

A report on current perception, legal status and expectation with respect to deer welfare in other countries.

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1. Introduction:

1.1 The project brief defines the current project as a review of stakeholder and general public perceptions and expectations with regard to the welfare of wild deer in Europe and North America and a review of the legal status of the welfare of wild deer.

1.2 The project has been carried out primarily as a desk exercise. While some reference is been made to the situation in North America (at least in relation to stakeholder perceptions and attitudes to welfare issues), it is considered that the most relevant information for Scotland should be based on review of the situation elsewhere within Britain (England, the Republic of Ireland) and in other European countries (which share the same deer species) and the bulk of the material thus focuses on the European perspective.

Welfare issues considered in this report

2.1 Perhaps in structuring this report, it is not inappropriate to begin with a caution urged by a colleague in North America, who noted:

“A lot of people, in my experience, do not appreciate the distinction between "animal welfare" and "animal rights". I am sure that you agree that the distinction is critical, but many commentators in North America understand these to be the same.”

2.2 Such distinction is indeed critical and we should at the outset outline what is considered in this report to be an issue of welfare, and what is not.

2.3 For our purposes, we will not be considering consider the ethical acceptability (or otherwise) of hunting as a form of recreation, or the ethical acceptability of lethal versus non-lethal methods of population control (which issues dominate the debate and the literature in many countries, particularly within both UK and US). Rather, as in ‘A report on the potential responsibilities of care for upland deer’, we will consider as welfare issues:

- i) overwinter mortality where this may be a consequence of management (or lack of management)
- ii) need for (or alternatively problems resulting from) of supplementary feeding
- iii) need for winter shelter
- iv) the problem of wounding
- v) the problem of orphaned calves.
- vi) welfare issues (and public safety issues) of deer involvement in road traffic accidents.

2.5 This list of issues for consideration was largely endorsed by the recent seminar on Welfare and Competence hosted by DCS in Perth on 20th November as comprising the main issues. Some of these issues (such as access to shelter, parasite burden, road traffic accidents) are not considered explicitly and individually in this report (where these are not explicitly identified in public or stakeholder attitudes, or have no explicit legal provisions to address them) although some aspects are considered further in ‘A report on the potential responsibilities of care for upland deer’.

Legal status

2.6 Many attitudes and expectations are derived from, and dependent upon, various legal instruments which either directly define welfare status or, more typically, do so *indirectly* by attempting to address perceived or potential welfare problems with specific regulations.

Such regulations may also, in themselves, have additional implications *for* welfare.

Thus this review will also consider in detail different legislative provisions in different countries which may help define welfare status and may improve or alternatively may constrain welfare.

Specifically this report will address the legal position in different countries in relation to

- ◆ Body condition, overwinter starvation/survival and the provision of supplementary feed.
- ◆ Humane despatch/ wounding
 - i) Permitted weapons and ammunition, minimum projectile size and energy
 - ii) shooting competence, hunter training and examination
 - iii) required provision for following up and despatch of injured animals
- ◆ Hunter training more generally in relation to welfare issues
- ◆ Permitted hunting methods (driving of deer permitted? use of dogs?)
- ◆ Open (hunting) season in different countries in relation to likelihood of
 - i) social distress through disruption of breeding (rut)
 - ii) orphaning of neonates, or dependent juveniles

2.7 While it is noted that Hunter training and competence are dealt with in more detail in separate reports on Competence it is felt that because of the welfare implications, these issues also warrants *brief* attention in the current context [Section 5].

3. Stakeholder and Public Perceptions/ Expectations

i) North America:

3.1 In reviewing the diffuse but extensive literature from the United States on deer management issues and public attitudes to deer hunting, it is notable that very few publications relate actually to what we might recognise as true welfare issues (as listed above) and most are concerned with the ethics (or otherwise of) lethal control (e.g. Fulton *et al.* 2004); a quite remarkable amount of consideration is devoted to alternatives methods of control - especially immuno- contraceptive techniques (see 2.1). The issue is further complicated (and the literature similarly distorted) by the fact that major concerns relate to issues of control of deer or their impacts in urban or peri-urban areas where, again, cultural attitudes are distinctly different from those which may obtain in more rural areas/ States. In consequence, as elsewhere, perceptions and attitudes are often polarised - with attitudes of actual hunters often distinctly different from those of a larger non-hunting public.

3.2 In assessing public perception and attitudes more generally to deer hunting as an activity, it is significant to note that a recent review (published July 2007) by the US Fish and Wildlife Service of “Fishing, Hunting and Wildlife-Associated Recreation” presents statistics to show a progressive decline in almost all States of the number of hunters (and hunters of large ungulates) from 1991 - 2001 - 2006 (with a corresponding increase in numbers of Americans involved in non-consumptive pursuits (wildlife watching etc).

3.3 It is perhaps significant to note that in response to this an Executive Order was issued by the White House in August 2007 whose purpose was explicitly “to direct Federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat”.

3.4 Directives include (e.g):

“Federal agencies shall, consistent with agency missions:

(a) where appropriate, to address declining trends, implement actions that expand and enhance hunting opportunities for the public;

(c) Manage wildlife and wildlife habitats on public lands in a manner that expands and enhances hunting opportunities, including through the use of hunting in wildlife management planning;

3.5 Such overview is entirely consistent with feedback received from my own personal enquiries or contacts with professional game managers or wildlife biologists in various parts of the US. Some points are worth highlighting here.

3.6 One typical response suggests (as above):

“The number of hunters is on a long term decline. This is in absolute terms as well as percent of the population and I guess the long term prospects are for continuing decline. The age structure gets older, the recruitment of young hunters declines, and females are a small percentage. There are still rural people that hunt, but the majority of Americans are living in urban areas. Even the wild west - the Wyomings, Montanas, etc. are becoming urbanized as people buy their mini-ranches and build what we call Mac-mansions (after McDonalds).

“Given all of this, hunters, and hunting are changing. The rural, semi-subsistence hunter is clearly on the decline, and the upscale, well-to-do, safari-type hunter is increasing. Overall we are evolving into something more like the European system, where hunting leases, etc. tie up the land, and only the rich have the resources to continue in the "sport."

“Mainly, there is bucks-only hunting, with some of the eastern states doing some antlerless seasons. Nobody seems to be worrying much about population control, management or sustainability, just satisfaction of the hunter's craving for antlers.

3.7 In relation specifically to welfare issues, he notes:

“Because each state manages its deer population independently, regulations vary all over the place. **Usually there are requirements about minimum cartridge power, taking a safety course, day light only, no dogs, and usually no baiting.**

“Modern hunters, by and large, are unreconstructed, and know nothing about real deer biology and management. They care more about their grown-boy toys, big pickup trucks, ATVs, GPSs, lazer range finders, etc. Of course, this is unfair, because some of them are truly interested and attempt to learn about deer, and some follow old-time ethics. But, they are a minority. **The firearm skill level is godawful, and crippling loss (*maiming/injury*) is ridiculous.**

“The animal rights/welfare attitude is predominant in the U.S., and continues to grow. But because deer hunting is so below the radar screen these days, the animal rights people are looking elsewhere. **Most of the bad practice or injury loss is out of sight, and the animal rights/welfare groups are unaware, or unable to get a handle on any of it.**

3.8 As above

“Much of the more public debate is about urban deer, and impacts of deer on public interests and whether or not lethal control is ethically acceptable gets some attention. But most the time the general public ignores both the hunters and the protectionist groups until some particular issue grabs media attention”.

3.9 I quote my anonymous informant verbatim, because his views are refreshingly blunt (and actually seem to articulate much of what lies beneath the surface of more politically-correct accounts!). It is clear that “most the time the general public ignores both the hunters and the protectionist groups until some particular issue grabs media attention”. This suggests that expectations are low (or simply do not exist). It is notable also that, while “the animal rights/welfare attitude is predominant in the U.S., and continues to grow, because deer hunting is so below the radar screen these days, the animal rights people are looking elsewhere”.

3.10 Although as above, there remains considerable public debate more generally about the ethics of lethal versus non-lethal methods of control, which might suggest some concern about welfare issues involved in (specifically) shooting, such debate would appear in practice to be much concerned about the wider argument of whether or not mankind has the right to take animal life *per se* and I have discovered very little formal literature about actual welfare issues.

3.11 It would appear that there are issues, certainly in relation to **wounding**... but it seems it is difficult to get good objective evidence. One other issue which *is* repeatedly aired at least in the academic arena is the question of **supplementary winter feeding**. There are many reviews of the arguments for and against provision of supplementation in different situations [see for example Smith, 2001; Peek *et al.*, 2002] but in practice there is no “national” or Federal policy on this and supplementation is required in some states, encouraged but not mandatory in others, and forbidden in others (Smith 2001, Peek *et al.* 2002, Putman and Staines, 2004).

3.12 As illustration of this dichotomy of attitude we may note that permanent feeding grounds for wapiti (or elk: *Cervus e. canadensis*) have been in the past promoted in Idaho, Utah, Washington State and Wyoming. Feeding is carried out in Colorado during emergencies, such as especially severe winters. By contrast, South Dakota and New Mexico strongly discourage supplemental feeding and New Mexico actively advocates reduction in deer populations when problems occur. Montana and Nevada have no established feeding programmes and promote habitat improvement or acquisition as alternatives. Feeding in the US of other species: white tailed deer, *Odocoileus virginianus*, mule deer, *O. hemionus* or black-tailed deer, *O. h. columbianus*, has usually been undertaken in response to particularly severe winter conditions, rather than as a routine measure, although animals are fed regularly in restricted 'feed-yards' in some northern states.

I am however advised that attitudes are changing - and because of the increased incidence and rapid spread of diseases such as bovine TB and Chronic Wasting Disease in the US, feeding of deer is now more generally prohibited, or at least not recommended [Jonathon Jenks; *pers. comm.*]

Stakeholder and Public Perceptions/ Expectations

ii) Europe

3.13 Attitudes to (and the public perception of) game management, hunting and welfare issues in continental Europe are enormously varied - because I suspect, the role that hunting plays within the wider culture of each country and the historical status of hunting in that country shows equal diversity. In attempting to provide some overview of stakeholder perceptions and attitudes of the general public in Europe, I find it helpful to recognise four different ‘models’ of hunting and game management.

3.14 Lecocq (in his presentation to the DCS seminar at Drumossie, June 2007) recognises four distinct cultural attitudes towards hunting and game management which he summarises as the Scandinavian (North European) model, the Germanic (mid- European) model, the Anglo-Saxon model and the southern European model.

3.15 Such a device is clearly oversimplistic and perhaps something of a caricature, and not every country fits into its regional stereotype [I have heard complaints from Italy!] but by the same token emphasises distinct differences in perspective of both hunter and wider public to hunting, game management and related (welfare) issues. This is useful not only in reviewing attitudes and perceptions, but also in later pages in this report, in *understanding* the differences in legislative requirements.

3.16 Lecocq notes characteristics as:

North European (Scandinavian) model: [Norway, Sweden, Finland, Denmark]

- Hunting is recreational, but with a major focus still concerned with generating food.
- Hunting is popular and widespread- with the highest proportion of hunters per head of population in Europe

Lecocq uses Denmark as his ‘type species’. I prefer to describe Norway (after Andersen *et al.*, 2007):

“The main objective for cervid management in Norway is based upon sport/recreational hunting, but with a focus on venison production. Most of the venison harvested is consumed by the hunter and his family/friends, and only small amounts are accessible for trade.

A total of 195,200 persons paid the hunting fee for small game or large game for the hunting year 2005/2006, of whom 23% were women. 65%, or 125 000 of the hunters in 2005/06 were aiming for cervids. **In total there are more than 400 000 persons in the official register of hunters, i.e. 10 % of the population.**”

3.17 In general, hunting is widely accepted and there are no ethical objections raised to the exploitation or harvest of wildlife species. Nor am I aware of significant concern about welfare issues. Again, using Norway as an example “The Wildlife Act of 1981 emphasises that the concept of *sustainable use* should underpin all wildlife management in Norway” (Andersen 2007). In Sweden: “The only general and national objective for the management of games species in Sweden is that they should be preserved in viable populations, but not be allowed to seriously damage other vital interests of the society. The national official authority officially responsible for the supervision of both hunting management and conservation of wild species is the Swedish Environment Protection Agency (Naturvårdsverket)” (Liberg *et al.*, 2007).

3.18 Central European (German) model:

[Germany, Hungary, Austria, Poland, other countries of the former German, Polish, or Austro-Hungarian Empires, as Slovakia, Croatia, Slovenia, Romania, etc]

Lecocq characterises this as:

- Very closely-regulated hunting, strongly circumscribed by administrative and regulatory requirements and constraints as well as traditional practices
- Long tradition and very strict 'rules'
- Hunting is more concerned with management of ungulate populations than exploitation (at least for venison), but trophy quality important
- Relatively few hunters

Clearly the 'expression' of this system varies somewhat from country to country, but with Austria as a type example, we may note that perhaps 1.5% of the population are involved in hunting; for Slovenia as another illustration 1.1% of the population are active hunters.

3.19 In all cases, hunters belong to old-established Hunter's Associations or Hunters' Families (Slovenia) with well-established (and treasured) traditions of hunting and game management. Generally speaking, these Associations take responsibility (and considerable pride) in training new hunters (and imbuing them with a sense of continuing tradition); such training may or may not include specific attention to welfare issues (below). Game Management Areas (or *reviers*) are traditionally leased to regional Hunting Clubs, or regional 'chapters' of these national Associations. So well established is the hunting tradition in these countries that hunting is accepted by the wider public, and its 'regulation' largely left to the Hunters' Associations.

3.20 Anglo-Saxon model: [typified perhaps by the UK and Ireland]

- Hunting largely recreational
- Trophy quality of (now) decreasing importance
- Small number of participants - as Germany, Austria etc
- High proportion of professional stalkers

Finally;

3.21 Lecocq's Southern European model:

Lecocq typifies this with Spain, but also includes Portugal, France, Italy, Greece and other Mediterranean countries. I myself consider this category perhaps the most diverse and might actually consider it not a truly homogeneous group.

Lecocq notes as characteristic of this 'approach'

- Management more focused on habitats than species
[I'm not sure I agree; although it is true that neither meat nor trophies appear of paramount importance, this is partly a function of availability (low population numbers and distorted age-structures); and the hunting activity itself is important as a social/status thing]
- Hunting is recreational and often engaged upon as a strongly social event
[This is true also in many aspects of Scandinavian hunts, especially for moose]
- Hunting relatively common and widely accepted [perhaps 3% of the population as hunters]

3.22 Hunting would indeed appear to be a more social activity, it is widely accepted, culturally, and it is perhaps notable in other contexts also, that these countries have perhaps a lesser sensitivity to animal welfare issues in general

3.23 As noted already, this characterisation of different 'national' attitudes is over-simplistic ; hunting practices and attitudes in some countries fit uneasily within their 'type' while others really

do not easily fit into any of Lecocq's categories (Netherlands, Belgium, Switzerland, perhaps Italy).

Nonetheless the implications are clear.... that there is no single European 'model' and that **attitudes and expectations amongst stakeholders and the wider public both to hunting in general and to associated issues of animal welfare will be strongly coloured by the 'traditional' view of hunting within the national culture and the proportion of the human population who are themselves actively engaged in hunting.**

3.24 Lecocq's estimates of the proportion of any national population who are actively involved in hunting is based on numbers engaged in all 'bloodsports' (whether flesh or fowl) . From figures available to me I have attempted to tabulate below the actual number of people engaged in hunting of ungulates (owning game-licences) against the total national population for a selection of European countries of Lecocq's 'model'

Country	Number Ungulate hunters	Total population	%hunters
Finland	200,000	5.2 m	3.8
Sweden	300,000	9.1 m	3.3
Norway	125,000	4.7 m	2.7
Denmark	172,000	5.4 m	3.2
UK	13,400	60.3 m	0.02
Netherlands	Hunting very restricted by law		-
Belgium	??	10.5 m	
Germany	340,000	82.5 m	0.4
Poland	100,000	38.1 m	0.3
Czech	100,000	10.2 m	1.0
Slovakia	40,000	5.4 m	0.7
Croatia	55,000	4.5 m	1.2
Austria	118,000	8.2 m	1.4
Slovenia	22,000	2.0 m	1.1
Hungary	50,000	10.0 m	0.5
Romania	25,000	21.1 m	0.1
Portugal	300,000	10.5 m	2.9
Spain	150,000	45.0 m	0.3

***UK estimate from BASC survey 2004**

Stakeholder and Public Perceptions/ Expectations

iii) UK

3.25 As in the US, much 'debate' in the wider public arena would appear to be more concerned with the ethics of recreational shooting, or the relative acceptability of lethal versus non-lethal methods of control, rather than concern about issues of actual animal welfare- although occasional articles in the media do raise issues of winter mortality due to starvation/resource limitation consequent on over-stocking.

3.26 Most practitioners in Scotland (at least among resident stalkers, if not necessarily amongst visiting stalking clients) are also aware of recent publications by Ken Urquhart and others on the incidence of wounding in stags and hinds during routine culls (e.g. Urquhart and McKendrick, 2003). All are broadly aware of the risk (and that risk increases with distance of shot).

3.27 It is generally accepted that wounding rates may be of the order of around 10% (that is to say in 10% of cases a second shot is fired because the animal did not go down immediately). However, the interpretation of such a statistic is complicated. In many cases that second shot may have been fired within seconds simply 'to make sure' and the original shot may itself have delivered a mortal wound. The actual proportion of animals which survive for a protracted period following initial injury (minutes, hours, or longer) is less clear; nor is it clear what may be the actual level of suffering experienced by animals which do survive for a number of minutes after being hit (since it may be expected that such animals are in physiological shock and may in practice feel little). Indeed it has never been adequately defined what is an 'acceptable' period (in welfare terms) between an animal being hit, and death resulting, although the BDS advocate an empirical period of 2 minutes between impact and death.

3.28 Finally, even were this issues to be satisfactorily resolved, it remains unclear what change in policy (whether through practitioner guidance [Best Practice] or changes in legislation) might reduce the incidence or welfare implications of such wounding.

3.29 In this respect, the British Deer Society did initiate a survey among members investigating wounding rates experienced by different categories of stalkers (amateur/ professional; regular/occasional; new/experienced etc.). This latter project also aimed to investigate the relationship between frequency of wounding and shooting practice (distance over which shot taken, rifle calibre, projectile size and muzzle energy). Clearly any obvious correlations between wounding rates and either stalker experience, rifle characteristics or distance over which the shot was taken could be of value in informing future practice.

3.30 Attitudes of practitioners and the wider public in Scotland to welfare implications of current seasons (or various options proposed for altering those seasons) are reasonably well-documented in comments already received by the DCS in response to specific questions posed in the recent Seasons Consultation. The main responses to that consultation may be summarised here from the DCS's own "**Summary of Responses to the Consultation on Close Seasons**" (March 2005).

3.31 There was no clear consensus as to whether there were moral imperatives that dictated the need for close seasons. Primary issues which were raised related to the 'distasteful' aspect of shooting pregnant hinds, the welfare implications of orphaning calves and the need for stags to have a period to recover condition after the rut before entering winter.

Thus:

3.32 There was a majority view that close seasons should take account of the stage of pregnancy. The arguments for this included the abhorrence of shooting females heavy in calf both from the sensitivities of the stalker and from the possible reaction by the general public. Both of these concerns however raise issues of ethics rather than welfare, and a strictly welfare issue can only be

argued for the killing of females with foetuses approaching full term - in relation to the welfare implications for the foetus itself. **To date there is no objective information** available to define at what stage in pregnancy the foetus does become a separate, sentient being.

3.33 The majority of commentators did consider that there was a welfare issue involved in the orphaning of dependent juveniles although there remains continuing discussion about how long that period of dependency might last (and see below, Section 7). There was clearer opinion about the ability to set a date when the juvenile was no longer **nutritionally** dependent on its . and this was related to weaning.

3.34 Finally, the majority of respondents to the DCS's consultation advocated a close season for males at least for red deer. This was based on the premise that red stags require protection after the rut, especially those of open range, because they are in poor condition and require access to undisturbed winter feeding and shelter.

A number of statutory Agencies or NGOs consulted, however, believed that there was no biological or welfare argument that required males to have a close season.

3.35 Similar consultation about changes to permitted seasons have also been carried out more recently in England and Wales. The consultation revealed a very similar profile of views and attitudes. It is noted that a recent Regulatory Reform Act has extended the open season for female deer of all species to the end of March.

4. Legal Status of Welfare of wild deer; a wider "duty of care"

4.1 As noted above, the Netherlands as a country does not fit easily into any of Lecocq's 'Attitude Models' and the legal position is also perhaps unusual. Conflicts were highlighted during a recent debate in the Netherlands over the management of a large nature reserve (Oostvaardersplassen) managed by grazing by cattle, ponies and red deer. The management ethic for conservation within the Netherlands is to move as far as possible towards non-intervention. Thus, after introduction of Heck cattle, Konik horses and red deer to this large wetland reserve, populations were left largely unmanaged to 'find their own equilibrium'; actual intervention was limited to humane destruction of animals found near death.

4.2 In the event, considerable controversy has resulted over recent years as populations levels of all three species have risen and (due to resource limitation) levels of overwinter mortality among cattle, horse and red deer populations have risen dramatically (ICMO, 2006). This helps illustrate both public attitudes to welfare and actual legal responsibilities.

4.3 Conflicts arise because under Dutch law every citizen has a duty of care and a responsibility to safeguard as far as is possible the welfare of all animals (specifically any animal, whether wild or domestic, for which they are **aware** that there is a welfare problem).

Explicitly, under Dutch law any person is obliged by law to intervene when he or she sees evidence of unacceptable suffering [Dutch Animal Health and Welfare Act (GWWD) Section 36 subsection 3 "Every person has a duty to provide the necessary care to animals in need".]

4.4 At the same time (emphasising yet again the distinction between ethics and welfare both in perception and in the law), prophylactic control (shooting sufficient animals each year to keep ungulate populations below the (limited) winter carrying capacity) was equally considered to be unacceptable in this particular situation since (whatever the conservational ethic of non-intervention), there is an ethical and legal presumption against taking the life of healthy animals (with the explicit exception of farmed livestock).

4.5 In fact under Dutch law roe deer, red deer, wild boar and fallow deer are in any case, fully protected and can only be culled

- for reasons of public health and public safety;

- in the interest of safety of air traffic;
- to prevent damage to crops, cattle, forests, fishery and waters;
- to prevent damage to flora and fauna or
- other reasons, to be defined by specific order in Government.

which made things even more complicated. But that was not the issue here.

The issue was a conflict between an ethical presumption against taking the life of an apparently healthy animal and the fact that there is a legal obligation on all citizens to take responsibility and take appropriate action where they are aware that the welfare of any wild animal is in jeopardy [GWWD 36 subsection 3].

4.6 As far as I am aware this is the only country in which there is an explicit general responsibility of citizens to safeguard the welfare of all animals (wild or domestic). Although I make no pretence of being an expert in international law and I am aware that there may be similar legislation on other countries I have not uncovered, my impressions here are corroborated in correspondence with Dr Arthur Lindley, former Head of Science with the RSPCA Professor David Favre of the Michigan State University College of Law (www. animallaw.info) - an international authority on welfare legislation and Matthew Collis, UK Parliamentary Officer for the International Federation for Animal Welfare (IFAW).

In most instances, therefore, legal obligation in relation to welfare of deer and other game is primarily indirect through specific provisions in Game Acts or Hunting Law in relation to seasons, permitted weapons, use of dogs etc for hunting, or provision of supplementary feeding and ‘winter care’.

4.7 Any **general** imposition of responsibility for welfare which may be implied by animal welfare legislation in the UK (equivalent to that implied by Dutch law) is not explored in detail in the current paper*. My understanding is that while the current legislation (The Animal Health and Welfare (Scotland) Act 2006; Wild Mammals (Protection) Act 2006) makes it illegal for any person wilfully and deliberately to cause suffering to any animal, it does not impose a more general duty of care on citizens to act in the case where a welfare issue may become apparent which is not caused by their own action .

***But for further discussion in detail of actual legal responsibilities for welfare, see ‘A report on the potential responsibilities of care for upland red deer’, Responsibilities, paras 4.1 - 4.5.**

4.8 As in other European countries, the definition of both the legal status of welfare of wild deer and other game, and legal obligations in relation to that welfare, is primarily indirect through specific provisions in Game Acts or Hunting Law in relation to seasons, permitted weapons, use of dogs etc for hunting, or provision of supplementary feeding and ‘winter care’. (see paragraph 2.6). It is these ‘obligations’ imposed through Hunting Law which will be examined in more detail here - discussed individually in Sections 5 - 10.

5. Hunting Practice and welfare implications

5.1 Consideration here is largely restricted to a review of hunting practice within Europe. As already noted, within the US “each state manages its deer population independently; regulations vary all over the place. However **there are usually requirements about minimum cartridge power, taking a safety course, daylight only, no dogs, and usually no baiting.**” Similar diversity is well represented within European practices and thus it was felt that there was no need to explore variation in US practice in more detail

5.2 Here, quite explicitly, consideration is given to the following particular issues, to explore wider European practice in relation to :

- ◆ Wounding/Humane despatch
 - a) requirements for obtaining a hunting licence;

- b) requirements for hunter training (insofar as this affects welfare issues);
 - c) legal restrictions on firearm calibre minimum projectile size and energy;
 - d) other permitted weapons (such as shotguns, bows etc);
 - e) required provision for following up and despatch of injured animals;
 - f) Permitted hunting methods (driving of deer permitted? use of dogs?)
- ◆ Orphaning of neonates, or dependent juveniles
 - a) whether or not there is a legal or statutory definition of open (hunting) seasons in different countries
 - b) consistency between countries and
 - c) the relationship of open seasons/ close seasons to actual biological seasons;
 - ◆ Body condition, overwinter starvation/survival:
 - a) the legal position in relation to the provision of supplementary feed and whether this is mandatory, encouraged, discouraged or actively prohibited..

6. Legal requirements for obtaining a licence to shoot game:

6.1 In every country considered, formal application must be made to hold a firearms (or shotgun) licence; in the majority of cases an additional licence is required in order to be permitted to shoot large ungulates (whether this is a general licence or a licence for a particular number of animals of given age and sex). This 'secondary' licence to shoot ungulates is commonly dependent on proof of the right to shoot over a particular area of land and in many cases it is also dependent on membership of a regional hunting association/ cooperative ('game management group') or recognised Hunter's Club (e.g. Hungary, Romania, Poland, Slovakia, Slovenia, Croatia).

Training

6.2 In the vast majority of European countries, issue of a licence is dependent on some degree of formal training which is usually assessed by formal examination; this is (less commonly) offered by national or regional administrations, more commonly (whether formally or informally) through Hunter's Associations.

6.3 Training in many instances involves period of supervised training in the field (eg. Poland, Lithuania etc.) and in some cases even after obtaining a hunter's licence the individual still 'suffers' a period of probation where he/she may only hunt under supervision (e.g. Romania). In Germany a hunter can only assume responsibility for his own hunting ground (revier) after he/she has held a full licence for 3 years.

6.4 The level and intensity of training (and the 'ease' of the examination) varies enormously from country to country, as does the inclusion within the "syllabus" of welfare -related issues.

6.5 Further, while in most cases the examination does require a practical test of shooting skills and accuracy (whether this is a requirement simply for gaining a firearms licence in the first place, or required more specifically towards a licence to hunt ungulates) the level of expectation is notably variable.

6.6 Specifically:

Countries where no formal training is required after issue of a straightforward gun licence:
Netherlands, Belgium , UK, Spain

Countries with fairly minimal training required before issue of a hunting licence for ungulates
Finland (12 hours of voluntary lectures), Norway (mandatory 16 hour course and theory exam), Denmark, Latvia, ?Switzerland, Portugal, France, Italy, Greece (no practical examination)

Countries with more extensive expectation of training

Germany (120 hours mandatory plus exam), Poland (1 year training in a Hunting Club), Estonia (56 hour mandatory course), Lithuania (1 year training in a Hunting Club), Czech Republic, Slovakia, Croatia (hunting exam and 1 year practical training), Austria, Slovenia, Romania.

Countries where training includes specific attention to ethics and welfare considerations

Sweden, Germany, Austria, Lithuania, Czech Republic, Hungary, possibly others although my correspondents were not always specific, and, as above, there is a strong distinction to be drawn between ethical and welfare issues.

6.7 The most comprehensive training is, not unexpectedly, required in German speaking (and related) countries of central Europe, with a long-established tradition of game management through established (and respected) Hunter's Associations.

6.8 Consideration here of 'hunter training' is included for completeness and because it does have some bearing on welfare, both where defined syllabuses may consider welfare-related issues, and where training affects proficiency. Treatment is however kept here to a minimum since Training and Competence form a major focus of complementary Reports

7. Legal restrictions on firearm calibre and muzzle energy/velocity

7.1 Most European countries do have explicit legislation prescribing weapons, calibres and projectile energy to be used when hunting different species of game animals.

Rather than rehearse in each case the particular detailed regulations, I attempt below to extract

- a) those countries where it is permissible to use a shotgun to pursue and kill ungulates of any species
- b) those countries where it is permissible to use small calibre rifles (and for what species)
- c) those countries/species where rifles of large calibre and providing a minimum projectile energy at 100m (E100) are required

Consideration is limited to the taking of species relevant to UK: thus red deer, sika, fallow, roe and muntjac

7.2 Shotgun permitted for small species

Finland (roe; also fallow if single slug); **Sweden** (roe); **Norway** (roe, except males 10th August - 25th September); **Denmark** (roe, except males in summer, as Norway); **UK**: all species, but only where loaded with a single slug and where deer can be shown to be causing damage to agricultural crops, growing timber or other property; [**Croatia**; wild boar only]; **Austria** (permitted for roe deer in one province only but not used in practice); **Switzerland** (roe, but primarily only in central plateau); [**Italy**; wild boar only]; **Portugal** (all ungulate species but single slug only); **France**.

7.3 Small calibre rifles

Sweden (roe), **Norway** (roe; restriction is that expanding bullets with E100 > 980 joules must be used), **Denmark** (roe; bullet weight must be >50 g (3.2 grain) and E100 >800 J); **Scotland** (roe; bullet weight must be >50 g (3.2 grain) and muzzle energy >1356 J); **Netherlands** (roe: E100 >980 J); **Belgium** (roe: E100 >980 J); **Czech Republic** (roe: muzzle energy > 1000J); **Croatia** (roe: bullet weight must be >50 g (3.2 grain) and E100 >1000 J); **Slovenia** (roe: bullet weight must be >50 g (3.2 grain) and E100 >1000 J); **Switzerland** (roe); **Hungary** (roe: rifle with muzzle energy >1000 J);

7.4 Larger Game:

In almost all cases, where shooting larger animals (i.e. species other than roe) all countries specify the use of rifles and ammunition capable of delivery of a bullet of 9 or 10 grains (140 or 154 g.) with a minimum E100 of respectively 2700 joules or of the order of 2500 J.

Exceptions to this general rule are:

Denmark, Finland : E100 for 10 grain bullet 2000 J; **Norway** 2200 J,
Czech Republic Muzzle energy >1500 J

and also **Portugal, France, Spain**, where it appears no specific restrictions apply.

[In Portugal, “recommendations” are made in a technical manual : Victorino, JA (2001). *Armas de fogo e munições de caça* (weapons and hunting ammunitions). In: **Carta de Caçador: manual para exame**. Direcção Geral das Florestas. Lisbon. ... but these are recommendations only and not legally binding]

Other permitted weapons

7.5 Use of shotguns (usually, but not always presuming these are loaded with a single ball or slug) is permitted for all ungulate species in Portugal (and I believe also France) and for smaller species (roe) in Finland, Sweden, Norway, Denmark (except in both cases males in summer), Austria (one province only), Switzerland. Shotguns can currently also be used in the UK for all species, but only where loaded with a single slug and where deer can be shown to be causing (or likely to cause) damage to agricultural crops, growing timber or other property.

7.6 Traps and snares are not permitted in the majority of countries, but bow-hunting is permitted for roe deer in Finland, Denmark and for other species in France (bow), Portugal (bow, cross-bow, spear). Bow hunting is also increasingly permitted in a number of States of the USA. In some cases there may be a restriction on bow power (as for example in Finland where the bow must have a minimum power of 180 N).

8. Hunting practice and the use of dogs

Driving or beating game (“battue”)

8.1 In most European and North American countries/States, hunting of ungulates is either carried out from a high seat, or by stalking.

In some cases groups of hunters ‘drive’ an area by walking through it in line abreast (e.g. Denmark) or lines of human beaters drive game to stationary guns (e.g. Sweden, Germany, Hungary, Poland (silent drives only), Baltic Countries, Portugal), but this is relatively uncommon compared to situations where game may be driven by dogs.

Use of dogs for driving game

8.2 Dogs are frequently used by moose hunters throughout Scandinavia to seek out and hold moose at bay; in many other countries single dogs or packs may be used (with or without human beaters) to flush and drive deer to waiting guns (Finland, Sweden, Norway, Denmark, Germany, Austria, the Baltics, Romania, Portugal, France and Spain).

8.3 In Poland Hungary and Slovakia, as well as in Italy, dogs may be used for hunting wild boar, but not for deer

8.4 Use of dogs for driving deer is specifically forbidden by law in the Netherlands, Belgium, UK and Ireland, while in the Czech Republic it is illegal to use dogs >55cm at the withers.

Use of dogs for tracking injured game:

8.5 The other side of this particular coin is that in many countries it is mandatory to have, or to have access to a specially trained dog for following blood trail and finding injured animals which have run to cover. [I understand that DCS itself now makes access to such a trained dog a requirement in issue of night-shooting licences]

For comparison we may note that access to a trained dog for location of injured animals is mandatory in Sweden, Norway, Slovakia, Germany and I believe also Austria; it is common also in Poland, and in Hungary but I am not clear whether or not it is mandatory in these countries.

9. Hunting seasons

9.1 Almost all European countries operate with a principle of restricted hunting periods for some or all species (exception Portugal, where technically the season lasts from 1st June in any year to 31st May of the following year, although most hunting activity is carried out between September and February). There is however an enormous diversity in length (and actual time of year) of the permitted season, which shows little consistency between countries and often little relation to actual biological breeding seasons (rut, parturition, period of dependency of young). The mismatch between hunting and biological seasons, and the implications of this for welfare, social dynamics - and the ability (or failure) of hunters to regulate prey populations is the subject of a major analysis in preparation by Bartos *et al.* (ms in preparation).

9.2 I cannot attempt to emulate this here (the review, due next year, will however be of very significant relevance). Instead, and to illustrate something of the complexity, I have chosen here simply to list the open seasons for red deer males and females and roe deer males and females in different countries. Figures below offer visual summary only; these can not be definitive, since in some cases only parts of months shown are included in the season; in other cases seasons vary between provinces within a given country (e.g. Italy, Austria, Germany), or may vary with age-class of animal (for example distinct seasons in Wallonia, Hungary or Romania for prime age stags and 'poor'/cull stags). Further details are summarised in tabular form in the Appendix; Tables 1 and 2.

Further, seasons are shown here only for adult males and females and calves of the year; in some countries (e.g. Germany, Poland, Slovenia, Estonia), there are distinct (and different) seasons specifically for juveniles/yearlings of both sex.

9.3 Even from a cursory examination of the Tables, it is clear that there is enormous variation in both timing and duration of seasons [compare for examples seasons in the three adjacent countries of the Baltics: Latvia, Lithuania and Estonia, or the different parts of Belgium]. Seasons also vary (often quite markedly) between different regions or provinces of one country (e.g. Italy, Austria, Germany).

9.4 We may also note that in many countries, seasons for males and females are the same - or show significant overlap perhaps, at first glance, suggesting little regard for biological season.

9.5 While it is difficult to extrapolate too widely (the different countries of Europe span a wide range of latitudes and timing of the rut and juvenile dependency may vary) we may note that (as long as we exclude Portugal, where there are no closed seasons at all) the earliest permitted time for culling red deer females is 1st August (Netherlands) and the latest 31st March (France, England) [or 31st May in southern Spain].

Correspondingly, the earliest permitted time for culling roe deer females is 1st May (Austria, Switzerland) or 15th August (Latvia), while the latest is 31st March (Scotland, England) [with the exception of Spain: where the season extends to 31st May].

Figure 1: Open seasons for red deer males/females

Country	Males												Females												
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
Finland	Red deer do not occur in Finland																								
Denmark																									
Norway																									
Sweden																									
Scotland																									
EnglandWalesNI																									
Ireland (Eire)																									
Netherlands																									
Belgium Flanders																									
Belg. Wallonia																									
Germany																									
Poland																									
Estonia																									
Latvia																									
Lithuania																									
Czech																									
Slovakia																									
Croatia																									
Austria																									
Switzerland																									
Slovenia																									
Hungary																									
Romania																									
Portugal																									
Spain																									
France																									
Italy Alps																									
Italy Appenines																									

Figure 2: Open seasons for roe deer males/females

Country	Males												Females											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Finland																								
Denmark																								
Norway																								
Sweden																								
Scotland																								
EnglandWalesNI																								
Ireland (Eire)	Roe deer do not occur in Eire																							
Netherlands																								
Belgium Flanders																								
Belg. Wallonia																								
Germany																								
Poland																								
Estonia																								
Latvia																								
Lithuania																								
Czech																								
Slovakia																								
Croatia																								
Austria																								
Switzerland																								
Slovenia																								
Hungary																								
Romania																								
Portugal																								
Spain																								
France																								
Italy Alps																								
Italy Apennines																								

9.6 Scotland has one of the earliest openings of the permitted season for shooting red stags (1st July) [elsewhere the more general start of the season is August or September]; in the majority of countries the season extends through to end of January or February; only in France (and England) does it continue to the end of March. Start of the roe buck season (1st April) in Scotland and England is also one of the earliest in Europe, but in many countries/states, buck shooting may continue to the end of November, December, or even into January (Switzerland).

9.7 Clearly male seasons extend through the rut in the majority of countries (with an associated potential for disruption of breeding, or social ‘distress’); only in Denmark and Wallonia, does the roe buck season appear deliberately ‘broken’ to accommodate an undisturbed rut (Denmark: 16th May - 15th June and 1.October - 15th January; Wallonia 1st May - 15th May and 1st August - 30th November)

9.8 We may broadly assume (over the latitudinal range) that the period of parturition for roe deer is from late April/early May to end of June and that for red deer is from mid May to the end of June.

[9.9 For roe deer it is apparent that there is some considerable variation. Although calving season is quite 'tight', with 80% of fawns born within 20-30 days of median date of parturition (Irvine 2004), that median date itself may vary from 11th May - 13th June in different locations (Linnell and Andersen, 1998). There is however no simple relationship with latitude, although birth dates do follow some pattern, with southern and Atlantic coast populations giving birth in general before inland, continental ones (Linnell *et al.*, 1998). For red deer there appears to be far less variation and populations in most areas give birth over the same range of dates (26th May- 15th June; Fletcher, 1974)].

9.10 Given these general dates, we may speculate that neonates, not accompanying the mother may be orphaned if mothers are shot before say mid June (roe) or mid July (red), while **unless culled with the mother**, juveniles of either species nutritionally dependent on lactating dams will die if mothers are shot before the end of August. [I appreciate that there is an enormous debate on the issue of from what precise date orphaned calves of either species may survive the loss of their dam, and I am deliberately choosing a very conservative date here. It may well be that animals whose mother is shot still later than this will not survive; I simply consider it unlikely that animals whose mother is shot before this date will do so. This analysis also takes no account of possible social consequences of early loss of the mother].

9.11 On such a basis it is clear that with seasons for mature red deer females in most countries not opening until September (Croatia, Slovenia, Hungary Romania - all central European, with earlier breeding seasons anyway) or October (Denmark, Norway, Sweden, Wallonia, Poland, Estonia, Lithuania) cull seasons may be considered outside the period of maximum welfare risk. Some countries delay the commencement of the season even further ((November in England and Eire). **However we may note that seasons in the Netherlands, Latvia, the Czech Republic, Slovakia and Switzerland open as early as the beginning of August.**

9.12 Seasons for roe deer generally are restricted to a period well before parturition (e.g 1st January to 15th March, or 15th January - 15th March in the Netherlands or Flanders) or do not commence until September or the beginning of October (the majority of countries). **Only in Spain, Austria and Switzerland is the season for *mature* females open from April (Spain) or May** . Females culled at this time may well be near-term or actually have given birth. While the season for roe does finished at the end of March, we may note that for the final month (1st-31st March, roe may only be hunted by coursing!

10. Body condition, overwinter mortality and the provision of supplementary feed

10.1 In a number of countries, especially those where Hunting Clubs, or Hunting Associations take on the lease of a defined Management Area (*Revier*, or other), they are presumed to have taken on a legal responsibility for management of the area, with obligations to manage the animals in balance with the capacity of the environment.

10.2 In many instances they themselves are severally or collectively responsible for damage caused by deer or other ungulates to agriculture, forestry or other land-use interests and may be required to pay compensation. In other instances they are charged with the responsibility of 'management of a population in good condition' although in no case does there seem to be any specific or objective mechanism whereby this may be assessed or judged and loss of a lease, or failure to have a lease renewed, is more commonly associated with failure to meet required (if externally imposed) or agreed quotas and cull targets, or complaints about excessive environmental impacts, than with actual assessment of population or individual condition.

10.3 Perhaps the only area in which specific action may be taken to try and address actual animal condition is in

- a) deliberate efforts made by managers to improve forage resources by habitat management or planting of game crops, or
- b) through provision of supplementary foodstuffs during periods of food shortage.

10.4 In many cases such manipulations are carried out at the instigation of individual or collective managers (individuals or Hunting Associations responsible for ungulate populations in a particular area), largely through self-interest, in that such measures are directed towards

- i) attempting to improve the condition or 'quality' of animals for harvest,
- ii) attempting to hold animals on their own ground (or own leased ground) and counteracting any potential drift of animals to neighbouring reserves, or hunting grounds, or
- iii) as a simple diversionary tactic in attempting to sustain high densities on their own ground for hunting purposes, while reducing the damage caused to agriculture, forestry etc.

10.5 The actual effectiveness and/or cost-effectiveness of such manipulations were considered by Putman and Staines (2003, 2004), together with a detailed consideration of the likely effects of (in particular) winter feeding on body condition and animal welfare.

As the specific 'focus' of a recent DCS contract report, this is not dealt with in detail here, beyond concluding that there is little objective evidence from studies throughout Europe and North America, that winter feeding causes (at the population level) any increase in average body weight, any increase (at the population, rather than the individual level) in antler size of males or fecundity of females, or any increase in rates of overwinter survival. By contrast, provision of concentrated or bulk foods in a limited number of feed sites, combined with a tendency for animals to become reliant on the artificial supplement in place of more extensive foraging, promotes aggregation of animals, leading to an increased probability of transmission of disease, increased competition for (usually) limited resources and may thus lead to actual loss of condition in less dominant males and especially among females (Putman and Staines 2003, 2004)

10.6 Such conclusions are widely echoed by others [eg. Arnold (2002), Meile (2006), Adamic *et al.* (2007), Bartoš *et al.* (2007), Imesch-Bebić *et al.* (2007), Findo and Skuban (2007)].

However, despite such argument, we should conclude this review by noting that winter supplementation remains compulsory in some countries and common practice in others.

There is however no simple consensus and there are also countries in which such supplementation is explicitly forbidden by law.

[For further treatment of this issue see 'A report on the potential responsibilities of care for upland red deer']

Feeding obligatory	Feeding common	Feeding sporadic	Feeding forbidden
Germany (part)	Germany (part)	Denmark (roe)	Netherlands
Austria	Hungary (esp. red)	Belgium (roe)	
Slovakia	Slovenia (esp. red)	Portugal	
Poland	Baltics	Spain	
Czech Republic	Switzerland	UK	
Croatia	Italy (red and roe)		
	Finland (roe)		
	Norway (roe)		
	Sweden (roe)		

Conclusions:

Attitudes, Perceptions and Expectations:

11.1 It is clear that attitudes to hunting, and welfare implications of hunting practices vary enormously between countries and cultures, and there is no single 'model' to inform deliberations in Scotland. Further, my consultations suggests that any wider 'public' expectation in relation to welfare issues is minimal. Public concern is more generally restricted to matters of ethics than actual welfare, and there is more generally an implicit presumption that welfare issues are addressed by legislation. Bluntly, both at home and abroad, the wider public would appear largely ignorant of the issues and thus largely unconcerned and it is stakeholders themselves who recognise the different welfare problems arising through management.

Training and Codes of Practice:

11.2 In many countries there is a strong tradition of training and promulgation of Codes of Practice through various regional and national Hunting Associations, of which membership is often a mandatory prerequisite for obtaining a licence to take game or manage a hunting area.

Legislative framework:

11.3 Only in one country (The Netherlands) is there a specific positive requirement/duty of care on all citizens to safeguard as far as is possible the welfare of all animals (specifically any animal, whether wild or domestic, for which they are **aware** that there is a welfare problem). Explicitly, under Dutch law any person is obliged by law to intervene when he or she sees evidence of unacceptable suffering. In most other countries legal obligation in relation to welfare of deer and other game is primarily indirect through specific provisions in Game Acts or Hunting Law in relation to seasons, permitted weapons, use of dogs etc for hunting, or provision of supplementary feeding and 'winter care'.

Weapons and wounding:

11.4 In all countries there is a strong legal framework regulating types of weapons and ammunition that may be used, and prohibition of traps, snares, poisons etc. There is however some considerable variation in what those weapons may be used (with a number of countries permitting the use of bows or shotguns) and more specifically minimum specifications permitted for different species, so that there is again no 'consensus' to which Scotland might conform.

11.5 One country (Croatia) has in recent legislation taken the step of imposing a maximum distance in law, over which animals may be shot. This would appear to be a useful innovation.

Seasons and orphaning of dependent young:

11.6 Every country has open and closed seasons defined in law (although in Portugal this season formally extends from 1st June - 31st May), although there is considerable variation between

countries (and even between provinces or States of the same country: Italy, Austria, Germany). In most cases defined seasons for adult females are well-designed to avoid periods of parturition or risk of orphaning dependent young. Seasons for males are more varied (and commonly are the same as those prescribed for adult females). In countries operating a more 'Germanic' model of hunting, separate and distinct seasons are commonly defined for adult (breeding) and subadult males and adult and subadult females. This might be worthy of consideration were seasons for females to be extended.

Supplementary feeding:

11.7 Legislation in relation to supplementary feeding is variable both in the US and Europe, with provision of supplementary winter food mandatory in some countries/states, common practice in others and strictly forbidden in others.

Legislative intervention or industry Codes of Practice?

11.8 Given the mix and match pattern in relation to numerous welfare issues of formal legislative prescription/proscription alongside practitioners' accepted Codes of Practice, it is perhaps important to give further consideration to the extent to which welfare-friendly practices are best delivered by regulatory intervention or stakeholder Codes of Practice.

The problem with any legislative intervention is of course that it requires policing or may in practice be difficult to enforce. However, in terms of satisfying wider public expectation, formal legislation is seen to be an independent, governmental or state view and statement of policy, while less formal, industry Codes of Practice risk being viewed with more suspicion simply as a form of self-justification of existing practice.

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Open seasons for red deer males/females

Country	Males	Females
Finland	Red deer do not occur in Finland	
Denmark	1.09 -31.01	1.10 - 31.01
Norway	10.10 - 11.11	10.10 - 11.11
Sweden		
Scotland	1.07 - 20.10	21.10 - 15.02
EnglandWalesNI	1.08 - 30.4	1.11 - 31.03
Ireland (Eire)	1.09 - 28.02	1.11- 31.01 [28.02 in some counties]
Netherlands	1.08 - 15.02	1.08 - 15.02
Belgium Flanders	21.09 - 31.12	1.10 - 31.12
Belg. Wallonia	[21.09- 30.09 Large males only]	
Germany	[most states] adults 1.08 - 31.01 (or 15.01); subadults 1.06-31.01	[most states] adults 1.08 - 31.01 (earliest 16.06); subadults 1.06 -31.01
Poland	21.08- 28.02	1.10 - 15.01
Estonia	1.09 - 31.01	1.10 - 30.11
Latvia	1.09 - 31.01	15.08 - 31.12
Lithuania	15.08- 15.10	1.10 - 31.12
Czech	1.08- 15.01	1.08- 15.01
Slovakia	1.08 - 31.12	1.08- 31.12
Croatia	16.08 - 14.01	1.09 - 14.01
Austria	1.05 - 31.01	1.05 - 31.01
Switzerland	1.08 - 31.12	1.08 - 31.12
Slovenia	16.08 - 31.12	1.09- 31.12
Hungary	1.09 - 31.10 (prime age) or 31.01	1.09 - 31.01 (old) or 28.02 (young)
Romania	10.09-15.12 (prime) or 1.09-15.12	1.09 - 15.02
Portugal	1.06 - 31.05	
Spain	September to mid February	
France	23.08 -31.03	23.08 -31.03
Italy Alps	15.10-31.12	15.10-31.12
Italy Apennines	1.08 - 30.09	1.08 - 30.09 and 1.02 - 15.03 or 25.03

Open seasons for roe deer males/females

Country	Males	Females
Finland	1.09-31.01 and 16.05 - 5.06	1.09 - 31.01
Denmark	16.05 -15.07 and 1.10 - 15.01	1.10 - 15.01
Norway	10.8 - 23.12	25.9 - 23.12
Sweden		
Scotland	1.04 - 20.10	21.10-31.03
EnglandWalesNI	1.04 - 31.10	1.11 -31.03
Ireland (Eire)	Roe deer do not occur in Eire	
Netherlands	1.05 - 15.03	1.01- 15.03
Belgium Flanders	15.05- 15.09	15.01 - 15.03
Belg. Wallonia	1.05 - 15.05 and 1.08 - 30.11	1.10 - 30.11
Germany	[most states] 1.05- 15.10	[most states] adults 1.09- 31.1; subadults 1.05- 31.01
Poland	11.05 - 30.09	1.10- 15.01
Estonia	1.06 - 30.09	1.09 - 30.11
Latvia	1.06 - 30.11	15.08 - 30.11
Lithuania	1.06 - 1.11	1.10 - 31.12
Czech	16.05 - 30.09	1.09- 31.12
Slovakia	16.05 - 30.09	1.09- 30.11
Croatia	1.05- 30.09	1.09 - 31.01
Austria	1.05 -31.12	1.05 -31.12
Switzerland	1.05- 31.01	1.05- 31.01
Slovenia	1.05 - 31.10	1.09 - 31.12
Hungary	15.04 - 30.09	1.10 - 28.02
Romania	15.05- 15.10	1.09 - 15.02
Portugal	01.06- 31.05	
Spain	midApril - 31.07	midApril - 31.07
France	15.05 - 31.03	1.09 - 31.03
Italy Alps	2ndSunday.09 - 7.12	2ndSunday.09 - 7.12 and 1.02 - 15.03
Italy Appenines	1.08 or 15.08 - 30.09	1.08 or 15.08 - 30.09; 1.02 - 15.03

INFORMATION SOURCES:

A1.1 Information on attitudes and legal status of deer in North America have been gleaned from review of recent books and reviews published on deer and their management and by correspondence with established colleagues in various different States (Professor D. McCullough at Berkeley, Professor W. Porter at New York (Syracuse) Dr Jon Jenks at South Dakota State University, Dr Susan Russell, Dr Bill Faber and others).

A1.2 The bulk of the emphasis of this review was however focused on the situation in other UK and European countries

A1.3 Factual information (seasons, legislation) and subjective comment were sought from:

1. **Austria:** Professor Freidrich Reimoser, University of Vienna
2. **Belgium:** Dr Jim Casaer, Research Institute for Nature and Forestry, Scientific Institute of the Flemish Government, Gaverstraat 4, 9500 Geraardsbergen, Belgium; Dr. Alain Licoppe, Centre de Recherche de la Nature, des Forêts et du Bois Laboratoire de la Faune sauvage et de Cynégétique, avenue Maréchal Juin 23, 5030 Gembloux,
3. **Croatia:** Dr Josip Kusak, Biology Department, Veterinary Faculty, University of Zagreb, Heinzelova 55 HR-10000 Zagreb; Dr. Krešimir Krapinec; Department of Forest Protection and Game Management, Faculty of Forestry, University of Zagreb, Svetošimunska 25 HR-10002, Zagreb
4. **Czech Republic:** Professor Ludek Bartos, Institute of Animal Science (former Research Institute of Animal Production), Přátelství 814, Praha 10- Uhřetěves, 104 01, Czech Republic
5. **England and Wales:** Peter Watson, Director, The Deer Initiative.
6. **Estonia:** Dr T. Randveer, Estonian Agricultural University, Kreutzwaldi 5, Tartu 51014, Estonia; Dr J. Tonisson, Centre of Forest Protection and Silviculture, Rõõmu tee 2, Tartu 51013, Estonia; Dr Z. Andersone-Lilley, Defra, 1/06 Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6EB
7. **Finland:** Drs. V. Ruusila and I. Kojola, Finnish Game and Fisheries Research Institute
8. **France:** D. Maillard, Office National de la Chasse et de la Faune Sauvage, 75017 Paris, France; Professor J-M. Gaillard, Laboratoire de Biométrie et Biologie Évolutive, Université Claude Bernard Lyon ; Dr A.H.M.Hewison, Laboratoire Comportement et Ecologie de la Faune Sauvage, Institut National de la Recherche Agronomique (INRA), Toulouse, France
9. **Germany:** Ulrich Wotschikowsky; Dr Frank Zachos, Zoological Institute, Christian-Albrechts-University Kiel, 24118 Kiel, Germany
10. **Greece:** H. Pappaioannou, Department of Environmental and Natural Resources Management, University of Ioannina, Seferi 2, 30100 Agrinio, Greece
11. **Hungary:** Professor, S. Csanyi, Department of Wildlife Biology and Management, St. Stephen University, H-2103 Gödöllő; Professor A. Nahlik, Faculty of Forestry, University of West Hungary, H-9400 Sopron, Hungary
12. **Ireland (Eire):** T. Birkett, Eire Wildlife Service, Killarney
13. **Italy:** Professor M. Apollonio, Department of Zoology and Evolutionary Genetics, University of Sassari, Via Muroni 25, I-07100 Sassari, Italy; Professor Sandro Lovari, Department of Environmental Science, The University of Siena, via Mattioli 4, 53100 Siena, Italy
14. **Latvia:** J.Ozolins, State Forest Service, 13.Janvara Str. 15, Riga, LV-1932, Latvia; Dr Z. Andersone-Lilley, Defra, 1/06 Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6EB
15. **Lithuania:** Dr.L. Balciauskas, Institute of Ecology of Vilnius University, Akademijos 2, LT-08412 Vilnius-21, Lithuania; Dr Z. Andersone-Lilley, Defra, 1/06 Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6EB

16. **The Netherlands:** Dr. S.E. van Wieren, Resource Ecology Group, Wageningen University, Bornsesteeg 69, 6708 PD Wageningen, Netherlands; Dr. G.W.T.A. Groot Bruinderink, Alterra, Wageningen University Research Centre, P.O. Box 47, 6700 AA Wageningen
17. **Norway:** Professor R.Andersen, Professor, Conservation Biology, Museum of Natural History and Archaeology, N-7491 Trondheim, Norway
18. **Poland:** Dr. P. Wawrzyniak, Regional Directorate of the State Forests, ul. Lipowa 51, 15-950 Białystok, Poland; Dr. Tomasz Borowik, Mammal Research Institute, Polish Academy of Sciences, 17-230 Białowieża, Poland
19. **Portugal:** Dr. Carlos Fonseca, Department of Biology, University of Aveiro, Campus Santiago, 3810-193 Aveiro; Dr J. Vingada, Department of Biology, University of Minho. Campus de Gualtar. 4710-057 Braga. Portugal
20. **Romania:** Professor A. Nahlik, Faculty of Forestry, University of West Hungary, H-9400 Sopron, Hungary
21. **Slovakia:** Dr. S.Findo, and Dr M. Skuban, Carpathian Wildlife Society, St. Tulská 29, SK-960 01 Zvolen, Slovakia
22. **Slovenia:** Dr M. Adamic; Dr B.Pokorny, ERICo Velenje, Ecological Research and Industrial Cooperation, Koroška 58, 3320 Velenje, Slovenia
23. **Spain:** Professor J. Carranza, Department of Biology & Ethology, University of Extremadura, Cáceres, Spain
24. **Sweden:** Professor O.Liberg, Swedish University of Agricultural Sciences, Grimsö Wildlife Research Station, S-730 91 Riddarhyttan, Sweden
25. **Switzerland:** Dr. N. Imesch-Bebié, Federal Office for Environment, 3003 Bern, Switzerland

Other statistical sources consulted (weblinks)

General

www.gamehuntersguide.com/Encyclopedia/Country/Statistics.htm

(for example of specific route, see below: Denmark)

Denmark:

Databases compiled by Statistics Denmark, www.statbank.dk,

www.gamehuntersguide.com/Encyclopedia/Country/Denmark/Statistics.htm

Germany

www.forst.bayern.de/jagd_in_bayern/verbissgutachten

Deutscher Jagdschutzverband : www.jagd-online.de/

Hungary:

www.vvt.gau.hu/adattar.html National Game Management Database of Hungary (OVA)

Slovenia:

www.sigov.si/zgs/lov/zacetek/lov.htm

Slovene Register of Large Game Species and Large Carnivores : www.stat.si/eng/

United Kingdom: www.shootingfacts.co.uk/

United States:

www.fws.gov/hunting/huntstat.html