.gov.uk/wildlifecountryside/climatechange/nature/execsum.htm (October, 2007)

vulnerable to climate change in Scotland. However, information on this is available, e.g. through Scottish Natural Heritage.

Key issue

- Effects of deer on species and habitats most likely to be affected by climate change

7.5 Impacts of climate change on insects & disease (e.g. ticks)

Current situation

Vector-borne diseases (i.e. various diseases transmitted by mosquitoes or ticks) are climate-sensitive and can increase or be introduced through climate change.

Past & possible future trends

Malaria might potentially be re-established in the UK in the future. The health impacts of this are likely to be localised, however, cases could be imported among travelers returning to he UK. The emergence of tick-borne encephalitis is unlikely and the likely effects of climate change on the incidence of Lyme disease is difficult to predict. Monitoring will need to look for the emergence of other vector-borne diseases, such as West Nile Fever.[42]

Key issue

- Impact of climate change on the prevalence and spread of diseases transmitted by deer to human and livestock

[42] UK Health Impacts of Climate Change, Postnote: (November 2004)

8 SEA Topic: Material Assets

Wild deer populations can be considered a material asset as they relate to tourism, venison production, and employment in the deer sector. Deer densities and deer management have significant effects on plantation, forest and agricultural resources. Material assets relevant to the Strategy include the status of plantation, forest, agricultural and tourism resources, deer sector, employment in the deer sector, and waste production.

8.1 Plantation / forest & agricultural resources

Current situation

Forestry is an important land use in Scotland using both native and non-native tree species. There are 1.33 million hectares (13,300 km2) of woodland in Scotland, having risen from 4.5% of land area in 1905 to 11.8%, in 1980, and 17.1%, in 2006. The climate in Scotland provides good conditions for growing trees and the last century saw a large expansion of conifer plantations in the plains, see Figure 8.1.a[43].

Though deer are often associated with woodland, the different species occur in a wide range of habitats.[44] Most damage occurs to forestry interests (especially young plantation trees and regeneration). Agricultural damage is a limited and local problem although, where it occurs, it may be significant. Below are summaries of the types of damage the different deer species can cause:

- **Roe deer** can cause substantial tree damage but are not seen as a serious agricultural pest;
- At high densities, **red deer** can cause severe damage to commercial plantations. Damage to agriculture may also be locally significant;[45]
- Even at high densities, **muntjac** and **sika** deer cause little agricultural loss; sika damage forestry interests, especially conifer plantations in Scotland, and there are serious concerns about muntjac damaging coppice and ground flora;[46]
- **Fallow deer** damage newly planted trees and ground flora in more established areas[47] and any crop damage is small and localised;
- **Chinese water deer** occur in such small numbers that they cause negligible damage of any sort.[48]

[43] State of the Environment Report for Scotland, SEPA (2006)
[44] Staines B., Palmer S.C.F., Wyllie I., Gill R. and Mayle B. Desk and limited field studies to analyse the major factors influencing regional deer populations and ranging behaviour. A report for MAFF, (1998)
[45] Moore N.P., Hart J.D. & Langton S.D. Factors influencing browsing by fallow deer (*Dama dama*) in young broad-leaved plantations. *Biological Conservation* 87: 255-260, (1999)
[46] Ratcliffe PR. The control of red and sika deer populations in commercial forests. In: *Mammals as Pests* pp. 98-115 (ed. R.J. Putman). Chapman and Hall, London, (1989)
[47] Putman, R.J. and Moore, N.P. Impact of deer in lowland Britain on Agriculture, Forestry and Conservation Habitats. *Mammal Review* 28: 141-164. (1998)
[48] Trout R.C., Putman R.J., Moore N.P. and Hart J.D. A review of lowland deer. A report for MAFF, (1994)

Past & possible future trends

Within the timescales available for collecting baseline information, it was not possible to collect information on past and possible future trends relating to plantation and agricultural resources in Scotland. However, information on this is available, e.g. from the Forestry Commission for Scotland and SEERAD.

Key issues

- The effect of deer management practices on forest productivity.
- The effect of deer management practices on agricultural resources

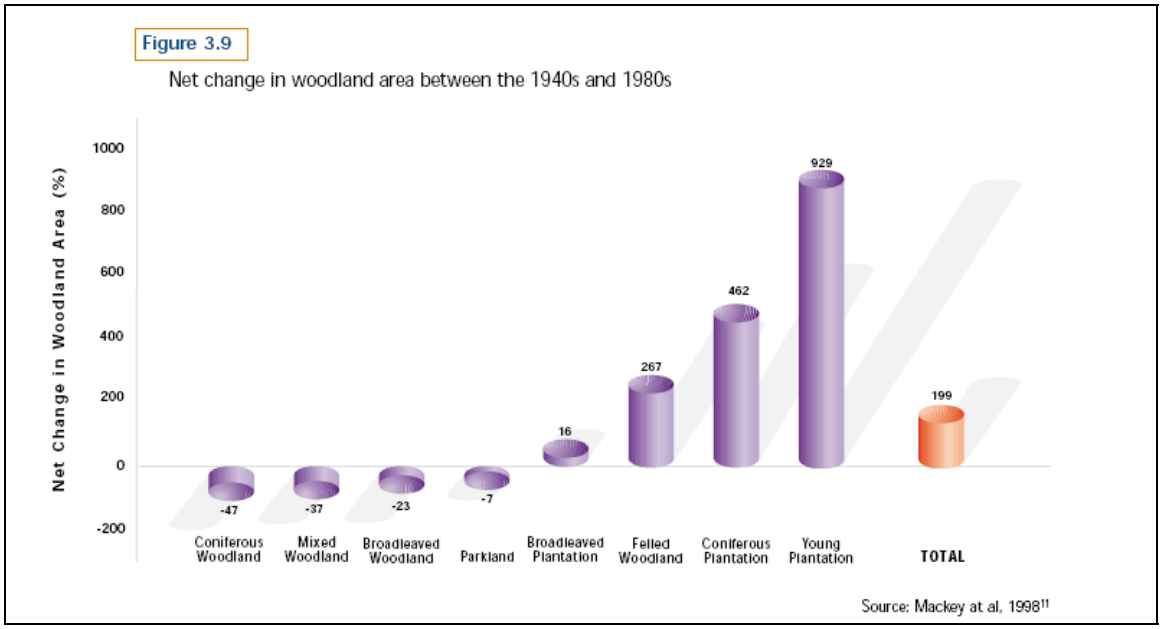


Figure 8.1.a: Net change in the woodland area in Scotland between 1940 and 1980. (Source: Scotland's State of the Environment Report, SEPA, (2006)

8.2 Tourism resources

Current situation

Tourism supports around 9% of all employment.[49] In 2005, over 17 million tourists took overnight trips to Scotland, and their expenditure was over £4.2 billion. Recreational activities undertaken by tourists in Scotland in 2005 are presented in Table 8.2.a below. The total income from tourism in the Highlands and Islands is currently estimated at £606m with an additional £317m from day trips. The visitor attitude surveys of 1999/2001 demonstrate that 90% of tourists place the landscape as the key reason for their visit.

[49] http://www.visitscotland.org/tis_summary2005updated.pdf - Visit Scotland Tourism Statistics Leaflet (2005)

Table 8.2.a: Activities undertaken by tourists in Scotland, 2005
Source: Tourism in Scotland, Visit Scotland (2005) [50]

	UK Holiday Trips (%)*	Overseas HolidayTrips (%)**
Visiting castles, monuments, churches etc.	39	83
Hiking/Hillwalking/Rambling/ Other walking	33	39
Visiting museums, galleries, heritage centres, etc.	29	58
Swimming	21	5
Field/Nature Study	17	9
Watching performing arts (including cinema)	16	16
Golf	8	2
Visiting Theme Parks/Activity Parks	8	6
Traditional Regional Music Events	7	n/a
Fishing	6	3

** 2003 data – no further update available*
*** 1996 data – no further update available*

While no figures are available for the recreational value of deer in Scotland, their recreational value in the East of England was estimated at around £343,066, assuming a 10% contribution of deer to wildlife tourism. A figure for Scotland could be potentially be extrapolated on this basis.[51]

The Review of Wildlife Tourism in 2001 identified 283 facilities and sites which can be classed as wildlife tourism businesses i.e. offering supported viewing of wildlife. There are over 250 businesses involved in nature and wildlife tourism in Scotland, with over 3,000 employees. Since 2001, activities relating to the development of wildlife and nature-tourism have increased significantly. Projects such as 'Nature-based Tourism' (Highlands and Islands) and 'Making Tracks' (South of Scotland) have sought to strengthen the sector through networking, financial assistance and best practice.[52]

Past & possible future trends

International Tourist numbers have increased between 2005 and 2006, while Domestic Tourist numbers decreased from 14.87million (in 2005) down to 13.28 million (in 2006). Correspondingly, International Tourist spend increased from £1.208million (in 2005) up to £1,415million (in 2006), and Domestic Tourist spend decreased from £3,006 (in 2005) down to £2,720million (in 2006).[53]

Key issue

[50] http://www.visitscotland.org/tis_summary2005updated.pdf - Visit Scotland Tourism Statistics Leaflet (2005)
[51] Economic Impacts of Wild Deer in the East of England, Piran C.L. White, James C.R. Smart, Monika Böhm, Jochen Langbein & Alastair I. Ward, http://www.woodlandforlife.net/wfl-woodbank/documents/Executive_Summary.pdf (2007)
[52] Wildlife Tourism – Training For Success
[53] Scottish Tourism Current Position Summary (2006)

- The effect of deer management practices on tourism resources

8.3 Deer resources

Current situation

The Scottish Biodiversity List Social Criterion Survey found that the animals most frequently selected as being important were the red or roe deer. Each of these were identified as important by around half of respondents who provided a preference.[54]

A wide range of wild species are used for both consumptive and non-consumptive purposes. Despite many uses not being documented, collectively they are significant in socio-economic terms accounting for a minimum contribution of £4,800 million to the UK economy and supporting 35,000 jobs. This figure is equivalent to some 0.5% of the United Kingdom's gross domestic product for the year 2000. By contrast, agriculture accounts for some 1-2% of GDP.[55]

In 2006, the Association of Deer Management Groups commissioned a consultancy study by Public and Corporate Economic Consultants (PACEC) of Cambridge under the title "The Contribution of Deer Management to the Scottish Economy". This was a supplementary study to the UK-wide study into shooting sports as a whole by the same consultancy. The key findings were as follows;[56]

- Total cost of all Deer Management in Scotland amounted to £105m in 2005. Two-thirds of this spend is retained in Scotland;
- Deer Management in Scotland supports the equivalent of 2520 paid full time jobs in the country. The value of this employment for the Scottish economy is £70.4m;
- The average operational expenditure on Deer Management per land holding was £54,468 per annum, of which 47% was spent on staff.

Past & possible future trends

Total gross and net expenditures in 1996 for deer stalking in Great Britain are estimated at £14 million and £5 million respectively. Scotland contributes most to this, with £10.4 million direct expenditure on stalking.[57]

Key issues

- The effect of deer management practices on the venison market.
- The manner in which value is added to deer related activities and products, aside from shooting.

[54] Scottish Biodiversity List Social Criterion: Results of a Survey of the Scottish Population - Research Findings, http://www.scotland.gov.uk/Publications/2006/03/27152321/2
[55] Use of wild living resources in the United Kingdom: a review, IUCN & DEFRA, (2005)
[56] Use of wild living resources in the United Kingdom: a review, IUCN & DEFRA (2005)
[57] Developing a policy framework for managing diffuse deer impacts, Landwise Scotland for the Deer Commission for Scotland, (March 2005)

8.4 Employment in deer sector

Current situation

Deer Management in Scotland supports the equivalent of 2520 paid full time jobs in Scotland. The value of this employment for the Scottish economy is £70.4m.[58]

Past & possible future trends

The number of full time equivalent jobs from direct involvement in red deer in 1978/9 was assessed at 315.[59] Therefore, the trend seems to be one of increasing employment in the deer sector.

Key issue

- The effect of deer management practices on the quality, quantity, diversity and versatility, of employment.

8.5 Deer sector waste

Within the timescales available for collecting baseline information, it was not possible to collect information on the current situation, and past and possible future trends on deer sector waste in Scotland. However, information on this is available, e.g. from the Deer Commission for Scotland.

Key issues

- The disposal of waste associated with culling activities (e.g. carcasses).

[58] Use of wild living resources in the United Kingdom: a review, IUCN & DEFRA, (2005)
[59] Developing a policy framework for managing diffuse deer impacts, Landwise Scotland for the Deer Commission for Scotland (March 2005)

9 SEA Topic: Cultural Heritage

Scotland's historic environment features are an integral component of the landscape and make an important contribution to tourism. The continued survival of many archaeological sites is linked to an appropriate level of grazing. Deer populations and deer management practices can contribute to the management of archaeological sites by helping to keep them free from natural vegetation regeneration. However, excessive grazing may cause damage through trampling. Cultural heritage aspects relevant to the Strategy include the status of Scheduled Ancient Monuments, archaeological sites, historic parks and gardens, battlefields, and World Heritage Sites.

9.1 Historic Environment features

Current situation

Historic environment features are an integral component of the landscape and make an important contribution to tourism. There are three main services for the historic environment; the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS), Historic Scotland and Local Authority Archaeology Services. The historic environment is defined as;

"*any or all of the structures and places in Scotland of historical, archaeological or architectural interest or importance"*.[60]

The historic environment encompasses built heritage features (such as ancient monuments, archaeological sites and landscapes, historic buildings townscapes, parks gardens and designed landscapes, as well as marine heritage) and the context or settings in which they sit. Scotland has a rich historic environment including; four world heritage sites (and one proposed site – the Antonine wall), over 7800 scheduled ancient monuments, over 47 000 listed buildings, and 386 gardens and designed landscapes.[61]

There are numerous recorded archaeological sites within Scotland and details of these are held by the Local Authority Archaeological Services. Historic Scotland provides GIS data on Scheduled Ancient Monuments on their PASTMAP web facility, and also lists Local Authority archaeological contacts.[62]

The management of scheduled sites can be subject to restriction through management agreements which are normally agreed between the landowner and Historic Scotland and commonly include limitations on farming practices. As well as the use of the Ancient Monuments and Archaeological Areas Act (1979) to protect sites through primary legislation, there are restrictions on development of archaeological sites through the national planning policy guidelines.

Past & possible future trends

The number of archaeological sites is increasing as a result of new sites being identified, primarily during construction. These sites often lie in rural areas where construction has not previously been undertaken.

[60] Public Appointments and Public Bodies etc (Scotland) Act, 2003.
[61] The draft Scottish Historic Environment Policy (SHEP) paper (2007)
[62] http://www.historic-scotland.gov.uk/ (October, 2007)

The continued survival of the many archaeological sites is linked to an appropriate level of grazing. Deer grazing can contribute to the management of archaeological sites by helping to keep them free from natural regeneration, however, excessive grazing may cause damage through trampling.

Historic Scotland is currently preparing a policy for the protection of battlefields in Scotland, which includes proposals to create a battlefields inventory. In the future, Historic Scotland is likely to request that historic landscapes are taken into consideration. Historic Land-Use Assessment (HLA) can add information on the historic dimension of landscape character assessment.

Key issues

- The effect of deer density or species mix on erosive and trampling damage to historic environment features.
- The effect of deer density or species mix on vegetation root depth or growth close to archaeological features (e.g. root growth can damage the structural integrity of stone).
- The effects of fencing and treeguards on archaeological sites and the setting of Scheduled Ancient Monuments

10 SEA Topic: Landscape

Scotland's landscape results from a combination of many factors including geology, habitats and species, historic environment features, agriculture and forestry, and human presence. Wild deer populations and deer management can affect all of the above factors, and therefore, alter the balance of Scotland's landscapes. Landscape aspects relevant to the Strategy include the status of land-use, landscape designations, and sporting estates.

10.1 Land use & land use change

Current situation

Changes in land use have been implicated as having significant impacts on the landscape of rural Scotland, as well as the water environment, air quality (local, national and international), climatic factors, and biodiversity as detailed in the sections above. One of the major land uses in Scotland is agriculture with approximately 80% of land in Scotland being given over to agriculture, and a further 16% of land in Scotland being afforested (see Figure 10.1.a for the land cover of Scotland).[63]

Past & possible future trends

Over the period from about 1947 to 1988, significant changes have taken place within Scotland's urban and rural environment. The largest change was the increase in woodland (from about 5% to 14% of Scotland), primarily due to the increase of coniferous plantation forest throughout the Highlands and Southern Uplands. This accounted for much of the decline in heather, mire and grassland in the uplands. In the lowlands, arable expanded at the expense of grassland. Transport links were transformed through a programme of road building and improvement, and built & bare ground increased mainly onto lowland farmland.[64]

Key issues

- The impact of deer on land use objectives
- The interactions of agriculture, forestry and deer management
- The effect of hill and All Terrain Vehicle tracks for managing deer on the landscape

[63] Scottish Executive Environment Statistics, http://www.scotland.gov.uk/Topics/Statistics (October, 2007)
[64] Scottish Executive Environment Statistics, http://www.scotland.gov.uk/Topics/Statistics (October, 2007)

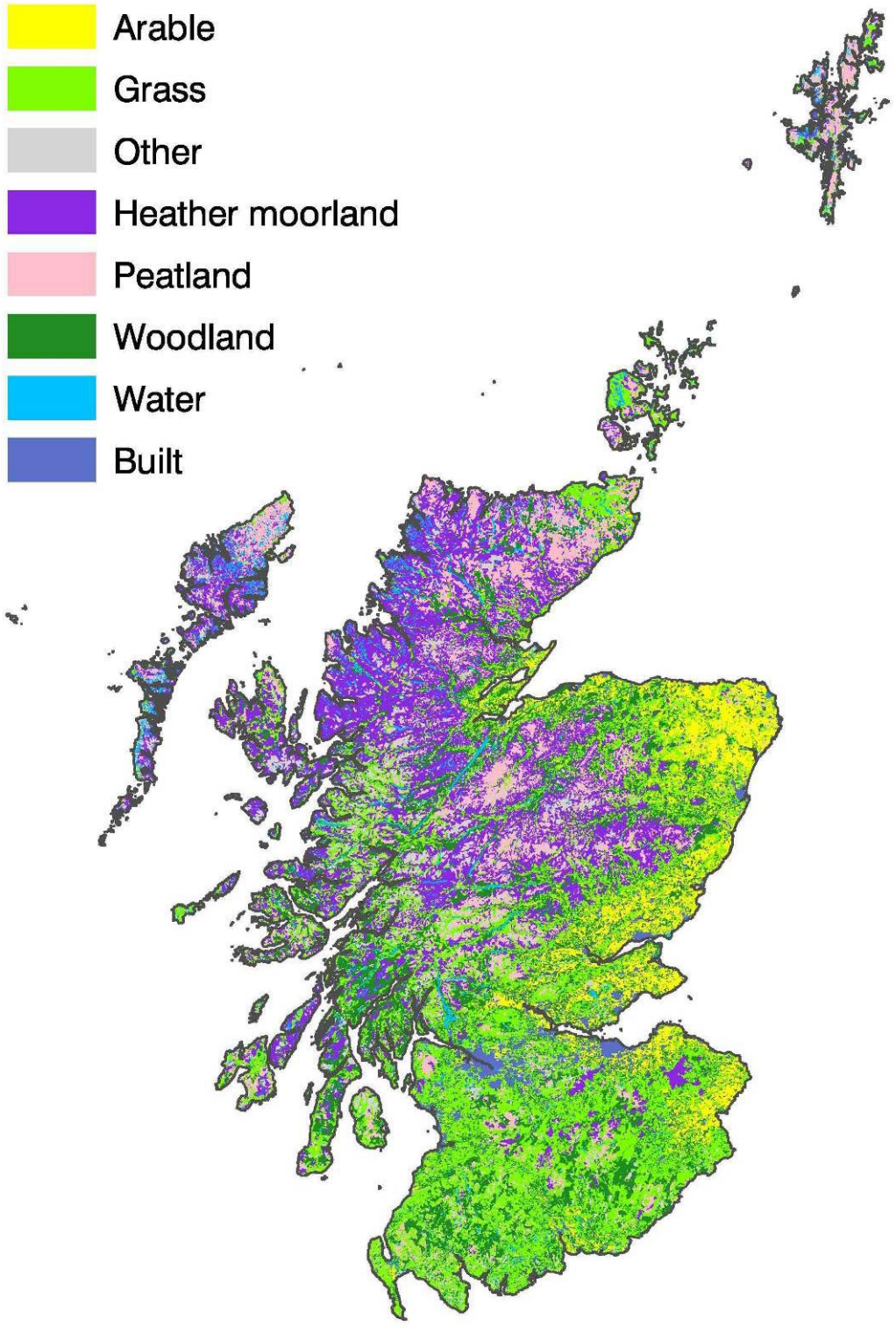


Figure 10.1.a: The land cover of Scotland, 1988
(Source: Scottish Natural Heritage, 2007)

10.2 Landscape designations

Current situation

The main national landscape designations in Scotland are National Scenic Areas (NSAs). These are areas of land considered of national significance on the basis of their outstanding scenic interest. There are currently 40 National Scenic Areas in Scotland. Areas of Great Landscape Value (AGLVs) may be designated by planning authorities for the purpose of safeguarding regionally or locally important areas of outstanding scenic character or quality from inappropriate development. In addition, some authorities have also identified areas of regional scenic significance.

Table 10.2.a shows that in 2005, 568,000 hectares of land in Scotland were covered by National Parks; 1,002,000 hectares were covered by National Scenic Areas; and 155,000 hectares by Green Belt. The proportions of land in Scotland covered by each of these designations are lower than the UK averages.

Table 10.2.a: Designated Areas, 2005
(Source: DEFRA, Regional Trends 39; ONS, 2006):

	National Parks		Areas of Outstanding Natural Beauty / National Scenic Area		Green Belt	
	Area (thousand hectares)	% of total area in region	Area (thousand hectares)	% of total area in region	Area (thousand hectares)	% of total area in region
UK	1,972	8	3,377	14	2,032	8
England	994	7	2,018	16	1,650	13
Wales	410	20	72	4	-	-
Scotland	568	6	1,002	13	155	2
Northern Ireland	-	-	285	20	227	16

Note: AONB is an English designation, andt the Scottish equivalent is National Scenic Area
Note: Green Belts are not a landscape designation but do present a constraint on development.

Past & possible future trends

A landscape character assessment of Scotland commissioned by SNH identified changes in farmland; woodland; mountain and moorland; freshwater; and the coast line areas within Rural Scotland. Some of the key changes recorded during the assessment were attributed to changes in farming practice (i.e. conversion of grass land to arable land); the loss of field boundaries; large scale coniferous afforestation; and loss of vegetation due to recreation in upland areas.[65]

Key issues

- The effects of deer on the condition of landscape designations

[65] http://www.countrysports.co.uk/sheets/scotlandmap.htm (October, 2007)

- The effect of deer populations and management on the balance of habitats in the landscape (i.e. landscape ecology)
- The effect of erosion and vegetation loss caused by deer and other grazing animals on landscape character.

10.3 Sporting estates

Current situation

Currently there are around 304 sporting estates in Highlands and Islands, covering around 5.2 million acres and accounting for about 30% of private land in Scotland with over 50% of that in Highlands and Islands. Only a part of that total will be deer forests which are now estimated to occupy some 10,000 square kilometres (3860 square miles) of the Highlands and Islands. Certain trends in landholding in deer forests can make deer management more difficult, including;

- Fragmentation of the larger estates into smaller landholdings,
- The diverse backgrounds of estate owners (some are absentee landowners and as such and are less aware of situation on the ground), and
- More rapid turnover in ownership, making the consistency of long-term policies that are often essential in the management of such areas more difficult to maintain.[66]

Past & possible future trends

In 1811, there were only six or seven deer forests which were actively managed for hunting, by 1873, this had risen to 79 and by end of 19th century there were 130 –150 covering 2.5 million acres. By 1957 there were 183 deer forest in the Scottish Highlands and Islands covering 2.8 million acres. They regard this as the last date for which accurate figures are available.[67]

Key issues

- The effects of trends in landholding on the effectiveness of deer management

[66] Developing a policy framework for managing diffuse deer impacts, Landwise Scotland for the Deer Commission for Scotland (March, 2005)

[67] Developing a policy framework for managing diffuse deer impacts Landwise Scotland for the Deer Commission for Scotland (March, 2005)

Appendix 4:

Environmental baseline information reference list

Appendix 4: Baseline Information Reference Table

Note: This table presents a list of all data used in undertaking the SEA of the Strategy, where it may be sourced for further reference and what type of data it is e.g. quantitative/qualitative/trends data etc.

SEA Objective	Baseline Info Theme	Baseline data title	Scotland-wide: Current Condition Data Available?	Scotland-wide: Trend Data Available?	Reference
Biodiversity, Flora & Fauna					
To maintain and enhance biodiversity	**Habitats**	Trends in natural and semi-natural habitats	√ Quan	√ Quan	Natural Heritage Trends Scotland 2001 , http://www.snh.org.uk/ Scottish Executive Environment Statistics, http://www.scotland.gov.uk/Topics/Statistics/Browse/Environment
		Status of UKBAP habitats	√ Quan	√ Quan	Natural Heritage Trends Scotland 2001 , http://www.snh.org.uk/ Scottish Executive Environment Statistics, http://www.scotland.gov.uk/Topics/Statistics/Browse/Environment
		Broad habitat change	√ Quan	√ Quan	Natural Heritage Trends Scotland 2001 , http://www.snh.org.uk/ Scottish Executive Environment Statistics, http://www.scotland.gov.uk/Topics/Statistics/Browse/Environment
		Deer induced habitat changes	~ Qual	X	Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland, August 2003, prepared by John F Hunt Managing Deer in the Countryside 1999 http://www.forestry.gov.uk/website/PDF.nsf/pdf/fcpn6.pdf/$FILE/fcpn6.pdf The Impact of Deer on Woodland Biodiversity http://www.forestry.gov.uk/website/PDF.nsf/pdf/fcin36.pdf/$FILE/fcin36.pdf
		Impact of deer fencing on habitat structure and distribution	~ Qual	X	Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland, August 2003, prepared by John F Hunt
	Species	Status of UKBAP species	√	√	Natural Heritage Trends Scotland 2001 , http://www.snh.org.uk/ Scottish Executive Environment Statistics, http://www.scotland.gov.uk/Topics/Statistics/Browse/Environment
		Species adversely affected by deer	√	X	Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland, August 2003, prepared by John F Hunt
		Species adversely affected by deer fencing	√	X	Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland, August 2003, prepared by John F Hunt
	Deer	Deer distribution	√ Quan	X	National Biodiversity Network Gateway http://www.searchnbn.net/index_homepage/index.jsp
		Deer numbers and density (number / ha by species)	√ Quan	√ Quan	Variation in red deer density in the Highland http://www.snh.gov.uk/publications/on-line/advisorynotes/100/100.htm Developing methodologies for monitoring deer impacts in the wider countryside: Initial Scoping Study http://www.dcs.gov.uk/downloads/research_impacts_rp35a.doc UK Mammal Species and population Trends (Mammal Tracking Partnerships 2005) The Impact of Deer on Woodland Biodiversity http://www.forestry.gov.uk/website/PDF.nsf/pdf/fcin36.pdf/$FILE/fcin36.pdf
		Percent of red / sika deer hybrids	~ Quant	X	Abernethy, K. (1994). The establishment of a hybrid zone between red and sika deer (genus Cervus). Molecular Ecology 3: 551-562.
		Rate of non-native deer establishment in Scotland	~ Qual	~ Qual	Alastair I. Ward. (2005). Expanding ranges of wild and feral deer in Great Britain. Mammal Review 35 (2), 165–173.
		Non-native deer species effect on habitat structure & distribution	X	X	Data Gap
		Number of culls	√ Quan	√ Quan	http://www.dcs.gov.uk/downloads/DEER%20COMM%20REPORT%20PDF%20MASTER.pdf
		Urban deer distribution/density	X	X	Deer problems in urban and suburban areas, Hunt 2003, http://www.defra.gov.uk/rds/publications/technical/tan_37.pdf The Scottish Government is commencing a study into the management of roe deer in peri urban Scotland
	Designated Sites	Area of protected areas (SSSIs, SPAs, SACs, Ramsar)	√ Quan	√ Quan	http://www.snh.org.uk/about/ab-pa00.asp
		Condition of protected areas (SSSIs, SPAs, SACs, Ramsar)	√ Quan	X	www.snh.org.uk/.../main_board_papers/14%20Mar%2006/SITE%20CONDITION%20MONITORING%20THE%20FIRST%20CYCLE.pdf
Population and Human Health					
	Road & Sport Shooting Accidents	Number of deer-related road accidents (number of injuries/deaths)	√ Quan	√ Quan	DCS - Deer Vehicle Collisions http://www.dcs.gov.uk/info_news.aspx http://www.deercollisions.co.uk/ftp/Scotpressrel.pdf
		Number of deer-related sport shooting accidents (number of injuries/deaths)	X	X	Home Accident Surveillance Survey 1995, DTI http://www.basc.org.uk/content/shooting

SEA Objective	Baseline Info Theme	Baseline data title	Scotland-wide: Current Condition Data Available?	Scotland-wide: Trend Data Available?	Reference
To protect and enhance human health	Recreation & Access	Length of footpaths / tracks & rights of way	√ Quan	X	http://www.outdooraccess-scotland.com/default.asp?nPageID=303 Rights of Way in Scotland (http://www.snh.org.uk/pdfs/access/sr-sprow.pdf) http://www.ramblers.org.uk/info/paths/pathsregion.html#SC http://www.ramblers.org.uk/info/britain/access.html#Scotland%20paths Scottish Rights of Way Environmental Report of the Scottish RDP – map 2.1 accessible and non accessible rural areas
		Proportion of people taking part in open-air recreation	√ Quan	X	http://www.outdooraccess-scotland.com/default.asp?nPageID=303
		Access to stalking opportunities	√ Qual	X	Deer Marketing Report - http://www.greentourism.org.uk/Deer-Marketing-Report.pdf www.dcs.org
		Number of deer management fences affecting public access	X	X	Data Gap
		Number & expenditure of tourists visiting Scotland	√ Quan	X	Visit Scotland Tourism Statistics Leaflet http://www.visitscotland.org/tis_summary2005updated.pdf
		Recreation activities undertaken by tourists	√ Quan	X	Visit Scotland Tourism Statistics Leaflet http://www.visitscotland.org/tis_summary2005updated.pdf
		Direct and indirect effects of deer management on recreation activities	√ Qual	X	http://www.ramblers.org.uk/scotland/ Ramblers Association, Tourism and the Environment: sustaining Scotland's natural advantage (website) http://www.greentourism.org.uk/Default.aspx.LocID-008new1bj.RefLocID-008015.Lang-EN.htm,
	Disease Transmission	Diseases transmitted from deer to humans (rates & risk factors)	√ Qual	√ Qual	Concern as sheep-tick disease cases soar, John Ross, The Scotsman, Tue 31 May 2005, http://thescotsman.scotsman.com/index.cfm?id=594082005 Economic Impacts of Wild Deer in East England (Chapter 7) http://www.woodlandforlife.net/wfl-woodbank/displayarticle.asp?id=2333
	Venison Quality	Quality of venison products (hygiene)	~ Qual	~ Qual	http://www.scotland.gov.uk/News/Releases/2002/06/1814 http://www2.defra.gov.uk/research/Project_data/More.asp?I=LK0671&SCOPE=0&M=PSA&V=FS%3A060A
		Effect of diseases on venison food chain and food quality	X	X	Food Standards Agency
	Demographics & Education (as relates to the deer sector)	Demographics & Education (as relates to the deer sector)	X	X	Data Gap
Water					
To meet environmental standards required by the Water Framework Directive (WFD)	Freshwater bodies	Number of morphological changes to freshwater bodies due to agricultural and forestry activities	√ Quan	X	The Scotland River Basin District: Characterisation and impacts analyses required by Article 5 of the Water Framework Directive, Summary Report - www.sepa.org.uk
		Morphological alterations to freshwater bodies due to grazing animals, including deer	~ Qual	X	The Scotland River Basin District: Characterisation and impacts analyses required by Article 5 of the Water Framework Directive, Summary Report - www.sepa.org.uk
	Water Quality	Water Quality Classifications	√ Quan	√ Quan	State of Scotland's Environment, SEPA, 2006
		Effect of grazing animals, including deer, on water quality	~ Qual	X	Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland, August 2003, prepared by John F Hunt
To avoid, reduce and manage flood risk	Flooding	Causes of flooding	~ Qual	X	http://www.multimap.com/clients/places.cgi?client=SEPA
		The links between vegetation cover and flooding (buffering capacity of vegetation)	~ Qual	X	Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland, August 2003, prepared by John F Hunt
Soil					
To conserve soil resources and quality	Soil resources	Soil types	~ Qual	X	State of the Environment Soil Quality Report http://www.sepa.org.uk/pdf/publications/state_of/soil/soil_report.pdf
		Soil quality	~ Qual	X	State of the Environment Soil Quality Report http://www.sepa.org.uk/pdf/publications/state_of/soil/soil_report.pdf
		Soil erosion & compaction	~ Quan	X	The Significance of soil erosion in the Scottish uplands http://www.snh.org.uk/publications/on-line/advisorynotes/43/43.htm Trends in Soil Erosion http://www.snh.org.uk/pdfs/publications/commissioned_reports/F00AC106.pdf
	Soil Carbon Content	Levels of organic matter in Scottish soils	√ Quan	X	State of the Environment Soil Quality Report http://www.sepa.org.uk/pdf/publications/state_of/soil/soil_report.pdf
		Loss of organic matter from Scottish soils	√ Quan	X	State of the Environment Soil Quality Report http://www.sepa.org.uk/pdf/publications/state_of/soil/soil_report.pdf Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland, August 2003, prepared by John F Hunt
Air and Transport					
To improve air quality (with reference to the pollutants under the EC Air Quality Directives)	Air quality	National and local air quality	√ Quan	√ Quan	State of the Environment - Air Quality report (SEPA, 1999)

SEA Objective	Baseline Info Theme	Baseline data title	Scotland-wide: Current Condition Data Available?	Scotland-wide: Trend Data Available?	Reference
Climate Factors (including energy)					
To reduce contributions to climate change	**GHG emissions**	GHG emissions by sector	√ Quan	√ Quan	http://www.scotland.gov.uk/Publications/2007/08/20165714/11 National Atmospheric Emissions Inventory, www.naei.org.uk State of Scotland's Environment Supplementary Material - Greenhouse Gas Emissions and Removal http://www.sepa.org.uk/publications/state_of/2006/supplemental/pdf/SC1.pdf
	Deer Management	Total carbon equivalent emissions from deer sector	X	X	DCS
		Percentage electricity generated from renewable sources used in deer sector	X	X	DCS
	Carbon sinks (focus on moorland)	Impacts of deer on moorland habitat	~ Qual	X	Impacts of Wild Deer in Scotland: How Fares the Public Interest? Report for WWF Scotland and, RSPB Scotland, August 2003, prepared by John F Hunt
		Significance of moorland as a carbon dioxide sink.	√ Quan	X	State of Scotland's Environment Supplementary Material - Greenhouse Gas Emissions and Removal http://www.sepa.org.uk/publications/state_of/2006/supplemental/pdf/SC1.pdf
		GHG emissions associated with loss of forest due to deer population levels	X	X	Forestry Commission
To contribute to adaptations to climate change	**Climate records**	Temperature and rainfall records for Scotland	√ Quan	√ Quan	Changing our ways: Scotland's Climate change Programme, Scottish Executive (2006)
	Species / Habitats	Species / Habitats vulnerable to climate change	~ Qual	X	DEFRA - Climate Change and UK Nature Conservation: A Review of the Impact of Climate Change on UK Species and Habitat Conservation Policy; http://www.defra.gov.uk/wildlifecountryside/climatechange/nature/execsum.htm
		Influence of climate change on relative balance of species and habitats	X	X	Data Gap
	Disease	Impacts of climate change on insects and disease (e.g. ticks)	~ Qual	X	Postnote, nov 2004, UK Health Impacts of Climate Change
Material Assets (including waste and resource management)					
To reduce the impact of built assets on the environment	**Plantation, Forest & Agricultural Resources**		~ Qual	X	State of the Environment Report for Scotland (SEPA, 2006) Staines B., Palmer S.C.F., Wyllie I., Gill R. and Mayle B. (1998). Desk and limited field studies to analyse the major factors influencing regional deer populations and ranging behaviour. A report for MAFF. Trout R.C., Putman R.J., Moore N.P. and Hart J.D. (1994). A review of lowland deer. A report for MAFF. Ratcliffe P.R. (1989). The control of red and sika deer populations in commercial forests. In: Mammals as Pests pp. 98-115 (ed. R.J. Putman). Chapman and Hall, London. Moore N.P., Hart J.D. & Langton S.D. (1999). Factors influencing browsing by fallow deer (Dama dama) in young broad-leaved plantations. Biological Conservation 87: 255-260. Putman, R.J. and Moore, N.P. (1998). Impact of deer in lowland Britain on Agriculture, Forestry and Conservation Habitats. Mammal Review 28: 141-164. Forestry Commission, Scotland http://frcc.forestry.gov.uk/website/forestresearch.nsf/ByUnique/INFD-6CHDN7?Open&PrintFriendly=y Scottish Executive Environment Statistics, http://www.scotland.gov.uk/Topics/Statistics/Browse/Environment
	Tourism Resources		√ Quan	√ Quan	Wildlife Tourism – Training For Success Review of wildlife tourism (2001) http://www.greentourism.org.uk/wild-main%20report.pdf Economic impacts of Wild Deer in East England http://www.the-tree.org.uk/TreeTalk/4/deerstudy.htm Tourism in Scotland 2005 http://www.visitscotland.org/tis_summary2005updated.pdf Deer related recreation and tourism http://www.woodlandforlife.net/wfl-woodbank/documents/Chapter_8.pdf
	Deer Resources	Number and location of roads, hill roads, and buildings associated with deer management Value of deer as a resource.	√ Quan	X	Scottish Executive - Scottish Biodiversity List Social Criterion Results of a Survey of the Scottish population http://www.scotland.gov.uk/Resource/Doc/99806/0024169.pdf The Contribution of Deer Management to the Scottish Economy http://www.deer-management.co.uk/documents/contribution02.pdf http://www.deer_management.co.uk/documents/contribution01.pdf Deer Marketing Report http://www.greentourism.org.uk/Deer-Marketing-Report.pdf Who Manages the Deer http://www.dcs.gov.uk/manage_whoManages.aspx
	Employment in Deer Sector	Deer management related employment opportunities	√ Quan	√ Quan	USE OF WILD LIVING RESOURCES IN THE UNITED KINGDOM: A REVIEW, IUCN & DEFRA DEVELOPING A POLICY FRAMEWORK FOR MANAGING DIFFUSE DEER IMPACTS Landwise Scotland for the Deer Commission for Scotland, March 2005
	Deer Sector Waste		X	X	Animal By Products Regulations http://www.nationalgamekeepers.org.uk/library/resource/77/ Deer Commission Best Practice Guides on Deer Carcass Handling http://www.dcs.gov.uk/BestPractice/CarcassInspect.aspx
Cultural Heritage					
To protect conserve, and where appropriate, enhance the historic environment and cultural heritage	**Historic Environment Features**	Scheduled Ancient Monuments (SAMs)	√ Quan	√ Quan	Public Appointments and Public Bodies etc (Scotland) Act, 2003. The draft Scottish Historic Environment Policy (SHEP) paper, http://www.historic-scotland.gov.uk/
		Archaeological sites	√ Quan	√ Quan	
		Historic parks and gardens	√ Quan	√ Quan	
		Battlefields	~ Qual	X	
		World Heritage Sites	√ Quan	√ Quan	
		Number of Scheduled Ancient Monuments affected by deer activities	X	X	
Landscape					
To protect, conserve and enhance the Scottish landscape	**Land Use & Land Change**		√ Quan	√ Quan	Scottish Executive Environment Statistics, http://www.scotland.gov.uk/Topics/Statistics
	Landscape Designations		√ Quan	√ Quan	DEFRA Deer Fencing Policy Paper http://www.dcs.gov.uk/downloads/final%20fencing%20policy.pdf Natural Heritage Trends Scotland 2001 http://www.snh.org.uk/pdfs/strategy/trends/SNH_Trends.pdf
	Natural Heritage Zones		√ Quan	X	Natural Heritage Trends Scotland 2001 , http://www.snh.org.uk/
	Sporting Estates		√ Quan	X	Developing a policy framework for diffuse deer impacts http://www.dcs.gov.uk/downloads/final%20rp35c.pdf

Appendix 5:

Compatibility of the strategy's vision with SEA objectives

Appendix 5: Compatibility of the Strategy's Vision Elements and the SEA Objectives

Note: A compatibility assessment of the Strategy's Vision Elements and the SEA Objectives was undertaken as part of the SEA process. This table presents graphically, the outcome of the assessment.

Key: ✓ Supportive of SEA objectives; ✖ Identified potential conflicts with SEA objectives; 0 No identified conflicts with SEA objectives; ? Uncertain whether will conflict with SEA objectives		SEA Objectives: To maintain and enhance biodiversity, flora, fauna & habitats	To protect and enhance human health	To meet environmental standards required by the Water Framework Directive (WFD)	To avoid, reduce and manage flood risk	To conserve soil resources and quality	To improve air quality (with reference to the pollutants under the EC Air Quality Directives)	To reduce contributions to climate change	Contribute to adaptation to climate change	Promote sustainable management of natural and man-made resources.	To protect conserve, and where appropriate, enhance the historic environment and cultural heritage	Protect, conserve and enhance the Scottish landscape	Comments
Vision Objectives: High Quality Environment	Maintaining populations of wild deer as a highly valued part of Scotland's natural heritage	✖	?	✖	✖	✖	0	✖	✖	?	✖	✖	Because this objective is focused on deer populations, it may potentially conflict with the wider objectives of marinating biodiversity, water quality, soil resources etc.
	Minimising any adverse impacts of wild deer on nature and natural systems	✓	?	✓	✓	✓	✓	✓	✓	✓	✓	✓	This objective balances the previous one by seeking to minimise any adverse wild deer impacts on ecosystems.
Sustainable Economic Development	Careful use of wild deer as a resource, contributing to successful rural businesses	✖	✖	✖	?	✖	?	✖	✖	✖	✖	✖	The expansion of rural businesses may involve putting in place infrastructure including buildings, septic tanks, access routes and car parks. Therefore, there are Potential negative effects across most SEA objectives.
	Developing the skills, knowledge and employment opportunities of those involved in deer management;	?	?	?	?	?	?	?	?	?	?	?	The effects are uncertain and could potentially be positive, but only if capacity building incorporates consideration of environmental and socio-economic issues.
	Minimising any adverse impacts of wild deer on other land uses	?	?	?	?	?	?	?	?	?	?	?	This objective may favour certain land uses. If these are prioritised over biodiversity, reducing contribution to climate change etc., negative effects on the environment are likely.
Contribute to Social Wellbeing	Safeguarding public health and reducing safety risks associated with wild deer	✖	✓	✖	0	0	0	0	0	0	0	0	Safeguarding health and safety risks, e.g. by preventing deer-related road accidents, may involve cutting back road side verges that act as important wildlife corridors. Also, leaving culled carcasses near watercourses may negatively affect water quality. There is little to no negative or positive effects on other SEA objectives.
	Facilitating the observation and understanding of wild deer by the public	✖	✖	✖	?	✖	?	✖	✖	?	✖	✖	This objective may involve putting in place infrastructure including buildings, septic tanks, and access routes and car parks. Therefore, there are Potential negative effects across most SEA objectives.
	Promoting the enjoyment of wild venison as a high quality food product	?		?	?	?	?	?	?	?	?	?	Promoting venison through advertising / information dissemination may potentially have an uncertain effect on most SEA objectives. However, it may have Potential positive effects on human health (if food safety is also promoted).
	Comments Overall compatibility of vision objectives	x/? Potential conflicts or uncertain compatibility between most vision objectives and maintaining biodiversity. A minority are supportive.	?/ X/ √ Uncertain whether most vision objectives will conflict with enhancing human health. A few are supportive or potentially conflicting.	X/ ? Potential conflicts or uncertain compatibility between most vision objectives and maintaining water quality. A minority are supportive.	? Uncertain whether most vision objectives will conflict with avoiding flood risk. A minority of objectives are supportive or potentially conflicting.	X/ ? Potential conflicts or uncertain compatibility between most vision objectives and conserving soil resources. A minority are supportive.	? Uncertain whether most vision objectives will conflict with improving air quality. A minority of objectives are supportive or potentially conflicting.	X / ? Potential conflicts or uncertain compatibility between most vision objectives and reducing contributions to climate change. A minority of objectives are compatible.	X/ ? Potential conflicts or uncertain compatibility between most vision objectives and contributing to climate change adaptation. A minority are supportive.	? Uncertain whether most vision objectives will conflict with promoting sustainable resource management. A minority are supportive or potentially conflicting.	X / ? Potential conflicts or uncertain compatibility between most vision objectives and protecting the historic environment. A minority are supportive.	X / ? Potential conflicts or uncertain compatibility between most vision objectives and protecting the Scottish landscape. A minority are supportive.	

Appendix 6:

Compatibility of the Strategy's high quality environment objectives with the SEA objectives

Appendix 6: Compatibility of the Strategy's High Quality Environment Objectives and the SEA Objectives 22/10/2007

Note: A compatibility assessment of the Strategy's High Quality Environment Objectives and the SEA objectives was undertaken as part of the SEA process. This table presents graphically, the outcome of the assessment.

		SEA Objectives											
Key: ✓ Supportive of SEA objectives ✖ Identified potential conflicts with SEA objectives 0 No identified conflicts with SEA objectives ? Uncertain whether will conflict with SEA objectives		To maintain and enhance biodiversity, flora, fauna & habitats	To protect and enhance human health	To meet environmental standards required by the Water Framework Directive (WFD)	To avoid, reduce and manage flood risk	To conserve soil resources and quality	To improve air quality (with reference to the pollutants under the EC Air Quality Directives)	To reduce contributions to climate change	Contribute to adaptation to climate change	Promote sustainable management of natural and man-made resources.	To protect conserve, and where appropriate, enhance the historic environment and cultural heritage	Protect, conserve and enhance the Scottish landscape	Comments
Strategy Objectives	High Quality Environment												
	6.1 a) Safeguard the welfare of all species of wild deer.	✖	✖	✖	?	✖	0	?	?	✖	✖	✖	May involve altering culling methods, or reducing culling, which would possibly have negative effects on biodiversity, cause 'darting' accidents, affect sustainable use of resources etc.
	6.1 b) Minimise further spread of non-native deer species in Scotland.	✓	✖	✖	?	✓	✓	?	?	?	✓	✓	The approach to controlling the spread of non-native deer could possibly negatively affect biodiversity and other environmental factors. Some likely positive effects on protecting the Scottish landscape.
	6.1 c) Secure the -favourable condition of features in designated sites.	✓	0	✓	0	✓	0	✓	✓	✓	✓	✓	Likely to have positive effects.
	6.1 d) Conserve and enhance biodiversity in the wider countryside.	✓	0	✓	✓	✓	0	✓	✓	✓	✖	✓	Potential major positive effects on SEA objectives. Also Potential negative effects on the conservation and enhancement of cultural heritage sites / historic environment if , e.g., wildlife corridors are established near archaeological sites.
	6.1 e) Maintain the integrity of natural processes.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Potential positive effects on all SEA objectives (depending on the types of actions which will support achieving this objective).
	6.1 f) Help tackle and adapt to the effects of climate change.	✓	✓	?	✓	✓	0	✓	✓	✓	✓	✓	Likely to have positive effects on all SEA objectives.
	6.1 g) Conserve and enhance the cultural and historic environment.	✖	0	?	0	?	0	?	0	✓	✓	✓	Likely to have a slight negative effect on biodiversity if this objective and objective 6.1d) have competing interests.
	Comments Overall Compatibility of Environmental Objectives	✓	✓ / X / 0	✓ / X / ?	✓ / ?	✓	✓ / 0	✓ / ?	✓	✓	✓	✓	✓
		Environmental objectives mostly supportive of maintaining biodiversity. A minority are potentially incompatible.	As relates to protecting human health, the strategy environmental objectives are split almost equally between; no identified conflict / supportive/ and potentially conflicting.	As relates to protecting water quality, the strategy environmental objectives are split almost equally between; uncertain / supportive/ and potentially conflicting.	Environmental objectives mostly supportive of reducing flood risks.	Environmental objectives mostly supportive of conserving soil resources. A minority are potentially conflicting.	Environmental objectives mostly have no identified conflicts with maintaining local air quality. A minority are potentially supportive.	Environmental objectives mostly compatible supportive reducing contributions to climate change.	Environmental objectives mostly supportive of contributing to climate change adaptation.	Environmental objectives mostly supportive of sustainable resource use . A minority are potentially conflicting.	Environmental objectives mostly supportive of protecting the historical environment. A minority are potentially conflicting.	Environmental objectives mostly supportive of protecting the Scottish landscape. A minority are potentially conflicting.	

Appendix 7:

Compatibility of the Strategy’s sustainable economic

Appendix 7: Compatibility of the Strategy's Sustainable Economic Development Objectives and the SEA Objectives

Note: A compatibility assessment of the Strategy's Sustainable Economic Development Objectives and the SEA objectives was undertaken as part of the SEA process. This table displays graphically, the outcome of the assessment

Key: ✓ Supportive of SEA objectives x Identified potential conflicts with SEA objectives 0 No identified conflicts with SEA objectives ? Uncertain whether will conflict with SEA objectives		SEA Objectives: To maintain and enhance biodiversity, flora, fauna & habitats	To protect and enhance human health	To meet environmental standards required by the Water Framework Directive (WFD)	To avoid, reduce and manage flood risk	To conserve soil resources and quality	To improve air quality (with reference to the pollutants under the EC Air Quality Directives)	To reduce contributions to climate change	Contribute to adaptation to climate change	Promote sustainable management of natural and man-made resources.	To protect conserve, and where appropriate, enhance the historic environment and cultural heritage	Protect, conserve and enhance the Scottish landscape	Comments
Strategy Objectives	Sustainable Economic development												
	6.2 a) Increase the economic opportunities associated with wild deer.	X	X	X	?	X	?	X	X	X	X	X	May involve setting up infrastructure such as buildings, septic tanks and roads, which could have Potential negative effects across most SEA objectives.
	6.2 b) Minimise economic costs attributable to wild deer.	?	?	?	?	?	?	?	?	?	?	?	May favour certain land uses. If these are prioritised over biodiversity, reducing contribution to climate change etc. there may be Potential cumulative negative effects on the environment.
	6.2 c) Develop the market and supply chain for venison.	X	✓	X	?	X	?	X	X	X	X	X	May involve setting up infrastructure such as buildings, septic tanks and roads, which is likely to have negative effects on environmental factors. There are also potential positive effects on human health with respect to venison consumption (if food safety is also promoted). .
	6.2 d) Contribute to the social and economic development of communities.	X	?	X	?	X	?	X	X	X	X	X	Economic development of rural communities may involve setting up infrastructure such as buildings, septic tanks and roads, which could have Potential negative effects across most SEA objectives.
	6.2 e) Ensure the skills and knowledge required to manage deer as an integral part of natural resources.	?	?	?	?	?	?	?	?	?	?	?	The effects are uncertain and could potentially be positive, but only if capacity building incorporates consideration of environmental and socio-economic issues.
		X	✓ / X / ?	X	?	X	?	X	X	X	X	X	
	Comments Overall compatibility of Sustainable Economic Development Objectives	Potential conflicts or uncertain compatibility between most economic objectives and maintaining biodiversity.	Uncertain whether most economic objectives will conflict with enhancing human health. A few are supportive or potentially conflicting.	Potential conflicts or uncertain compatibility between most economic objectives and maintaining water quality.	Uncertain whether most economic objectives will conflict with avoiding flood risk.	Uncertain whether most economic objectives will conflict with conserving soil resources.	Uncertain whether most economic objectives will conflict with maintaining local air quality.	Potential conflicts between most economic objectives and reducing contributions to climate change.	Potential conflicts between most economic objectives and contributing to climate change adaptation.	Potential conflicts between most economic objectives and sustainable resource use. y.	Potential conflicts between most economic objectives and protecting the historic environment.	Potential conflicts between most economic objectives and protecting the Scottish landscape.	

Appendix 8:

Compatibility of the Strategy's social well-being objectives with the SEA objectives

Appendix 8: Compatibility of the Strategy's Social Well-being Objectives and the SEA Objectives

Note: A compatibility assessment of the Strategy's Social Well-being Objectives and the SEA Objectives was undertaken as part of the SEA process. This table presents graphically, the outcome of the assessment.

Strategy Objectives		SEA Objectives											Comments
Key: ✓ Supportive of SEA objectives x Identified potential conflicts with SEA objectives 0 No identified conflicts with SEA objectives ? Uncertain whether will conflict with SEA objectives		To maintain and enhance biodiversity, flora, fauna & habitats	To protect and enhance human health	To meet environmental standards required by the Water Framework Directive (WFD)	To avoid, reduce and manage flood risk	To conserve soil resources and quality	To improve air quality (with reference to the pollutants under the EC Air Quality Directives)	To reduce contributions to climate change	Contribute to adaptation to climate change	Promote sustainable management of natural and man-made resources.	To protect conserve, and where appropriate, enhance the historic environment and cultural heritage	Protect, conserve and enhance the Scottish landscape	
Social Well-being	6.3 a) Increase participation in management and enjoyment of the wild deer resource.	X	✓	X	?	X	?	X	X	?	X	X	Increasing the number of people in the countryside may have a potentially positive effect on human health. However, it may result in a degree of trampling and have potential negative effects on some environmental factors including biodiversity, as well as the historic environment and the landscape.
Social Well-being	6.3 b) Contribute to a safe and healthy environment for people.	X	✓	X	0	0	0	0	0	0	0	0	If roadside verges are cut back to reduce deer-related car accidents, this may have Potential negative effects on biodiversity. Also, leaving culled carcasses near riverbanks may potentially have negative effects on water quality. There are no identified conflicts with other SEA objectives.
Social Well-being	6.3 c) Manage the impacts of wild deer in and around communities.	?	X	?	?	?	?	?	?	?	?	?	If management includes shooting, this may lead to a higher frequency of shooting accidents near rural communities. The potential effects on the other SEA objectives are uncertain.
Social Well-being	6.3 d) Promote opportunities for outdoor recreation.	X	✓	X	?	X	?	X	X	?	X	X	Increasing the number of people in the countryside may have a potentially positive effect on human health. However, it may result in a degree of trampling and have potential negative effects on some environmental factors including biodiversity, as well as the historic environment and the landscape.
Social Well-being	6.3 e) Promote venison as a healthy food.	?	✓	?	?	?	?	?	?	?	?	?	Promoting venison through advertising / information dissemination may potentially have an uncertain effect on most SEA objectives. However, it may have Potential positive effects on human health (if food safety is also promoted).
Comments Overall compatibility of vision outcomes		X	✓	X	?	X / ?	?	X / ?	X / ?	?	X / ?	X / ?	
		Potential conflicts between most social wellbeing objectives and maintaining biodiversity. .	Social wellbeing objectives mostly supportive of enhancing human health. A minority are potentially conflicting.	Potential conflicts between most social wellbeing objectives and protecting water quality.	Uncertain whether most social wellbeing objectives will conflict with avoiding flood risk. .	Potential conflicts and uncertain compatibility between most social wellbeing objectives and conserving soil resources.	Uncertain whether most social wellbeing will conflict with improving air quality.	Potential conflicts and uncertain compatibility between most social wellbeing objectives and reducing contributions to climate change.	Potential conflicts and uncertain compatibility between most social wellbeing objectives and contributing towards adapting to climate change.	Uncertain whether most social wellbeing objectives will conflict with promoting sustainable resource management.	Potential conflicts or uncertain compatibility between most social wellbeing objectives and protecting the historic environment.	Potential conflicts or uncertain compatibility between most vision objectives and protecting the Scottish landscape.	

Appendix 9:

Prediction and evaluation of the effects of the Strategy's high quality environment actions

Appendix 9: Prediction & Evaluation of the Effects of the Strategy's High Quality Environment Actions

Note: This matrix shows how the effects on the environment of the Strategy's High Quality Environment Actions were assessed. The method of scoring used in the assessment is intended to be illustrative and indicative, not definitive, in terms of the effects of the actions.

++	Major positive
+	Minor positive
0	Neutral
-	Minor negative
--	Major negative
++/-, +/-- etc.	Mixed
?	Uncertain
S	Short term effects
M	Medium term effects
L	Long term effects

SEA Objectives	Environment Actions: 7.1.1 Achieving the favourable condition of Scotland's most important nature conservation sites			Environment Actions: 7.1.2 Conserve and enhance biodiversity in the wider countryside			Environment Actions: 7.1.3 Contribute to climate change mitigation and adaptation			Overall effect on SEA objectives	Commentary (potential cumulative, secondary, synergistic, temporal, permanent, temporary, reversible or irreversible effects)	Monitoring Recommendations
	7.1.1 a) Actively manage grazing and trampling impacts of deer and other animals on Sites of Special Scientific Interest to achieve favourable condition	7.1.1 b) Integrate management action with other land-uses including agriculture in order to achieve favourable condition	7.1.1 c) Seek the most effective management solutions using flexibility of management area and timescale in order to achieve long-term benefits for designated sites	7.1.2 a) Develop effective ways to address deer management within an ecosystem scale approach to landscape and biodiversity	7.1.2 b) Integrate biodiversity and ecosystem objectives and data into deer management planning	7.1.2 c) Contribute to the conservation of species on the UK and Scottish biodiversity action plan lists	7.1.3 a) Protect woodlands and carbon-rich soils in order to maintain and enhance carbon storage	7.1.3 b) Facilitate establishment and maintenance of habitat networks in order to help biodiversity adapt to climate change	7.1.3 c) Research the impacts of climate change on wild deer and their habitats			
To maintain and enhance biodiversity, flora, fauna & habitats	++ S	++ S-L	+ / ++ M-L	+ M	++ S	+ / ++ S-M	+ / ++ S-M	++ M-L	?	Potentially major and minor positive effects on maintaining biodiversity.	The nature of the strategy's environment actions are such that they have the potential to cause many direct and secondary positive effects on biodiversity. For example, action 7.1.1a will have a direct positive effect on biodiversity by reducing the effects of trampling/grazing on SSSIs. Actions 7.1.3 a and b whilst having direct positive effects on climate change adaptation will also have positive secondary effects on biodiversity by protecting existing habitats and promoting the establishment of new ones.	
To protect and enhance human health	0	+ M	0	0	0	0	0	0	0	Mostly potential neutral effects on protecting and enhancing human health, as well as some minor positive effects.	The strategy's environment actions have no direct effect on human health. However, all of the environment actions will have some positive bearing on biodiversity. Any improvements to biodiversity are likely to lead to an increase in opportunities for people to enjoy 'nature' and subsequently secondary benefits of the environment actions may accrue to general levels of human 'well-being'.	
To meet environmental standards required by the Water Framework Directive (WFD)	+ S-M-L	+ S-M-L	?	+ M	+ S	?	?	?	0	Mostly minor positive effects on protecting water quality, as well as some uncertain and neutral effects.	Potential direct positive effects at local levels on riparian water quality through active management of the negative effects of grazing/trampling in SSSI riparian habitats promoted by action 7.1.1a which would reduce erosion and increase the buffering capacity of bank side vegetation.	
To avoid, reduce and manage flood risk	+ M/L	+ M/L	0	+ M	+ M	0	?	?	?	Mostly minor positive effects on avoiding flood risk, as well as some uncertain and neutral effects.	Action 7.1.1a is likely to have a direct positive effect on flood risk by encouraging vegetation growth/regeneration on certain sites. Growth/regeneration on sites in the vicinity of 'flashy' rivers will lead to a decrease in flood risk due to the increased vegetation cover.	
To conserve soil resources and quality	++ S-M	++ S-M	+ M	+ M	++ S	?	++ S	+ M	?	Mainly potential major and minor positive effects on conserving soil resources, as well as some possible uncertain and neutral effects.	Several of the strategy's environment actions are likely to have positive direct and secondary effects on soil resource quality. For example action 7.1.1 a will have a direct effect on the quality of soils at SSSIs by managing the impacts of trampling and grazing. Actions 7.1.1 b and c and 7.1.2 a and b are likely to have positive secondary effects on soil quality by promoting deer management practices and land uses that are less intensive and more evenly distributed. Action 7.1.3 which seeks to protect carbon sinks will have a positive synergistic effect on climate change mitigation and adaptation by protecting and enhancing current capacity.	
To improve air quality (with reference to the pollutants under the EC Air Quality Directives)	0	?	?	0	0	0	0	0	0	Mostly potential neutral effects on local air quality, as well as some uncertain effects.	Likely to be few to no potential negative effects on local air quality.	
To reduce contributions to climate change	?	?	?	?	?	0	++ S-L	?	?	Mostly uncertain effects on reducing contributions to climate change, as well as some major positive and neutral effects.	Action 7.1.3a is likely to have a potential positive effect on reducing national contributions to climate change via conservation/enhancement of Scotland's carbon sink capacity, particularly woodlands and carbon-rich soils such as peat.	
Contribute to adaptation to climate change	+ L	+ L	+ / ++ L	++ L	+ L	+ / ++ L	+ L	++ L	?	Mainly potential minor and major positive effects on promoting climate change adaptation, as well as some uncertain effects.	The strategy's environment actions are likely to have several positive direct and secondary effects on climate change adaptation. For example actions 7.1.3 a and b will have a direct positive effect of maintaining and enhancing Scotland's carbon sink capacity.	
Promote sustainable management of natural and man-made resources.	+ S	++ S/M	+ M -L	+ M	+ M	+ / ++ S	+ / ++ S	+ / ++ M	?	Mainly potential minor and major positive effects on promoting sustainable resource use, as well as some uncertain effects.	The strategy's environment actions are likely to have several positive direct and secondary effects on the sustainable management of man-made/natural resources. For example, action 7.1.1b promotes the integration of deer management practices with other land-uses such as agriculture. If implemented well, this action will mean that agricultural resources will be subjected to less deer related impacts. Positive secondary effects of actions such as 7.1.3 a and b for example are likely to accrue to biodiversity, woodland and soil resources.	
To protect conserve, and where appropriate, enhance the historic environment and cultural heritage	++ S-M	+ S-M	- / + M-L	?	?	+ S	+ S	- S/M	?	Mixed potential effects on protecting the historic environment including; some potentially minor and major positive effects, some potentially minor negative effects, as some neutral	Several of the environment actions will have a direct positive effect on the integrity of protected sites e.g. action 7.1.1a. There is potential for a negative secondary effect on the integrity of cultural heritage sites if, for example, habitat networks are established near or on these sites - action 7.1.3b. This negative secondary effect could occur as new habitat networks in close proximity to protected sites could lead to grazing/trampling pressures from any herbivores using the new habitat networks.	7.1.1 c) & 7.1.3 b) Monitor condition of SAMs Monitor incorporation of management issues for cultural heritage sites at Action Plan level (e.g. location of habitat networks)
Protect, conserve and enhance the Scottish landscape	++ S	++ S/M	+ M-L	++ M	+ S	+ / ++ S	++ S	+ M	?	Potentially major and minor positive effects on maintaining biodiversity, as well as some uncertain effects.	The strategy's environment actions are likely to cause several positive direct and cumulative (additive) effects towards conserving and enhancing the Scottish landscape. For example actions 7.1.1a and 7.1.3 a and b will cause localised positive direct impacts at the site level. The cumulative nature of these individual positive impacts is likely to be significantly positive towards national and regional landscape integrity/character.	
Summary of action's potential environmental effects	**Overall strongly positive effect**	**Overall strongly positive effect**	**Overall positive effect, however because the objective applies only to natural heritage designations there are also potential negative effects on the integrity of other historic and geological designations.**	**Overall positive effect**	**Overall strongly positive effect**	**Overall positive effect**	**Overall positive effect**	**Overall positive effect, however there are also potential negative effects on the integrity of cultural heritage sites.**	**Uncertain effect as there is no indication of how the results of the research will be applied.**			
Mitigation recommendations								Cultural heritage sites should be considered in planning the location of habitat networks at the Action Plan level.				
Enhancement recommendations			Include historical and geological designations in planning to widen benefits.		Review the level of integration of biodiversity and ecosystem objectives and data into deer management planning		Attempts should be made to foster links between the management strategy for wild deer and other related PPS such as those for the management of woodland/peat bog etc. to further enhance the effectiveness of deer managements contribution to climate change.	Monitor the degree of integration of historic environment issues into lower level management plans. Consider compiling/collecting data on the level of deer impacts on archaeological sites and their settings.	Evaluate how climate change research is incorporated into planning in the short, medium and long-term.			

Appendix 10:

Prediction and evaluation of the effects of the Strategy's sustainable economic development actions

Appendix 10: Prediction & Evaluation of the Effects of the Strategy's Sustainable Economic Development Actions

Note: This matrix shows how the effects on the environment of the Strategy's Sustainable Economic Development Actions were assessed. The method of scoring used in the assessment is intended to be indicative and illustrative, not definitive, in terms of the effects of the actions.

Key to scoring:

++	Major positive
+	Minor positive
0	Neutral
-	Minor negative
--	Major negative
++/-, +/-- etc.	Mixed
?	Uncertain
S	Short term effects
M	Medium term effects
L	Long term effects

	Sustainable Economic Development Actions				Sustainable Economic Development Actions		Sustainable Economic Development Actions		
	7.2.1 Enhance the economic benefits derived from wild deer				7.2.2 Minimise costs to land-use objectives and rural development				
SEA Objectives	**7.2.1 a) Retain existing markets and develop new markets associated with wild deer, both in stalking and other activities and products**	**7.2.1 b) Identify the most effective means to brand and market venison as a quality, sustainable product.**	**7.2.1 c) Increase the number and value of people participating in deer-related activities including stalking and wildlife watching, and remove barriers to participation.**	**7.2.1 d) Seek to capture fairly the economic value of wild deer among those involved in deer management**	**7.2.2 a) Actively manage wild deer to minimise losses to woodland establishment and growth, agriculture and other land uses**	**7.2.2 b) Maintain and develop capacity to manage deer cost-effectively in woodlands**	**Overall effect on SEA objectives**	**Commentary** (potential cumulative, secondary, synergistic, temporal, permanent or temporary, reversible or irreversible effects)	**Monitoring Recommendations**
To maintain and enhance biodiversity, flora, fauna & habitats	**- / + S-M**	**?**	**- / + S-M**	**?**	**++ / - S-M-L**	**+ / - M-L**	Mixed potential effects on maintaining biodiversity including; some potentially major and minor positive effects, some potentially minor negative effects, and some uncertain effects.	Actions 7.2.2 and b can cause positive effects on biodiversity by protecting the regeneration of woodlands for example. Action 7.2.2a may have negative secondary effects on biodiversity if additional deer fencing is implemented due to increased bird mortality from striking fences. Action 7.2.1c can cause negative secondary effects as an increase in participation in deer related activities may cause secondary impacts through trampling of vegetation etc.	7.2.1a), 7.2.1c), 7.2.2 a), 7.2.2 b) Monitor effects of managing woodland and other land uses on biodiversity e.g. birdstrike due to deer fencing. Also monitor effects of an increased number of people in the countryside, especially in sensitive sites e.g. natural heritage designations.
To protect and enhance human health	**?**	**++ / - S-M**	**+ S-M**	**?**	**0**	**0**	Mixed potential effects on protecting human health including; some potentially minor and major positive effects, some potentially minor negative effects, as well as neutral and uncertain effects.	Action 7.2.1b can cause positive secondary effects on human health from associated health benefits of increased exercise as a result of participation in deer related activities	7.2.1b) Monitor venison quality
To meet environmental standards required by the Water Framework Directive (WFD)	**- / + S-M-L**	**?**	**?**	**?**	**?**	**?**	Mostly uncertain effects on water quality as well as some mixed potential effects including; potentially minor positive and potentially minor negative effects.	There is the potential for new/expanded deer markets to cause negative secondary effects on local water quality. However, Actions 7.2.2 a and b can cause positive secondary effects on water quality as woodland regeneration/establishment can increase the buffering capacity of vegetation in riparian habitats - Medium to Long term benefits due to growth period.	7.2.1a) Monitor water quality (biological)
To avoid, reduce and manage flood risk	**?**	**0**	**?**	**?**	**+ S-M**	**+ S-M**	Mostly uncertain and neutral effects on avoiding flood risks, as well as some potential minor positive effects.	Actions 7.2.2 a and b are likely to have a positive secondary effect by reducing the local flood risk of 'flashy' rivers, particularly those where vegetation cover is sparse and in riparian habitats - Medium to Long term benefits due to growth period.	
To conserve soil resources and quality	**- S-M**	**?**	**?**	**?**	**?**	**?**	Mostly uncertain effects on protecting soil quality, as well as some potential minor negative effects.	As a secondary effect of actions 7.2.1a and c, increased visitor numbers/expanded existing and new markets are likely to cause some localised negative effects on soil resources as a result of the trampling and contraction effects off the increased visitor numbers/frequency of visits. The additive nature of these kinds of impacts repeated across different sites over Scotland may also be a significant cumulative effects issue at regional and national scales.	7.2.1a) Monitor local soil erosion, particularly in sensitive areas
To improve air quality (with reference to the pollutants under the EC Air Quality Directives)	**- S-M**	**0**	**?**	**?**	**0**	**0**	Mostly neutral and uncertain effects on local air quality, as well as some potential minor negative effects.	Actions 7.2.1a and c are likely to have a secondary effect of inducing more travel as visitor numbers/haulage miles increase as the market for deer related products and tourism increase also. This may have an effect locally during peak season.	7.2.1a) Monitor local air quality (?)
To reduce contributions to climate change	**- S-M-L**	**?**	**- S-L**	**?**	**+ M-L**	**+ L**	Mixed potential effects on reducing contributions to climate change; some potentially minor positive effects, some potentially minor negative effects, and some uncertain effects.	Actions 7.2.2 a and b can have positive effects by increasing the capacity of Scotland's carbon sinks through increased woodland cover. Actions 7.2.1 a and c however are likely to have negative secondary effects as GHG emissions increase as a result of deer related travel (see comments for Air Quality also).	7.2.1a), 7.2.1c)
Contribute to adaptation to climate change	**- S-M**	**0**	**- S-L**	**?**	**+ L**	**+ L**	Mixed potential effects on contributing to climate change adaptation including; some potentially minor positive effects, some potentially minor negative effects, as well as neutral and uncertain effects.	Actions 7.2.2 a and b can have positive effects by increasing the capacity of Scotland's carbon sinks through increased woodland cover. Actions 7.2.1 a and c however are likely to have negative secondary effects as GHG emissions increase as a result of deer related travel (see comment for Air Quality also).	7.2.1a), 7.2.1c) GHG emissions from deer-related activities
Promote sustainable management of natural and man-made resources.	**- / + S-M**	**- / + S-M**	**?**	**?**	**+ / ++ S-M**	**+ M-L**	Mixed potential effects on protecting sustainable resource use including; some potentially minor positive effects, some potentially minor negative effects, as well as neutral and uncertain effects.	Actions 7.2.1 a - d are likely to have positive effects by promoting sustainability in the market for wild deer e.g. action 7.2.1d ensures that profits are split 'fairly'.	7.2.1a), 7.2.1b)
To protect conserve, and where appropriate, enhance the historic environment and cultural heritage	**- S-M-L**	**?**	**- / + S-M-L**	**?**	**?**	**?**	Mixed potential effects on protecting the historic environment including; some potentially minor positive effects, some potentially minor negative effects, and uncertain effects.	As a secondary effect of actions 7.2.1a and c, increased visitor numbers/expanded existing and new markets are likely to cause some negative effects on historic and cultural heritage sites as a result of the trampling and contraction effects and general 'wear and tear' caused by increased visitor numbers/frequency of visits. The additive nature of this kind of impact repeated across different sites over Scotland may also be a significant cumulative effects issue at regional and national scales.	7.2.1a), 7.2.1c) Monitor condition of cultural heritage sites e.g. SAMs
Protect, conserve and enhance the Scottish landscape	**- / + S-M**	**?**	**- / + S-M**	**?**	**+ S-M**	**+ M-L**	Mixed potential effects on protecting the Scottish landscape including; some potentially minor positive effects, some potentially minor negative effects, as well as neutral and uncertain effects.	Actions 7.2.2 a and b are likely to have positive effects on the Scottish landscape at different scales as improvements are made to woodland e.g. small scale regeneration efforts in vulnerable conservation areas are likely to be more successful while at the national scale, cumulative woodland cover is likely to increase. However, the negative secondary effects identified such as increased transport etc. as a result of actions 7.2.1a and c could have negative effects on Scottish landscape quality.	7.2.1a), 7.2.1c)
Summary of action's potential environmental effects	**Overall potential negative and uncertain effects, as well as some positive effects.**	**Overall mixed effects with some potentially uncertain, positive and negative effects identified.**	**Overall mixed effects with some potentially uncertain, positive and negative effects identified.**	**Overall uncertain effect as the application of knowledge of the economic value of wild deer to deer management is not defined.**	**Overall potential positive effects with some unknowns.**	**Overall potential positive effects with some unknowns and minor possible negative effects identified.**			
Mitigation Recommendations	At action plan level; 1. Detail how people participating in deer-related activates will be managed locally 2. Detail how sport shooting accidents will be avoided 3. Detail how the potential negative effects of infrastructure linked to deer markets will be mitigated	Review and agree venison production guidelines as relates to food safety and deer farms.	At action plan level; 1. Detail how people participating in deer-related activates will be managed locally 2. Detail how sport shooting accidents will be avoided 3. Detail how the potential negative effects of infrastructure linked to deer markets will be mitigated						
Enhancement Recommendations	Enhance all potential positive effects to maximise the possible environmental benefit from this action. For example, a portion of the profit from all deer markets could be fed back in to sustainable projects. For example, an educational project could be funded to promote sustainability/biodiversity issues etc. in rural communities to visitors and locals.		Enhance all potential positive effects to maximise the possible environmental benefit from this action. For example, a portion of the profit from all deer markets could be fed back in to sustainable projects. For example, an educational project could be funded to promote sustainability/biodiversity issues etc. in rural communities to visitors and locals.						

Appendix 11:

Prediction and evaluation of the effects of the Strategy's social wellbeing actions

Appendix 11: Prediction & Evaluation of the Effects of the Strategy's Social Wellbeing Actions

Note: This matrix shows how the effects on the environment of the Strategy's Social Well-being Actions were assessed. The method of scoring used in the assessment is intended to be illustrative and indicative, not definitive, in terms of the effect of the actions.

Key to scoring:

++	Major positive
+	Minor positive
0	Neutral
-	Minor negative
--	Major negative
++/-, +/--	Mixed
?	Uncertain
S	Short term effects
M	Medium term effects
L	Long term effects

	Social Well-being Actions		Social Well-being Actions			Social Well-being Actions		
	7.3.1 Increase opportunities and quality of experience for observing and enjoying wild deer		7.3.2 Safeguard health and safety					
SEA Objectives	**7.3.1 a) Promote locations and opportunities where people are likely to observe wild deer**	**7.3.1 b) Provide information to local communities and tourism businesses on wild deer and their management**	**7.3.2 a) Demonstrate high standards of competence in food safety, operator safety and public safety**	**7.3.2 b) Reduce the risks of road traffic accidents involving wild deer**	**7.3.2 c) Co-ordinate action to minimise human disease risks**	**Overall effect on SEA objectives**	**Commentary** (potential cumulative, secondary, synergistic, temporal, permanent or temporary, reversible or irreversible effects)	**Monitoring Recommendations**
To maintain and enhance biodiversity, flora, fauna & habitats	- / + S-M		0	- S-L	?	Mixed potential effects on maintaining biodiversity including; some potentially minor positive effects, some potentially minor negative effects, as well as neutral and uncertain effects.	The strategy's social wellbeing actions have the potential to cause both positive and negative secondary effects. For example the negative secondary effect of action 7.3.1a which is likely to induce an increase in frequency and volume of visitors to certain sites is likely to be impact on biodiversity at site level through trampling/disturbance etc. Conversely, action 7.3.1b is likely to have positive secondary effects on biodiversity as interest and awareness in deer increases, interest and awareness in wider biodiversity issues is also likely to increase.	7.3.1a), 7.3.2b) Monitor extent of road-side verges and newly established habitat networks. Monitor condition of sensitive locations e.g. designations.
To protect and enhance human health	+ S-M	+ S-M	+ S-M	++ S	++ S	Potentially major and minor positive effects on protecting and enhancing human health.	Several of the social wellbeing actions are likely to have positive secondary effects on human health. For example, as a result of action 7.3.1a, there is likely to be an increase in the number of people participating in outdoor recreation with the associated health benefits.	
To meet environmental standards required by the Water Framework Directive (WFD)	?	+ S-M	?	?	?	Mostly uncertain effects on protecting water quality, as well as some minor positive effects.	Likely to have uncertain effects on water quality.	
To avoid, reduce and manage flood risk	?	?	0	0	?	Mostly uncertain and neutral effects on avoiding flood risks.	Likely to have few and uncertain effects on reducing flood risk.	
To conserve soil resources and quality	?	+ S-M	0	0	?	Mostly uncertain and neutral effects on protecting soil quality, as well as some minor positive effects.	Likely to have few and uncertain effects on conserving soil resources.	
To improve air quality (with reference to the pollutants under the EC Air Quality Directives)	0	0	0	0	?	Mostly potential neutral effects on local air quality.	Likely to have few to no effects on local air quality.	
To reduce contributions to climate change	- S-L	+ S-M-L	0	0	?	Mixed potential effects on reducing contributions to climate change including; some potentially minor positive effects, some potentially minor negative effects, as well as neutral and uncertain effects.	The implementation of action 7.3.1a is likely to induce an increase in travel to certain sites as a result of deer/outdoor related recreation. The negative secondary effect as a result of this increased travel is an increase in GHG emissions detrimental to reducing contributions to climate change. Conversely, action 7.3.1b if implemented well could provide communities and in particular tourism industries with information on climate change topics - the positive secondary effect being an increased awareness in the issue.	7.3.1a) Monitor outdoor recreation-related GHG transport emissions
Contribute to adaptation to climate change	?	+ S-M-L	0	+ M-L	?	Some potential minor positive, uncertain and neutral effects on promoting climate change adaptation.	The strategy's social wellbeing actions are predicted to have little effect towards climate change adaptation. However, there is potential for some minor positive secondary effects if information relating to climate change is disseminated amongst communities and tourism industries as a result of action 7.3.1b. Conversely, action 7.3.2b may have a minor direct negative effect on climate change adaptation if roadside vegetation is removed to promote road safety with respect to deer related RTAs.	
Promote sustainable management of natural and man-made resources.	?	++ S-M-L	?	?	?	Mostly uncertain effects on promoting sustainable resource use, as well as some potential major positive effects.	Action 7.3.1b has the potential to have a minor direct positive effect on sustainable resource management if information related to deer management is disseminated amongst communities and tourism industries.	
To protect conserve, and where appropriate, enhance the historic environment and cultural heritage	- S-L	+ S-M-L	0	0	?	Mixed potential effects on protecting the historic environment including; some potentially minor positive effects, some potentially minor negative effects, as well as neutral and uncertain effects.	The strategy's social wellbeing actions are likely to have positive and negative effects on the historic environment and cultural heritage. For example action 7.3.1a is likely to have the negative secondary effect of increased trampling/compaction on certain sites as a result of increased frequency and volume of visitors.	7.3.1a), Monitor condition of cultural heritage sites, e.g. SAMs
Protect, conserve and enhance the Scottish landscape	- S-L	+ S-M-L	0	?	?	Mixed potential effects on protecting the Scottish landscape including; some potentially minor positive effects, some potentially minor negative effects, as well as neutral and uncertain effects.	Action 7.3.1a is likely to cause a minor secondary negative effect on the Scottish landscape as increased visitor frequency and numbers causes greater impacts at certain sites. Also, the cumulative (additive) nature of these effects on different sites at regional and national scales across Scotland may be significant.	
Summary of action's potential environmental effects	**Mixed: mostly uncertain effects with some potential negative, and minor positive, effects identified.**	**Overall potential positive effects with some unknowns.**	**Overall some uncertain and positive effects, with many effects not applicable to SEA objectives.**	**Mixed: mostly uncertain effects with some strongly positive effects, some potential negative effects, and some effects not applicable to SEA objectives.**	**Overall uncertain effects as the ways in which human disease risk will be addressed are not defined.**			
Mitigation Recommendations	At action plan level; 1. Detail how people participating in deer-related activates will be managed locally 2. Detail how the potential negative effects of infrastructure linked to deer markets will be mitigated 3. Potentially detail an offset scheme or demonstrate how integration of deer management with other land uses can minimise the impacts associated with people observing deer in natural habitats			At action plan level; 1. Compensate any loss of road-side verges by connecting/creating nearby wildlife corridors.	Raise awareness during summer months when diseases transmitted by tics, such as Lyme disease, are most prevalent.			
Enhancement recommendations		Ensure that the information provided to local communities and tourism businesses on wild deer and their management incorporates consideration of environmental and socio-economic issues.			Promote research into how diseases that can pass from deer to humans will respond to climate change.			

Appendix 12:

Prediction and evaluation of the effects of the Strategy's cross-cutting actions

Appendix 12: Prediction & Evaluation of the Effects of the Strategy's Cross Cutting Actions

Note: This matrix shows how the effects on the environment of the Strategy's Cross-Cutting Actions were assessed. This method of scoring is intended to be descriptive, not definitive, in terms of the effects of the actions.

Key to scoring:

++	Major positive
+	Minor positive
0	Neutral
-	Minor negative
--	Major negative
++/-, +/-- etc.	Mixed
?	Uncertain
S	Short term effects
M	Medium term effects
L	Long term effects

	Cross-Cutting Actions																					
	7.4.1 Develop effective frameworks for sustainable deer management							7.4.2 Safeguard the welfare of wild deer					7.4.3 Use sound science to underpin management decisions					7.4.4 Raise awareness and understanding of wild deer and their management				Overall effect on SEA objectives	Commentary (potential cumulative, secondary, synergistic, temporal, permanent or temporary, reversible or irreversible effects)
SEA Objectives	7.4.1 a) Promote widespread understanding of sustainable deer management in practice	7.4.1 b) Understand at a local level the costs and benefits delivered by deer management	7.4.1 c) All relevant interests engage in the deer management planning and implementation process to consider social, economic and environmental objectives for management	7.4.1d) Facilitate greater community engagement in deer issues;	7.4.1e) Learn from other international models for managing wild deer in considering future approaches;	7.4.1 f) Build on the collaboration of deer management groups to integrate deer management with other land-uses and interests	7.4.1 g) Where deer management groups do not exist ensure that effective management forums exist in all relevant areas	7.4.2 a) Agree a common understanding of deer welfare	7.4.2 b) Articulate the welfare responsibility associated with managing wild deer	7.4.2c) Demonstrate high standards of competence in safeguarding welfare	7.4.2 d) Consider deer welfare in all management planning and activities affecting wild deer	7.4.2 e) Monitor disease risks and the effects of climate change on deer welfare	7.4.3 a) Establish a series of long term monitoring sites to inform management practice	7.4.3 b) Collate data from deer managers and processors more effectively and share data among relevant interests to be used in management	7.4.3 c) Empower land managers to use sound science to underpin the deer management planning process	7.4.3 d) Improve knowledge of optimal grazing regimes for site management	7.4.3 e) Refine methods of measuring impacts of wild deer on habitats	7.4.4 a) Develop a greater understanding of public perceptions of wild deer	7.4.4 b) Increase public understanding of the need to manage wild deer and how they are managed	7.4.4 c) Increase awareness of roe deer and the associated management needs in and around urban areas	7.4.4d) Increase awareness of the interactions of all species of wild deer with access and recreation in urban, woodland and open land settings.		
To maintain and enhance biodiversity, flora, fauna & habitats	+ S-M	?	+ M-L	+ M-L	?	+ M	+ M	0	0	0	?	0	+ M-L	+ M-L	+ S-M	+ M-L	+/?	0	?	?	- / + S-M	Mostly potential minor positive, uncertain and neutral effects on maintaining biodiversity.	Many of the cross-cutting actions have the potential to cause positive secondary effects on biodiversity. For example, actions 7.4.1 a, c and d promote increased understanding and engagement in deer management across all stakeholders - if implemented well these actions could also raise awareness about wider biodiversity issues leading to the positive secondary effects.
To protect and enhance human health	?	?	+ S-M	+ S-M	?	+ M	+ M	0	0	0	?	0	?	?	?	?	?/0	0	?	+ M-L	+ S-M	Mostly potential minor positive, uncertain and neutral effects on protecting human health.	Many of the cross-cutting actions have the potential to cause positive secondary effects on human health. For example, actions 7.4.1 c, f and g promote inclusive decision making and the consideration of wider social issues with regards to deer management decisions. This could have the secondary effect of increased awareness of deer related disease and better deer management with respect to deer related RTAs.
To meet environmental standards required by the Water Framework Directive (WFD)	+ S-M	?	+ S-M	+ S-M	?	+ M	+ M	0	0	0	?	0	+ M-L	+ M-L	+ S-M	+/?	+/?	0	?	0	?	Mostly potential minor positive, uncertain and neutral effects on protecting water quality.	Many of the cross-cutting actions have the potential to cause positive secondary effects on water quality. For example, actions 7.4.3 a - c promote long term monitoring sites and the dissemination of information among relevant interests. If deer related activities are impacting on water quality these actions will ensure that the impacts are flagged up and details passed on to relevant parties to ensure that water quality is maintained or enhanced..
To avoid, reduce and manage flood risk	?	?	?	?	?	?	?	0	0	0	?	0	+ M-L	+ M-L	?	+/?	+/?	0	?	0	?	Mostly potential uncertain and neutral effect on avoiding flood risks. A minority of actions have potentially minor positive effects.	Actions 7.4.3 a and c have the potential to cause positive secondary effects on flood risk management. Dependent on how these actions are implemented, secondary positive benefits could accrue by the dissemination of relevant data established at the long term monitoring sites to interested authorities e.g. SEPA - will require cross agency cooperation.
To conserve soil resources and quality	?	?	+ S-M	+ S-M	?	+ M	+ M	0	0	0	?	0	+ M-L	+ M-L	+ S-M	+ M-L	+/?	0	?	0	?	Mostly potential minor positive, uncertain and neutral effects on maintaining protecting soil quality.	Many of the cross cutting actions have the potential to cause positive secondary effects on soil resources and quality. For example, actions 7.4.3 a - c could accrue positive secondary effects on soil quality if soil issues are included in any monitoring that is implemented.
To improve air quality (with reference to the pollutants under the EC Air Quality Directives)	0	?	?	?	?	?	0	0	0	0	?	0	?	?	?	0/?	0/?	0	?	0	0	Mostly potential neutral and uncertain effects on local air quality.	Few significant effects on air quality.
To reduce contributions to climate change	+ S-M	?	+ S-M	+ S-M	?	+ M	?	0	0	0	?	0	+ M-L	+ M-L	+ S-M	0/?	0/?	0	0	0	- S-L	Mostly possible minor positive, uncertain and neutral effects on reducing climate change. Also some potential minor negative effects.	The strategies cross cutting actions are likely to have positive secondary effects towards limiting Scotland's climate change contribution. For example the scope of action 7.4.1a whilst promoting widespread understanding of sustainable deer management, could be expanded to promote the understanding of wider sustainability issues. This could be implemented by demonstrating how sustainable deer management can contribute to these wider issues e.g. landuse management for climate change adaptation.
Contribute to adaptation to climate change	+ S-M	?	+ S-M	+ S-M	?	?	?	0	0	0	?	0	+ M-L	+ M-L	+ S-M	+/?	+/?	0	?	0	?	Mostly potential minor positive, uncertain and neutral effect on contributing to climate change adaptation.	Similarly to the above, several of the cross-cutting actions could potentially have positive secondary effects towards contributing to climate change adaptation. For example, actions 7.4.3 a - c could induce landowners to change land management practices which could lead to land use change such as increased woodland cover.
Promote sustainable management of natural and man-made resources.	++ S-M	?	+ S-M	+ S-M	?	++ S-L	+ M	0	0	0	?	0	++ M-L	++ M-L	++ S-M	+/? M-L	+/?	0	?	?	?	Some potential major positive effects, as well as uncertain and neutral effects on sustainable resource use.	Many of the cross-cutting actions are likely to have secondary positive effects on sustainable natural/man-made resource management. For example actions 7.4.1 a, c and d promote sustainable deer management and inclusiveness over these issues. If implemented well, the scope of these actions could be expanded to encompass the wider issues of sustainable resource management and subsequently positive secondary effects would accrue.
To protect conserve, and where appropriate, enhance the historic environment and cultural heritage	+ S-M	?	+ S-M	+ S-M	?	+ S-M	+ M	0	0	0	?	0	+ M-L	+ M-L	+ S-M	+ M/L	+/?	0	?	?	- S-L	Mostly possible minor positive, uncertain and neutral effects on protecting the historic environment. Also some potentially minor negative effects.	Many of the cross-cutting actions are likely to have secondary positive effects on historic and cultural heritage. For example actions 7.4.1 f and g promote integration of deer management practices with other land use practices. If implemented well, these actions could potentially enhance the protection of sites by promoting their more sustainable use and subsequently positive secondary effects would accrue. Also some potentially negative secondary effects if action 7.4.4d) leads to increased travel for recreation purposes, as well as the development of infrastructure such as car parks, access routes etc.
Protect, conserve and enhance the Scottish landscape	+ S-M	?	+ S-M	+ S-M	?	+ S-M	+ M	0	0	0	?	0	+ M-L	+ M-L	+ S-M	+ M/L	+/?	0	?	?	- S-L	Mostly possible minor positive, uncertain and neutral effects on protecting the Scottish landscape. Also some potentially minor negative effects.	Potentially positive secondary effects on the Scottish landscape as a result of promoting widespread understanding of sustainable deer management, engaging all relevant interest and deer management groups, establishing long-term monitoring sites, collating deer management data, and empowering land owners to use sound science in planning their deer management activities. Also some potentially negative effects if action 7.4.4d) leads to increased travel for recreation purposes, as well as the development of infrastructure such as car parks, access routes etc.
Summary of action's potential environmental effects	**Overall uncertain, but potentially positive effects.**	**Overall uncertain effects.**	**Overall uncertain, but potentially positive effects.**	**Overall uncertain, but potentially positive effects.**	**Overall uncertain effects.**	**Overall uncertain, but potentially positive effects.**	**Overall uncertain, but potentially positive effects.**	**No significant effects.**	**No significant effects.**	**No significant effects.**	**Overall uncertain effects.**	**No significant effects.**	**Overall positive effects.**	**Overall positive effects.**	**Overall positive effects.**	**Overall positive effects**	**Overall positive uncertain effects**	**No significant effects,**	**Overall uncertain effects.**	**Overall uncertain effects, with some slight positive effects on human health.**	**Mixed: mostly uncertain effects with some potential negative, and minor positive, effects identified.**		
Mitigation recommendations																					At action plan level; 1. Detail how people participating in deer-related activates will be		
Enhancement recommendations	Include a wide range of topics when promoting understanding of sustainable deer management in practice												Evaluate how data gathered from long term monitoring sites is used in reviewing the Strategy and Action Plans	Evaluate how data collated from deer managers and processors is used in reviewing the Strategy and Action Plans		Review how knowledge of optimal grazing regimes is used in reviewing the Strategy and Action Plans.	Evaluate how the knowledge resulting from refined methods for measuring the effects of wild deer on habitats is used in reviewing the Strategy and Action Plans.					

Appendix 13:

Deer management approaches mapping summary

Appendix 13: Deer management approaches mapping summary

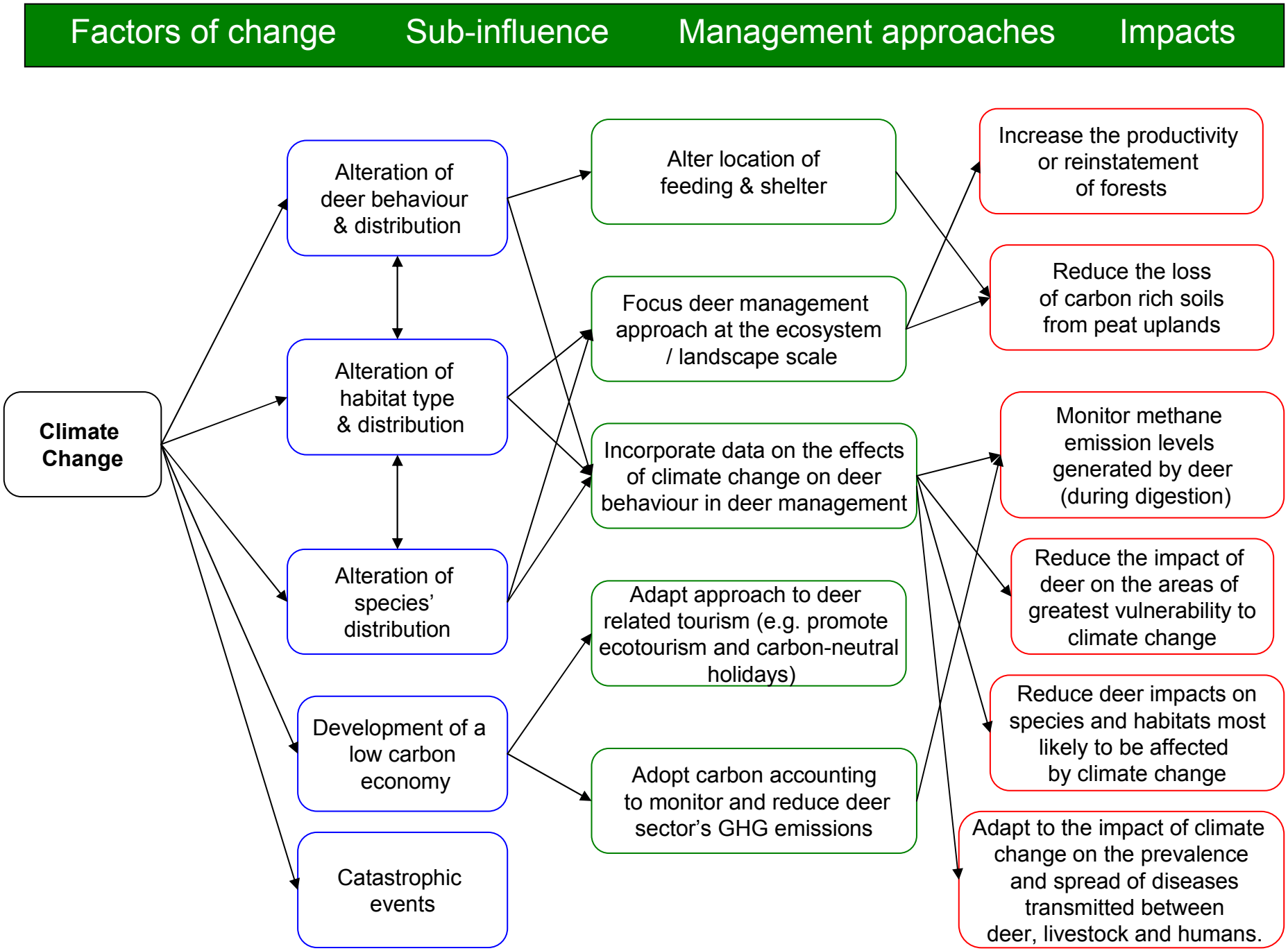
Note: This table describes how future approaches to deer management are inter-linked to and can respond to certain sub-influences or factors of change.

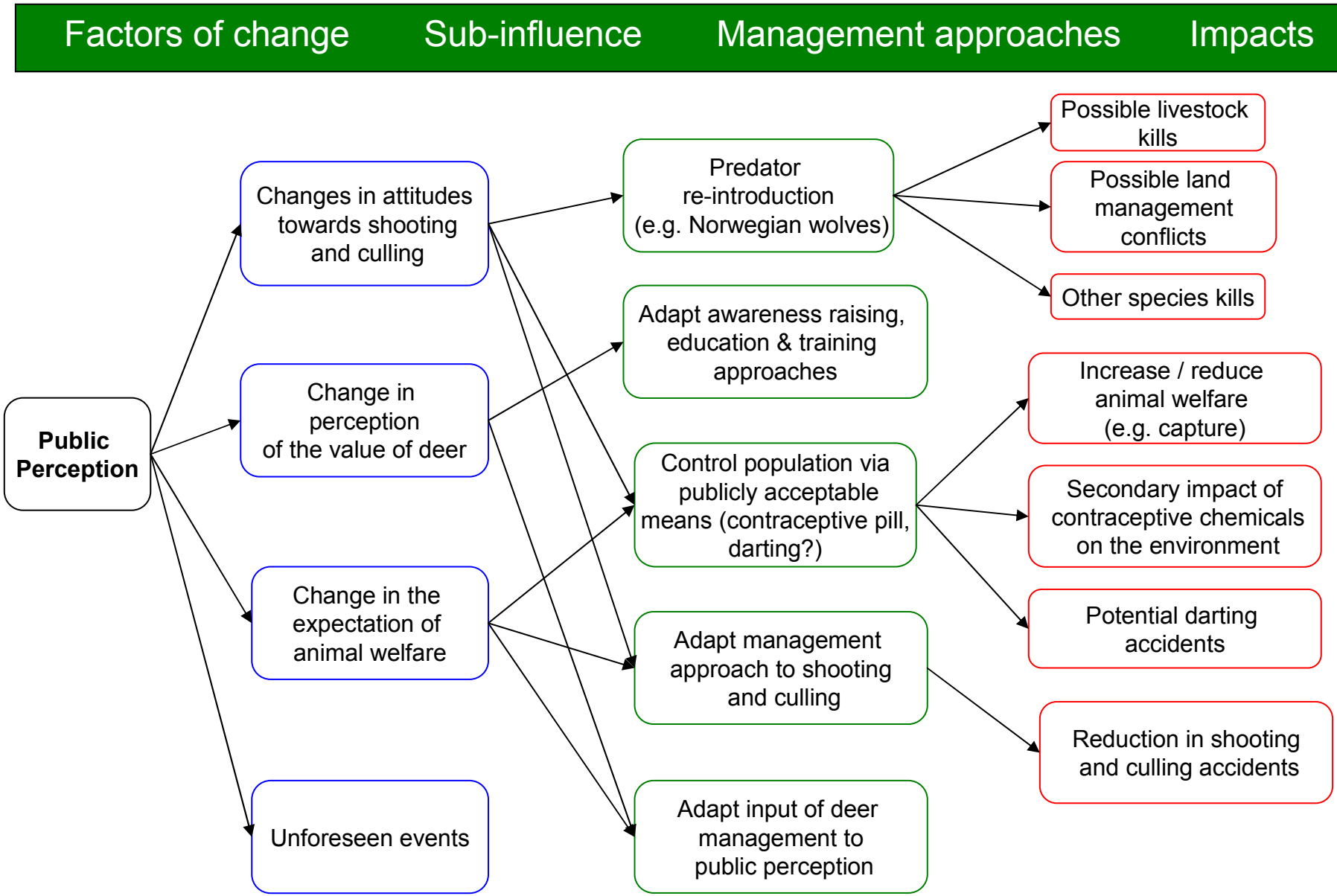
Sub-influence	Relevant Strategy Objectives	Relevant Strategy Actions	Management approaches	Outcome/implication of management approach
Climate Change				
Alteration of species' distribution **Alteration of habitat type and distribution** **Alteration of deer behaviour & distribution** **Development of a low carbon economy** **Catastrophic event**	6.1 f) Help tackle and adapt to the effects of climate change. 6.1 d) Conserve and enhance biodiversity in the wider countryside. 6.1e) Maintain the integrity of natural processes	7.1.2 c) Contribute to the conservation of species on the UK and Scottish biodiversity action plan lists. 7.1.3 a) Protect woodlands and carbon-rich soils in order to maintain and enhance carbon storage. 7.1.3 b) Facilitate establishment and maintenance of habitat networks in order to help biodiversity adapt to climate change. 7.1.3 c) Research the impacts of climate change on wild deer and their habitats. 7.4.2 e) Monitor disease risks and the effects of climate change deer welfare.	Alter location of feeding & shelter	Reduce the loss of carbon rich soils from peat uplands.
			Focus deer management approach at the ecosystems / landscape scale.	Increase the productivity or reinstatement of forests. Reduce the loss of carbon rich soils from peat uplands.
			Incorporate data on the effects of climate change on deer behaviour / distribution into deer management	Reduce the impact of deer on areas of greatest vulnerability to climate change. Monitor methane emission levels generated by deer (during digestion). Reduce deer impacts on species and habitats most likely to be affected by climate change Adapt to the impact of climate change on the prevalence and spread of diseases transmitted between deer, livestock and humans
			Adopt carbon accounting to monitor and reduce deer sector's GHG emissions	Monitor methane emission levels generated by deer (during digestion).
			Adapt approach to deer-related tourism (e.g. promote ecotourism and carbon-neutral holidays)	
			Adapt approach to deer-related sports	
			Incorporate data on the effects of climate change on deer behaviour / distribution into deer management	
Public Perception				
Change in Attitudes Towards Shooting & Culling **Change in perception of the value of deer** **Change in expectation of animal welfare** **Unforeseen events**	6.1 a) Safeguard the welfare of all species of wild deer. 6.3 a) Increase participation in management and enjoyment of the wild deer resource. 6.3 c) Manage the impacts of wild deer in and around communities. 6.3 e) Promote venison as a healthy food 6.2 a) Increase the economic opportunities associated with wild deer 6.2 b) Minimise the economic costs attributable to wild deer 6.2 d) Contribute to the social and economic development of the community	7.3.1 b) Provide information to local communities and tourism businesses on wild deer and their management. 7.2.1 b) Identify the most effective means to brand and market venison as a quality sustainable product. 7.3.2 a) Demonstrate high standards of competence in food safety, operator safety and public safety. 7.3.2 b) Reduce the risks of road traffic accidents involving wild deer. 7.3.2 c) Co-ordinate action to minimise human disease risks. 7.4.2c) Demonstrate high standards of competence in safeguarding welfare. 7.4.2 d) Consider deer welfare in all management planning and activities affecting wild deer. 7.4.4 a) Develop a greater understanding of public perceptions of wild deer. 7.4.4 b) Increase public understanding of the need to manage wild deer and how they are managed. 7.4.4 c) Increase awareness of roe deer and the associated management needs in and around urban areas.	Predator re-introduction (e.g. Norwegian wolves)	Possible livestock kills Possible land management conflicts Other species kills
			Control deer via publicly acceptable means (e.g. contraceptive pills, darting)	Secondary impacts of using contraceptive chemicals on the environment Potential darting accidents Increase / reduce animal welfare (e.g. capture)
			Adapt management approach to shooting and culling.	Reduction in shooting and culling accidents
			Adapt awareness raising, education, training approaches	
			Adapt input of deer management to public perception	
			Adapt direct deer management practices	
Land-use Change				
Forestry Land Use Change **Upland Agricultural Land Use Change** **Lowland Agricultural Land Use Change** **Change in number and distribution of livestock** **Energy generation / use change** **Urban land use change** **Chanage in number and distribution of habitats / species (including networks)** **Unforeseen events**	6.1 e) Maintain the integrity of natural processes. 6.2 b) Minimise economic losses attributable to wild deer. 6.1 d) Conserve and enhance biodiversity in the wider countryside	7.1.1 b) Integrate management action with other land-uses including agriculture in order to achieve favourable condition; 7.2.2 a) Actively manage wild deer to minimise losses to woodland establishment and growth, agriculture and other land uses; 7.2.2 b) Maintain and develop capacity to manage cost-effectively in woodlands cost effectively. 7.4.1 c) All relevant interests engage in the deer management planning and implementation process to consider social, economic and environmental objectives for management; 7.4.1 d) Build on the collaboration of deer management groups to integrate deer management with other land-uses and interests. 7.4.1 e) Where deer management groups do not exist ensure that effective management forums exist in all relevant areas	Adopt a flexible approach to deer management with respect to the potential removal of sheep in some upland areas	Review of deer management practices on agricultural resources
			Adapt deer management to a possible multi-approach to forestry that potentially includes carbon storage	Increase forest productivity and carbon-sink capacity
			Manage deer in urban and around urban areas e.g. through culling and shooting	Possible increase in shooting and culling accidents
			Managing for grouse and open moorland	

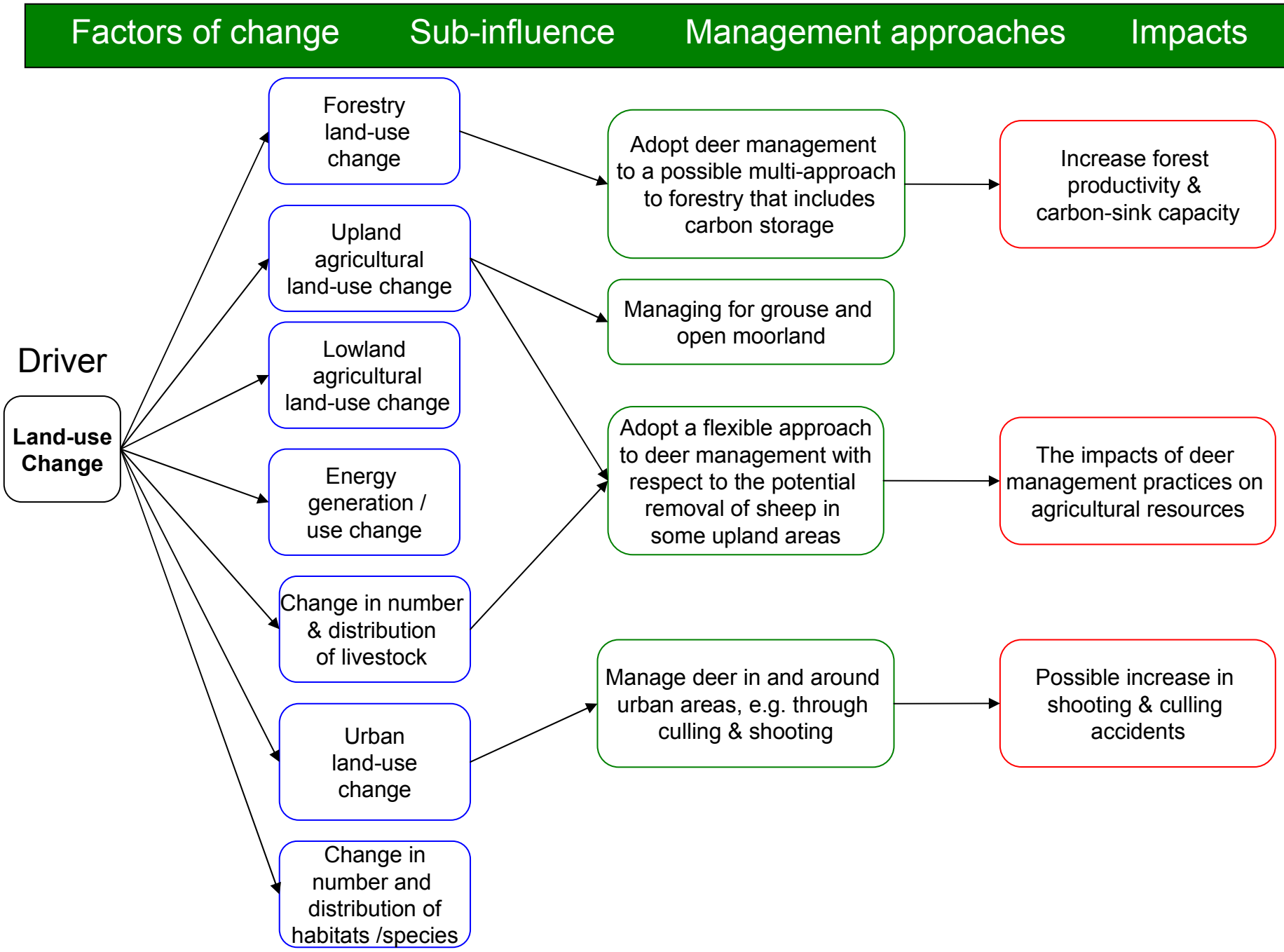
Sub-influence	Relevant Strategy Objectives	Relevant Strategy Actions	Management approaches	Outcome/implication of management approach
Policy / Legislative / Administrative Change				
Planning policy change **Firearms policy change** **Agricultural reform** **Land reform & property rights change** **Unforeseen events**	6.2 e) Ensure the skills and knowledge required to manage deer as an integral part of natural resources.	7.1.1 b) Integrate management action with other land-uses including agriculture in order to achieve favourable condition 7.1.2 a) Develop effective ways to address deer management within an ecosystem scale approach to landscape and biodiversity 7.4.1 a) Promote widespread understanding of sustainable deer management in practice 7.4.1 b) Understand at a local level the costs and benefits delivered by deer management 7.4.1 c) All relevant interests engage in the deer management planning and implementation process to consider social, economic and environmental objectives for management 7.4.1 d) Build on the collaboration of deer management groups to integrate deer management with other land-uses and interests. 7.4.1 e) Where deer management groups do not exist ensure that effective management forums exist in all relevant areas 7.4.3 a) Establish a series of long term monitoring sites to inform management practice 7.4.3 b) Collate data from deer managers and processors more effectively and share data among relevant interests to be used in management 7.4.3 c) Empower land managers to use sound science to un	Adapt approach to overall deer management and responsibility	
			Adopt a flexible approach to deer management with respect to trends in landholding	Review on the interaction of agriculture, forestry and private deer management
Tourism Markets				
New markets change **Existing markets change** **Declining markets change** **Unforeseen events**	6.1 g) Conserve and enhance the cultural and historic environment. 6.1 c) Secure favourable condition of features in designated sites. 6.3 d) Promote opportunities for outdoor recreation. 6.2 a) Increase the economic opportunities associated with wild deer. 6.2 c) Develop the market and supply chain for venison. 6.2 d) Contribute to the social and economic development of communities	7.2.1 a) Retain existing markets and develop new markets associated with wild deer, both in stalking and other activities and products; 7.2.1 b) Identify the most effective means to brand and market venison; 7.2.1 c) Increase the number and value of people participating in deer-related activities including stalking and wildlife watching 7.2.2 a) Actively manage wild deer to minimise losses to woodland establishment and growth, agriculture and other land uses; 7.3.1 a) Promote locations and opportunities where people are likely to observe wild deer; 7.3.1 b) Provide information to local communities and tourism businesses on wild deer and their management;	Adapt approach to managing deer in ecotourism locations	Reduce deer-related habitat/landscape degradation on the recreational value of countryside
				Review of deer-related habitat/landscape degradation on the recreational value of countryside
			Adapt deer management as it relates to deer- specific leisure activities	Review of hunting practice regulation and education on the safety of hunters and the general public.
			Adapt management of the production of deer-related products e.g. venison	Review of deer fencing on public access to rural and protected areas.
			Impacts of sport shooting and culling activities, and safety concerns linked to these, on public access to rural and protected areas.	Review of deer-related habitat/landscape degradation on the recreational value of countryside
				Review of deer management practices on tourism resources
Economic Circumstances / Global Economics				
Change in personal levels of personal wealth **Change in market trends** **Change in fiscal regime** **Global market change**	6.2 a) Increase the economic opportunities associated with wild deer. 6.2 b) Minimise economic costs attributable to wild deer. 6.2 c) Develop the market and supply chain for venison. 6.2 d) Contribute to the social and economic development of communities. 6.3 e) Promote venison as a healthy food.	7.2.1 a) Retain existing markets and develop new markets associated with wild deer, both in stalking and other activities and products 7.2.1 b) Identify the most effective means to brand and market venison 7.2.1 c) Increase the number and value of people participating in deer-related activities including stalking and wildlife watching, and remove barriers to participation 7.2.1 d) Seek to capture fairly the economic value of wild deer among those involved in deer management 7.2.2 a) Actively manage wild deer to minimise losses to woodland establishment and growth, agriculture and other land uses 7.2.2 b) Maintain and develop capacity to manage cost-effectively in woodlands cost effectively	Alter approach to minimising economic losses associated with deer management	Value added to deer related activities and products, aside from shooting.
			Alter approaches of marketing of deer products	Increase demand for venison.
				Value added to deer related activities and products, aside from shooting.
				Increase the quality, quantity, diversity and versatility, of employment.
				Balancing rural employment needs and biodiversity objectives.
			Alter approach to managing deer-related tourism activities	Increase the quality, quantity, diversity and versatility, of employment.
				Balancing rural employment needs and biodiversity objectives.
				Value added to deer related activities and products, aside from shooting.
			Alter private deer management objectives	

Appendix 14:

Cause and effects mapping of factors of change (climate change, public perception change and land-use change)


Factors of change
Sub-influence
Management approaches
Impacts
Climate Change
Alteration of deer behaviour & distribution
Alteration of habitat type & distribution
Alteration of species' distribution
Development of a low carbon economy
Catastrophic events
Alter location of feeding & shelter
Focus deer management approach at the ecosystem / landscape scale
Incorporate data on the effects of climate change on deer behaviour in deer management
Adapt approach to deer related tourism (e.g. promote ecotourism and carbon-neutral holidays)
Adopt carbon accounting to monitor and reduce deer sector's GHG emissions
Increase the productivity or reinstatement of forests
Reduce the loss of carbon rich soils from peat uplands
Monitor methane emission levels generated by deer (during digestion)
Reduce the impact of deer on the areas of greatest vulnerability to climate change
Reduce deer impacts on species and habitats most likely to be affected by climate change
Adapt to the impact of climate change on the prevalence and spread of diseases transmitted between deer, livestock and humans.


Factors of change
Sub-influence
Management approaches
Impacts
Public Perception
Changes in attitudes towards shooting and culling
Change in perception of the value of deer
Change in the expectation of animal welfare
Unforeseen events
Predator re-introduction (e.g. Norwegian wolves)
Adapt awareness raising, education & training approaches
Control population via publicly acceptable means (contraceptive pill, darting?)
Adapt management approach to shooting and culling
Adapt input of deer management to public perception
Possible livestock kills
Possible land management conflicts
Other species kills
Increase / reduce animal welfare (e.g. capture)
Secondary impact of contraceptive chemicals on the environment
Potential darting accidents
Reduction in shooting and culling accidents


Factors of change
Sub-influence
Management approaches
Impacts
Driver
Land-use Change
Forestry land-use change
Upland agricultural land-use change
Lowland agricultural land-use change
Energy generation / use change
Change in number & distribution of livestock
Urban land-use change
Change in number and distribution of habitats /species
Adopt deer management to a possible multi-approach to forestry that includes carbon storage
Managing for grouse and open moorland
Adopt a flexible approach to deer management with respect to the potential removal of sheep in some upland areas
Manage deer in and around urban areas, e.g. through culling & shooting
Increase forest productivity & carbon-sink capacity
The impacts of deer management practices on agricultural resources
Possible increase in shooting & culling accidents

Appendix 15:

Key environmental issues arising from the Strategy

Appendix 15: Key environmental issues arising from the Strategy for Wild Deer

Note: The purpose of this table is to highlight the environmental issues in Scotland that the management of wild deer have and can influence. The issues highlighted in bold are the most significant.

Generic SEA Sub-topics		Significant environmental issues	Significant at International, National, or Local scale	Links to other topics
Biodiversity				
Designated Areas		**Grazing and trampling damage to designated sites.**	International	
		Biodiversity management in the wider countryside affecting designated sites.	International	
Habitats		**The impact of deer on habitats (general)**	National	
		The impact of deer on native woodland (specific)	Local	
		The impact of deer fencing the structural diversity of woodlands (specific)	Local	
		Managing deer as part of an ecosystem-scale context rather a species-specific context.	National	
Species		Deer impacts on other species	National	
		Species adversely affected by deer fencing (e.g. birdstrike of capercaillie and black grouse)	Local	
		Managing combined effects of deer and other grazing animals	Local	
Deer		**The establishment of non-native deer species (e.g. muntjac) and spread of sika**	Local	
		Red deer and Sika deer hybridisations	Local	
		Effect of the policy on non-native deer on the genetic composition of native deer and the consequences for habitat impacts	National	
		The effect of the open season's timing and length on deer population levels .	National	link to recreation
		The effect of culling activities on deer population levels .	Local	
		The effect of deer carcases disposal practices on on carrion sources for wildlife.	Local	
		Defining sustainable deer management.	National	
Population & Health				
Demographics	Rural areas	**Balancing rural employment needs and biodiversity objectives.**	Local	
	Education	Effectiveness of ecological training in informing deer management	National	
Health	Disease	**Prevalence of infectious disease transmission (e.g. Lyme disease).**	Local	
		The effect of deer density/ distribution/ species mix on the risk of disease transmission to livestock (e.g. Bovine Tuberculosis) and the quality/safety of meat and other animal products.	Local	link to climate change
	Road accidents	The effect of habitat creation on road traffic safety and deer welfare (e.g. roadsides, central Scotland forest habitat network).	Local	link to habitats
		The effect of deer population management close to urban areas on the frequency of road accidents.	Local	
	Food quality	The effect of access to venison on nutrition and human health.	Local	
Recreation and access	Access to rural and protected areas	The effect of sport shooting and culling activities, and safety concerns linked to these, on public access to rural and protected areas.	Local	
		The impact of deer-related habitat/landscape degradation on the recreational value of countryside	National	link to habitats
		The effect of communications strategies to promote responsible access provision and behaviour.	National	
		The effect of deer fencing on public access to rural and protected areas.	Local	
	Hunting/Stalking	The effect of hunting practice regulation and education on the safety of hunters and the general public.	Local	
Water				
Freshwater bodies	Sedimentation	The impact of deer on morphological change in freshwater bodies.	Local	
	Groundwater levels	The impact of deer on vegetation root depth, which affects groundwater levels, specifically in waterlogged / potentially waterlogged areas.	Local	
Water quality		**The effect of deer on riparian habitats and the filtering and buffering capacity of vegetation**	Local	
Flood risk		Land use change in fluvial flood plains related to deer management activities	National	
		The effect of deer management on flood risk (e.g. resulting from vegetation cover loss, compaction and erosion of soil).	Local	
Soil				
Soil resources (including agricultural soils, quality, stability, erosion and compaction)	Nutrients	The impact of deer population densities in vulnerable areas on nutrient loss through excessive grazing and trampling.	Local	
	Carbon Content	**The effect of deer density/ species mix on the organic carbon content of soil.**	National / International	link to climate change
	Compaction	**The effect of compaction and erosion due to deer trampling and poaching.**	Local	Links to waters & flooding
	Soil erosion	The effect of deer density/ species mix on levels of soil erosion (e.g. through excessive grazing and trampling).	Local	
Landscape				
Land use & land use change		**The impact of deer on land use objectives**	National	Link to habitats
		The interactions of agriculture, forestry and deer management	National	
		The effect of hill and ATV tracks for managing deer on the landscape	Local	
Landscape designations		The impact of deer on the condition of landscape designations	National / Local	
		The effect of deer populations and management on the balance of habitats in the landscape (i.e. landscape ecology)	National	Link to habitats
		The effect of erosion and vegetation loss caused by deer and other grazing animals on landscape character.	National	Link to water and soil
Hunting Grounds		The effects of trends in landholding on the effectiveness of deer management	National	
Cultural Heritage				
Historic environment		The effect of deer density / species mix on erosive and trampling damage to historic environment features.	National / Local	link to soil
		The effect of deer density / species mix on vegetation root depth/ growth close to archaeological features (e.g. root growth can damage the structural integrity of stone).	Local	
		The effects of fencing and treeguards on archaeological sites and the setting of SAMs	National / Local	
Air & Transport				
Climate Change				
GHG emissions	Forests	**The effect of deer population densities on the productivity or reinstatement of forests.**	Local	link to habitats
	Peat uplands	**The impact of deer management on the loss of carbon rich soils from peat uplands.**	Local/ National / International	link to habitats
	Deer	Methane emission levels of deer population (generated during digestion).	National	link to deer densities
Carbon sinks		The impact of deer densities on the condition of carbon sinks (moorlands & forests)	National / International	link to soil
Areas of greatest vulnerability climate change		The impact of deer on areas of greatest vulnerability to climate change	National	
Species & habitats most likely to be affected by climate change		**Deer impact on species and habitats most likely to be affected by climate change**	National	link to species and habitats
Impact of climate change on insects and disease		Impact of climate change on the prevalence and spread of diseases transmitted by deer to human and livestock	Local / National	link to health
Material Assets				
Agricultural resources		**The effect of deer management practices on agricultural resources**	National / Local	link to soil
Forestry resources		**The effect of deer management practices on forest productivity.**	National / Local	link to habitats
Tourism resources		The effect of deer management practices on tourism resources	National / Local	
Deer as a resource		The manner in which value is added to deer related activities and products, aside from shooting.	National / Local	link to recreation and tourism
		The effect of deer management practices on the venison market.	National / Local	link to health
Employment in the deer sector		The effect of deer management practices on the quality, quantity, diversity and versatility, of employment.	National / Local	link to population / demographics
Waste associated with deer sector		The disposal of waste associated with culling activities (e.g. carcasses).	Local	

Appendix 16:

Summary of prediction and evaluation of the Strategy's high quality environment actions

Appendix 16: Summary - Prediction & Evaluation of the Effects of the Strategy's High Quality Environment Actions

Note: This matrix is a summary of the effects on the environment of the Strategy's High Quality Environment Actions. Note: Summaries reflect the prevailing scores. This method of scoring is intended to be descriptive, not definitive, in terms of effects of Actions.

Key to scoring:

++	**Major positive effects**
+	**Minor positive effects**
0	**Neutral effects**
-	**Minor negative effects**
--	**Major negative effects**
++/-, +/-- etc.	**Mixed effects**
?	**Uncertain effects**
S	**Short-term effects**
M	**Medium-term effects**
L	**Long-term effects**

SEA Objectives	Commentary (Potential cumulative, secondary, synergistic, temporal, permanent or temporary, reversible or irreversible effects)	Overall Potential Effects
To maintain and enhance biodiversity, flora, fauna & habitats	Overall, the potential effects of the Strategy's environmental actions on biodiversity are strongly positive. Actions 7.2.2 a) and b), 7.1.2 b), and 7.1.3 b) are likely to have major positive direct effects and secondary effects on biodiversity, for example through actively managing grazing and trampling on SSSIs, promoting woodland regeneration and facilitating the establishment of habitat networks.	++
To protect and enhance human health	Overall, the strategy's environment actions are likely to have no direct effects on human health. However, all of the environment actions will have some positive bearing on biodiversity, and therefore, the natural systems that human beings depend on for wellbeing and natural resources. Action 7.2.1 b) is likely to have positive secondary effects on human health due to increased levels of exercise through participation in deer related activities.	0 (+)
To meet environmental standards required by the Water Framework Directive (WFD)	Overall, the potential effects of the Strategy's environmental actions on water quality are positive, with some level of uncertainty. Action 7.1.1 a) is likely to have positive local effects on riparian water quality through active management of grazing or trampling in SSSI riparian habitats (which would reduce erosion and increase the buffering capacity of bankside vegetation).	+ (?)
To avoid, reduce and manage flood risk	Overall , the potential effects of the Strategy's environmental actions on flood risk are positive, with some level of uncertainty. Action 7.1.1 a) is likely to have direct positive effects on flood risk by encouraging vegetation growth or regeneration on SSSIs. Vegetation growth or regeneration in the vicinity of 'flashy' rivers may potentially have positive effects on flood risk.	+ (?)

To conserve soil resources and quality	Overall , the potential effects of the Strategy's environmental actions on soil resources are strongly positive. Several of the strategy's environmental actions are likely to have positive direct effects and secondary effects on soil resource quality. For example action 7.1.1 a) may potentially have a direct effect on the soil erosion or compaction in SSSIs through active management of the negative effects of trampling and grazing. Action 7.1.3 a), which seeks to protect carbon sinks, is likely to have positive synergistic effects on peat upland habitats, as well as climate change mitigation and adaptation .	**++**
To improve air quality (with reference to the pollutants under the EC Air Quality Directives)	There are likely to be few potential negative or positive effects on local air quality.	**0**
To reduce contributions to climate change	Overall , the potential effects of the Strategy's environmental actions on reducing contributions to climate change are mixed and mainly uncertain. Action 7.1.3 a) is likely to have positive effects on reducing national contributions to climate change via conservation or enhancement of Scotland's carbon sinks, particularly woodlands and carbon-rich soils such as peat.	**? (0 /++)**
Contribute to adaptation to climate change	Overall, the potential effects of the Strategy's environmental actions on our contributions to climate change are positive. The strategy's actions are likely to have several positive direct effects and secondary effects on climate change adaptation. For example, action 7.1.3 b) may potentially have indirect positive effects on species and habitats ability to adapt to climate change through establishing habitat networks.	**+**
Promote sustainable management of natural and man-made resources.	Overall , the potential effects of the Strategy's environmental actions on promoting sustainable resource management are positive. For example, action 7.1.1 b) promotes the integration of deer management action with other land-uses such as agriculture. This is likely to have a positive effect on agricultural resources. Actions such as 7.1.3 a) and b) are likely to have positive secondary effects on managing biodiversity, woodland and soil resources sustainable.	**+**
To protect conserve, and where appropriate, enhance the historic environment and cultural heritage	Overall, the potential effects of the Strategy's environmental actions on the historic environment are mixed, with some potential negative and positive effects. Negative secondary effects on the integrity of cultural heritage sites are likely if, for example, habitat networks are established near or on these sites, which could lead to increased grazing or trampling pressure from grazing animals (action 7.1.3 b). Several of the environment actions are likely to have direct positive effects on SSSI (action 7.1.1 a).	**- / +**
Protect, conserve and enhance the Scottish landscape	Overall , the potential effects of the Strategy's environmental actions on protecting the Scottish landscape are strongly positive. The Strategy's environment actions are likely to cause several positive direct effects and cumulative (additive) effects. For example actions 7.1.1 a) , and 7.1.3 a) and b) are likely to have positive direct effects at the local level on SSSIs, woodland, moorland and habitat networks which, combined, will have a positive cumulative effect on landscape character.	**++**

Appendix 17:

Summary of prediction and evaluation of the Strategy's sustainable economic development actions

Appendix 17: Summary - Prediction & Evaluation of the Effects of the Strategy's Sustainable Economic Development Actions

Note: This matrix is a summary of the effects on the environment of the Strategy's Sustainable Economic Development Actions. Summaries reflect the prevailing scores. This method of scoring is intended to be descriptive, not definitive, in terms of effects of Actions.

SEA objectives	Commentary (Potential cumulative, secondary, synergistic, temporal, permanent or temporary, reversible or irreversible effects)	Overall Potential Effects
To maintain and enhance biodiversity, flora, fauna & habitats	Overall, the effects of the Strategy's sustainable economic development actions on biodiversity are mixed, and both negative and positive effects are possible. For example, action 7.2.2 a) is likely to have negative secondary effects on some woodland species, such as grouse, if deer fencing is used to manage effects of wild deer on woodland. However, actions 7.2.2 a) and b) may also potentially have positive effects on biodiversity by promoting the regeneration of woodlands. Action 7.2.1 c) is likely to have negative secondary effects on biodiversity if participation in deer-related activities increases, and there are corresponding increases in trampling of vegetation, browsing, etc.	**-/+**
To protect and enhance human health	Overall, the effects of the Strategy's sustainable economic development actions on human health are mixed. For example, action 7.2.1 b) may potentially have negative effects on human health if venison production is not subject to strict regulations. Action 7.2.1 b) is likely to have positive secondary effects on human health from associated health benefits of increased exercise as a result of increased participation in deer-related activities.	**-/+/?/0**
To meet environmental standards required by the Water Framework Directive (WFD)	Overall, the effects of the Strategy's sustainable economic development actions on water quality are uncertain, with some negative and positive effects possible. For example, new and expanding deer markets are likely to have negative secondary effects on local water quality. However, actions 7.2.2 a) and b) may potentially have positive secondary effects on water quality resulting from woodland regeneration, which could increase the buffering capacity of vegetation in riparian habitats.	**? (-/+)**
To avoid, reduce and manage flood risk	Overall, the effects of the Strategy's sustainable economic development actions on flood risk are mainly uncertain, with some potential positive effects. For example, actions 7.2.2 a) and b) are likely to have positive secondary effects on reducing the local flood risk of 'flashy' rivers, through minimising losses to woodland; particularly in riparian habitats.	**? / 0 / +**
To conserve soil resources and quality	Overall, the effects of the Strategy's sustainable economic development actions on soil resources are uncertain, with some potentially negative effects. For example, actions 7.2.1 a) and c) are likely to lead to increased trampling and compaction due to new / expanding deer markets and increases in visitor numbers to the countryside. The additive nature of the above types of effects repeated across different sites over Scotland may also become a significant cumulative effect at the regional or national scale.	**? (-)**

To improve air quality (with reference to the pollutants under the EC Air Quality Directives)	Overall, the effects of the Strategy's sustainable economic development actions on air quality are neutral and uncertain, with some potentially negative effects. For example, actions 7.2.1 a) and c) are likely to induce increased travel in the context of new and expanding deer markets. This may have an effect on local air quality during peak season.	**0 / ? (-)**
To reduce contributions to climate change	Overall, the effects of the Strategy's sustainable economic development actions on reducing our contributions to climate change are mixed, with uncertain as well as potentially negative and positive effects. For example, actions 7.2.1 a) and c) are likely to have negative secondary effects as greenhouse gas emissions increase due to increases in deer-related travel (also see comments for Air Quality). However, actions 7.2.2 a) and b) are likely to have positive effects on increasing the capacity of Scotland's carbon sinks through minimising loses to woodland.	**-/+/?**
Contribute to adaptation to climate change	Overall, the effects of the Strategy's sustainable economic development actions on contributing to adaptation to climate change are mixed, with uncertain as well as potentially negative and positive effects possible. For example, actions 7.2.1 a) and c) are likely to lead to an increase in deer-activity participants and trampling of vegetation, etc. This may have secondary negative effects on the ability of habitats or species to adapt to climate change. Actions 7.2.2 a) and b), by protecting woodland habitats, are likely to have positive effects on climate change adaptation.	**-/+/?**
Promote sustainable management of natural and man-made resources.	Overall , the potential effects of the Strategy's environmental actions on promoting sustainable resource management are mixed, with uncertain as well as potentially negative and positive effects possible. For example, action 7.2.1 a), promoting new and expanding existing deer markets, may potentially lead to either more or less unsustainable management of deer resources.	**-/+/?**
To protect conserve, and where appropriate, enhance the historic environment and cultural heritage	Overall, the effects of the Strategy's sustainable economic development actions on the historic environment are mixed, with uncertain as well as potentially negative and positive effects possible. For example actions 7.2.1 a) and c) may potentially have negative effects on archaeological sites due to trampling, and general 'wear and tear', caused by increases in visitor numbers/frequency of visits. The additive nature of the above types of effects repeated across different sites over Scotland may also be a significant cumulative effect at the regional or national scale.	**-/+/?**
Protect, conserve and enhance the Scottish landscape	Overall, the effects of the Strategy's sustainable economic development actions on the Scottish landscape are mixed, with uncertain as well as potentially negative and positive effects possible. For example, negative secondary effects, such as increased transport resulting from actions 7.2.1 a) and c), may have negative effects on Scottish landscape character. Actions 7.2.2 a) and b) are likely to have positive effects on the Scottish landscape as a result of minimising loss to woodland.	**-/+/?**

Appendix 18:

Summary of prediction and evaluation of the Strategy's social wellbeing actions

Appendix 18: Summary prediction and evaluation of the environmental effects of the strategy's social well-being actions

Note: This matrix is a summary of the effects on the environment of the Strategy's Social Well-being Actions. Summaries reflect the prevailing scores. This method of scoring is intended to be descriptive, not definitive, in terms of effects of Actions.

SEA Objectives	Commentary (Potential cumulative, secondary, synergistic, temporal, permanent or temporary, reversible or irreversible effects)	Overall Potential Effects
To maintain and enhance biodiversity, flora, fauna & habitats	Overall, the effects of the Strategy's social well-being actions on biodiversity are mixed, and both negative and positive effects are possible. For example, action 7.3.1 a) is likely to have negative secondary effects on biodiversity due to trampling and disturbance of habitats resulting from an increase in the frequency and volume of visitors to the countryside. Conversely, action 7.3.1 b) is likely to have positive secondary effects on biodiversity because, if interest and awareness of deer increases, interest and awareness of wider biodiversity issues is also likely to increase.	**-/+/?/0**
To protect and enhance human health	Overall, the effects of the Strategy's social well-being actions on human health are positive to strongly positive. For example, action 7.3.1 a) is likely to lead to an increase in the number of people participating in outdoor recreation and corresponding health benefits.	**++**
To meet environmental standards required by the Water Framework Directive (WFD)	There are likely to be few significant potential negative or positive effects on water quality.	**? / +**
To avoid, reduce and manage flood risk	There are likely to be few significant effects and uncertain effects on reducing flood risk.	**0 / ?**
To conserve soil resources and quality	There are likely to be few significant effects and uncertain effects on conserving soil resources.	**? / 0 / +**
To improve air quality (with reference to the pollutants under the EC Air Quality Directives)	There are likely to be few to no significant effects on local air quality.	**0/?**

To reduce contributions to climate change	Overall, the effects of the Strategy's social well-being actions on reducing our contributions to climate change are mixed, and both negative and positive effects are possible. For example, the implementation of action 7.3.1 a) is likely to induce an increase in travel to certain sites as a result of deer or outdoor related recreation. This is likely to result in an increase in greenhouse gas emissions.	**-/+/?/0**
Contribute to adaptation to climate change	Overall, the effects of the Strategy's social well-being actions on contributing to adaptation to climate change are mixed, and both negative and positive effects are possible. For example, action 7.3.2 b) is likely to have minor direct negative direct effects on climate change adaptation if roadside verges are cut back to promote road safety related to deer related road accidents.	**-/+/?**
Promote sustainable management of natural and man-made resources.	Overall, the effects of the Strategy's social well-being actions on sustainable resource management are uncertain, with some possible strongly positive effects. Action 7.3.1 b) is likely to have positive direct effects on sustainable resource management if information related to deer management is disseminated amongst communities and tourism businesses.	**? (++)**
To protect conserve, and where appropriate, enhance the historic environment and cultural heritage	Overall, the effects of the Strategy's social well-being actions on protecting the historic environment are mixed, and both negative and positive effects are possible. For example action 7.3.1 a) is likely to have negative secondary effects on archaeological sites if there is e.g. increased trampling or compaction resulting from the increased frequency and volume of visitors to the countryside.	**-/+/?/0**
Protect, conserve and enhance the Scottish landscape	Overall, the effects of the Strategy's social well-being actions on the Scottish landscape are mixed, and both negative and positive effects are possible. Action 7.3.1a) is likely to cause minor secondary negative effects on the landscape character if there is a large increase in the volume of visitors to the countryside. Also, the cumulative (additive) nature of these effects on different sites at regional and national scales across Scotland may be significant.	**-/+/?/0**

Appendix 19:

Summary of prediction and evaluation of the Strategy’s cross-cutting actions

Appendix 19: Summary prediction and evaluation of the environmental effects of the strategy's cross-cutting actions

Note: This matrix is a summary of the effects on the environment of the Strategy's Cross-cutting Actions. Summaries reflect the prevailing scores. This method of scoring is intended to be descriptive, not definitive, in terms of effects of Actions.

SEA Objectives	Commentary (Potential cumulative, secondary, synergistic, temporal, permanent or temporary, reversible or irreversible effects)	Overall Potential Effects
To maintain and enhance biodiversity, flora, fauna & habitats	Overall, the effects of the Strategy's cross-cutting actions on biodiversity are mainly uncertain and positive, with some possible negative effects. For example, action 7.4.4 d) is likely to have negative secondary effects on habitat and species due to increased travel for recreation purposes, as well as the development of infrastructure such as car parks, access routes etc.	**?/0 (+/-)**
To protect and enhance human health	Overall, the effects of the Strategy's cross-cutting actions on human health are uncertain and neutral, with some possible positive effects. For example, actions 7.4.1 c), f) and g) promote inclusive decision-making and consideration of wider social issues with regards to deer management decisions. This is likely to have secondary positive effects on raising awareness of Lyme disease and deer collision accidents.	**?/0 (+)**
To meet environmental standards required by the Water Framework Directive (WFD)	Overall, the effects of the Strategy's cross-cutting actions on water quality are uncertain and neutral, with some possible positive effects. For example, actions 7.4.3 a) to c) promote long-term monitoring sites and the dissemination of information among relevant interests. If deer related activities are negatively affecting on water quality these actions will ensure that the effects are flagged up and details passed on to relevant parties to ensure that water quality is maintained or enhanced.	**?/0 (+)**
To avoid, reduce and manage flood risk	Overall, the effects of the Strategy's cross-cutting actions on flood risk are uncertain and neutral, with some possible positive effects. Actions 7.4.3 a) and c) are likely to have positive secondary effects on flood risk management.	**?/0 (+)**
To conserve soil resources and quality	Overall, the effects of the Strategy's cross-cutting actions on soil resources are uncertain and neutral, with some possible positive effects. For example, actions 7.4.3 a) to c) are likely to accrue positive secondary effects on soil quality if soil issues are included in monitoring.	**?/0 (+)**
To improve air quality (with reference to the pollutants under the EC Air Quality Directives)	Overall, the effects of the Strategy's cross-cutting actions on air quality are uncertain and neutral. There are likely to be no significant effects on air quality.	**?/0 (+)**
To reduce contributions to climate change	Overall, the effects of the Strategy's cross-cutting actions on reducing our contributions to climate change are mixed. For example, action 7.4.4 d) by promoting access and recreation may lead to increased visitor numbers and effects of trampling on habitats.	**?/0/+/-**
Contribute to adaptation to climate change	Overall, the effects of the Strategy's cross-cutting actions on adaptation to climate change are split between uncertain / neutral effects and positive effects. For example, monitoring sites to inform management practice and researching optimal grazing regimes is likely to have a positive effect on our ability to adapt deer management practices to the effects of climate change.	**?/0/+**
Promote sustainable management of natural and man-made resources.	Overall, the effects of the Strategy's cross-cutting actions on biodiversity are uncertain and neutral, with some possible positive effects. For example action 7.4.1 a), promoting widespread understanding of sustainable deer management practice, is likely to have positive effects on sustainable management of deer as well as other resources.	**?/0/+**
To protect conserve, and where appropriate, enhance the historic environment and cultural heritage	Overall, the effects of the Strategy's cross-cutting actions on protecting the historic environment are uncertain and neutral, with some possible positive effects.	**?/+ (0/-)**
Protect, conserve and enhance the Scottish landscape	Overall, the effects of the Strategy's cross-cutting actions on protecting the Scottish landscape are uncertain and positive, with some possible negative effects. For example, action 7.4.4 d) is likely to have negative secondary effects due to increased travel for recreation purposes, as well as the development of infrastructure such as car parks, access routes etc.	**?/+ (0/-)**