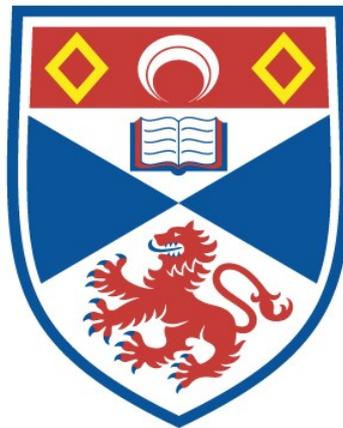


ROLES, RIGHTS, AND RESPONSIBILITIES IN THE
SUSTAINABLE MANAGEMENT OF RED DEER
POPULATIONS IN SCOTLAND

Lorin E. Witta

A Thesis Submitted for the Degree of PhD
at the
University of St Andrews



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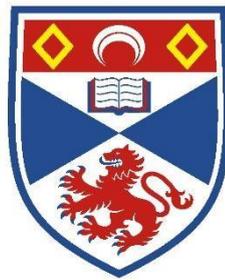
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Roles, Rights, and Responsibilities in the Sustainable Management of Red Deer Populations in Scotland

Lorin E Witta



University of
St Andrews

This thesis is submitted in partial fulfilment for the degree of
Doctor of Philosophy (PhD)
at the University of St Andrews

August 2017

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The community of red deer management professionals in Scotland is such that if interviews are publicly available, the identities of participants could be established.

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Thank you all for an incredible experience! ☺

Abbreviations

DCS	Deer Commission for Scotland
DEFRA	The Department for the Environment, Food, and Rural Affairs
DMGs	Deer Management Groups
DSA 1996	The Deer (Scotland) Act 1996
FC	Forestry Commission
NT	National Trust for England, Wales, and Northern Ireland
NTS	National Trust for Scotland
RSPB	Royal Society for the Protection of Birds
SD	Sustainable Development
SDM	Sustainable Deer Management
SSSI	Sites of Special Scientific Interest
SWT	Scottish Wildlife Trust
UN	United Nations
UK	United Kingdom
WANE 2011	The Wildlife and Natural Environment (Scotland) Act 2011

Parts of this thesis contributed to the following articles and conference presentations:

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Abstract

The aim of the project was to explore the acquisition and dissemination of knowledge amongst decision-makers involved in the management of red deer in Scotland. While research exists on the ecology of red deer habitat, no research exists that focuses on the relationship between the deer and the people responsible for their management. Therefore, this thesis is primarily qualitative research which aimed to explore the various aspects of red deer management in Scotland within the socio-ecological context in which it exists. There are numerous groups with interest in red deer management, however this research, due to scope and time restrictions, was limited to two primary groups, the individuals tasked with implementing policy and the practitioners who carry out culling. During the course of the project, under-researched topics surfaced, highlighting areas of practical and theoretical divergence between stakeholders. This thesis therefore aims to explore how differing views and perspectives of two of the key stakeholder groups – the estate-based practitioners (including stalkers, land-managers, and land-owners) and staff of governmental agencies – influence the management of red deer in Scotland. This research indicates that people with different roles hold different relationships with the deer, which affect management decisions and implementation at local, regional, and/or national level. As with other areas within conservation and wildlife management, this research indicates there is a disconnect between blanket governmental policy and site-specific needs, with a lack of inclusion of practitioner knowledge. Potential future research would include additional qualitative research to follow up some of the management issues raised by this research and formulate recommendations for changes to practice, followed by collection of quantitative data assessing the efficacy of interventions.

“These are fine beasts. We must take them out for the good of the herd. But they’ve earned our respect and they deserve a clean death.”

(‘The Gamekeeper’, Downton Abbey Season 3, Episode 9, PBS TV, 2013).

Table of Contents

Chapter 1: Introduction to the management of red deer in Scotland.....	1
1.1 Environmental management	1
1.2 Management or stewardship?	2
1.3 Challenges for stewardship	3
1.4 Can Sustainable Development offer solutions?	4
1.5 Human-Animal interactions and animal welfare	8
1.6 Landscapes	10
1.6.1 Site Designations.....	11
1.7 Red deer management in Scotland.....	15
1.7.1 Red Deer Ecology.....	15
1.7.2 Legislation	20
1.7.3 “Scotland’s Wild Deer – a National Approach”	22
1.7.4 Code of Practice	23
1.7.5 Best Practice Guidelines	25
1.8 Practitioners of deer management	26
1.8.1 Organizations and Red Deer Management	27
1.8.2 Landownership, Estates, and Stalking	34
1.9 Research into sustainable management or red deer.....	40
1.10 New Directions of Research	40
1.11 Statement of the aims of the thesis.....	42
Chapter 2: Research Methods - people managing red deer in Scotland	43
2.1 General methods	43
2.2 Field research data collection and analysis.....	43
2.2.1 Sampling: Snowball, Convenience, and Theoretical	44
2.2.2 Questionnaires.....	44
2.2.3 Semi-structured Interviews	45
2.3 Characteristics of participants	46
2.3.1 Questionnaire participant characteristics	46
2.3.2 Semi-Structured interview participant characteristics	50
2.4 Positionality.....	54
Chapter 3: An Icon or a pest?	56
3.1 Introduction	56
3.1.1 Religious and mystical status of deer	56
3.1.2 Red deer in literature.....	57
3.1.3 Red deer representation in the visual arts	58
3.1.4 Hunting of red deer.....	60
3.2 Methods.....	60
3.3 Results.....	61
3.3.1 Cultural Icons	61
3.3.2 Personal feelings about the deer	61
3.3.3 Deer as a pest	62
3.3.4 Conflicted views.....	63
3.4 Discussion.....	64
Chapter 4: Knowledge, Information, and Decision Making.....	68
4.1 Introduction	68
4.2 Methods.....	69

4.3	Results.....	69
4.3.1	Avenues into red deer management	69
4.3.2	Information channels.....	71
4.3.3	Flow of Information	74
4.3.4	How are decisions made?	75
4.4	Discussion.....	76
Chapter 5: Legislation and Implementation - voluntary or not?		80
5.1	Introduction	80
5.2	Methods.....	85
5.3	Results.....	85
5.3.1	How is Section 7 perceived by government agency participants?	85
5.3.2	The view of the estate-based participants	87
5.3.3	Perceived success of Section 7 culling	88
5.3.4	Political influences	91
5.4	Discussion.....	92
Chapter 6: Issues of Animal Welfare		95
6.1	Introduction	95
6.2	Methods.....	97
6.3	Results.....	98
6.3.1	Status and influence of animal welfare guidelines	98
6.3.2	How do animal welfare considerations impact practice?	99
6.3.3	Which animals are to be culled?.....	99
6.3.4	Closed seasons and exemptions for out-of-season culling.....	101
6.3.5	Welfare implications of Section 7 agreements.....	101
6.4	Discussion.....	105
Chapter 7: Implications for Sustainable Management.....		108
7.1	Summary of research findings	108
7.2	Future Research	111
7.2.1	Protecting red deer.....	112
7.2.2	Improving the knowledge base.....	113
7.2.3	Protecting the land	114
7.2.4	Human impacts	114
7.2.5	A new framework for the sustainable management of red deer in Scotland ...	115

References

Appendices

Chapter 1: Introduction to the management of red deer in Scotland

The red deer (*Cervus elaphus*) and the Scottish people have a long association, stretching back several millennia. The red deer is a native species and one of the most iconic of all Scottish animal species, named first by around 50% of respondents who expressed a view as 'important for Scotland' (Stewart, 2006). It is therefore unsurprising that red deer are the subject of research (e.g., Bradshaw and Bateson, 2000; Warren, 2002; White, 2005; McCauley, 2006) and are widely represented in the media and popular culture (e.g., BBC programs: Rannoch the Red Deer, 1998; Rowling, J. K., 1999 book, 2004 movie; Downton Abbey S3E9, PBS TV, 2013). This notwithstanding, the adult deer have no natural predators other than humans and the population of deer therefore needs to be managed. The aim of the thesis is to explore the implications of their dual status, being both a cultural icon and a pest, for the sustainable management of the red deer population of Scotland.

Similar to other highly populated areas worldwide, natural predators of deer within Scotland - species such as bear, lynx, and wolves – have been hunted to extinction (Monbiot, 2013). Without predators, the population of red deer is only naturally regulated by food availability or disease. Allowing this natural regulation, however, is not consistent with goals for habitat conservation and restoration, especially for woodland regeneration (Davies and White 2012). In addition, there are other economic implications from a failure to regulate deer populations, including, for example, motor vehicle collisions, tick-borne diseases, and agricultural productivity. There are also ethical implications of relying on population-self-regulation via illness and starvation of an animal population. The management of red deer is made more complex because of their status as a cultural icon (Bradshaw and Bateson, 2000).

1.1 Environmental management

The environment - its ecosystems, ecosystem services, and natural resources – is of obvious value (Begon et al., 2006). It has been argued that the spiritual and aesthetic value of nature (including tourism and other outdoor pursuits) is sufficient to promote its conservation (e.g. McCauley, 2006), notwithstanding our practical dependence on the environment for goods and services (including food production, air to breathe, and water to drink), which makes many of our current actions seem disturbingly short-sighted (Brown, 2011; Pullin, 2002). Environmental management is informed by many disciplines, but has especially strong ties with conservation biology. Barrow (2000, p. 35) explains that "*environmental management is a myriad of individual and collective decisions by persons, groups, and organizations, that together these decisions and interactions constitute processes which results in management (or mismanagement) of the*

environmental resources of a society or nation.” Ecosystems may share widely applicable functional principles, but small differences in soil type, altitude or aspect or connection to habitat corridors cause species and processes to be unique to each site (Daily et al., 1997; Marten, 2001; Opdam et al., 2002; Begon et al., 2006). Local users and managers need to build up an understanding – albeit one that will likely be coloured by their particular perspective - of the interactivity of resources within the same place, because environments are complete systems, so that one resource within a system affects all other aspects of the local environment.

The term ‘environmental resource’ traditionally implies the potential of a specific supply of natural product for human exploitation. Nevertheless, this perspective is gradually shifting with increased emphasis on ecosystem services in regulatory and theoretical outputs. In this thesis, natural resource management (such as forestry, maintenance of grasslands, conservation of wildlife populations) and the management of ecosystem services (seeing the interconnectedness of ecological processes and items, such as carbon or nitrogen management) are considered within the broader concept environmental management (comprising also additional commercial activities, such as agriculture and water-catchment management).

Socio-economic processes are primary drivers for changes in land use and land cover, and therefore these determine the structure, function, and dynamics of most landscapes (Wu and Hobbs, 2002). The drivers of these processes (e.g., mass production of food, tourism, and so forth) have consequences, including soil erosion, redirected water ways, climate change, and biodiversity loss (Barrow, 2000; Begon et al., 2006; Rockstrom et al., 2009). Each of these consequences in turn results in new environmental challenges (Brown, 2011). For example, local and regional decreases in biodiversity diminishes ecosystem resilience by increasing vulnerability to disease (Rockstrom et al., 2009) and reduces available habitat to maintain ecological processes (Begon et al., 2006). Although most environmental problems have these common characteristics, difference between socio-ecological systems necessitate individual solutions (Birnbaum and Mickwitz, 2009). Additionally, while most environmental changes and management usually take place at a local level, there is difficulty in maintaining an awareness of the ecological status of the region in which they exist (Marten, 2001; De Groot, 2006; Opdam et al., 2006). We thus have scale challenges both in working at a sufficiently local level to facilitate effective management, and in linking local levels into regional, national and global pictures of environmental resource availability and degradation.

1.2 Management or stewardship?

Some professionals suggest that environmental management is changing and should now be considered an aspect of environmental stewardship, de-emphasizing control and giving greater prominence to the integration of ecology, policy making, planning and social development (Barrow,

2000; Marten, 2001). Along with this shift of emphasis towards environmental stewardship, there is an increasing awareness of how social values and culture influence environmental strategy (Cash et al., 2003; Milner et al., 2006; Ostrom, 2007). If, as argued above, anthropogenic influences have caused environmental changes, and these environmental changes greatly impact on humanity, we need to understand these social values both to be able to influence these changes and to mitigate effects. Anthropogenic effects on the environment are caused by policy makers through the development of regulatory approaches; statutory agencies responsible for implementing regulation; land managers; other land users; and in some instances, individuals comprising the wider public (for example, in causing carbon emissions). Changing the behaviour of these individuals has proved complex and challenging. It is now understood that barriers such as disempowerment, infrastructural constraints and social norms limit the ability of individuals to develop more sustainable behaviour patterns (Gardner and Stern, 1996). Education certainly forms part of successful strategies to change behaviour (Myers, 2005), but awareness-raising alone has limited potential to cause behavioural change, because behaviour is influenced by values (Kasser, 2011) and facts alone are rarely sufficient to instigate behavioural change (Myers, 2002).

1.3 Challenges for stewardship

Consideration of ecosystems as dynamic and ever-changing, rather than being in equilibrium (Pullin, 2002), results in challenges for environmental management, not least arising from inadequate data in the face of increasing appreciation of system complexity (Barrow, 2000; Begon et al., 2006). It is now accepted that there are large gaps in knowledge of environmental processes, structure and function, as well as the specifics of how human societies and individuals behave and the impacts of economic issues across varied spatial scales: local, regional, and global (Opdam et al., 2002). Additionally, most management models are less than adequate because they are 'hermetic' – that is, completely separated from the complexities of human behaviour and the constraints imposed by the environment (Wilson, 1998). Furthermore, many management interventions have not been evaluated, which leaves decision-makers without the evidence on which to make evidence-based decisions (Pullin et al., 2003). Due the variety of these challenges, environmental managers typically focus on a specific area – an individual ecosystem, sector of activity or resource (Barrow, 2000). The lack of information has left much of environmental and conservation management practice accused of being based upon anecdote and myth rather than being founded on evidence or the experience of others who have successfully overcome similar problems (Sutherland et al., 2004).

Inconsistencies in aligning ecological scale to political jurisdiction significantly increase the challenges to environmental and conservation efforts (Birnbaum and Mickwitz, 2009). While some environmental areas have been left for nature to reclaim, others have been set up as specific sites of special scientific interest (SSSI), national parks, or other areas with special significance, which are given some sort of designation on which governmental policies and legislation can act. Environmental managers and scientists often use these governmental regulations as an opportunity to try to correct a problem (Jordan, 2008; Hilden, 2009). However, governmental and political actions may appear to presume or seek, environmental control, which could be considered not only arrogant, but also ineffective (Pullin, 2002). Additionally, environmental policies often attempt to restore or maintain an equilibrium and resist change (Wu and Hobbs, 2002; Begon et al., 2006), rarely accounting for nonlinear changes, threshold changes, and discontinuities which only unfold with the passing of time (Hilden, 2009).

Evidence-based frameworks (i.e., review and dissemination of efficacy of management and policy interventions) aim to increase efficacy of decision-making and are increasingly being used (Pullin and Stewart, 2006). Both public and private sectors have demanded a greater focus on evaluation of conservation and environmental interventions (Poister, 2003). Environmental evaluators struggle with addressing four main, methodological challenges: (a) differing and frequently long-time horizons; (b) disparities in scaling; (c) data quality and credibility; and (d) the problem of research designs in environmental policies and programs, given that they are formed at various levels (local, regional, state, national, continental, and global) (Birnbaum and Mickwitz, 2009). Additionally, for environmental policies, time perspectives are particularly important because policies not only evolve over incremental time, but intervention is path-dependent (Hilden, 2009). Hoffman-Reim and Wynne (2002) indicate that the greatest challenge for environmental and conservation management is to acknowledge that an extension of any timeline, either backward or forward, not only allows for conflicting and contradictory interpretation of policies, but also greatly increases uncertainties and 'outright ignorance,' which is neither acknowledged nor admitted.

1.4 Can Sustainable Development offer solutions?

Human behaviour creates environmental problems (Barrow, 2000) and, globally, human and natural systems are regarded as 'dangerously stretched' (Holling, 2000). Sustainable development (SD), as an academic discipline, acknowledges the interdependence of social justice and environmental integrity, while reconciling environmental and economic theory (Dresner, 2002). SD is a particular kind of development (Graham, 2006) which has various definitions associated with the concept, although the most popularly accepted definition comes from the Brundtland Commission, named after the chairman of The World Commission on Environment and Development: *Our*

Common Future (1987) in the United Nations (UN) report which detailed the commission's findings. Brundtland stated, *'the environment does not exist as a sphere separate from human actions, ambitions, and needs'* (Kates et al., 2005, p. 9) which led to his elusive, ideological explanation of SD: *'meeting the needs of the present without compromising the ability of future generations to meet their own needs'* (Brundtland, 1987).

As the world has embraced the SD concept, it has grown and developed rapidly. Most SD takes the view that the challenge of SD is the 'reconciliation of society's development goals with the planet's environmental limits' (Clark and Dickson, 2003, p.8059). One conceptual framework which arose out of SD became focused on three interlocking pillars: economic, social, and environmental (Figure 1.1). These pillars are usually discussed in terms of benefits – an economic, a social, or an environmental benefit arising out of a particular management strategy or opportunity. However, just because something is a benefit does not mean that it will be embraced by a population. Additionally, this model assumes that the three pillars are interchangeable, with greater economic benefit, for example, countering environmental deficits. However, earth systems do not necessarily work like this, because the planet is a finite resource (Rockstrom et al., 2009). Furthermore, if development is contemplated at an 'infinite forever' time frame, then any growth extended indefinitely is unsustainable (Parris and Kates, 2003). These weaknesses have initiated work which focuses on the concepts of weak sustainability and strong sustainability. Weak Sustainability is identified by SD models which use economic growth and production to counteract non-renewable natural resource loss, while Strong Sustainability is recognized by the understanding that 'at least a portion of natural capital' cannot be substituted by any other form of capital, it must be protected (Dietz and Neumayer, 2007). The three-pillar approach is considered Weak Sustainability, though this model is still predominant across many industries.

In 2002, at Johannesburg, South Africa, the World Summit on Sustainable Development met and reaffirmed the commitment to SD (Kates et al., 2005). In the 21st century, SD has come to focus on the 'dynamic interactions between nature and society,' considering 'how social change shapes the environment and how environmental change shapes societies' (Clark and Dickson, 2003, p. 8059). Additionally, SD indicators which include an Environmental Sustainability Index that has 68 indicators for 148 countries, has been created (Parris and Kates, 2003). Furthermore, global change research and a new scientific discipline, sustainability science, attempts to understand essential Earth processes, including human actions (Rockstrom et al., 2009). According to Clark (2007), sustainability science is centred on 'use-inspired basic research' while encompassing theorizing and 'pragmatic problem solving.' While sustainability science is interdisciplinary and it recognizes the need to engage theory with practice, it is still a science, which means it may often lack understanding of the arts and humanities.

Theoretically, and increasingly in practice, people have moved away from the three pillars, aiming for more synergy and stronger sustainability models (Jordan, 2008). One model includes the environment, a culture or world view, as well as social and economic aspects (Figure 1.2). This model is an example of strong sustainability: it suggests that economic aspects are drivers of social changes which then influence human interactions with the environment. Even with all of these developments in SD, things have continued to get worse since the Brundtland Commission and the following 1987 UN report (Jordan, 2008), and natural habitat loss and degradation has continued (Blamford et al., 2002).

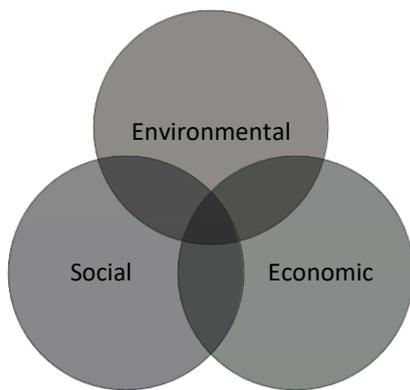


Figure 1-1 The Three Pillars of Sustainable Development (Recreated from <http://sustainabilityadvantage.com/2010/07/20/3-sustainability-models/> accessed 3 Jan 2018)

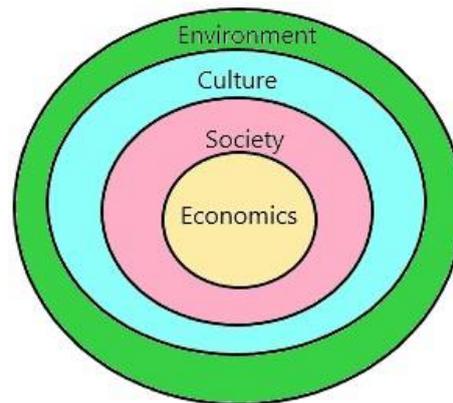


Figure 1-2 Model of Strong Sustainable Development (as described by Rehema White, Lecturer in Sustainable Development, University of St Andrews, 2010)

The question of *how* to put SD into practice, or even into policy, has been widely debated (Jordan, 2008). ‘True’ SD requires the participation of all stakeholders, while aiming to reconcile diverse values and goals toward a new ‘coordination of mutual action’ to achieve goals simultaneously (Kates et al., 2005). Sustainability governance is required to reach SD goals, if the ‘system of governance’ can be configured in ways to encourage societal dialogue, while also transforming beliefs and attitudes that actively facilitate SD (Jordan, 2008). Governance does not mean just government, but rather the influences of government plus other stakeholders. In fact, “some government policies accelerate resource destruction” (Ostrom, 2009, p. 420). While hierarchical modes of governance aim to instruct individuals on ‘how’ to achieve something, network-based models allow the participating actors, including businesses, individuals, and non-governmental organizations (NGOs), to work out ‘how’ to steer society for themselves, which provides greater coordination and success (Jordan, 2008). Cash et al. (2003) found that effectiveness suffers when communication is predominantly one-way and declines dramatically when stakeholder communities see themselves as excluded from dialogue.

These socio-ecological concerns have led researchers to investigate social-ecological systems and knowledge systems. While both social-ecological systems and knowledge systems focus on the social aspects of sustainability, they also note the extensive use of 'misguided policy efforts' to make human-environment systems sustainable over time (Ostrom, 2007). Socio-ecological systems use conceptual maps to investigate resource use and resource users (Ostrom, 2009), while knowledge systems consider mechanisms which 'facilitate communication, translation, and mediation across boundaries' and asks how to better integrate the private sector, which is both a user and a source of relevant knowledge, into SD. This integration occurs through a recasting of the interactions between scholar and practitioner, while noting that experts and decision-makers are usually "divided by different languages, usages, and histories" (Cash et al., 2003, p. 8097). These differences may include differing knowledge and moral and ethical standards, and will impact any perception and understanding of a resource, hence actions taken with regard to a resource. Research in socio-ecological systems and knowledge systems indicates some aspect of cultural cohesion amongst practitioner groups, including knowledge, histories, and moral and ethical standards, and amongst individuals who utilize a resource, while also emphasizing the value of the knowledge these individuals have regarding the natural resource (Ostrom, 2007; Ostrom, 2009; Cash et al., 2003). For example, local level harvesters, with a long-term interest in the sustainability of a particular resource or resource system, are not only more likely to invest in social norms and rules relating to timing, technology, and the quantity and quality of harvesting, but will also generate useful information regarding the resource, the resource conditions, and better strategies for harvesting (Ostrom, 2007).

Both knowledge systems and socio-ecological systems explore, to some extent, how to link knowledge to action, yet still lack an effective means for integrating less tangible aspects and decision-making. For example, values, attitudes, and behaviour are influenced by emotion (Myers, 2005). Ostrom (2007, p. 15183) suggests that the long-term goal for scholars is "recognize which combination of variables tends to lead to relatively sustainable and productive use of particular resource systems operating at specific spatial and temporal scales." But, as Cash et al. (2003, p. 8086) explains, a difficulty will be that "evaluations of scientific advice in general, and environmental assessments in particular" are only likely to be effective in influencing social responses to "the extent that the information is perceived by relevant stakeholders" to be credible, salient, and legitimate.

Although notions regarding the theory and practice of SD are evolving rapidly, one major aspect that is problematic is that the definition remains ambiguous (e.g. Redclift 2005). Practical SD objectives should be realistic and based on a workable strategy (Barrow, 2000). Yet while culture and world-view aspects of SD have been acknowledged, little research has focused on the potential

these have to enhance the SD paradigm. Although humanity has dramatically changed the environments in which they live, Wilson (1998) states that *'humans are biologically and culturally adapted to the natural environment in which we evolved'*, such that cultural values and beliefs passed down from our earliest ancestors are reinforced over time, yet maintained throughout environmental, human-induced changes relative to specific location (Matsumoto, 2000). Therefore, we, as scientists and individuals, cannot separate ourselves and our socio-cultural realities from the natural world we inhabit.

1.5 Human-Animal interactions and animal welfare

Animals may be perceived in negative and positive ways, such as both pest and icon, depending on circumstances (Bateson and Bradshaw, 2000). However, specific animals tend to evoke certain feelings, for example for many people a rat is just a pest, while a red deer stag – especially in Scotland – may evoke emotive responses, such as power, strength, or mysticism. Therefore, human interactions with animals is not simply a discussion on welfare or legislation. Campbell (1988), cited in Nelson (2008), reveals the hidden and complex world of human-wild animal interactions, stating:

'encounters with large wild animals are liminal experiences, bringing us to and sometimes over, the edge of our normal awareness or consciousness ... we have dropped out of our accustomed social structure ...we are thrown into all the hero adventure stories we have heard, where the moment stands large with potential ... time stops ... and we humans get to ask ourselves questions: 'this a battle of physical strength or wit; what kind of person is the animal; what kind of person will I prove to be ...'

This quotation suggests that everyone, from hunters to animal rights activists, is affected by interactions with animals, and this is especially true for individuals who work with these animals regularly (Zinn et al., 2008). Furthermore, as animals, specifically mammals, are thought to be the only other sentient beings on Earth, people may perceive animals to have a mental state and abilities based on their own experiences with animals and other knowledge sources that are integrated to form specific judgements and beliefs (Spence et al., 2017). Therefore, a concept of an animal mind by an individual is likely "to have wider relevance than animal welfare, ethical, or political and policy issues" (ibid).

Although interactions with wildlife are often planned activities, these encounters usually have an impact on both human and animals (Nelson, 2008). It is *how* the interactions between humans and animals take place which affects us and animals either positively or negatively. Hunting can be seen to be either positive or negative, based on personal beliefs, the perception of the

management action, and the perception of how the animals were treated. In the South African government's cull of wild elephant herds in the 1980s for "population control and the protection of habitat;" Pacelle (2011, p. 2) rationalizes "the practice was widely reviled because of the traumatic emotional effects" on the animals. If these animals had been hunted, with respect to animal welfare and stress concerns, would people have still reacted in the same way? This is a prime example of how hunting is not merely a management tool; the act of hunting remains complex, partially due to culture dependent responses in current societies, especially with respect to the welfare of the animals being culled: their humane treatment and the emotional impact (stress) on the animals being hunted. Hence, in Western societies we see a shift from the reasons for hunting for necessity (food, survival) towards either hunting as sport, hunting as management, or hunting as sport to support conservation. In addition, there is a wider social context to culling animals which includes the acceptability of the action to the general human population where the animals are located.

In terms of the legal and regulatory context in which red deer are managed, there are a number of applicable animal welfare measures. The 'Universal Declaration on Animal Welfare (UDAW; issued 2007, revised 2011), arose following animal welfare conferences in Manila (2003) and Costa Rica (2005) and is supported by the 28 EU member states, including the UK. UDAW (2007) sets out 'Five Freedoms' for animals, which are the same as those adopted by the UK RSPCA (RSPCA, 2013), which are: freedom from hunger, thirst, and malnutrition; freedom from fear and distress; freedom from physical and thermal discomfort; freedom from pain, injury, and disease; and freedom to express normal patterns of behaviour. Within the principles of the declaration, there is acknowledgement that "while there are social, economic, and cultural differences between societies, each should care for and treat animals in a humane and sustainable manner" and that appropriate standards of welfare should be developed or elaborated for, but not limited to, "farm animals, companion animals, animals in scientific research, draught animals, wildlife animals, and animals in recreation" (UDAW, 2007). The UDAW, through its wording appears to primarily focus on human behaviour regarding animals under the control of human care. While many wildlife species, such as red deer, are not under human-care in the same way that domestic species are, and many of the five freedoms cannot be ensured for wildlife species within their natural environment, (for example, predators will cause stress on prey, but it is a naturally occurring phenomenon as is hunger and thirst for wild species), many species, including red deer, are managed to some degree by humanity. Within this management action, there is the potential for the principles of the UDAW to be integrated, such as acknowledging and minimizing possible stress on the animals being managed.

The earliest relevant UK legislation was the Martins Act (1822) the objectives of which included prevention of cruelty and suffering; promoting animal and public health; protecting and

conserving some wildlife; and promoting responsibility. This act reflected the culture of moral consciousness in the 19th century (Buillet, 2005). Nevertheless, the most relevant legislation still in force is the Protection of Animals Act (1911) and the Protection of Animals (Scotland) Act (1912). More recently, the Wild Mammals (Protection) Act (1996) and Protection of Wild Mammals (Scotland) Act (2002) both should provide stronger legislative protection. However, these Acts require proof of intention to harm, and furthermore they explicitly exclude red deer. There are a number of other acts that extend protection for wild species (for example, Nature Conservation (Scotland) Act (2004) and Conservation of Seals (Scotland) Order (2002)) but while these are concerned with protection of wild species, they do not necessarily include animal welfare, beyond the explicit requirement to prevent suffering. In recent years, older acts have been revised, so that the most relevant now is the Animal Health and Welfare (Scotland) Act (2006) but Harrop (1997) noted that wildlife has no legislative welfare protection, and this remains the case to date. So how is animal welfare to be ensured for wildlife species during management operations?

1.6 Landscapes

A nation's cultural history can provide clues with which to understand current values held by its society because human histories are played out in-conjunction with complex environmental histories (Berkes, 1999; Haviland et al., 2007). While political context influences landownership, the history, myths, legends, and landscapes create and inform culture (Boyd and Richerson, 1992; Newton, 2000; Haviland et al., 2007), which then, the culture acts on the landscapes through attitudes, beliefs, perceptions, and therefore, management action. The Scottish context is distinctive in numerous ways – in landscape, climate, history, culture, law, education, and politics (Warren, 2002). Scotland's intriguing cultural heritage is rich and ancient, stretching back across nine millennia or more (McCrone, 1998) and is closely tied with its landscape and its wildlife species, including red deer.

Scotland's landscape is unique and complex, with geological striations in its rocks and soil recording world-changing events and having been shaped and chiselled by recent ice ages, but ultimately it was transformed by its human population (Ritchie and Ritchie, 1997; Walker and Lowe, 1997). The rising seas led to the British Isles being truly isolated no later than 7,800 years ago and possibly as early as 10,500 years ago (Yalden, 1999). The Scottish landscape has played a key role in Scottish history and for Scottish wildlife, including red deer, since the land itself influences many aspects of society, which then acts upon, and manages, the landscape and the wildlife. For most of Scottish history, the people of Scotland have been closely associated with the landscape and the cultural value of the Scottish landscape remains today, being of cultural importance and having designations of unique cultural, habitat, or species value.

1.6.1 Site Designations

The Scottish landscape in the 21st century is a result of historical changes and influences from over 2,000 years of human habitation. For example, the loss of the human population in the highlands during the 18th and 19th centuries due to famine and removal (Fry, 2005) and the creation of gaming estates (MacLeod, 1997) has led to the highlands being sparsely populated and in the lowlands, the effects of the Enlightenment Era (later 18th century) are still in existence.

The Scottish landscape, in its various forms, has cultural importance for the Scottish people. In addition, the many habitats have scientific value for Scotland and much of Europe, as well as the species that live within them. The result of the landscape having cultural, habitat and species, and scientific value are site designations.

Designated sites arise out of the distinct character of the Scottish landscape. A book by Scottish Natural Heritage (SNH) (1995) entitled, *Heaths and Moorland: Cultural Landscapes*, and publications: Scottish Office (1996) entitled, *Natural Heritage Designations Review* and SNH (2002) *Natural Heritage Zones: A National Assessment of Scotland's Landscapes* (<http://www.snh.org.uk/futures/Data/pdfdocs/LANDSCAPES.pdf> (accessed 16 August 2017) and includes maps of the various landscapes discussed below), are invaluable to understanding Scotland's unique landscape characteristics and their value in the 21st century. The following discussion on landscapes and designations are a summary of these publications. Scotland's landscape, in the simplest classification, is made up of coastal, highland, island, lowland, and upland areas, as well as a combination of these which all require individual management. The landscape of Scotland is continually changing. It includes variations that change from urbanized townships to wild, rugged mountains, open coastlines as well as landlocked lochs, and also glens with dramatic mountains, and sweeping moorland contrasting with rolling uplands, all on a relatively small landmass. The northern landscapes of the highlands are usually viewed as being relatively natural (Robbins and Fraser, 2003), and where the majority of red deer are found. Mountains offer a sense of grandeur, with breath-taking panoramas which create an intimate and mystical landscape. Meanwhile, the lowlands are dominated by farms and farmland (SNH, 2002). The open landscapes and fertile soils tend to show the greatest seasonal changes of all of Scotland's landscapes. Finally, all coastlines are greatly shaped by the seas. The exposure to harsh weather shapes vegetation, while physical characteristics illustrate the strength of mother-nature in shaping this landscape.

Scotland's landscape is physically diverse, comprised of landscape types with distinct features created by geological and meteorological variations, but it is also full of cultural and natural

heritage landscapes which have been created by the many people which have inhabited Scotland throughout its history, which has resulted in a unique landscape. Interestingly, the Scottish Natural Heritage report (2002) not only identifies the importance of culture on the landscape but also identifies cultural effects, which include: built heritage, rural character, field patterns and designed landscapes, cultural monuments, and transitional landscapes. The Scottish Natural Heritage publication explains these cultural effects in detail. Built heritage sites focus on the larger cities, which are usually located on estuaries where valuable trading links provided Scotland both incoming monetary wealth and cultural influences. Rural character is identified by the lack of large settlements and stone dykes which mark field boundaries. These are often farms or villages which are located on spring lines or at river crossings. Field patterns were laid during the agricultural revolution and were set across the fertile lowlands. Designed landscapes are usually associated with castles and large houses or hunting lodges, which are prominent in the open landscapes of farmland or uplands. The untamed, wild, often romanticised landscape of the Highlands became highly valuable in the 19th century (Magnusson, 2000; Fry, 2005; Devine, 2006). This Scottish landscape provokes emotional responses and aesthetic reactions, which are ingrained in Scottish culture and continually influences the appreciation and understanding of landscape by the Scottish public (SNH, 2002). The 2002 Scottish Natural Heritage report further explains that cultural monuments may refer to the castles or great houses with planned grounds, or it may manifest itself where ancient monuments appear to majestically ascend above the landscape. Natural landmarks such as volcano remnants, hills, and high waterfalls, which may be emphasized by monuments or structures, are also a part of this cultural landscape. Finally, transitional landscapes are located between major landscape types, such as where the land meets the sea and where mountains meet lowlands (SNH, 2002). These landscapes tend to be not only complex, as they have elements of all surrounding landscapes, but they are also fragile and liable to change.

Regional landscape characteristic reports indicate there are significant, special landscape characteristics across Scotland, each of which requires individual management aims. These special features include: openness, intervisibility, naturalness, natural processes, remoteness, and infrastructure. Openness refers to exposed coastlines, inland water, and the natural rockiness of the mountains. Intervisibility areas emphasize a range of colours and tones through layered compositions which embody distance. It is often associated with the transitional landscapes of coasts and islands. Perceived naturalness corresponds to remoteness and wildness, which is emphasized by the roughness of many northern landscapes. Natural processes refer to the areas where water is still shaping the physical characteristics of the surrounding landscape. Scotland's water can be calm and reflective, winding, tumbling and wild or occasionally breaking its banks.

Inaccessible areas and Scotland's rugged topography accentuates distance and characterises remoteness.

The infrastructure of Scotland is uniquely associated with the topographical landscape. Roads along narrow passes reinforce the visibility of Scotland's natural landscapes. There are many effects which may change these landscapes. Human affects are most obvious and include changes in land-use and expanding human populations. Land-use changes include: mechanization, new technologies: communication and renewables, mixed-farming, crofting, recreational facilities, creation of upland tracts, and the planting of forests (Robbins and Fraser, 2003). All of these human interests need to be balanced with the precious natural environment. Scenic areas within the Scottish landscape are especially beneficial as they contribute to the quality of life for the public through their aesthetic context, they draw tourism from local and international people, they draw investment into the local area, and they are often recreational assets (SNH, 2002).

All of these landscape changes and perceptions of value have resulted in site designations, which aim to protect valuable habitats and natural features (SNH, 2003; Macually Institute website, 2011). Land-use within these areas is greatly influenced and impacted by nature conservation legislation. National Scenic Areas (NSAs) are just one designation which can be found in Scotland. Other designations include: Sites of Special Scientific Interest (SSSIs), National Parks, National Nature Reserve (NNR), Special Area of Conservation (SAC), and Special Protection Area (SPA). Some of these designations are created by the Scottish or UK government, while others are through European directives. Additionally, there are local nature reserves and joint-working programmes in which several government agencies work together to attain a common goal, or to enhance these designated sites.

The Joint Nature Conservation Committee (JNCC) as well as Scottish Natural Heritage (SNH) provide in-depth resources regarding the site designations occurring throughout Scotland. SNH provides a guidance publication regarding designated sites and maps which is available on their website. Table 1.1 provides a list of the principle designations (Macually Institute website, 2011). In 1996, the Scottish Office indicated that over 12% of the landscape in Scotland had nature conservation designations and almost 13% had landscape conservation designations. Each of these designations may impact or influence the management of the landscape, and all of the flora and fauna species located on them in various ways, including red deer. Nature conservation designations focus on the flora and fauna species and do not include the visual landscape as part of their remit. Landscape conservation designations do include the visual landscape as part of their remit, and include things like Areas of Outstanding Natural Beauty (AONB) and regional and country parks. Natural heritage conservation sites also include the visual landscape as part of their remit. However,

these sites often extend across a wide range of both nature conservation and landscape interests, which may include cultural aspects such as structures or gardens. International designations arise from European legislation. They are usually used to designate natural habitats occurring in natural regions or for preservation of European flora and fauna. These sites may be used for long-term scientific studies, including environmental change or species diversity. World heritage designations are awarded to areas of outstanding natural habitats or superior natural features and these sites often have 'exceptional natural or cultural value.' The European Diploma sites are awarded based upon superior protection and management of area which include recreational or social attributes. Many parts of the Scottish landscape hold more than one designation and all sites are evaluated and monitored for site condition. Priority sites, on which governmental organizations will focus attention and financial resources, are usually in substandard condition, but are believed to have potential to successfully achieve favourable status. Many of these sites have red deer herds that need to be managed so that favourable status may be achieved.

According to the Macaulay Institute website (2011), there are other, non-statutory designations as well. The list includes: Special Landscape; Special Landscape Area; Area of Landscape Value/Merit/Significance; Great/Particular Landscape Value; Outstanding Landscape Area/Quality; Local Landscape Area; High Landscape Value; Historic Landscape; Landscape Conservation Area; Landscape Protection/Merit/Feature/Significance. These designations are created only at the local level and will vary between individual councils. Red deer may live in any of these areas, such that red deer management of some sort will be required.

Table 1 Primary Landscape Designations

<i>Nature conservation</i>	
○	National Nature Reserves (NNR)
○	Local Nature Reserves (LNR)
○	Sites of Special Scientific Interest (SSSI)
○	Special Protection Areas (SPA)
○	Special Areas of Conservation (SAC)
<i>Landscape conservation</i>	
○	Areas of Outstanding Natural Beauty (AONB)
○	Heritage Coasts
○	National Scenic Areas (NSA) (Scotland only)
○	Regional and Country Parks (Scotland only)
<i>Natural heritage conservation</i>	
○	National Parks
○	Environmentally Sensitive Areas (ESA)
○	Natural Heritage Areas (NHA) (Scotland only, none designated at this time)
<i>International Designations</i>	
○	Biosphere Reserves
○	Biogenetic Reserves
○	World Heritage Sites
○	Council of European Diploma Site

This discussion has been primarily based on an objective, scientific viewpoint. However, landscapes are usually much more; they tend to evoke a strong emotional response in the people who live (and interact) with them (McCrone, 1998). Though there is not room to thoroughly discuss the ethnographic nature of human identity, which would include both belonging and territorial rootedness of individuals with specific landscapes, there is substantial evidence that landscapes have special meaning relating to human identity (for example, see Ateljevic and Doome, 2002), and evoke emotions, especially when one is forced to physically leave a location, they rarely do psychologically (Basu, 2001). McCrone (1998) states, 'our visions of who we are, our identity and culture, are bound up with the land,' and embedded in these notions is 'an attachment to the land which is Scotland, such that its iconography is easily recognized and mobilized.' The clearest evidence for the meaning of the Scottish landscapes to the people of Scotland can be found in the numerous songs, tales, and pictures which arose throughout history as well as in other countries, such as the United States of America and Canada, when people left their homeland for new opportunities, either by force or due to survival (Kay, 2006). The Scottish Natural Heritage report (2002) suggests that not only do cultural impacts shape our landscape, they are so important that we want to conserve them, in order to conserve aspects of previous cultures. Interestingly, some authors have stated that when conservation agencies present specific visual and ecological order as '*the natural heritage*' of Scotland, they forget that ecosystems both arise from and reflect the social systems, or culture, which give rise to them (MacDonald, 2002; Harvey, 1996).

1.7 Red deer management in Scotland

Red deer management in Scotland comprises a mixture of legislative acts, governmental organizations, and individual practitioners, who are often associated with sporting estates.

1.7.1 Red Deer (*Cervus elaphus*) Ecology

The first deer-like animals arose around 30 million years ago, with the forbearers of red deer colonizing Europe and Asia approximately three million years ago, before spreading to North America (Clutton-Brock and McIntyre, 2007). The North American red deer (*Cervus elaphus canadensis*) are called 'wapiti' and often 'elk' by the native population, probably due to their large size, similar to the European Elk/Moose (*Alces alces*) when colonists first arrived in the Americas (ibid, 2007). Red deer are a very adaptable species and have been introduced in many other parts of the world, including New Zealand (Clutton-Brock et. al., 1982). While red deer have a large range, the primary focus of this section will focus on characteristics specific to Scotland's red deer populations.

There are few wildlife species which have a history that is intimately intertwined with humanity as the red deer (Clutton-Brock and McIntyre, 2007). Human habitation of Scotland probably resulted

from people following animal food resources, specifically game herds and notably, red deer. There is high probability that a permanent human population existed from at least 9,000 years ago (Ritchie and Ritchie, 1997). Various stone, bone, ivory, and antler tools have been found, and it was increasingly evident that these hunter-gatherers were highly dependent on the red deer, not only for sustenance but also for technological tools and hunting weapons (Magnusson, 1997; Love, 1987). At the end of the first millennium, the landscape of Scotland would have been settled for at least the past 2,000 years and the biodiversity was rich with vast woodland and scrub covering the uplands, the dominant species of trees were Scots pine and oak, and a variety of wildlife species would have existed, including: red deer, roe deer, capercaillie, red and black grouse, pine martens, wildcat; and probably beavers, wolves, wild cattle, wild pigs, and lynx and bear (Woolf, 2007). As people settled across Scotland and reduced forests and woodlands through human use, the woodland-based red deer retreated and adapted to the more remote and less hospitable areas – the slopes and heather-filled hills of the Scottish Highlands (Clutton-Brock and McIntyre, 2007). The harsh environment of the highlands results in a reduction red deer body size of between 20 – 30% of that of woodland, farmed, and European red deer for both sexes (de Nahlik, 1992).

Red deer have characteristics, life spans, and mortality which differ between the sexes. Male red deer, called 'Stags', have a life span, on average of 9-12 years (Clutton-Brock and McIntyre, 2007), and vary in weight and height, usually 14 – 18 stone (1 stone = 14 pounds; 95-115kg) and 105-125cm (42-48 inches) at the shoulder for a Scottish hill stag, where woodland or European stags average 18 – 30 stone (115-190kg) and 115-135 cm (45-54 inches) at the shoulder (de Nahlik, 1992). Although males also have higher mortality as infants, juveniles, and older stags during the harsh winter conditions as they use up their reserves due to their larger body size and higher need for food than the females (Clutton-Brock et al., 1982). Due to the harsher conditions on an open hill, Scottish deer have a smaller skeletal structure and antlers than their European or woodland counterparts (de Nahlik, 1992). Antler growth, only occurring in stags, begins in February or March, after shedding the previous year's antlers, is completed by late summer (Mitchell, et al., 1977; Clutton-Brock and McIntyre, 2007), and can be up to 5% of a male's body weight (de Nahlik, 1992). In late summer, testosterone levels increase prompting antler cleaning of the velvet, development of mane and neck muscles, and by late September stag groups have fragmented as the males migrate to their rutting grounds (Clutton-Brock, et al., 1982; Clutton-Brock and McIntyre, 2007). Female red deer, called 'hinds', are approximately 35% smaller and lighter than stags, and on average, live only a year or two longer than stags (ibid, 2007). Female size and weight also differs between hill (stands 90 cm/36 inches at the shoulder and weighs 65-90kg/10-14 stone) and woodlands (standing 105-125 cm/42-48 inches at the shoulder and weighing 80-115kg/13-18 stone) (de Nahlik, 1992). Woodland and European hinds give can conceive and give

birth at the age of two, while Scottish hill hinds more often conceive or give birth at the age of three or even four years old (ibid, 1992).

During the rut, successful stags rarely eat while holding harems of hinds, defending them from challengers day and night, through roaring, which may play a part in conception, and occasionally fighting, which can result in serious or temporary injuries (Clutton-Brock and McIntyre, 2007). Older stags have an advantage in collecting and retaining a harem as there is a 'large degree of correlation' between age, antler size, and body weight (de Nahlik, 1992). By late September hinds begin to come into oestrus, which usually lasts for 6 – 24 hours where the females may lick or mount the stag, with the majority of conceptions (over 80%) occurring in October (Clutton-Brock and McIntyre, 2007). Hinds are pregnant throughout the winter months, eventually calving in mid-May through early July after 33 weeks of gestation (ibid, 2007). The highest time of mortality where death peaks for both sexes is from late February through early April as feed is scarce and animals use the last of their stored reserves, and can be especially difficult for calves as 20-40% of calves perish (Clutton-Brock, et al., 1982; de Nahlik, 1992; Clutton-Brock and McIntyre, 2007). When females of poor condition fail to conceive or bear a calf, becoming temporarily barren after rearing a calf successfully, they are called 'yeld hinds', and this condition can affect up to 40% of females in a population depending upon food availability, deer density, and age as fecundity tends to decline after a female's 12th year (Clutton-Brock and McIntyre, 2007).

As a hind gets close to birth she will separate herself from the herd for calving (Mitchell, et al., 1977; de Nahlik, 1992). The birthweight of calves averages around 15 pounds (7kg) for stag calves, with hind calves being about one pound lighter; however, colder years can result in lighter calves and warmer springs in heavier calves of both sexes and around 1/5th of all calves will not live past the first month (Clutton-Brock and McIntyre, 2007). More dominant and larger hinds tend to produce more stag calves, however due to the cost associated with their development and early development of calves will impact the animals for life, i.e. smaller animals at birth will remain small throughout life and impact breeding success (ibid, 2007). Although calves will be on their feet within an hour of its birth, it is most often concealed within high grasses close to its mother for the first few weeks of life (de Nahlik, 1992), hiding from predators such as golden eagles (Clutton-Brock, et al., 1982; Clutton-Brock and McIntyre, 2007). Calves will suspend their growth through the winter months only to begin again in the spring; and will continue to grow until the animal is six or seven years of age for stags and five or six for hinds (ibid, 2007). Calves are born chestnut with white spots before changing as they age into a summer coat that can vary from buff/grey to a reddish-brown to a deep brown for the rest of their life, and a winter coat which is usually a grey to dirty brown (de Nahlik, 1992).

Red deer have a social structure that differs between the sexes. Stag calves may stay with the female and calving herd up to around three years of age when they will be kicked out and will then join a stag only herd (de Nahlik, 1992). Stag herds are social groups that exist only outside of the rut, in which a massive change in behaviour occurs where each stag sees another as a rival (ibid, 1992). Stags within a group are not often closely related, with some 40% travelling more than five miles away from their calving herd, and thus tend to be evenly dispersed within their group (Clutton-Brock and McIntyre, 2007). However, the hind herds have a hierarchical social system where each herd has a 'lead hind', usually an older animal, that determines feeding areas and herd movement (de Nahlik, 1992). Hinds usually stay within a 'home range' that is determined by a calving area, is often where the majority, if not all, of the hinds were born, and they are very territorial (ibid, 1992). Home ranges can vary from around a half square mile up to two square miles, and since most of the hinds are related, they will associate with their families (mothers, daughters, siblings, etc) and thus are often more closely bunched in groupings than stag herds (Clutton-Brock, et al., 1982; Clutton-Brock and McIntyre, 2007). Day to day movements are determined by feeding, shelter, and weather conditions, as well as by fly and midge activity (de Nahlik, 1992). In larger hind groups, there may be a subordinate, second 'lead hind' that guards the rear (ibid, 1992). Disputes within hind herds are decided by 'boxing' where hinds rear up on hind legs and 'box' each other with their forelegs (de Nahlik, 1992).

Traditionally, red deer are forest dwellers but they do not do well in coniferous forests, usually only accessing them for shelter (Mitchell, et al., 1977; de Nahlik, 1992). Red deer are ruminant, opportunistic feeders and are adaptable (ibid, 1992). Heathers and grasses make up about 90% of their diet, with heather almost 50% in the autumn and winter; red deer may also consume Bilberry and seaweed, as well as bones and shed antlers for calcium (Clutton-Brock and McIntyre, 2007). Red deer are highly selective feeders, consuming only a small portion of vegetation in an area, and usually consuming a proportion of coarse forage along with more nitrogen-rich, nutritious grasses (ibid, 2007). However, stags often consume more food of lower quality, which is often less digestible and coarser while hinds consume more nitrogen-rich foods, which may be due to dietary needs and available food sources on specific ground (stags use lower ground in winter and higher ground in summer than the hinds) (Clutton-Brock, et al., 1982; Clutton-Brock and McIntyre, 2007).

Red deer populations have fluctuated through recent history. At the beginning of the 19th century only six deer 'forests' (land tracks devoted to hunting) existed and had sizable populations (Clutton-Brock and McIntyre, 2007). However, with Queen Victoria's purchase of Balmoral and the increased wealth from the Industrial Revolution, interest in hunting deer became popular such that by the beginning of the 20th century over two million hectares of the Scottish landscape became deer 'forests' (ibid, 2007). Red deer numbers declined again during the World Wars, in part due to poaching,

although estimates vary regarding exact numbers (Clutton-Brock and McIntyre, 2007). After the creation of the Red Deer Commission in 1959, when closed seasons (when animals are at their most vulnerable and/or have young) for stags (21st October – 30th June) and hinds (16th February to 20th October) were created, it led to red deer populations increasing steadily with an approximated number of around 300,000 red deer living across Scotland today (ibid, 2007). Red deer populations are either controlled by man or through food availability and the carrying capacity of the habitat (Clutton-Brock, et al., 1982; Clutton-Brock and McIntyre, 2007). Large deer densities can negatively impact their environment. One main area where these deer densities can cause conflict is regarding tree regeneration through browsing, thrashing, and stripping (de Nahlik, 1992), although thrashing is a male only activity. De Nahlik (1992) explains that while the young shoots and leaves of trees are very palatable for the deer, browsing of trees is most often when other ground growth is dormant. Thrashing occurs usually twice a year, when a stag removes the velvet from his antlers and in marking territory prior to the rut; however, frustration and stress may also simulate thrashing (ibid, 1992). Stripping, i.e. removing the bark of trees to satisfy feeding requirements, also occurs primarily in harsh winters and in times of stress (de Nahlik, 1992). De Nahlik (1992) also states that deer are not the only animals to cause woodland damage. Within the red deer habitat heaving grazing that reduces or causes the disappearance of herbs and grasses and especially destruction of heather is also a major concern (Clutton-Brock and McIntyre, 2007), while outside of traditional deer territories agricultural damage may occur, mostly through trampling (Mitchell, et al., 1977; de Nahlik, 1992). Red deer and sheep have diets that overlap, i.e. shrubs and trees, such that sheep density with impact and influence red deer densities (Clutton-Brock and McIntyre, 2007). However, recent research at the Letterewe Estate suggests that because deer occupy their range more evenly than sheep, other than in areas of exceptionally high densities and wintering grounds, deer impacts on heather are more widely dispersed and show little correlation between deer occupancy and heather cover (Milner, et. al., 2002). Deer density and carrying capacity is difficult to determine and may be influence by land-use objectives. Clutton-Brock and McIntyre (2007) note the 'Hill Deer Model' which is a computer-based modelling system that was created by the Macaulay Land Use Research Institute, which includes altitude relative to plant communities to estimate carrying capacity of deer in an area. However, de Nahlik (1992) suggests that specific parameters which include characteristics of particular areas and specific deer species is needed, along with specific definitions and understandings of both density (number of deer in an area) and capacity (density figure on a given section of ground with an acceptable level of damage tolerance). De Nahlik (1992) also notes that vegetation is determined by the specific geophysical conditions of the area, including: water and soil structure, and altitude and climate, while also influenced by drainage, fertilization, plant recruitment, and sunlight. Furthermore, the specific needs of

the deer populations (nutrients, shelter, etc) can also impact vegetation within an area (de Nahlik, 1992; Milner, et. al., 2002).

Another area of concern regarding the red deer populations in Scotland is the interbreeding with Japanese Sika deer (*Cervus nippon*), which were introduced in the late 19th century and have spread throughout the country via woodlands, mostly below the central belt, but some are also found in the highlands (Clutton-Brock and McIntyre, 2007). Sika deer are similar to red deer, but the males do not grow multi-tined antlers and as a whole, the populations remain in woodland areas such that interbreeding occurs in woodlands with low densities of red deer (de Nahlik, 1992). The hybridization impacts both species including colour variations and in Ireland, there are few, if any pure deer of either species (Clutton-Brock and McIntyre, 2007).

Although red deer have a long, intertwined history with the Scottish people, it was during the Victorian Era, when hunting parties would spend days on the hill, camping and following the red deer movements. It is at this time that the idea of stalking a deer, rather than driving the deer arises. The individuals of the hunting parties, with the aid of their gamekeeper, would sneak close to the red deer before taking aim, usually within 100 – 150 yards (Milner, et. al., 2002). The stalking of red deer, with a focus to minimalizing the disturbance to the animal, would become a tradition which would continue through to present day (Waterson, 1987). Since the Victorian Era, stalking for both sexes has increased as hinds are often less costly. In addition, stalking in Scotland focuses not on trophies, as much as culling the less desirables from a herd, although there are occasional trophies taken, usually at the end of a stags breeding viability, before they begin to decline physically (ibid, 1987). Currently, around 15 million pounds per year enters the Scottish economy through venison and stalking lets, while around 65,000 red deer are culled annually (Clutton-Brock and McIntyre, 2007).

1.7.2 Legislation

1.7.2.1 Wildlife and Natural Environmental (Scotland) Bill (WANE)

In the opening years of the Scottish parliament, they aimed to ‘place sustainable development at the heart of government’ (Roberts and Jackson, 2002), but by 2001, Scotland had not produced any comprehensive strategy and no effective programmes for the government to deliver sustainability (Birley, 2001). Interestingly, the Department for the Environment, Food, and Rural Affairs (DEFRA) for the UK provides sustainable development principles, which are supposed to inform government decision-making, however they are not legally binding. These principles focus on ‘living within environmental limits’ and ‘ensuring a strong, healthy, and just society,’ which is to be achieved through a ‘sustainable economy, good governance, and sound science’ (sd.defra.gov.uk,

2011). However, these principles often fail to include integration of practitioners, and many other aspects of the Millennium Assessment (Ghosh et al., 2005).

In 2009, a SP Bill 6 Wildlife and Natural Environmental (Scotland) Bill [as introduced] Session 3 (2010) was drafted in the Scottish Parliament and sent out for consultation. This bill is relevant because it is the first legislation regarding red deer that the Scottish Parliament has drafted and passed. Interestingly, the consultation documents appeared to suggest a relaxation of the restrictions for taking and killing deer even further than in the previous legislation (The Deer (Scotland) Act 1996). Some of the recommendations included: removal of close seasons (stags: 21st October – 30th June; hinds: 16th February to 20th October), a greater allowance to drive deer (chasing deer, usually with a mechanical vehicle, such as a helicopter), and a greater increase in night shooting. Although the documents spoke of sustainable management and it mentioned welfare, the relaxations proposed seem contradictory. Neither were defined and much of the proposed legislation changes would be in direct opposition to both welfare concerns and sustainable management.

The Wildlife and Natural Environment (Scotland) Act 2011asp 6 (WANE 2011) was passed by the Scottish Parliament on the second of March, 2011. Part three of the 2011 Act specifically relates to deer and uses the 1996 Act as its foundation. The 2011 Act identifies repealed or inserted phrasing rather than the creation of a new piece of legislation, which creates an obvious obstacle for individuals trying to understand the 'new' law. The Scottish government did appear to have taken notice of the responses from the consultation as the hunting season for deer was retained. However, there are several sections of WANE 2011 which appear to be somewhat unfavourable to deer. In the 1996 Act, the deer had to be found to be causing 'serious' damage. The term 'serious' was repealed in the new legislation, which is not only evidence of relaxed regulation, but it also suggests that any individual perception of damage may result in the killing of wild deer. This appears to be a marked shift in legislation, from support of red deer as a valuable part of the natural heritage and the environment to perceiving the red deer as a pest to the natural environment.

The WANE 2011 also granted Scottish Natural Heritage (SNH) new powers and responsibilities with which to enforce deer management, even though they are already extensive including the ability to force an owner to sell land, while relaxing the responsibility of the organization to provide justification for their management decisions. Of note, the part of the 1996 Act, sch 2 (13), which protected the DCS (Deer Commission for Scotland) from any judicial prosecution for their actions was retained and now applies to SNH. Meanwhile, the 2011 Act places new burdens on the majority of deer management practitioners in the form of a legislatively dictated competence register and the submission of cull returns. The majority of traditional estates, who stalk red deer, already submit

their cull returns to their Deer Management Group (DMG), which can also act to ensure competence through the evaluation and judgement of peers, which has been shown to be a stronger influence (Cash et al., 2003; Ostrom, 2007). Additionally, most estate practitioners have extensive experience, participate in continual professional development, and are members of the Scottish Gamekeepers Association, which offers training and evaluation of abilities along with peers which support enhancing one's competence.

The Scottish government had the potential to create forward-thinking, positive legislation which comprised sustainable environmental, animal welfare, natural heritage, and public interests with their new WANE 2011. Unfortunately, the passed legislation falls far short of this, in part because there was no integration of DEFRA's SD principles – or any from the Scottish Government itself, nor any aspect of the Millennium Assessment. In 2002, Jack McConnell, the then First Minister, stated 'too often new policies are constructed and the consideration of their contribution towards a sustainable future is tacked on at the end' (SEIS, 2002). This new bill seems to continue this tradition, especially since it is merely an edited version of the 1996 Act. While the passed WANE 2011 does not extensively cover detailed management practices of red deer, developing policy, including *Scotland's Wild Deer, A National Approach* and a Code of Practice attempts to cover these areas more thoroughly.

1.7.3 “Scotland's Wild Deer – a National Approach”

'*Scotland's Wild Deer – a National Approach*' is a quinquennial review of the Scottish Natural Heritage (SNH) strategy for all deer management within Scotland. Last updated in 2014, its aim is to describe a strategy that will '*Manage wild deer to achieve the best combination of benefits for the economy, environment, people and communities for now and for future generations*' (WDNA, 2014). The 2014 strategy is based on the first, 2008, publication, in which Michael Russell, MSP, states that the new approach 'sets out ways to make the most' of the deer asset by 'managing deer for the benefit of the nation' as well as 'ensuring that deer welfare is safeguarded.' He also indicated that this approach is a 'vision of sustainable deer management.' Within the vision statement, however, the consideration of the animals is related solely in terms of (largely unidentified) human interests. Furthermore, the government maintains a top-down directorate tone, only included other organizations into its creation, and there is little mention of animal welfare, which is abstract when mentioned. The remainder of the publication hints at a few practical management ideas, but primarily focuses on abstract goals. It does not communicate an effective idea for future (sustainable) management of wild deer in Scotland. Furthermore, there is little mention of maintaining the valuable, cultural stalking activities which have made Scotland's deer management internationally recognized. This strategy was developed by a steering group, consisting of: the Deer Commission for

Scotland (DCS), Forestry Commission for Scotland (FC), Scottish Natural Heritage (SNH), and the Rural Directorate of the Scottish government, as well as an advisory group, consisting of organizational representatives. While this steering group may be typical for such strategies, given the tensions and known conflicts in deer management, and although a consultation phase was held, it is probable that a longer term and more participatory approach could have not only led to a better outcome, but also have improved relationships amongst stakeholders and enhanced acceptance of the outcome as has been found in other participatory contexts (e.g. Blackstock et al., 2007).

One last note of significance is the language used in the national approach regarding the deer species. The first draft of the document stated that all deer are iconic species for Scotland, going on to suggest that the red deer in particular are thought of in an iconic manner. The 2014 update acknowledges, in a single sentence, that red and roe are '*commonly regarded as "iconic" animals*', apparently downplaying the animals' cultural status. The Scottish public's cultural relationship with each species of deer is unique and varied – one species cannot be substituted for the whole or vice versa. While some researchers suggest that the nation's fascination with red deer is based on 19th century rhetoric and political manipulations of culture, nationhood, popular memory, and localized history (Lorimer, 2000), others have suggested that red deer are iconic not just for the Scottish (Burns and Westbrook, 2000). The millions of tourists, who come to see these animals, bringing welcome tourism income to Scotland, and the growing industry of wildlife watching supports the view that red deer in Scotland are not only a valuable commodity to the Scottish, but are important to the numerous visitors who take pleasure in their existence (MacMillan and Phillip, 2008; Stewart, 2006). Regardless of what academics or scientists believe, national identities are constructed out of popular ideas about history, landscape, animals, and perceptions of the collective 'us' (Ateljevic and Doome, 2002) which often achieve mythic status (Smout, 1994) and are reinforced over time. In fact, several recent studies have clearly indicated that the iconic species of deer for The Scottish, and tourist visitors alike, continues to be, specifically, the red deer (Stewart, 2006). This misrepresentation opens many doors for conflict because the value of the resource to the people is not clearly understood or acknowledged by the government or its organizations. Additionally, this document, like the legislation, does not appear to acknowledge that the situations, such as habitat, populations, and breeding, of the various deer species differ considerably amongst them and probably should be managed individually, and specifically as the issues arise. The overly obscure nature of the document suggests that much more work will be needed in order to find a pathway forward to sustainable wild deer management.

1.7.4 Code of Practice

In May of 2011, a Draft Code of Practice on Deer Management, led by Scottish Natural Heritage (SNH), was sent out for consultation. As stated in the consultation letter, the code, which was introduced by the Wildlife and Natural Environment (Scotland) Bill (WANE), 2011, sets out recommended practice for sustainable deer management. The consultation states that the purpose of the Code of Practice is to support managers and the desired outcome is sustainable management of wild deer. The code is divided into two categories: delivering good practice and SNH regulatory action, which is then discussed in seven chapters. Remarkably, in the introduction of the code consultation, there is no mention of animal welfare. The authors simply state that, 'managing deer sustainably involves maximising the benefits of deer and deer management and minimising any damage they may cause.' Consequentially, deer management is portrayed as being dictated through a top-down approach. In chapter two of the code out for consultation, the guiding principles include using sound science and the best available evidence as well as promoting deer welfare. However, if the deer management is dictated from SNH to practitioners, who often have the best available evidence because of their intimate relationship with the animals, then how are SNH going to gain access to and then integrate this insight into their decision-making? Also, any mention of deer welfare continually appears at the end of each section, almost as if it were an afterthought. If other priorities, such as short timescales are fundamental principles of management then deer welfare will be compromised to some extent and there is no indication as to how deer welfare will be ensured under these circumstances. Chapter three of the document, sustainable deer management, provides an interesting look into government thinking. There are actions which contradict each other, such as reducing deer for environmental objectives, while maintaining them for the aesthetics they provide to the public. There is no guidance on how to manage these conflicting actions, nor any indication which should take precedence, if any. Chapter four discusses deer management planning and focuses on collaborative management, which is the established goal of Deer Management Groups (DMGs). However, there is no suggestion in how to overcome conflicts between land management objectives among diverse groups of practitioners or when there are opposing management actions on-going, nor does it suggest management action should be suspended if there are deer welfare concerns until agreements can be reached.

What arises out of the chapter six is that while Scottish Natural Heritage (SNH) has such massive regulatory powers, there is no mention of how practitioners are going to be ensured that SNH will cooperate with them or if they will be held accountable for their actions. Chapter six, states that public bodies must have regard to the code when they carry out any functions relating to the code. However, the legislation does not allow for these bodies to be held accountable by judicial means, so how is this to be ensured? Finally, chapter seven lays out semi-realistic scenarios, while indicating that the individuals who put the code together have thought extensively on what are

appropriate steps to take, should they occur. As any conflicting management scenario is unique, more detailed steps are improbable to assume. One note of interest on the Code of Practice consultation is that there is a concentration of 'public interest' in the document and how deer management must take public interest into account. However, there is no indication as to what public interest is (Campbell and Marshall, 2000; Fan, 2005), nor is there any indication that the Scottish public have actually been asked what they want to see from deer management. It is remarkable that so much attention is placed onto something which is not identified or defined. Overall, the Code of Practice consultation document appears to try to put specific objectives of wild deer management on paper. However, it is not really clear how this document will affect deer management across Scotland. In many ways, it looks simply like a more user-friendly repetition of the Scottish Parliament's environmental bill. The Code of Practice went into effect on 01 January 2012 and may also be called 'The Deer Code' (SNH: <https://www.nature.scot/professional-advice/land-sea-management/managing-wildlife/managing-deer/code-practice-deer>, 2016). Within the adopted code, there is much more inclusion of animal welfare, including a definition found on page 10 (ibid, 2016). However, there is nothing in the code to ensure basic animal welfare standards are practiced.

One final note regarding both the current legislation and the code of practice document is that neither one seems to acknowledge that the situations of each deer species is unique, such as red deer primarily occupying the open hill, while roe deer are found most often in forests. Each of these situations creates its own set of circumstances and challenges, as unique as the species themselves and probably should be managed in a way which accounts for the specific situation, rather than a blanket approach for all species.

1.7.5 Best Practice Guidelines

The Best Practice Guidelines were created through collaboration between Deer Commission of Scotland (DCS) and other red deer management practitioners and are a key contribution of DCS to deer management. The guides arose out of a need for clarity on the Deer (Scotland) Act, and they will be revised in light of new research or changes to policy or legislation (DCS, 2013). The initial inception of Best Practice Guides occurred in the early years of the 21st century. The latest edition, for the purposes of this thesis, consists of 74 guidelines, which were published in July 2008.

The Best Practice Guides cover many areas relating to wild deer management. The broad categories include: deer ecology, health and welfare, planning, firearms, culling, carcass preparation, impacts, crop and habitat protection, people and resources, DCS guides, and a reference section. Deer ecology includes information specifically relating to the individual species of wild deer. Health and welfare guides include: deer health, diseases, as well as a primary focus on deer welfare:

definition, culling, and use of helicopters. Planning refers to the counting, identification, culling, and planning procedures within deer management. Firearms includes: safety, maintenance, rifles and ammunition, marksmanship, firing position, and transport and storage of firearms. The best practice guides on culling are rather extensive. They cover shot placement, humane dispatch, team culling, extraction methods, helicopter support, and use of dogs in culling. The carcass guides explain the best practice on all aspects of carcass preparation including: gralloching, larding, butchering, hygiene, venison, and trophy preparations. The impact guides specifically relate to deer impacts on various habitats and also discusses habitat analysis. Crop and habitat protection guides include management tools that may assist in habitat protection. People and resources cover risk assessment, health and safety, Lyme disease, clients, stalking, and DMGs. DCS guides include definitions, site designations, deer impacts, legislative procedures, records, and alternative culling practices: night shooting, driving deer, and compensatory culls. The reference section includes a guide on butchering, anatomy, as well as forms.

These Best Practice Guides represent much of the basic foundations of red deer management in Scotland. They were intended to be the ‘benchmark against which all activities are measured’ (DCS, 2008). The strong emphasis on animal welfare along with the extensive section on culling indicates that these are the primary drivers for practitioners of (red) deer management in Scotland. Also, Best Practice demonstration events are arranged throughout Scotland. They are an opportunity for both practitioners and the general public to further their understanding and skills of deer management. These events are often used as an education tool and are usually a collaboration between DCS and individual traditional estates who both have an interest in promoting responsible, welfare conscious deer management. However, these best practice guidelines are not legislation and are not therefore, enforceable by law, which means that while there is welfare guidelines in existence for culling deer there is no assurance that the guidelines are followed or adhered to.

1.8 Practitioners of deer management

Practitioners of red deer management in Scotland are a combination of governmental organizations, Non-Governmental Organizations (NGOs), charities, community-owned groups, and individual practitioners. All of these have been subject first to the Red Deer Commission (RDC), then Deer Commission for Scotland (DCS), and since 2010 to Scottish Natural Heritage (SNH), as these have been the governmental organizations formed from legislation tasked with the responsible management of these animals. Interestingly, each organization appears to have its own set of management criteria and objectives regarding red deer, while individual or estate-based practitioners appear to have more of a cohesive management approach. Because of the numerous groups involved in red deer management, only a few of these groups will be discussed.

1.8.1 Organizations and Red Deer Management

Governmental organizations are instrumental to implementing policy and affect management of all natural resources. Within Scotland there are two main organizations affecting red deer and their management, Scottish Natural Heritage (SNH) and Deer Commission for Scotland (DCS), although DCS is now absorbed within SNH. In addition to these, other peripheral organizations, non-governmental organizations (NGOs), and community- owned locations affect red deer management, or carry out management practices: Royal Society for the Protection of Birds (RSPB), Scottish Wildlife Trust (SWT), John Muir Trust, National Trust for Scotland (NTS), Forestry Commission (FC), and others. SNH and DCS have regulatory powers, and will be discussed in detail. In this section, we will review the organizations and how they affect or manage red deer in Scotland. Although DCS was incorporated into SNH in June 2010, they were separate for much of this project, so will be discussed separately along with the integration. The government has indicated that the merger is part of a shift in focus, within government and governmental bodies, from red deer management to ecosystem management, such that species and habitat action plans are to be converted to ecosystem action plans.

1.8.1.1 Other Stakeholders

These other organizational stakeholders tend to manage wildlife and red deer specifically, on a more local level, on land that they own or manage. However, many do not have any clearly defined, specific management plans, aims, or goals which are readily available to the public on their websites. Though most of these do perform some sort of management on red deer, the focus will be on the National Trust for Scotland (NTS) as an example.

The National Trust for Scotland (NTS), founded in 1931, is an independent charity with ‘the aim of conserving, managing and promoting Scotland’s cultural and natural heritage.’ It owns or manages many properties within Scotland. However, no clear plan or mission statement exists regarding red deer and their management. Since no clear plan exists, one must review available documentation to generate some sort of perspective. NTS’s associate charity, The National Trust, for England, Wales, and Northern Ireland (NT), does have a clearly developed plan, which is available to the public, via their website (<https://www.nationaltrust.org.uk/>; 2011), last published September 2000, within which they provide guidelines in the management of wild deer (<https://www.nationaltrust.org.uk/features/deer>; 2012). In determining the need for management, within the document, supportive reasoning includes: (a) the lack of carnivores, which helped to regulate deer populations, having been hunted to extinction, which has prompted the need for humans to take over this aspect of regulation, (b) changes in land use has ‘provided extensive and

often favourable habitat for deer,’ and (c) ‘increasing numbers and spread of deer ... result in environmental or commercial damage.’ The NT then lists three objectives regarding management: (1) ‘to protect valued wild plant communities,’ (2) ‘to contain damage to commercial crops and to ornamental produce,’ and (3) ‘to reduce the incidence of road traffic accidents involving deer.’ The NT additionally states that they will aim to: ‘carry out all operations in a safe and humane manner’ including ‘... the clean dispatch of deer to be culled ...’ and ‘to cooperate with neighbours in the preparation of management programmes.’ Following this is a list of management options: ‘habitat management; protection of vulnerable areas or plants by use of fencing or guards; use of reflectors or other deterrents to reduce road casualties; and culling.’ The NT then states that ‘A combination of these usually provides the most effective strategy.’ This document also states that before culling is implemented the NT intends to assess: ‘the extent of damage directly attributable to deer,’ and ‘a current estimate of changes within deer population in terms of numbers and gender.’ Furthermore, the NT emphasizes that ‘it is vital that the Trust is open in presenting its case for essential management.’ Based on the above, and the close ties of the NT, one would expect similar ideology regarding deer management. However, if a management plan similar to this exists, it is very difficult to find.

The above provides insight into the National Trust for Scotland (NTS) charity, however removed from its associates. To gain clarity on NTS and its management policies, consider the following three differing NTS properties (<https://www.nts.org.uk/Buildings/Properties/>; 2011). First, Culzean Castle, a 600-acre estate in South Ayrshire, at which there is an ‘adopt a deer for a year’ programme, in support of the Deer Park and Country Park at the castle. The programme allows the public to support a deer for a year, with funds going to feeding and veterinary care. In a pamphlet for Goatfell, which is located on the Isle of Arran, overlooking the Firth of Clyde, it states, ‘Red deer are a common sight ... the absence of natural predators means that numbers may increase to a level that damages the health of the deer and the habitat in which they live ...’ The pamphlet also claims that deer and sheep are to blame for the lack of trees on the island, stating that NTS ‘has protected some sparsely wooded burns with deer fence.’ Finally, Mar Lodge, which is a 70,000-acre estate located outside of Braemar, brought into NTS management in 1995. Within the boundaries of Mar Lodge, exists some of the ancient Caledonian pine forest. This ancient forest is of considerable concern for conservation, and many factors influence its successful maintenance. As the forest exists within red deer territory, one would expect a great deal of documentation regarding both the forest and the red deer. On the website for Mar Lodge (<https://www.nts.org.uk/Visit/Mar-Lodge-Estate/>; 2011), under the management tab, it begins: ‘the future of Mar Lodge Estate represents a great challenge: an attempt to develop a new and responsible form of Highland estate management by working in harmony with nature. In general, management will be based on minimum intervention ...’ Red deer

are covered only briefly: 'following the reduction in deer numbers regeneration should occur naturally where native trees still remain ... through effective management of the deer population, the use of deer fences, so evident on many other woodland regeneration schemes, will be unnecessary ...deer form an important part of any woodland fauna, and their exclusion is as unnatural as over grazing.'

Although Mar Lodge is located in the heart of the highlands, a well-established and accepted area for red deer, the published National Trust for Scotland (NTS) management plan for Mar Lodge, 2001-2006 only dedicates one page to the management of any deer. Additional details of NTS red deer management at Mar Lodge arose out of media venues towards the end of 2009. *The Sunday Times* revealed that between 1995 and 2009, NTS culled approximately 800 red deer per year at a cost of over £750,000 (Macaskill, 2009). However, this extensive culling and large costs has produced 'virtually no new trees' within the Caledonian Pine forest (ibid, 2009). Other sources revealed that NTS has also received almost £3 million pounds of funding from Scottish Natural Heritage (SNH) for projects at Mar Lodge (Hogg, 2009). Several media sources discuss the claims that NTS has been continuously advised to use deer fences, though NTS has completely disregarded the suggestions (Masson, 2009; Hogg, 2011; Scotsman, 2011). In fact, in a paper by Watson (1983), pine regeneration in the area has only occurred with the use of fences for well over a hundred years. It has not been made clear why deer fencing is acceptable at some locations, but was disregarded as a management tool at Mar Lodge. Additionally, the head stalker at Mar Lodge, informed *The Sunday Times* that in addition to daytime stalking, the deer were killed at night using spotlights, such that there was never any reprieve for the deer (Macaskill, 2009). Thus, the deer at Mar Lodge were being hunted year-round (including throughout the normal closed seasons) and both day and night for many years. While no research was undertaken to investigate the specific welfare implications of this, the closed seasons were created to protect deer during their most vulnerable times and night shooting is usually restricted for similar reasons. It was in 2009 that the Deer Commission for Scotland (DCS) decided to investigate. This is interesting in itself since DCS, at the time, was the regulatory body for deer management, who must issue the 'rights' for any and all night shooting activities. Therefore, they should be fully aware of the attack on red deer which has been not only continual, but sustained at Mar Lodge. At the end of March 2011, NTS launched an independent review of their management of Mar Lodge Estate. Additionally, *The Scotsman* newspaper has reported that NTS is now facing a fine from SNH because they have failed to achieve targets (Scotsman, 2011). The Mar Lodge Independent Management Review found that the 'National Trust for Scotland has neither the management skills nor expertise to manage the Mar Lodge Estate' (http://www.nts.org.uk/site/docs/news/marlodgefinal_complete_18-11-11.pdf; 2017). In addition, the review made eight recommendations, the majority of which were accepted immediately, with

the remainder accepted shortly thereafter. Since the recommendations were accepted, noticeable regeneration has occurred (http://www.nts.org.uk/site/docs/news/marlodgefinal_complete_18-11-11.pdf; 2017).

National Trust for Scotland (NTS) is a good example of a stakeholder that represents differing priorities regarding red deer management within the organizations itself, which can be complicated by location, available funding, and disorganization within one body. Further, it raises many questions regarding red deer management in Scotland, questions which relate to both the validity and quality of regulations and of both responsibility and accountability of the regulating bodies.

1.8.1.2 Scottish Natural Heritage (SNH)

Scottish Natural Heritage (SNH) is a large organization covering a wide range of interests across Scotland. They own land, manage forest regeneration schemes, and monitor the natural heritage of Scotland. Scottish Natural Heritage (SNH), as an organization, heavily impacts red deer management in Scotland. In the past, through research associations, SNH has contributed to the expanding breadth of knowledge currently available on these animals. Initially, a brief discussion of SNH's land holdings and some contributions will be acknowledged before discussing the published guidelines concerning the Deer (Scotland) Act 1996, and finally SNH's specific impacts on red deer management.

Scottish Natural Heritage (SNH) initially began its inception as the Nature Conservancy. The founding legislation for what is known as SNH today was in the Natural Heritage (Scotland) Act 1991. This act aimed to provide Scotland with an organization which would conserve resources as well as promote sustainable uses – the first time the word 'sustainable' entered into United Kingdom (UK) legislation. The 1991 Act, defined SNH's general aims and purpose as:

'to secure the conservation and enhancement of, and to foster understanding and facilitate the enjoyment of, the natural heritage of Scotland; and ... (to) have regard to the desirability of securing that anything done, whether by SNH or any other person, in relations to the natural heritage of Scotland, is undertaken in a manner which is sustainable.'

The act also defines 'natural heritage' as:

'the flora and fauna of Scotland, its geological and physiographical features, its natural beauty and amenity.'

Further explanation of natural heritage is provided by SNH in its publication, 'Sustainable Development and the Natural Heritage.' It explains natural heritage in terms of use:

- *‘natural heritage includes the natural resources that provide us with our fundamental life-support systems – clean air, clean water, the food we eat, and genetic material ...’*
- *‘Many livelihoods depend on the natural heritage – the cultivation and harvesting of crops, livestock, timber and fisheries, and the raw materials for industry ...’*

Interestingly, Scottish Natural Heritage (SNH), itself, acknowledged that landscapes change ‘both naturally and in response to changing patterns of human use.’ This particular publication then lists and explains the ‘guidelines’ for sustainable development as it relates to the natural heritage. These are: sustainable use, carrying capacity, environmental quality, use of the precautionary principle, and consideration of shared benefits. However, a few of the statements appear to be both contradictory and confusing, especially when used for practical implementation, such as long-term changes are difficult to predict and chance events are a fact of life, but action can be taken to prevent outcomes that are not known. Furthermore, it states that all parties should be sensitive to each other’s needs, yet the 1991 Act allows SNH to either force management action or acquire ownership of property through force.

Shortly after the Deer (Scotland) Act 1996 was passed, guidelines for Scottish Natural Heritage (SNH) were created and published in an Information and Advisory Note, Number 94, June 1997. In the introduction of the guidelines it states, ‘The new Act marks an important milestone in the development of deer legislation.’ However, what exactly this milestone is, or what it might be referring to is never clarified. Within the guidelines produced by SNH, two main parts stand out. Part three of the guidelines state, ‘... there are distinctions between ‘damage’ and ‘serious damage’ to the *natural* heritage ...’ Part four is interesting as it identifies the ‘referred evidence of alleged deer damage to the natural heritage:

1. DCS receives all referrals. Any referred to SNH should be passed on to DCS.
2. DCS make initial judgements on whether or not to follow-up action as required. They visit the site.
3. Where action is needed, DCS contacts the *SNH Area Office*.
4. SNH advise on whether or not it is considered ‘damage’ or ‘serious damage.’ SNH staff will probably need to visit the site to make such an assessment.
5. If SNH office is unclear, having consulted other colleagues, DCS will need to commission an assessment (with guidance from SNH).

This section suggests that SNH is the determining body, rather than the DCS, regarding ‘natural heritage’ and the effects of deer causing ‘damage’ or ‘serious damage,’ which is undefined by SNH. Additionally, there is only the suggestion that SNH officials need to visit the site in question. However, on their website, SNH states, ‘assessing ‘damage’ involves a judgement, based on clear scientific evidence, that the impacts are causing a detrimental change in a particular location.’ These two statements appear contradictory and the three key terms of the guidelines remain undefined:

‘damage,’ ‘serious damage,’ and ‘natural heritage.’

Scottish Natural Heritage (SNH) owns many sites across Scotland, most notably the Isle of Rum. The Isle of Rum was purchased in 1957, by the Nature Conservancy, and they officially took over and began management of red deer in 1958. During its ownership, SNH has promoted scientific study of red deer on the Isle of Rum. The research that came out of this association is the most notable of SNH contributions to the field of knowledge on red deer. The Isle of Rum provided a fantastic opportunity for researchers because the deer were on an island and functioned in an essentially enclosed (eco)system. More background on both the island and its red deer population, see Clutton-Brock’s *Red deer on Rum: A 20-year study of the ecological consequences of changes to male and female numbers* (2001), Clutton-Brock, et al.’s, *Red Deer: Behaviour and Ecology of Two Sexes* (1982), and M. Magnusson’s *Rum: Nature’s Island* (1997). Clutton-Brock has studied red deer for well over 20 years and his (2001) investigation of different management regimes on red deer population contributed a great deal of knowledge, including: a paradigm change regarding male to female ratio for higher stag production, fertility and fecundity of females, effects of increasing density, and the expulsion of males from inception groupings. Much of this research has been instrumental in furthering the understanding of red deer and their management. In 2007, SNH decided to cull over half of this red deer herd. This action became so controversial across Scotland, that lengthy discussions took place within the Scottish Parliament, who effectively reversed the management decision. SNH aims to promote and safeguard public interest, but the resulting controversy suggests that the culling of the red deer on the Isle of Rum was at odds with the Scottish public’s interest.

There are great objectives and intentions set out by Scottish Natural Heritage (SNH) in published material, however, there are often no clear statements or ‘how’ to perform the procedures clearly outlined. Without clearly defined meanings, position, and procedures, and the apparent lack of inclusion of other stakeholder interests, the credibility, resilience, and legitimacy of its objectives may be called into question (Clark et al., 2003; Ghosh et al., 2005). Furthermore, it appears that some of their management plans may not reflect the public’s interests, which they aim to ensure. While it is clear that SNH has great potential and some very positive, published ideals and approaches, the implementation appears to need further work, in part due to clarification of what ‘public interest’ actually is, what the public are expecting or wanting, and how to collaborate different objectives and priorities.

1.8.1.3 Deer Commission for Scotland (DCS)

The Deer Commission for Scotland (DCS) had its foundations in the Red Deer Commission which was created in the original Deer (Scotland) Act 1959. In 1996, it was renamed, reorganized,

and refocused. DCS acts as advisor to Scottish ministers and is responsible for the sustainable management, conservation, and control of all species of wild deer in Scotland. According to their website they view all of Scotland's deer as a valuable resource. DCS's published aims include: improving management skills across the deer sector, working to protect Scotland's wildlife and countryside, promoting and safeguarding deer welfare, improving public safety, and partnering with organizations to reach these goals. There are four species of wild deer in Scotland. Two are native species: the red deer and the roe. The other two species are introduced: Sika and Fallow. In many of their publications, DCS acknowledges that the red deer is an iconic species, which 'encapsulates Scotland's wild and rugged landscapes' and is the foundation to the internationally recognized hunting and shooting industry. As the advisors of management and the enforcers of legislation, DCS often has a strong impact on the management of red deer, even while having only a few employees.

Although, DCS primarily exists to implement and enforce legislation, they also have the ability to produce positive change with their outreach focus. Deer officers interact with Deer Management Groups (DMGs), often providing advice and consultations to the groups as well as individuals within the groups. Since 1996, the majority of the DCS focus has been on red deer management, though roe management is becoming more prevalent. Additionally, DCS aims to work closely with all stakeholders and groups involved in red deer management. DCS has also commissioned scientific studies in order to enhance red deer management.

1.8.1.4 *Integration of the Deer Commission for Scotland (DCS) into Scottish Natural Heritage (SNH)*

In 2009, there were indications that the Deer Commission for Scotland (DCS) was going to be absorbed into another governmental agency. In the Public Services (Reform) (Scotland) Act 2010, the functions of the commission were transferred to Scottish Natural Heritage (SNH). The Scottish Government website states this integration was part of a wider programme to simplify the public sector and to provide 'better customer focused services.' In June 2010, DCS employees joined SNH and became a part of the new wildlife division. Initially, the deer officers are to maintain their previous roles working with and communicating with stakeholders of deer management. However, this new division will expand to include many more species, which creates uncertainty as to what this integration means for Scotland's wild deer and red deer specifically. DCS provided a concentration of deer knowledge, which may be lost over time. Additionally, there are many more opportunities for those same employees to advance, which could mean that the expertise is lost more quickly. One additional aspect which may be of concern is the centralization of all of the legislative power into one body. As has been previously discussed, both DCS and SNH have performed red deer management which appears contradictory to public interest. Now that the two organizations are one entity, with the legislation preventing judicial accountability, while

allowing forced acquisition, there is no apparent balance of power to ensure responsible red deer management.

The Deer Commission for Scotland (DCS) has both successes and failures in its 14 years of existence. Through the Best Practice Guidelines, the standards which red deer managers adhere to are available to all. Furthermore, these guidelines are reviewed and expanded regularly. DCS has also contributed to red deer knowledge and management through some of the science which they have funded. On the negative side, they have not been leaders in following the Best Practice guidelines. As the new age of red deer management dawns with the DCS integration into SNH, there is uncertainty relating to how the vast knowledgebase of these individuals is going to not only be maintained but provisioned to practitioners. The focus that the DCS had, on the wild deer of Scotland, will be missed.

1.8.2 *Landownership, Estates, and Stalking*

Thus far the legislation which informs current red deer management and the governmental organizations which play an active role have been discussed. Remarkably, both of these are only minor determinants in the red deer management in Scotland. The largest and most influential group of red deer practitioners are the individuals typically associated with the traditional sporting estates, including: estate owners and the gamekeeper/stalkers, along with seasonal staff and clients, as well as the groups or organizations that these individuals are involved with.

1.8.2.1 Landownership

Landownership is a highly contested subject in many areas of Scotland, with most of the debates originating from the central belt. However, because red deer are managed across landownership designations, specifically by their landscape territories, an in-depth discussion is somewhat irrelevant for this project. The basis for the landownership debate is a perception that no one person should own large tracts of land, and does not appear to include organizations which own large tracts of land. Much of this debate appears to stem from anti-aristocracy motivations, which can be traced to specific points in history, real or perceived, such as the clearances that took place during the era of Agricultural Improvement. Additionally, the historical aspect of Clan ownership in parts of Scotland, may mean that many individuals feel as if they have been restricted from the land of their families. While the landownership debate is extensive, and many sources can be found regarding this topic, most discussions fail to consider all aspects involved. The landownership debate is not simply about who should own Scotland or have access to the countryside, but also includes who is willing to pay for the maintenance, management, and care of these areas – large, significant

costs that have no real source of funding. Since most people will vote against tax raises, and some new regulations mean that there is lost revenue for access, how are these areas to be maintained?

Many authors who are antagonistic to traditional sporting estates have argued against their value, proposing reduced sporting activities as well as governmental regulation of ownership (McEwen, 1977; Wightman, 1999; Wightman & Higgins, 2000). Most of these ideas are both idealistic and naive, primarily because the Scottish government is not in a (monetary) position to acquire ownership (Parry, 2002; Wisniewski and Stewart, 2004; MacMillan, 2004). Additionally, any forced, compulsory land acquisition is perceived to be extremely negative (Home, 2009). And as the PACEC report (2006) indicates, these estates perform many conservation functions, which the government agencies cannot. Furthermore, the landownership debate has been, to some extent, marginalized by the 'Right to Roam' legislation which was part of the Land Reform (Scotland) Act 2003. The law asserts that all individuals have the right to access any and all forms of land if they act responsibly. However, the concept of responsibility is not easily regulated. Any individual accessing land can do so without providing compensation to the landowner while the landowner is often placed under additional financial strain to maintain aspects of access including footpaths, fencing, waste removal, and roads. These costs require additional funding which, as indicated above, the Scottish government currently does not have. There is also the question of who will manage red deer populations if the estates are marginalized or broken into smaller tracts of land and sport stalking is reduced. Current management conflicts already exist between managing deer populations and conserving flora and fauna across many parts of Scotland and annual culls being interrupted by visitors.

While outdoor activities, such as hill-walking, mountaineering, and wildlife watching, and other outdoor businesses seem to be flourishing, there is a notable absence of a discussion as to how all of this activity may be impacting the animals which live in these locations (Savage, 1993; Begon et al., 2006). This leads to a major area that the landownership debate fails to cover, the welfare of the animals that live in these areas. Animals, especially wild animals, are heavily impacted by the presence of humans in their habitat, mostly because humans are perceived to be a threat (Krebs and Davies, 2002; Begon et al., 2006). The presence of humans can increase not only an animal's energy expenditure, cause animals to flee and possibly cause environmental damage because they are in large groups, but significantly, it can increase their stress levels (Krebs and Davies, 2002), although how or if the levels are similar or different to that of normal predation is not known. However, recent research studies, primarily conducted in the USA National Parks and featured in the television programme, 'Lords of Nature: Life in a Land of Great Predators,' suggest that humans are rarely successful in recreating the effect of actual predators on both prey populations and their habitats (<http://www.lordsofnature.org/>, 2009). Although it is not yet known how constant human

presence affects red deer in Scotland, both the landownership debate and the Right to Roam Law, due to their sole focus on human rights, minimizes any concern with animal welfare standards.

While there is not room to fully discuss the landownership debate, it must be noted because it continues. There are numerous sides to the discussion, but most appear to come from human desires; perceptions of class, history, access, and inequality or fairness; issues of power and ownership; and an antagonistic attitude towards landowners or the aristocracy (McCrone, 1998; Wightman, 1999), with no regard, concern, or consideration for the animals, ecology, or valuable environmental processes these wild landscapes provide (Savage, 1993; Alberti et al., 2003).

1.8.2.2 Deer Management Groups (DMGs)

Deer Management Groups (DMGs) within Scotland began organizing in the 1980s. According to the Association for Deer Management Groups website, the DMGs comprise landholdings and traditional sporting estates which share access to distinct herds or populations of red deer. The aim of the DMGs is to collaborate so that the populations can be managed as a common resource available for all. Currently, DMGs are voluntary and DMG groups, along with any sub-group of a larger DMG, number over 70. While almost all of the red deer range is covered by DMGs, roe deer managers are beginning to form as well. In trying to ensure the quality of red deer are maintained, and that individuals' management objectives are reached, most DMGs organize a coordinated count of the population, which will determine the necessary cull of deer for the year. Most DMGs strive for sustainable red deer management in which the deer are compatible with both their environment and other land-use, such as forestry or agriculture. DMG management plans are often created and form the framework for integrated management of the population across the locality. These groups also often liaise and interact with other groups and their local communities. Remarkably, within the Deer Commission for Scotland (DCS), now Scottish Natural Heritage (SNH), there are a total of only six Deer Officers and one Operations Manager who interact with (including site visits and attendance at all DMG meetings) all of these numerous DMGs.

1.8.2.3 Estates

Sporting estates, their landowners and gamekeepers, are the most prevalent and primary managers of red deer in Scotland. Similar to many other countries, including the United States, in Scotland the legal right to shoot/take (or likewise, to not do so) deer rests with the landowner; thus, it is landowners who are responsible for the majority of red deer management (<https://www.nature.scot/professional-advice/land-sea-management/managing-wildlife/managing-deer/code-practice-deer>). However, the Deer Commission for Scotland (DCS), now part of Scottish Natural Heritage (SNH), is responsible for enforcing the legislation

(previously the Deer (Scotland) Act 1996, now the Wildlife and Natural Environment (Scotland) Bill 2011) and, if necessary, either influence landowner management (agreed mandatory culling) or take action themselves (government run and organized culls) through Section 7 and Section 8s.

Although the landowners are the largest group of managers, not as much is known about them as the organizations that have to publish annual reports. However, Public and Corporate Economic Consultants (PACEC) were commissioned to conduct research regarding the value of shooting in the UK. The results, written by J. Olstead, were published in 2006, and offer general insight into sporting estates in Scotland. Additionally, PACEC was then commissioned by the Association for Deer Management Groups (ADMG) to provide a report specifically relating to the value of wild deer in Scotland. This second report was published the same year and provides general insight into the economic contribution of deer stalking and these elusive red deer practitioners.

Shooting sports are an integral part of the management of the Scottish landscape. In Olstead's (2006) report, the term shooting refers to all manner and species of live quarry hunting, both mammals and birds. The report states that in the UK (2006), 480,000 people shoot live quarry, which supports the equivalent of 70,000 full-time jobs. The report also states that 2/3rd of the UK rural landscape is managed for shooting, and much of that land is managed for specific conservation as a result. Additionally, live quarry shooting contributes £1.6 billion to the UK economy. The report explains that every transaction creates further economic impacts, as both wages earned and supplier profits are put back into the local economy, so that the economic 'ripples' of live quarry shooting help to underpin and sustain the rural countryside. The report also referenced studies which indicated that land that is managed for shooting contributes significantly to biodiversity and conservation. The report suggests that shooting provides nearly 500,000 conservationists (through specific conservation aims) through shooting activities as the individuals involved work to improve the countryside, usually spending their own time and money. The study found that a shooting provider spends about 16 days shooting, but 155 days a year are spent actively managing wildlife and habitats. The study found that there are 11 paid gamekeepers, on average, for every 10 shooting providers. It also states that shooting directly supports 5,700 jobs in tourism, specifically for food and accommodation, which often makes the difference between profit and loss for rural services. Within the report, the species types as well as the specific location contributions are indicated. The PACEC report notes DEFRA's Wild Deer Strategy for deer management. DEFRA's Wild Deer Strategy and Action Plan, 2004, recognised that sport stalking is part of an overall deer management strategy which aims to sustain a balance between maintaining a healthy population of deer, while limiting the ecological and economic impact of deer. Of the 970,000 total shooting days a year, the report

indicated that 150,000 (15.5%) were spent deer stalking. Deer stalking has approximately 17,000 providers which support 86,000 participants.

Scotland is just one part of the contribution to these UK shooting figures. There are 4.4 million hectares, out of a total of 7.8 million, in Scotland where shooting influences land management. Shooting spends £43 million a year on improving habitat and managing wildlife (which includes culling), providing the equivalent of 2,000 full-time (conservation) jobs. Many of the governmental organizations or other conservation agencies cannot compete with this contribution. Jarvie et al., (1997), indicates that sport shooting employed over 12,000 people full-time. Additionally, the PACEC reports almost 9,000 shooting providers generate 202 visitor nights each. The shooting days, visitor nights, and conservation all combine to contribute approximately £240 million into the Scottish economy. The PACEC report (2006) commissioned by the ADMG provides more specific information relating to deer stalking. The report states that there are approximately 4,200 deer stalking providers, which contribute over £70 million into the Scottish economy. Jarvie et al. (1997), states that most deer stalking estates run at a loss. The PACEC report supported this statement. It found that deer management costs approximately £105 million in total, yet over 2/3rd of the expenditure is retained in Scotland. The report also asked participants why deer were managed. Ninety percent of respondents indicated that deer were managed to ensure that the population does not exceed their habitat, and over 50% indicated it was to protect the natural environment. All respondents indicated that management included shooting, while almost 70% of participants also indicated they use fencing as a management tool. The PACEC report also found that on average, approximately 20% of deer were culled on a given site each year. Sport stalking, culling, and the culling exercises imposed by DCS has kept the population of red deer somewhat constant, at approximately 300,000 over the last decade (SNH, Visit Scotland, DCS, 2011). Over 60% of the PACEC respondents indicated that they would continue to cull if sport stalking was no longer possible, while more than 2/3rd of participants believed that damage to habitats would occur if deer management were to cease. Less than 10% of participants indicated they would not cull if sport stalking were to cease. Most participants indicated that, on average, 1.8 gamekeepers are required to perform necessary deer management. The average operational expenditure to conduct deer management was £54,468, of which almost 50% was spent on staff. However, the PACEC report (2006) indicated that the capital expenditure was only a little over £2,000 per site, per year. The report also considered income from deer products, including the sale of venison, which averaged £6,372. The prevention of damage to crops, woodlands, and other aspects of the natural environment accounted for approximately £4,500 saved per site.

In summary, although there is opposition to their existence, it appears that sport stalking estates, whether they sell stalking to clients or not, perform significant and essential management operations which not only protect Scotland's landscape, but also contribute in many ways to Scotland's most fragile economies (PAECEC, 2006).

1.8.2.4 Sport Stalking

Traditional (sporting) estates are the foremost managers of red deer in Scotland. Both culling operations and sport stalking take place on traditional estates, although culling and stalking are often two parts of the same activity. 'Going to the Hill: An introduction to red deer stalking in Scotland,' is a British Deer Society (BDS) publication (Waterson, 1987) which provides a comprehensive introduction to red deer stalking. This publication covers all of the important aspects of stalking, including: safety, the law, clothing, equipment: rifle and camera, an introduction to the individuals involved in stalking, shooting, gralloch, the larder, trophies, thanking both the stalker and the host, and organizations with interests of deer. Admittedly, the section on cameras is a bit outdated technologically speaking, but it still mentions the practical considerations which need to be considered. The publication begins with a discussion of terms and the aims associated with them. For example, the stalk is explained as, 'the art of approaching a wild animal closely without disturbing it' while culling is explained as 'the removal of selected individuals from a deer herd or population for the benefit of the majority.' Then, the authors explain, 'the object is to finish up with a population within which the deer are healthy and thriving; where there is a proper balance of sexes and ages; and whose demand for feed will be in balance with what is available at the time of year (spring) when it is in shortest supply.' Although the authors indicate a difference between stalking and culling, the term stalking is often inclusive of culling. The stalking of red deer, both stags and hinds, is the traditional estate's chosen method to manage red deer populations. The authors then discuss the actors who participate in stalking in thorough detail. The stalkers, also referred to as gamekeepers, are given special attention. The authors explain:

'A good Stalker is a companion beyond praise. He will know the ground, the local weather, and the places where deer are likely to be found. He will also know the local landmarks and talks associated with them, and will have a good knowledge of highland flora and fauna. Above all he will be keen to share his knowledge and add to the pleasure of the stalk, and will be happy to discuss with his Rifle [i.e. client] the selection of a shootable beast and the approach he proposes.'

It is clear from this excerpt there is a lot of respect for the stalkers. For the processes of the stalk, there is only limited information which can be provided. As the authors explain:

'The more difficult the stalk, the greater the pleasure when it succeeds – and should it fail there is always the consolation that success would soon pall if it were routine. In theory, it should be simple enough to stalk your deer,

following the old military dictum – down, crawl, observe, sight, fire ... In practice the deer's keen sight, scent, and hearing given them a useful edge over the human with his relatively poor sensory powers.'

Additionally, each stalk is an experience of its own to the individuals involved and subject to the location and rules of where the stalk takes place. Therefore, suggestions which are aimed to assist novice individuals are provided in this section. The publication provides a great deal of useful guidance to individuals seeking to stalk red deer. However, as is the practice in real-world scenarios, there is the deference to and dependency upon the Stalker to provide guidance, knowledge, decision-making, and leadership on all aspects of red deer stalking. The basic ideas and processes of stalking are compiled within this publication. However, there appears to be a sort of 'secret' club of stalking. By this, the researcher means that each stalk, each estate, and each individual who participates in stalking have their own, possibly profound, experiences – ones in which the significance, value, and meaning is privileged only to the individual and their particular experience. Therefore, the value of many stalking experiences may not be easy to communicate to people who have no experience themselves. This difficulty in communicating often leads to the perception of secretiveness from stalking participants. What is clear is that stalking is often a deeply personal experience for the individuals involved.

1.9 Research into sustainable management of red deer

The Deer Commission for Scotland (DCS) commissioned a study for the sustainable management of red deer, which identified the importance of minimizing governmental bureaucracy and increasing public funding, as well as the need for facilitators to be independent, trustworthy, and knowledgeable. Rose (2010) emphasized the need to develop monetary indicators to measure cultural and environmental benefits relating to ecosystem services. However, there are also the values of aesthetics and the emotional benefits to the public to consider, neither of which are easily identifiable in monetary terms (Pullin, 2002). The study also calls for better information, guidance, and advice as to the roles of individuals, so that they may take ownership of the information and thus perform actions. This suggestion is of notable interest because there is no acknowledgement of the valuable information individuals hold, which could enhance legislation, science, and sustainable deer management aims, as has been acknowledged in other areas of environmental management as briefly discussed earlier in this chapter (Cash et al., 2003; Ghosh et al., 2005). While the study commissioned by DCS considers perceptions of sustainable deer management, this project considers a larger scope of individual perceptions which inform red deer management, one of which is the concept of sustainability.

1.10 New Directions of Research

In the plethora of influences upon current red deer management, a cacophony of interests arise which impact management decision-making. Although the relationships between the red deer and the Scottish people have changed over the centuries, they remain intricately associated with Scotland and the idea of Scottish-ness: red deer are a Scottish icon. The hunting of these animals has changed over the centuries, evolving from a valuable food source into a stalking exercise which aims to lower the human impact on the herd, improve welfare standards, lower suffering, and enhance the overall herd through selective culling practices while maintaining habitat and ecosystem services. However, there are conflicts arising at the forefront of red deer management. These conflicts are characterized by distinct, opposing objectives within the Scottish landscape and society.

McEwen (1977) stated that 'land' is a deeply embedded part of Scottish cultural identity and McCrone (1998) said that Scotland, as a country, is a landscape of the mind, however 'invented and fabricated' that association may be. What is clear is that both nature and landscapes are 'signifiers which are deeply embedded in the cultural constitution of the public, such that the bond between nature and the concept of 'nation' are very deep' (Cosgrove, 1994, Lorimer, 2005). While the cultural affects upon landscape are acknowledged by the government and governmental bodies, the cultural value of wildlife species is not.

Because landscapes, including their species, are an integral part of the formation of culture, the management of both landscapes and species must crucially consider culture, even though culture is a contested concept, which makes it very difficult to explore. Additionally, there is the historical moral legislation which influences individual thinking, as well as the current red deer legislation from both Westminster and the Scottish Parliament. However, there is no clear animal welfare standards within those laws, only 'protection' and an ability to prevent suffering, while there also remains a notable exclusion of practitioners involved in their creation. Since deer are a cherished icon and a valuable economic resource, one might expect to find strong, detailed regulations against the taking and killing of deer. Instead, the legislation represents conservation interest with less emphasis on welfare interest. It also establishes a context for conflict since it seems to be only representative of one interest, rather than a combination of all stakeholder interests, nor the different cultural views regarding red deer management in Scotland. Additionally, since the law was simply edited, it can be perceived as not being defined and derived by the Scottish for the Scottish, which again reinforces the Millennium Assessment findings of the need for both credibility and legitimacy, and for relevance to practitioners (Ghosh et al., 2005). Furthermore, there are four different species of deer found in Scotland, with different management scenarios, situations, and needs, and differing cultural responses from the Scottish public, who clearly hold red deer as iconic, yet the policies and law do not reflect this. The national approach is a perfect

example of an attempt at environmental management from an institution focused on ecological outcomes that does not sufficiently take into account cultural beliefs, relations, or historical meaning. It is clear that different actors within red deer management have different understandings, goals, and understandings of both the legislation and cultural context of red deer. From these differences potential conflict arises, which could have been avoided.

1.11 Statement of the aims of the thesis

The preceding introduction has set the context in which this research project was conducted, describing the aims underlying the need to develop sustainable management of red deer populations and how processes and procedures are intended to ensure that red deer are sustainably managed. This project questioned how the acquisition and dissemination of knowledge amongst decision-makers involved in the management of red deer in Scotland influenced their management? During the course of the project, under-researched topics surfaced, highlighting areas of practical and theoretical divergence between stakeholders. This thesis therefore aims to explore how differing views and perspectives of two of the key stakeholder groups – the estate-based practitioners (including stalkers, land-managers, and land-owners) and staff of governmental agencies – influence the management of red deer in Scotland.

Chapter 2 is a general methods chapter, describing the approach taken in conducting the research, the research methods employed, and the characteristics of the participants.

In Chapter 3 consideration is given to how red deer are perceived by the stakeholders. The assumption of the project at the outset was that there would be consensus about the fundamental requirement to control the populations of red deer and any divergent views were likely to be found in discussion about methods and process. For this reason, specific investigation of how red deer are perceived had not been intended: the information described in Chapter 3 was offered spontaneously by the participants. The fact that the majority of participants did offer this information was taken as indicative of the importance of the topic and therefore it is included here.

Chapter 4 is an exploration of how practitioners gain and perceived knowledge. It includes specific enquiry into sources of information; how information flows between different parties; and how this information comes to influence the decision-making of individual professionals. In legislation, there is a formalization of the national approach to red deer management and therefore Chapter 5 considers how the legal framework is both perceived by these stakeholders and how it is implemented and influences practice in red deer management in Scotland.

Chapter 6 focuses on issues of animal welfare with regard to red deer and management and how decisions are made and implemented by the different practitioner groups.

Chapter 2: Research Methods - people managing red deer in Scotland

2.1 General methods

An ethnographic approach to the research, using textual and document analysis, was taken to obtain insight into differing perspectives of various stakeholders and tensions between stakeholders involved in the red deer management of Scotland, awareness of media relating to red deer and management of landscapes, and an understanding of the economics of Scotland. Questionnaires and semi-structured interviews were used to provide not only the basic understanding that quantitative methods provide, but also the deep, rich data that qualitative methods draw from participants, such that the issues of participants would be allowed to surface and a more thorough understanding of behaviour and culture would be allowed to emerge.

Mixed methods relates to the philosophical worldview of pragmatism, and usually arises out of a need for further, detailed explanation of a quantitative finding (Creswell and Clark, 2007). Mixed-methods may either be quantitative data imbedded in a qualitative research, such as a survey/questionnaire integrated into a semi-structured interview designed to poll 'many' within a population, or the quantitative data may be used to lead the researcher to specific investigative questions for qualitative research (Creswell, 2008). Mixed-methodology allows for variation in perspectives and interaction to be considered when looking at the whole (Creswell and Clark, 2007). It also allows for deep consideration of the parts, the 'daily' players. This project aimed to use complementary methodologies in order to facilitate participation which allows us to understand how to establish long-lasting sustainable red deer management practices. The initial stages of this field work utilized questionnaires and semi-structured interviews.

2.2 Field research data collection and analysis

Initial contact with individuals in the red deer industry was made at the Perth Game Fair in 2008. The game fair provided an opportunity to gain a sense of the players involved within the industry and make some initial contacts with estate employees and organizations, such as the Scottish Gamekeepers Association (SGA), Deer Commission for Scotland (DCS), and Scottish Natural Heritage (SNH) employees. Participants were contacted via email and telephone, and initial meetings were scheduled. The first meeting was with a founding member of the Association of Deer Management Groups (DMGs). As a result of these meetings, initial research questions were identified and potential questions for both the surveys and the semi-structured interviews were developed and refined.

A questionnaire was designed and piloted (Appendix II) to ensure that the questions were understood, phrased for greatest understanding of participants, and easy for the respondents to address. The pilot questionnaire was taken to a gamekeeper, factor, and owner to gain feedback on questions and question design. The suggestions, which included additional questions and a change in the design of a couple of questions, were incorporated into the participant questionnaire (Appendix IV) that the participants completed.

2.2.1 Sampling: Snowball, Convenience, and Theoretical

Both 'snowball sampling' (where the researcher makes initial contact with a person or small group of people and then uses those individuals to establish further contacts) and 'convenience sampling' (a sample that is 'simply available to the researcher by virtue of its accessibility' (Bryman, 2004; p.100)) were used to select participants for the research.

Initial contacts arose from a specific individual, who also suggested attending game fairs for convenience sampling, as well as providing individual contacts and contacts for DMGs. To some extent theoretical sampling ('the process of data collection for generalizing theory, whereby the analyst jointly collects, codes, and analyses data, decides what to collect next and where to find it, in order to develop the theory as it emerges' (Bryman, 2006 p.305)) was used on both questionnaires and semi-structured interviews. 'Quota sampling', in which the aim is to produce a research sample of participants 'that reflects a population in terms of proportions of people in different categories' (Bryman, 2006 p. 102) was also considered: the estate employed gamekeepers outnumber the governmental employees (at the time of the research, DCS was still in existence and had approximately 7 deer officers for the whole of Scotland, while there are thousands of estates). Although numbers are small (questionnaire, n=22; interviews, n=19), which is not ideal for quota sampling, nevertheless the proportions within different participant categories do reflect the population.

2.2.2 Questionnaires

Questionnaires (see Appendix IV) were provided to participants through various means. The aim was to get a large spread of participants, therefore some participants received the questionnaire via email, while others were provided the questionnaire in person or at game fairs. About 100 were distributed and 22 were returned. The questionnaire initially sought basic, background questions about the participants. These background questions included: occupation, current and previous years in position, age, from: Scotland or other and rural or urban, affiliated DMG, education levels, and participation in continuing professional training. These were followed by questions regarding the decision-making process of each individual regarding their red deer management and strategy.

Finally, the questionnaire sought to identify roles of individuals and organizations that contribute to the management of red deer in Scotland both in what capacity and across spatial scales. The results are descriptive because the sample size did not lend itself to detailed statistical analysis.

2.2.3 Semi-structured Interviews

Most of the semi-structured interview participants (n=19) were initially referred by the researcher’s initial contacts, then by other participants. Referrals were based on the knowledge the individuals had on red deer and their management. The individuals held some standing within the red deer industry and have been active in advancing red deer management. There were 12 questions in the semi-structured interview. These were open-ended, allowing the interviewee to cover, in-depth, a range of topics including detailed background, management of deer, and defining of culture (see Appendix IV, page xiii). All 17 semi-structured interviews took place at a time and location set by the participants, usually in their home or office. Although most interviews were conducted in person, two of the participants chose to conduct the semi-structured interviews via telephone and two on-site interviews had two participants. Semi-structured interviews were digitally recorded, totalling over 33 hours, which were then transcribed (300 single spaced total pages, with an average of 17.7 pages per interview) and coded and the researcher also took notes during the interviews.

Due to the extensive data from the semi-structured interviews, a coding system was used to allow identify themes. Broader topic areas, such as environment, estate aims, and stalking, were coded into smaller topic areas, such as habitat, movement, disturbance, clients, equipment, carcass removal, and so on; see Table 2.1, below.

Table 2-1 Coding of Semi-structured interview data

<u>Major Categories</u>	<u>Sub-categories</u>
On Estate	<ul style="list-style-type: none"> · Estate Aims · Management Plans · Income/Financial Concerns · Deer Management: Ideological Approach · Deer Management: Densities, culling, clients, stalking · Sustainability/Environmental Management (Habitat, Deer, Agriculture, etc.) · Wildlife/landscape management with deer: Grouse, Forestry, Fishing, etc.
Outside of Estate	<ul style="list-style-type: none"> · Landscape designations (SSi, National Park, etc.) · Non-sporting: Agriculture, Forestry, Fencing · DMGs · Organizations (DCS, SNH, NHS, Forestry Commission, Woodland Trust, John Muir Trust, etc) · Public: Disturbance, Access, and Right to Roam Legislation
Politics and Perceptions	<ul style="list-style-type: none"> · History and Culture of Red Deer Management; Perception of Sport/Stalking

	<ul style="list-style-type: none"> · Public Perception of Estates and Keepers vs Personal Perceptions of Actions (Protection of Environment and Animal Welfare) · Urban vs Rural · DCS/Govt vs Estates/Estate Ownership; Role of Govt
Major Concerns	<ul style="list-style-type: none"> · Consultation · Major Govt Enforced Culls/Section 7s; Best Practice vs Govt Action

2.3 Characteristics of participants

2.3.1 Questionnaire participant characteristics

Due to the prevalence of red deer populations and the close, historical human-animal relationship between the species and the Scottish society, one could assume that most Scottish people would have an opinion or view regarding the management of the species. However, for the purposes of this research, the ideal participants had some role in the decision making and management of the species. Since red deer are wildlife, requiring limited human-based management compared to domestic animal care, the researcher identified ‘management’ in the most literal capacity – the culling process. Therefore, research participants of red deer management must either make decisions on the numbers of animals to be culled or participate in the culling process, i.e. own the land, work for the landowner, purchase stalking rights, or work for a governmental organization which oversees legislation specific to culling or performs culling on governmental owned properties. All other individuals were excluded as participants of this research project as they were considered non-management.

Of the 22 participants returning questionnaires, gamekeeper/stalkers (G) accounted for more than half of the sample (see Figure 2.1). Other groups were: estate owners (EO), Factors (F), and Organizations (ORG). A category ‘Other (O)’ was used where individuals did not associate themselves primarily with any of the specified categories and may refer to part-time/seasonal gamekeepers, company-based land managers, or clients (individuals who purchase estate stalking). As the criteria for participation in the research project were identified prior to individual participation, there was no reason to exclude participants who completed the questionnaires (n=22) or semi-structured interviews (n=19).

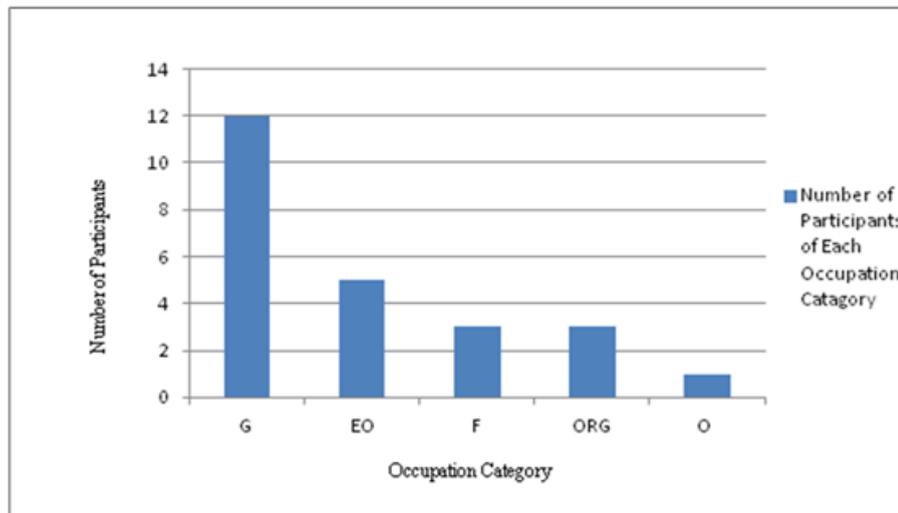


Figure 2-1 Participant numbers based on employment position from Questionnaire (n=22). Some participants considered themselves as holding multiple positions, such as owner and a client

The average length of current employment was 15 years (median = 14 years) and the average length of previous employment was similarly long, at 12 years (median = seven years), however, some lengths of employment were particularly long, for example the maximum time for current position was 50 years and the maximum time for previous position was 48 years. This was reflected in the ages of the participants: 12 were over 50 years and only four were under 30. Participants who had retired also noted that they usually continue to be involved in stalking activities, at least on a part-time basis.

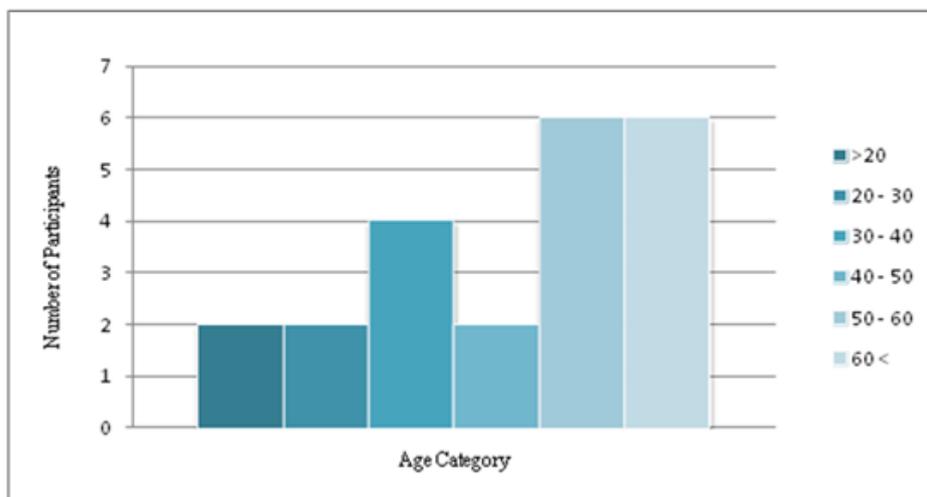


Figure 2-2 Participant Age (n=22)

All the participants were currently located in Scotland, with 19 being of Scottish origin. Sixteen described their current location as 'rural' and half of the sample (11) indicated that they were raised in a 'rural' setting. Of the other 11, only a single participant described their non-rural upbringing as being in an 'urban setting'.

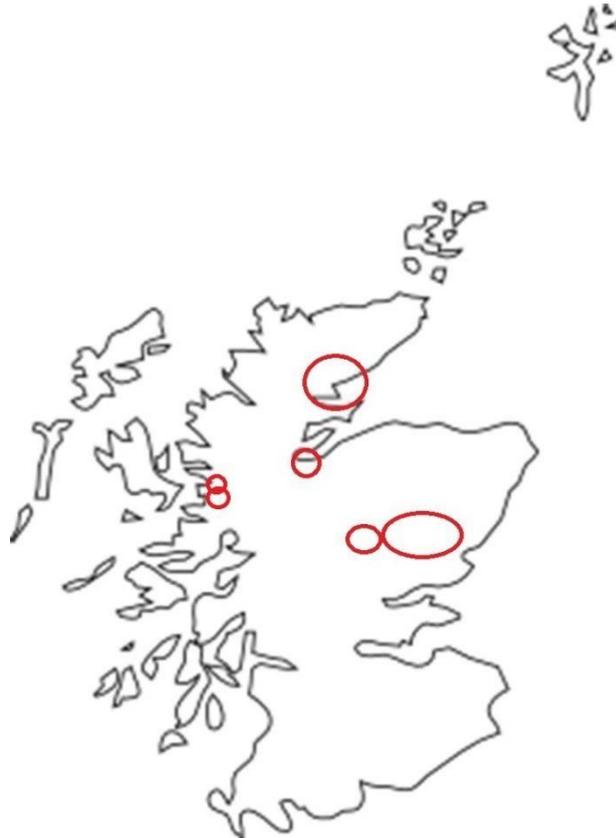


Figure 2-3 Deer Management Group Associations of Participants. Circled areas are general locations of Deer Management Group (n=22)

Of the 22 participants, 10 individuals indicated the DMG that they were associated with; three were from governmental organizations (hence likely to be covering multiple areas); two were still attending college, so they would not yet have a DMG association. Although this measure is not comprehensive for the sample, there is sufficient information to conclude that the participants were representative of the range of DMGs, covering the various habitat/landscape associated with red deer management. The DMG groups who were represented include: East Sutherland (2), Inverness (1), East Grampian (6), West Grampian (2), Knoydart (2), and Gleneig (1). One individual was part of both East and West Grampian DMG groups. The map, Figure 2.3 is a visual representation of the questionnaire participants DMG groups. DMG groups consist of both Upland Groups and Lowland groups, but no participant indicated that they were part of a Lowland DMG. The map indicates that while the participant numbers may be small, they come from a large and geographically diverse area.

Figure 2.4 portrays traditional, classroom education of the individuals who participated in the questionnaire.

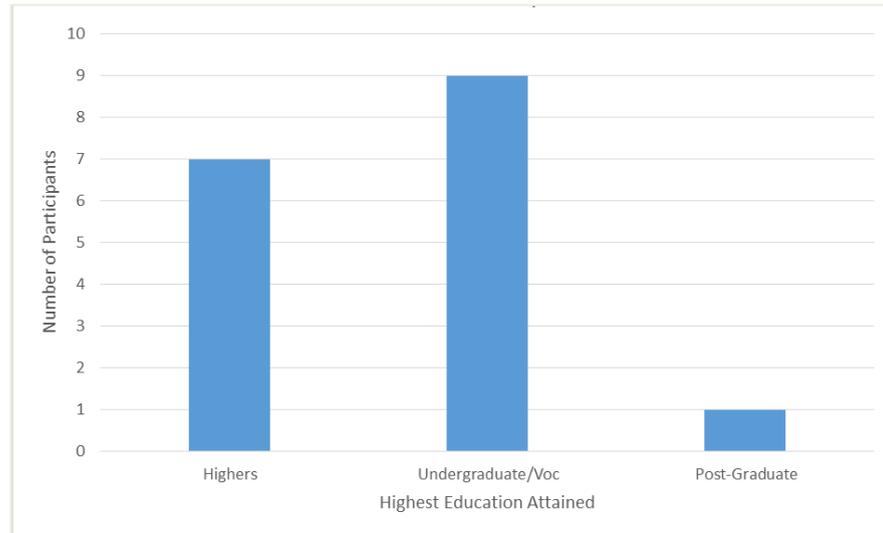


Figure 2-4 Classroom type education level of participants. Not all questionnaire participants noted education level and some did not complete highers or above (n=22)

Classroom education refers to three types of education: secondary level education (UK A Levels or Highers), vocational (NVQs) or a university undergraduate degree, and finally post-graduate degrees. Seven of 22 respondents completed secondary level education. Nine participants either completed training at a Further Education college or a university undergraduate degree. One participant had completed a post-graduate degree. Two participants did not note their highest education attained. And three participants simply noted 'other' as their highest education attained. Sixteen participants indicated they had taken vocational training or CPD (continued professional development), including Argo-cats, Quad-bikes, and IT training. Seven participants completed one or both Level 1 and 2 DCS courses. Other completed courses included: DMQ Assessor for DMQ, rural surveyor, SQC, Game Hygiene, LANTRA, and NH leaders.

While Figure (2.4) illustrates the highest education level of the participants (n=22), there has been a change in the level of education, with older participants less likely to have post- school education. Figure 2.5, shows education as a function of age bracket. This change likely reflects a more general societal change, with more people are attending university.

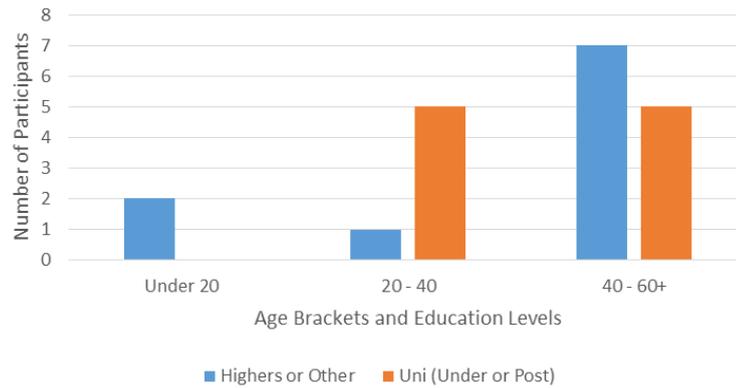


Figure 2-5 Education as a function of Age Bracket (n=22), although all participants did not note education level, and other includes continuing education or employment based education, such as quadbikes or other

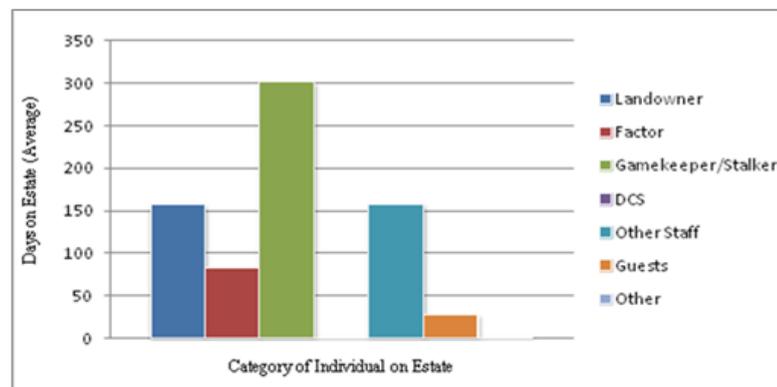


Figure 2-6 Categories of Individuals who spend time on Estates (n=22)

Not surprisingly, on average gamekeepers/stalkers, estate staff, and landowners spend the most time on the estate (162 – 365 days/year), as many live on-site. Factors (responsible for financial management of the estates) and guests/clients spend 60-83 days on the estate on average. While DCS spend the least amount of time on estates, two days a year on average: indeed, the participants on the West coast indicated during interviews that it had been several years since DCS had visited their estate. Regardless of the differing amounts of time on the estates, only 17 of the participants were actively engaged in day-to-day management action such as stalking, selecting animals to cull, and removing carcasses.

2.3.2 Semi-Structured interview participant characteristics

The questionnaires (n=22) focused on understanding of the basic decision-making process of practitioners, as well as seeking to identify in what capacity practitioners participated in red deer management. The responses provided a rich source of data regarding red deer management

in Scotland. They also raised unforeseen relationships and new research questions, which the semi-structured interviews (n=19) were designed to explore.

Seventeen semi-structured interviews were completed. Two interviews had multiple participants while the remaining 15 interviews only had a single individual present. At the beginning of the interviews, participants were asked background information relating to participation in red deer management. Eleven of the semi-structured interview participants completed both the questionnaire and the interview. Qualitative methods, which allow the properties, processes, and characteristics of phenomena to emerge, are not only complementary but necessary for true comprehension of the concept or phenomena under investigation (Creswell, 1994; Creswell, 2008).

The individuals who participated in the semi-structured interviews range in age. While the semi-structured interviews did not include a specific question regarding age, the participants who filled out the questionnaire provided an age bracket and two participants volunteered the information. Figure 2.7 shows the age brackets of the 11 individuals who completed both the questionnaire and the semi-structured interviews along with the two individuals who volunteered the information.

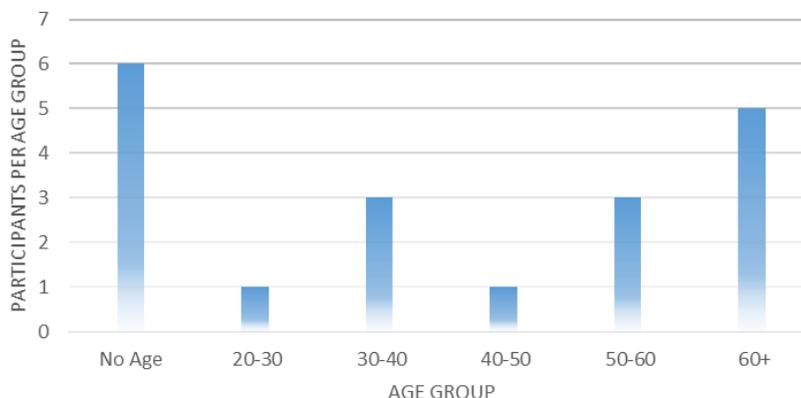


Figure 2-7 Interview Participants by Age (n=19). Half of the interview participants also completed a questionnaire

The total number of semi-structured interview participants was 19. Of these 15 were associated with the traditional sporting estate, while the remaining four were associated with a governmental organization. Interestingly, one traditional estate employee had a history of working for a governmental organization while two of the governmental organization employees had a history of working on a traditional estate. The governmental employees have an office location that may or may not correspond to their working location, i.e. at least two of the governmental employee participants had responsibilities which were carried out away from the office location,

such as estate visits and attending DMG meetings. Fourteen of the 15 traditional sporting estate employees requested interviews to be conducted on-site. The approximate estate locations have been mapped in order to provide a visual representation of the location of the estate participants of the semi-structured interviews. The approximate location of the estate participants includes East, Central, North, and West Scotland. However, there were no participants from south of the central belt.

Figure 2.8, shows that the estate interview participants (n=15 of 19) come from areas across Scotland. While there are only 15 participants, this map indicates that due to the varied locations, this project was inclusive of red deer managers across Scotland north of the central belt.

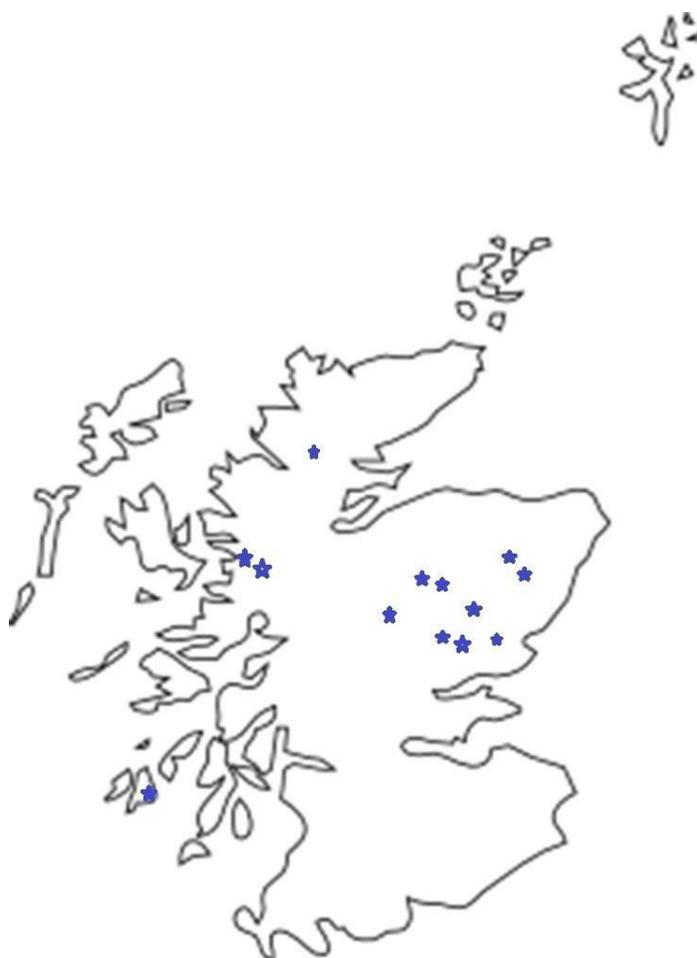


Figure 2-8 Interview Participants General Estate/Home Area (n=15 of 19 interview participants (15 participants from estates and 4 from governmental organizations))

The first interview question pertains to understanding the background of the interview participants, i.e. how they became involved with red deer management in Scotland. Within the group of 15 participants associated with traditional sporting estates, the individuals ranged from landowners, factors, deer managers, consultants, gamekeepers/stalkers, and land managers.

There were eight landowners in total. Of these, there were four individuals that either inherited an estate or stand to inherit. Two of the landowners considered themselves more in the

role of client and factor for the purposes of this project because their properties are on the fringes of the red deer management territories. Although these two individuals do not actively manage red deer, they do participate in stalking activities or culling to a minor degree – either as a stalking client or as a deterrent to marauding deer. Two more of the eight owners were ‘new’ to ownership, having purchased their properties within the last 30 years or so. One of these individuals was a foreigner, who had stalking experience when younger. The next group of traditional estate participants totalled six and considered themselves as either managers (deer or land) or stalkers/gamekeepers. Four of this group of individuals either started stalking at a young age, average of 10 years, or had a familial connection to stalking – two of these individuals mentioned a grandfather who stalked, one of which who stalked the same estate the individual is employed upon. The two individuals who had grandfathers who stalked also had farming and crofting in their background. The final two of the six stalking participants entered into the field after completing degrees at university. One wanted to work with wildlife; a path that led to red deer. And the other came from a land management perspective focused on living on and working on land. The final participant in the traditional estate group called himself a deer manager. He stated he arrived at the estate 30 years ago after leaving school, but provided no additional details.

The governmental organizational group had a total of four participants. Three of these held university degrees while the remaining individual held a higher national diploma. Of the three with university degrees, two of these individuals grew up in a stalker/gamekeeper household. Both of these individuals had fathers who were – and still are – stalkers on traditional sporting estates. While both of these individuals had personal stalking experience, one held the position of a stalker on a sporting estate as permanent employment prior to his employment with the governmental organization.

In summary, the semi-structured interview participants (n=19) were associated with one of two main groups: governmental organizational employees (n=4) and traditional sporting estates (n=15). Two of the four governmental employees had a rural background. And 10 of 14 of the sporting estate participants had a rural background, while one individual did not provide specific background location information.

All questions have inherent demand characteristics: for example, the form of the question might imply a particular answer is expected or certain answers. In addition, there are well known biases, such as the positivity bias (people tend to answer ‘agree’ more than ‘disagree’) and the social desirability bias (people want the questioner to perceive them in a positive light and also tend to express views or positions that they think are more socially acceptable or desirable than their actual beliefs or actions (Ewert and Galloway, 2008; van de Mortel, 2008). Although it is not

possible to rule out such biases, some precautions were taken to counter the possible effects. First, the researcher was able to participate in some management activities that allowed the researcher to observe both actions and behaviours regarding red deer management. Direct observation confirmed that the answers given in the questionnaire (n=22) and semi-structured interviews (n=19) were consistent. In addition, in two instances, multiple participants were interviewed together. It might be expected that social desirability bias would be greatest when provided in a social context and would therefore contrast sharply with the anonymous questionnaires or solo-interviews. However, this was not the case: there was remarkable consistency of views. A similar study from Southern Australia used qualitative methods to gain insight into the views of the indigenous communities surrounding the cull and consumption of Kangaroo (Thomsen, et al., 2006). The researchers found that the use of qualitative methods was successful in illuminating the various cultural values and beliefs of the indigenous people (ibid, 2006).

2.4 Positionality

The researcher's positionality can potentially influence the research due to the position the researcher takes when interacting with participants (Bryman, 2006). My main position throughout my research was primarily to learn and collect whatever information was available. I found that an individual's story was the most fascinating whether it related to red deer or not. Before I began my PhD work at the University of St Andrews, I knew that I wanted to study some aspect of Scottish culture, specifically in-relation to environmental management and as my past particularly included animals and their study across various disciplines, I felt I could excel with an animal species and the human interaction with them as my research focus. Although the human-animal relationship can, and has been, perceived in various ways, my personal history has shown me that human relationships with animals tend to arise from a pragmatic need, but caring for them often leads to some sort of emotional attachment, especially with domestic species. Britain's love affair with their animals and the awareness of animal welfare concerns meant that researching animals in Scotland had a familiar context to my own history, although the culture, itself, was different. Initially, I was interested in researching the Scottish wildcat. However, I became aware of the draw and perception of red deer. At the beginning of the research, although I was very open to Scottish culture and exalted in my experiences, I disagreed with 'hunting' as a sport, only seeing the need for culling when it related to human or animal safety, such as to save the animals from starvation or being hit by human traffic. Much of my perception and opinions came from my experiences in Texas, where many deer are drawn into a supplemental feeding area positioned by a 'hide' in order to shoot a prized animal.

In order to understand what I was studying, I immersed myself into Scotland society and culture, reading popular works as well as academic research. For example, Fox (2008) discusses aspects of 'Britishness' in a way that is both enlightening and humorous, while Devine's (2003) book entitled 'Being Scottish' is a reminder to look beyond cultural stereotypes. In order to assimilate into the red deer management group, I attended game fairs; management activities, such as grouse beating and stalking; visiting government run estates, such as the Isle of Rum; researching material which would provide insight, such as books, laws, folklore, history, and art; and spent many hours in conversation with the various participants of red deer management, including clients, gamekeepers, governmental employees, estate managers, and even the general public who attend events, such as game fairs. In addition, I also paid close attention to media sources and noted red deer depictions or references in news, movies, television, books, whiskey, and language.

Cultural immersion will affect the researcher as much as the researcher affects the world around them (Bryman, 2006). Bryman (2006) warns against 'going native' and reminds researchers of the importance of objectivity. That notwithstanding, a central topic of this research is precisely concerned with subjective matters such as the influence of attitudes and opinions of people involved in the management of red deer. Nowhere is this more obvious than when discussing the iconic nature of red deer. This is the focus of the following Chapter, which considers the impact of the inherent conflict that arises when an iconic species is also an environmental pest.

Chapter 3: An Icon or a pest?

3.1 Introduction

Management of deer populations is generally considered in the context of holistic environmental management, where the deer are regarded as one component part of the flora-fauna ecosystem of a geographic area. However, such management takes place in a cultural context – the beliefs and feelings of humans, whether directly or indirectly involved. Farnworth et al. (2014) found in New Zealand, where red deer were introduced, people who considered themselves ‘conservationists’ usually identified animals as pests compared to the general public, who may perceive animals in different ways due to factors of proximity, age, impact level, etc (Roskaft et al., 2007). Nugent and Fraser (1993) discussed how conservationists prefer elimination or extremely low deer densities compared to the hunting population in New Zealand who prefer higher populations to ensure hunting opportunities. However, control methods on deer populations in New Zealand do not necessarily translate into changes in deer densities (Forsyth et al., 2013). While these studies come from New Zealand, they may be comparable to Scotland in some ways – such as conservationists aiming for minimal deer populations that potentially contrast with the desires of the general public and sporting estates and the uncertainty of changes in deer densities and impacts due to large culling operations. Deer hunting in both Scotland (PACEC, 2006) and New Zealand (Nugent and Fraser, 1993) provide a substantial financial contribution to the economy, while the cost of habitat change from high density populations is unknown. But financial contributions or costs may be less important to the general public than the ability to see the animals in their natural environment. Furthermore, interactions with animals may lead individuals (general public, hunters, practitioners) to have a perception that these animals have a mental state, or sentience, which can then influence their perception of animal welfare (Spence et al., 2017; see Chapter 6) and management operations. In this Chapter, I will argue that cultural elements bring issues into deer management which have important implications, as significant as consideration of such factors as deer density, roaming territories, or biology.

3.1.1 *Religious and mystical status of deer*

There are many examples in human history where red deer are regarded as sacred (Bulliet, 2005), as well as a source of food and a source of tools (Caras, 1996; Pacelle, 2011). For example, in early European history, both Greek and Roman civilizations, held the red deer in great esteem, considering them a symbol of purity. Nevertheless, the Goddesses (Artemis and Diana, respectively) were goddesses of the hunt and Artemis loosely translates as ‘deer-shooting’ (Palmer, 2002). This

indicates that although deer were revered and respected, they were also hunted, being valuable and useful to humans. Similarly, in Scotland, although a food source, red deer have played a prominent role in historical cultural and religious beliefs: they have been identified with certain (desirable) traits, are key players in myths and legends and they have been recorded in literature and images.

The stag, *Damh* (Gaelic), was traditionally associated with majesty, grace, integrity, fertility and sexuality, and strength gained from independence (Carr-Gomm and Carr-Gomm, 2001) and a 'noble hart' was associated with magical powers, an ability to rejuvenate itself, and in a time of trouble, it provides strength and endurance, while the hind grants defensive cunning (Palmer, 2002). The stag specifically, was often associated with the 'Otherworld,' and usually seen as a messenger from it, being a creature from the beginning of time (Carr-Gomm and Carr-Gomm, 2001). Carr-Gomm and Carr-Gomm (2001) write: "*For millennia humans have attempted to partake of the stag's power, dignity, and connection with the otherworld, by dressing as stags for ceremony and dance; in Britain, this ritualistic activity is at least 9,500 years old*" (p. 26) and evidence of antlers, adapted for use as ritualistic headgear, was found in an archaeological excavation of a Mesolithic settlement (in Yorkshire) (Carr-Gomm and Carr-Gomm, 2001). In the 7th century, St. Augustine condemned "*that most filthy habit of dressing up as a Stag*" (cited by Carr-Gomm and Carr-Gomm, 2001, p. 27).

Red deer, mostly in the form of the stag, appear in many ancient myths and legends in the oral tradition. In a Celtic story of King Arthur, a Stag leads the king to the magical well of Pellinore, meanwhile luring his knights into a trap. Palmer (2002) notes that this story could be considered a metaphor for man's search for god, in which only King Arthur, as the chosen, was worthy. In the Druid tradition, the Stag is the second of five totem animals (the others being: blackbird/raven (1st); owl (3rd), eagle (4th) and salmon (5th)) that "*represent a journey that moves ever deeper into the Otherworld*" (Carr-Gomm and Carr-Gomm, 2001, p.9). A white deer or stag, regarded as magical, is also common to many legends, folktales and stories of the lives of Saints throughout the Middle Ages (Oxbow and Robertson, 2005).

3.1.2 Red deer in literature

At the end of the 19th century, Alexander Carmichael (2006) collected Gaelic verses from the Highlands and Islands of Scotland, many of which refer to deer, and deer are also found in modern recounting of folk-lore, such as Kennedy's (2005) 'The Craig Liath Mhor, a moralist tale about anger and fighting, or Wilson's (1999) 'Conan's Punishment,' a tale of curiosity, anger, punishment, and madness. The poet, Robert Burns (1759-1796), Scotland's national bard, often made references to deer, including in some of his most well-known work, such as 'My heart's in the Highlands' and 'Caledonia – A Ballad'. More recent examples of references to deer by Scottish writers include Hugh

MacDairmid (1892-1978) who wrote: “that pure, white stag with great branching horns... will betoken great good luck for Scotland at long last”. Although not Scottish born, J.K. Rowling (b. 1965) has made Scotland her home and the setting for her Harry Potter books. In one such book, a white stag appears to the young boy, Harry, as an otherworldly spectral vision, which is later revealed to be a reflection of Harry Potter’s character and teaches him how to use his own power. These are just a few examples from many literary references, which illustrate the point that stories of red deer, and the stalking or hunting of them, have been and continue to be sources of positive images.

3.1.3 Red deer representation in the visual arts

While much of the oral and written record of early history is lost, visual artefacts remain and in these, deer also feature prominently. For example, Pictish standing stones have illustrations of red deer, red deer stags, and red deer hunts (see Figure 3-1). Although little is known about the actual religious practices of the Picts, the representations of red deer on standing stones are some of the first, significant iconographic illustrations of the species.

Most of the representations on Pictish stones appear to be a combination of mystical and realistic, which suggests red deer were religious symbols, but also a food source, and hunting was a cultural and social activity. Additionally, although difficult to verify, some authors have suggested that Pictish warriors had a final test in which a red deer stag was hunted and brought to the local population by an individual before that person could become part of the warrior elite (Atchison, 2003).



Figure 3-1: detail from Eassie Sculptured Stone. Address: Churchyard in Eassie village, off the A94, 2 miles west of Glamis. Nearest postcode: DD8 1SE. Photo Credit: David Ross and Britain Express. Downloaded from <http://www.britainexpress.com/attractions.htm?attraction=4745> (Accessed: 24th July 2017).

Items of jewellery and personal adornment also often have depictions of red deer. For the Celts, Red deer were associated with the god, Cernunnos, and were a favourite of the Goddess, or Fairy (Sidhe) Queen: items of Celtic jewellery with deer images have been found across the British Isles. Scandinavians made combs from reindeer antlers and this tradition continued in the Northern Isles of Scotland, although the artistic styles of the different cultures are distinct (Woolf, 2007). Representations of the red deer stag – rivalled in number only by the lion – are evident in numerous clan crests and found on suits of arms and, in modern heraldry, the stag, with its properties of grace, beauty and acute senses, is ‘an emblem of prudence – the principle of all virtues’ (Palmer, 2002).

Arguably, one of the most significant representation of the red deer stag was created by Sir Edwin Landseer (1802-1873) in his 1851 painting known as ‘Monarch of the Glen’ (see Figure 3-2).

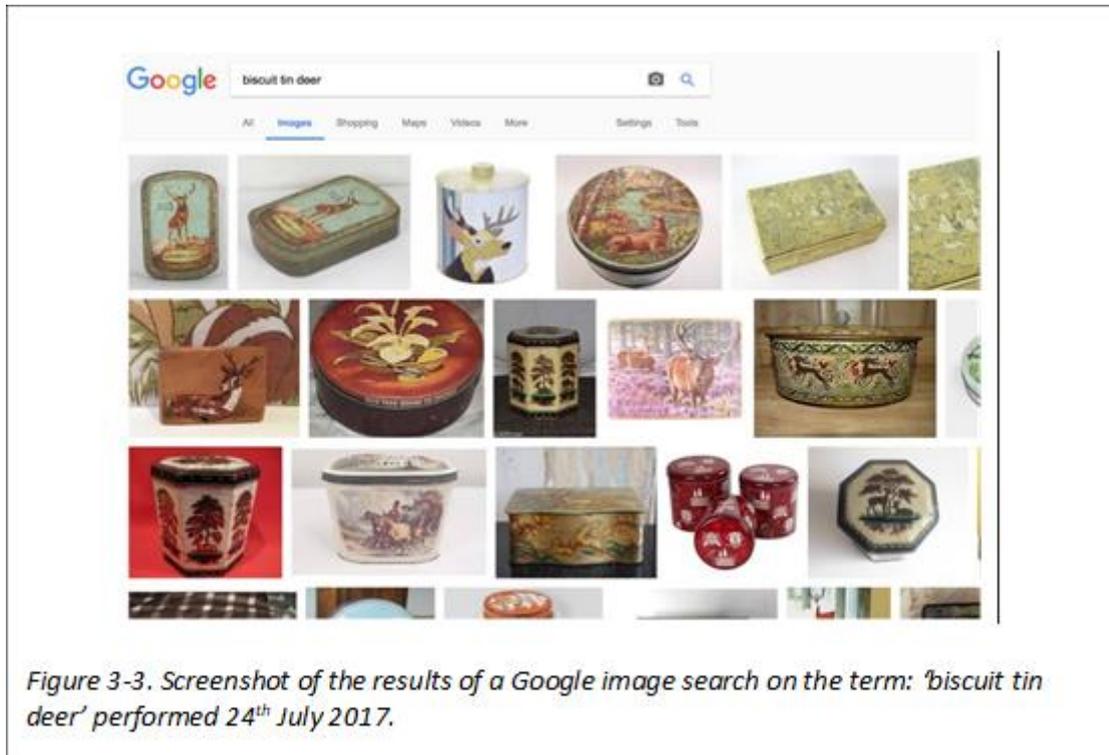


Figure 3-2 "Monarch of the Glen" by Edwin Landseer, 1851, collection of DIAGEO, on display at the National Museum of Scotland, June 2007 (creative commons licence: image not subject to copyright)

https://commons.wikimedia.org/wiki/File:Monarch_of_the_Glen,_Edwin_Landseer,_1851.jpg

(Accessed: 24th July 2017).

Photography has further expanded the prevalence of images of red deer, whose representations appear on every type of book, in popular media, advertising, in film and on television. As an example, images of deer are very popular on that other British cultural phenomenon, the biscuit tin (see Figure 3-3) often, but not exclusively, containing shortbread and/or marketed at Christmas time.



3.1.4 Hunting of red deer

In considering the important cultural status of the red deer in Scotland, its iconic status does not detract from the fact that it was also an important source of food. The images and stories about deer also feature hunting and stalking of the animals. The earliest peoples to arrive in Britain, between 8,000 and 10,000 years ago, were likely to have been following their food source and red deer, due to their size and high proportion of meat, were an important animal (Ross, 2004; Oram, 1997). Archaeological sites have provided evidence, such as antler tools and bones, which supports the utilitarian value of red deer to these societies. Medieval records indicate that red deer were both hunted on horseback with dogs, or groups of deer were driven by people into a restricted area, from which they could not easily escape, where they could then be dispatched.

3.2 Methods

When this project was conceived, the cultural context had not been fully appreciated. Therefore, the questionnaire (n=22; Appendix IV) did not ask specifically about attitudes to and

perceptions of the red deer. However, in the semi-structured interview (n=19), participants were very ready to share their thoughts about the animals and their connection to, and responsibility for, the animals. These interactions may provide practitioners with a perception of these animals having a mental state that may also influence their perception of animal welfare (Spence et al., 2017), discussed in Chapter 6. Therefore, the results presented below represent a description of comments made by participants in the course of the semi-structured interview (n=19; Appendix IV), in response to any question. Comments containing words referring to the deer as a cultural icon or in which they were referred to as vermin or a pest (or any similar word) were considered for content, but a formal discourse analysis was not undertaken.

3.3 Results

The perception of red deer is one way to understand the motivation for individuals to participate in management activities or to seek employment within the industry. All participants (n=19) made one or more reference to their or others' personal attitudes towards the deer.

3.3.1 Cultural Icons

Nine of the 19 participants specifically and explicitly referred to the red deer as a 'Scottish icon'. One participant expressed it like this:

'... The Scottish government had a – they did a survey and asked 3000 people which is a big study – and the number 1 iconic species was the [red] deer ... what of course the public were talking about was the big stag on top of a rock ~ Monarch of the Glen – that was the number 1 iconic species ...'

This participant held the view that he was therefore a custodian of this aspect of the national culture. More generally, the view that the deer are Scotland's icon, indicates that there is a perception of a wider societal value of the deer. It is also clear from these quotations, that the attitudes to deer are quite different from the attitudes that might be expected if the participants had regarded themselves as merely 'pest controllers'.

3.3.2 Personal feelings about the deer

Most of the estate-based participants (13 of 15) talked about their relationship with the deer. A majority of these also offered opinions on indicators of individual and herd health, with a clear focus on the deer and their behaviour. Meanwhile, all four organizational participants expressed opinions with reference to population numbers in relation to habitat and the impact of the herd on the habitat. Although two of the governmental employees spontaneously acknowledged the view that red deer are part of a Highland culture, this was given as a reason for partial protection

(preservation of the species), but was not necessarily regarded as relevant to deer management practices. For example, this participant said:

'... I wouldn't eradicate them because they are part and parcel of us ... and again, you're going back in our psyche as well – man the hunter ... even in our culture we've 'stag parties' ... it's still very much a part of our [culture] ... and you can go back to things like Landseer and Queen Victoria ... I suppose it goes back to even like Medieval times, deer were prevalent ... [they were/are] food source, clothing, tools ...'

It was clear from the spontaneously offered comments of the estate-based participants that they had positive feelings about the deer, which were frequently expressed in terms of 'wonderment' or awe. For example, three of the 19 participants indicated that the deer had an emotional impact on them, saying that they perceived a spiritual aspect with their interactions with the deer. One participant spoke broadly about his many experiences, stating,

'... I've been on the hill on my own just to be out there ... And I could find myself, sitting with a flask of tea – just listening and watching ... there was something that could almost move you to tears ... just to experience that was ... Spiritual ... it's very hard to describe it ...'

Another participant also spoke of a specific interaction, with a stag, that was also described in an emotional way, and also used the word 'spiritual':

'...one time I was walking out on the top end of the ground ... and I'd been following deer in the rut ... so, you can kind of hear the deer – but, no idea of where they were, as such ... and I was going up a gully ... and all of a sudden the mist cleared – and there's this really big, big stag – standing broadside to me ... and we basically just stood and watched each other ... it was probably not more than – I don't think it would've been more than 50 yards from me ... and we both just stood ... [probably] 3, 4 minutes ... then it turned its head, very gradually – and just walked down the hill ... I've never experienced it again – but, it was just incredible, spiritual ...'

The two individuals from DCS, who themselves had a history of stalking, noted the estate-based practitioners hold 'respect' for deer, which was echoed by all 15 estate participants as well. 'Respect' for the deer was generally regarded to be a positive feature of deer management that was widely assumed.

3.3.3 Deer as a pest

Six of the 15 estate-based participants volunteered comments about the idea of the deer being pests, specifically stating that they thought the red deer were being treated "like vermin". However, it was clear from their comments that they regarded this as inappropriate and it was not a view that they held. Particularly in the east of the country, where the changing aims for estate management focused on grouse moors, there was a feeling that the deer were regarded as having

no value. One participant noted, '*... they've an idea into their head, like a lot of this other places, get rid of the deer ...*' in favour of grouse. Other participants suggested that governmental influence had resulted in the deer being considered vermin/pests. One participant stated,

'... the government - they're taking away all the basic principles of deer management ... the knock-on effect – both environmentally and financially ... and I am concerned about some of the things they're doing – they've almost reduced Britain's largest mammal down to vermin status ...'

Interestingly, even when particular behaviour of deer was acknowledged to be damaging, often the behaviour was described as being out of necessity for survival, rather than an inherently negative aspect of deer. For example, one estate-based participant indicated that red deer are more likely to come onto the outskirts of the estate in harsh winters and they are a pest when they eat fresh grass needed for sheep or when they stay and graze for longer periods of time than normal. This participant suggested that individuals, or small groups of deer, could be a pest, but he added that in these circumstances his aim was to scare the 'pests' away; killing one or more was a last resort, but occasionally necessary. He had also noted that the animals were iconic and thought they should be with respect and not treated like vermin.

3.3.4 Conflicted views

While none of the four organizational based participants specifically suggested that they saw the red deer solely as vermin or pests, the views they expressed were phrased differently to those of the estate practitioners. For example, they were more likely to discuss the impact of the deer on agricultural ground or unique habitats. Four of the 19 participants indicated the deer were a key aspect of nature: for example, one participant stated, "*we recognize they are an important part of natural heritage, in terms of their ecological functions and species*". Nevertheless, another organizational participant stated,

'... I think we should be shooting all deer ... I think from a culturist and naturalistic point of view – that they are degrading a lot of the habitats ...'

This participant, like the other agency participants, expressed a sense of conflict between the necessity to protect the environment and valuing the deer. Interestingly, however, these individuals resolved this conflict by expressing it as a tension between a personal view (i.e., culturally valuing, and even feeling affection for, the deer as an animal) versus organizational aims (the requirement to control a pest, which is a threat to the environment).

3.4 Discussion

In spite of the fact that there were no questions about attitudes to the deer, the semi-structured interview did allow participants (n=19) to express their views, and all of the participants made some comments – with many of them making lengthy statements – about the impact of Scottish culture and heritage on deer management.

The majority of participants – whether estate-based or agency employed – spontaneously offered the view that red deer are a Scottish icon and that they are part of the cultural heritage of Scotland. Interestingly, however, there was a sharp divide between the estate-based participants and the agency employees when it came to statements about the relevance of this observation. Many of the estate-based participants, who arguably have far greater contact with the animals themselves, said that they valued their personal interaction with the deer. For them, the cultural status of the deer was very important (Milner, et al., 2006) and this afforded the deer a certain status and respect. The consequence is that their attitudes appear to reflect the idea that they are ‘custodians’ of the deer, whose job is concerned with controlling the deer for the good of deer. They rejected the notion that the deer were simply pests and commented unfavourably on what they perceived was the view of the governmental agencies. Respect for the deer was a common theme: there was no dissent from the view that the estate-based participants believed the deer were deserving of respect.

By contrast, the organizational employees acknowledged the cultural status of the deer. However, justifying the views expressed by the estate-based participants, there was a suggestion that this cultural significance might get in the way of efficient pest-control as cultural significance creates a tension when it comes to population control. However, there may be a way for these diverse views to unite under value or ethical convergence through a transcultural agreement, between managers and conservation goals, on the value of red deer (Albrecht, et al., 2009).

Individual perceptions regarding pest or icon influence how participants interact with the species being managed and the relative value that they place on the animal and its habitat. This is a small sample from which to draw firm conclusions. Nevertheless, it highlights an area which has been under-researched and is deserving of more attention in future. In other countries, iconic animals, along with iconic spaces, such as those found in Yellowstone National Park in the United States (US), have found ways of coexisting with management which supports both vegetation and animals (Taylor, et al., 2014).

Yet, similar to red deer in Scotland, other populations of wildlife continue to struggle due to the conflict between status and the need to keep populations in control. Although few wildlife

species are as intensely managed as the red deer in Scotland, there are similar controversies surrounding a few other species, notably elephants in Africa, wild horses in North America, and, to some extent, wild hogs in Texas. These examples involve healthy populations of animals that need to be controlled and, at times, may have a negative impact on their environment. Elephants in (southern) Africa have a socio-cultural value, but they also have negative impacts on plant communities (Cumming, et al., 1997; van Aarde, et al., 1999; Lombard, et al., 2001). Loss of vegetation can lead to a reduction of biological diversity due to high elephant densities (van Aarde, et al., 1999). When elephant densities exceed 0.5 per km², savannah woodlands are converted to grasslands and/or shrublands (Cumming, et al., 1997). But killing elephants is highly controversial, especially in National Parks where tourism plays a major role (van Aarde, et al., 1999), and externally, where international pressure against reducing numbers in game reserves exists because other savannah woodlands are being lost to agriculture (Cumming, et al., 1997).

Horses evolved in North America, but became extinct around 12,000 years ago before being reintroduced by the Spanish conquistadors in the 1500s (Garrott and Oli, 2013). The introduced horses either escaped captivity or were purposefully released (ibid, 2013), and they spread throughout the North American continent. Today, the wild horse range is limited, but a few populations remain, most prominently in Missouri and the western US, as well as in western Canada (Rikoon, 2006; Garrott and Oli, 2013; Notzke, 2013; Bhattacharyya and Larson, 2014). Wild horses may be considered feral, exotic, alien, or introduced species by governments or conservationists (Rikoon, 2006). Management of these animals is influenced by socio-cultural significance as well as environmental impacts (Notzke, 2013). While culls might have occurred in the past, most wild horse programs use the more expensive option of removal and adoption as a way to reduce population numbers today (Godfrey and Lawson, 1986). In Missouri, local members of the Wild Horse League said that 'the horses have a critical historical and cultural importance as icons of regional identity, history ...' and were core symbols of marginalized communities (Rikoon, 2006). While the Wild Horse League in Missouri has been successful in stopping removal, clashes with Ozark ecosystem preservation and restoration groups has been increasing. This highlights an issue concerning competition between social groups for the ability to successfully impose their preferences onto the political economy, and therefore the landscape (ibid, 2006). In Western Canada, wild horses are being considered as reintroduced wildlife due to mitochondrial DNA analysis and through the adoption of a paleoecological perspective, which places them as a 'native' species, although they have a cultural relationship with the people as well (Notzke, 2013). However, not all peoples are represented equally in management decisions regarding wild horses, specifically the indigenous First Nations, who see these animals as culturally significant and iconic but are underrepresented (Bhattacharyya and Larson, 2014). Bhattacharyya and Larson (2014) show how, similar to the

situation in Scotland surrounding red deer management, power imbalances exist within the expression of environmental values in relation to wildlife management.

While the socio-cultural value of both the elephant and the wild horse influences their management, this is not always the case. In Texas, there is a feral hog (*Sus scrofa*) population, which is estimated to be around two million; the largest in the United States (Rollins, et al., 2007). They cause severe damage to the environment and to landowners, but are valued by hunters (Mapston, 2007; <https://oaktrust.library.tamu.edu/handle/1969.1/87218>; accessed February 2018). In 2014, damage to landowners was estimated to be over \$7,500 per landowner state-wide (Rollins, et al., 2007). Feral hogs cause both environmental and agricultural damage not just from rooting and wallowing, but from predation as well; they will not only consume vegetation, but will also consume and kill other wildlife and domestic livestock (Mapston, 2007). Furthermore, there are knock-on effects which include soil erosion and soured water sources, as well as the numerous diseases and parasites these animals carry (ibid, 2007). Feral hogs are free-ranging exotic animals in the state of Texas, and they may be killed by legal means year-round as there are no closed seasons (Mapston, 2007). In fact, the state of Texas often provides an incentive for hog hunting through tail bounties, or the County Hog Abatement Matching Program (CHAMP) which was launched in 2013 (Xu, 2013; <https://www.outdoorhub.com/news/2013/06/20/texas-to-pay-sportsmen-to-hunt-hogs/>; accessed February 2018).

These three examples involve healthy populations that need to be controlled. However, only elephants and wild horses have a socio-cultural influence which effects their management as is the case with red deer in Scotland. Diseased populations, such as deer with Chronic Wasting Disease (CWD) that is currently spreading across parts of the United States are a different case as far as management is concerned because they are diseased, and especially due to the nature of this particular disease. CWD is a neurological, or prion, disease that is spread through saliva and excrement, is always fatal for the individual deer infected, and cannot only kill a population, but, may overtime, wipe out all deer on the North American continent (https://tpwd.texas.gov/publications/pwdpubs/media/pwd_If_w7000_0859b.pdf; accessed February 2018). As most 'users' want to maintain some sort of access to the resource of the various deer species for food and sport, culling the animals infected is favourable with both government and non-governmental parties.

These examples concerning other species highlight management challenges across the globe and across all areas of land and landscape management. What is to take priority – wildlife or vegetation? And is there a way to balance the affects animals have upon the environment? The examples concerning wild horses on the North American continent and the elephants in Africa also

indicate that there is a question of 'who' gets to determine what the priorities are for resources. The feral hog issue has a very different social context compared with elephants or wild horses. However, they could be considered in terms of how to manage a population once it has become out of control.

Chapter 4: Knowledge, Information, and Decision Making

4.1 Introduction

Sustainable red deer management requires competent decision-making. Therefore, this chapter aims to examine how management decisions are made, whether these decisions are evidence-based, and what evidence is brought to bear in making them. To do this, it is necessary to understand the process by which knowledge and information is acquired and shared in the management of red deer. Who provides the evidence? How is it disseminated? How is it regarded? Who actually makes the decisions and what evidence do they have access to and use? In other words, the aim of this chapter is to provide a description of the nature of the social-ecological system within which the management of red deer takes place. In particular, asking whether/how does information from best practice guidance and site-based evidence come into day-to-day and/or strategic deer management planning.

It is widely accepted in the literature that unidirectional information flow provides a very limited basis for the creation or broadening of knowledge (Boyd and Richerson, 1988; Howe, 1998; Palincsar, 1998; Derry, 1999). In recent years some authors have focused on the interaction and dialogue between scientists and policy makers (Johnston and Soulsby, 2006; Young et al, 2014; Tinch et al., 2016), others have emphasized stakeholder inclusion (Barrow, 2000; Reed et al., 2014). Feedback loops between stakeholders modify received wisdom, and this generates new knowledge which can result in improved practices, which in turn are beneficial to natural resource managers (Howe, 1998; Barrow, 2000; Evely et al., 2011; Reed et al., 2014). Reed et al. (2014) note the importance of accepting that knowledge exchange is socially constructed, knowledge is exchanged in a non-linear process utilizing feedback loops (Evely et al., 2011), and that knowledge creation should be aware and produced with an awareness of those who are to use it, i.e. stakeholders and practitioners, and thus will have greater significance to users and potentially greater legitimacy and relevance. Perhaps even more importantly, when researchers and policy-makers ignore valuable information from knowledgeable sources, such as practitioners, a negative message is portrayed which disempowers them as care-takers of the resource (Ghosh et al., 2005; Johnston and Soulsby, 2006; Ostrom, 2007) the alternative message – that they are valued as sources of information – serves to increase their sense of responsibility for the consequences of resource-management decisions (Cash et al., 2003; Ghosh et al., 2005).

Ostrom's seminal (and Nobel prize winning) research on resource management is also relevant in this context, as she challenges the notion that the state must act to preserve common

resources because the market will ensure that the resource will be depleted, as suggested by Hardin, (1968). Specifically, Ostrom wrote “...*The extensive field research that challenged Hardin’s theory was also inconsistent with an immense body of work based on game theory and microeconomic theory of individual decision-making*” (Ostrom 2009a: 218). Her point was that to focus on just two the factors of ‘the market’ and ‘the state’ neglected the importance of social frameworks in resource management, the consequence of which would be to assume that decisions would be resource depleting. She advocated a polycentric approach, combining institutional layers and acknowledging the importance of resource users, who collectively organize and follow informal rules and practices in order that they do not destroy the common resource (ibid).

Therefore, the purpose of the present chapter is to explore the social-ecological systems in red deer management and asks: to what extent have the social systems developed, as Ostrom (2007) suggests they should, in order to preserve the underpinning ecological resources?

4.2 Methods

In both the questionnaires (n=22) and the semi-structured interviews (n=19), in addition to explicit enquiry about education, knowledge flows and the use of official guidance, there was also a wealth of evidence, both spontaneously offered and explicitly sought, about attitudes to expertise in red deer management, obtained either in a formal education context or by practical (possibly informal) experience. The results are laid out in three main topic areas: first, the variety of backgrounds (and therefore prior knowledge and expectations) from which the individuals entered red deer management; second, how expertise is acquired and maintained and how information flows within the industry; and finally, perceptions of how decisions are made.

4.3 Results

4.3.1 Avenues into red deer management

Question six of the questionnaire asked participants (n=22) to mark their highest level of education, and this is illustrated in Table 4.1.

Table 4.1 showing highest level of education for the 22 questionnaire participants (n=22)

	Post-16 School	College (ongoing)	NVQ	University degree	Post-graduate degree
Number	5	2	5	6	1

Although five participants had no tertiary education, the majority (14) had attended, or were attending, college or university. Two participants had just recently started an HNC course in

Gamekeeping and Wildlife Management at North Highland College, UHI, and a further 12 had already completed tertiary education, with seven of these being university degrees, including one post-graduate qualification. The questionnaire was intended to capture educational level, rather than educational content, and therefore the degree subjects were not asked for. Nevertheless, participants reported studying relevant subjects including: environmental management (1); land economy (1); ecology/zoology (1); wildlife management (1); biological sciences (1); and geography (1). Other subjects studied were finance (1) and, less obviously relevant, music (1).

The semi-structured interviews (n=19) explicitly sought to explore the participants' route into red deer management. What might be regarded as the 'traditional' route in - specifically either growing up on an estate or having experience of deer management and/or stalking from a young age - was indeed well represented in the sample. Four interviewees had older family members who were gamekeepers employed on an estate and a further seven were themselves the owner, or belonged to the family of an owner, of a sporting estate. Educational choices were not mentioned specifically as a way to become involved in red deer management. Nevertheless, four of 19 indicated they became involved with red deer management almost by chance, as an employment opportunity arose, with only one of these having prior awareness or experience of red deer management and the issues around it. At least three of these did have prior tertiary education in a relevant subject area (biological science (1); ecology/zoology (1); wildlife science (1)). From this, it can be concluded that non-traditional entry routes might be associated with a higher level of formal education, albeit with a lower level of prior direct experience.

Experience (Table 4.2) is regarded as key for gaining employment in red deer management: nearly half (8/19) of the interview participants emphasized the importance of gaining knowledge from other practitioners: they cited stalkers and peers, or having done an apprenticeship, as sources of personal information gained from others with more experience. Three of these participants stressed the differences between what could be learned in a traditional classroom setting compared to getting a hands-on, apprentice-style, education, with the latter being regarded as far more valuable in the context of red deer management. Specifically, one individual (who had had little prior experience of red deer management) explained that his university degree was less important than gaining significant experience in the industry in order to secure permanent employment on an estate. Another (whose grandfather worked on an estate) noted that he had made an explicit choice to do an apprenticeship, rather than go to university. This had led first to a semi-permanent position and finally, with enough experience, permanent employment on an estate. Two individuals who were employed by the Deer Commission for Scotland (DCS) had both grown up on estates and both

had university degrees. Nevertheless, they had returned to estate employment prior to gaining employment at DCS and reported that this was a relevant factor in securing their positions at DCS.

<i>Table 4.2: Knowledge Sources for Red Deer Management Practitioners in Scotland, UK (similar to Sutherland et al., 2004). This table shows the value of knowledge gained from personal relationships within the red deer industry in Scotland.</i>		
Knowledge Source	Number of Participants	%
Learning from older generations/Exposure at young age	13	68
Other Stalkers/Peers	8	42
Apprenticeship	6	32
Owners who rely on stalker's expertise/learn from keeper	5	26

The evidence points, therefore, to the conclusion that prior experience is regarded as much more important than formal or classroom education for entry into this field of management. Indeed, practical experience is absolutely necessary.

4.3.2 Information channels

The evidence suggests that hands-on personal experience while learning from others who are more experienced is perceived to be the most important source of information relevant to both day-to-day as well as strategic (longer-term) management decisions. It is therefore pertinent to ask how – by what channels – this experience is gained.

Figure 4.1 depicts the participants' responses in the questionnaire (n=22) regarding the channels of information that inform their management decisions. Participants were given a list of potential channels of information and asked to indicate all that applied, therefore the numbers in the table are greater than the number of respondents, with the majority of respondents indicating at least two sources. One indicated only one source, two did not indicate any (incomplete questionnaire), while the maximum number of sources anyone indicated was 10.

The majority (16/22) indicated that peers were important channels of information, with 13 naming specifically 'the Owner' or 'the Factor', both of whom are likely to have greater experience, and not just greater authority. This indicates that interpersonal interactions with other practitioners are key. Nevertheless, the same number (16/22) named either Deer Commission for Scotland (DCS) or Scottish Natural Heritage (SNH) (which, as of 2010, have been merged) as important channels of information. Document-based information channels (many of which are produced by DCS/SNH or professional organizations), such as research reports (13/22), magazines (7/22) and websites (3/22), were also cited frequently. In addition, the elaborations accompanying 'other' (7/22) explicitly named professional organizations (Scottish Gamekeepers Association (SGA), British Deer Society (BDS), Deer Management Groups (DMG)), which are likely to be behind many of the document-

based information sources. 'Professional communications' were also cited, with examples being journals, deer newsletters, and conferences/seminars, which while not, strictly speaking, document-based, have more in common with document-based channels than with the interpersonal interactive channels of information.

Perhaps most important to note is that college/university education was not cited as an important channel of information. Although 12/22 were college educated (see Chapter 2), this was clearly not regarded as relevant to maintaining current information and staying up-to-date with best practice. Respondents were not asked to comment on the value of their college/university education in terms of foundational knowledge or, indeed, whether a college education was more likely to make document-based channels of information (in particular, documents such as formal research reports) more accessible. Overall, the conclusion is that while people are perhaps regarded the most important channels of information, it is noteworthy that there is not an outright rejection of any source. In particular, government and research sources (including trade papers, website and professional organizations) are all regarded as important.

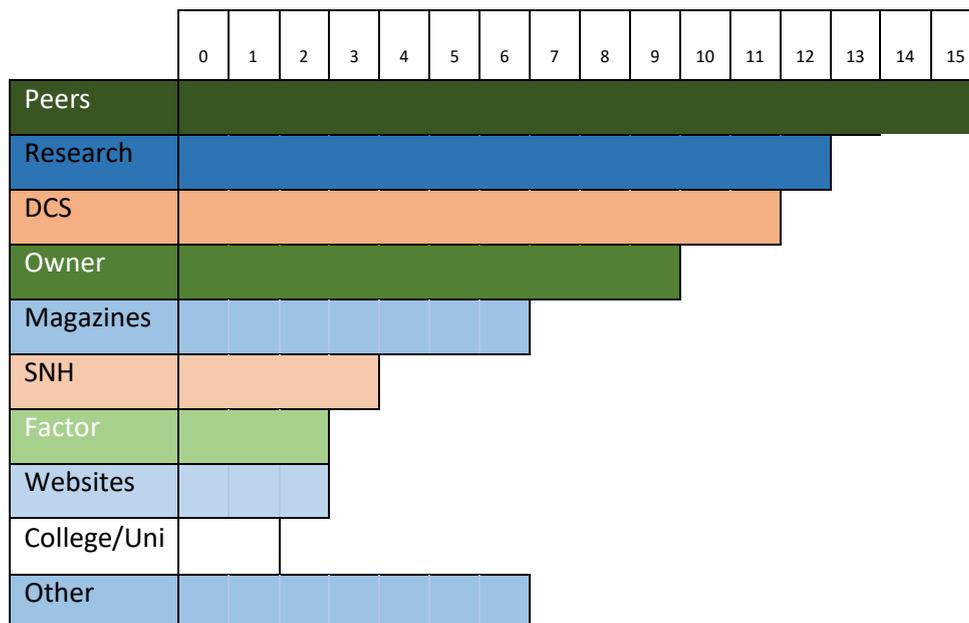


Figure 4.1 showing where respondents said were important channels of information. Sources that are 'other people' are coloured in shades of green; Government sources (Deer Commissioner for Scotland (DCS) and Scottish Natural Heritage(SNH)) are shown in shades of orange; research and reports (including magazines and websites) are shown in shades of blue.

In terms of research and the impact of this on red-deer management decisions, the interview participants (n=19) were clearly aware both of its existence and the importance of

accessing science-based research information, either directly from research reports or indirectly through professional magazines or websites. Nevertheless, a sizeable (albeit minority) of six volunteered their opinion of research, being that some of it is 'rubbish' or lacks knowledge of significant aspects of red deer management. Six participants indicated that 'numbers' (referring to scientific data) do not necessarily provide an accurate picture of reality. They also suggested that scientific models are 'inadequate' or even lacking altogether. One participant explained, in detail saying,

'I don't really go with the SNH measurements, well for a start they don't measure it, their habitat assessment is flawed and incomplete it doesn't take into account of all the factors ... it's not a good science.'

This participant went on to say,

'I think most of the conflicts that arise lack science ... the bodies that pronounce on these things make statements that they can't back up with any external science ... and the external science that's done, they don't concede has any value – like the work done at Letterewe ... And the government people ... well, the government hasn't commissioned that research at that level of detail ... at any time ... there is nothing written by government agencies to parallel that ... and the government people don't like it because they didn't write it ... they simply don't have the money, or the will, to pay for top-class habitat ecologists and habitat scientist to do that work ... that work is a very important bit of work ... it should be utilized, but they don't have a template, they don't have a proper scientific model ... for example, SNH designated [a site] 22 years ago without a base-line audit and to suddenly declare out of the blue it's not meeting standards ... they never did base-line studies ... they just come along from time to time and make some airy comments – that's NOT science...'

They also note that there are areas that should have been subjects of research, but which had been neglected, such as human disturbance effects on red deer populations (outside of regular recreational areas), deer behaviour, and tree regeneration with and without fencing.

Three participants were aware of ongoing research into aspects of sustainability, which had been commissioned by the Deer Commission for Scotland DCS in 2009. Five participants brought up the extensively-studied red deer herd on Rum (specifically, the data concerning reproduction rates), while four participants were aware of other ongoing research on red deer, including DCS research. Although not specifically citing the research on Rum, nine participants were, correctly, aware that 'research had shown' that hinds had not always been culled sufficiently. Without necessarily attributing the findings to any specific research report, the majority of respondents (16/19) explicitly stated that they were aware of scientific support for habitat-based red deer management and the fact that the ground condition determines the number of red deer an area can support. Five participants did, specifically mention one study undertaken at Letterewe Estate (Milner et al, 2002):

all five (independently and without prompt) said they considered it the ‘best’ and ‘most comprehensive’ scientific study undertaken on red deer management in Scotland and believed that should be important for informing management decisions at a strategic and practical level. Interestingly, however, the same five also expressed a lack of confidence that it actually did have an impact and that it would be ‘ignored’ or ‘disregarded’ by the governmental agencies. A participant said,

‘...how did they determine that number? No one knows ... it’s not – it’s just appealing the DCS isn’t it? ... and when there is some evidence that they don’t want – they just ignore it ... makes you wonder ... it really all should be balanced ...’

In discussing research, participants expressed strong opinions regarding how research is understood and applied. Eight participants specifically noted that organizations appear to either disregard or ignore valuable research; lack an interest in red deer management research; or have a narrowminded perception on how to manage a sustainable red deer population. And eleven participants stated that they felt as if governmental agencies used data only if it supported their political agenda. One participant said,

‘... they aren’t scientists – they call themselves scientists, but they aren’t ... they are people with a scientific degree who are doing contractual work ...’

This participant also said he has asked organizations,

‘...WHERE’S the science – you’re long on views – WHERE’S the science?????? ... And the ANSWER is, there is NO science!! They DON’T do science ... they have these views ...’

A different participant stated,

‘...and there’s politics in that as well ... Some of the science is rubbish, while other is disregarded ...’

Several conclusions may be drawn from these responses. Firstly, the respondents expressed a confidence in research as a process. However, they also expressed less confidence that it would be impactful, either because practitioners could not influence the research agenda (are researchers asking the right questions?) or because agencies would not apply the research findings (do policy and decision makers listen?)

4.3.3 Flow of Information

Clearly, there is a perception that there are factors that are inhibiting the flow of information. To try to understand how information flow works within this complex polycentric

system, questionnaire participants (n=22) were asked to describe how they perceived the information flows. Although fifteen participants responded to the question, eight of the answers were insufficiently descriptive for further analysis. For example, some respondents gave single word answers such as “reading” or “frequently discussed”; others responded that information flows were “inconsistent” or “ad hoc”; and four participants said the primary flow of information was exclusively between peers.

Four of the responses gave particularly detailed elaborations, which provide some additional points of note. In particular, it became clear from these elaborated answers that there was a disconnect between the perceptions of those working at agency or governmental organizations and those working on the estates. One agency respondent explained that site-based evidence was obtained by monitoring carried out by the agency. This monitoring is mainly concerned with habitat and a deer-population management policy. The implementation of these strategic decisions (in other words, the actual management of deer numbers), is carried out by stalkers who may be contracted specifically for the purpose of culling a certain population of animals or culling animals at a certain location rather than employed year-round by an estate. These individuals are expected to follow best practice guidelines and guidance from Deer Commission for Scotland/Scottish Natural Heritage (DCS/SNH). However, this respondent did state, that as an organization, Scottish Natural Heritage (SNH) is not necessarily concerned with selectively culling, rather reduction of numbers is their priority. Thus, the view of this respondent was that the strategic management decisions are made by a separate stream of knowledge than the on-the-ground decisions made by individuals performing the culling. While the agency monitors and evaluates the site, the stalker is only given numbers of animals to cull and is expected to follow best practice guidelines (see Chapter 1). This ‘top-down’ view of deer-management was echoed by another agency respondent, who went even further and suggested that all management decisions ultimately originated from legislation, albeit interpreted in its implementation by the context of landowners’ interests. As the landowner interest is dependent on the type and location of land, the requirements of legislation and conservation guidance that is acted upon by the practitioner (i.e., the stalker) is filtered by the landowner. Although this view appears to allow for input from the estates’ perspective, it is nevertheless still a top-down enforcement allowing for a small degree of local interpretation.

These agency-views do not correspond to the views of the estate-based practitioners. One estate respondent suggested that there were nested feedback loops, with influences on decision-making from various sources and channels, and that the day-to-day decisions made by practitioners were modified according to not just monitoring (performed by individuals or agencies) and research, but also practitioner development and knowledge (i.e. better tools, techniques, and experience). Two others, one of whom was the landowner and the other (his son) was the current head-stalker

for the estate, also stressed that there was a dynamic system, with constant re-evaluation of best-practice guidance, deer numbers, habitat monitoring, and the more practical considerations like weather conditions, client interests, and estate aims such as agriculture concerns or forest regeneration projects.

4.3.4 How are decisions made?

In addition to understanding how information is gathered and flows, it is important also to establish how it is used in the decision-making process. Therefore, the interview participants (n=19) were asked about the process of decision making. The use of a deer 'management plan' would be expected if deer are being managed strategically and the strategy is being implemented on-the-ground. Although only four respondents explicitly used the phrase 'management plans' in answer to the basis for making specific management decisions, others used expressions that clearly suggested that there was a plan in place. For example, 'deer numbers' (4/19) or 'land'/ 'environmental' management (5/19), both indicate that there is an explicit target for deer population control with consideration of the wider ecosystem: this would be the basis of, and contained within, a management plan. Other elements named that would also be expected to be contained within a management plan included: science, habitat, weather, neighbours, deer counts, deer condition, estate needs, environmental issues, venison, fences, forestry, income, knowledge, and sporting interests.

However, apart from implementing a deer-management plan, some respondents raised other factors that impacted on day-to-day management decisions. One respondent wrote, '*at present, we're part of this Section 7 – so we're compelled to implement things ... politics is becoming an over-riding factor.*' As detailed in Chapter 5, Section 7 covers culling of deer, usually for ecological conservation concerns, under the Deer Act (Scotland) 1996, and later WANE 2011 (see Chapter 1), which is an exceptional measure out-with a routine deer-management plan. A second similar response suggested that the perception was that the main factors entering into decision-making were: finances; government policy; and the landowner's objectives. This respondent went on to explain, that it is the landowners and/or estate employees who make the strategic decisions regarding red deer management, with the welfare of the deer being the responsibility of the individual culling the animals.

4.4 Discussion

Overall, the majority of the evidence from both the questionnaire and the interviews indicated that all parties involved in red deer management recognised the importance of sharing information and making evidence-based decisions. Nevertheless, what is clear is that there are

differences in the perception of different sources of evidence according to the respondents' perspective, with the agencies suggesting that a top-down management strategy should be implemented according to published guidelines. Estate practitioners, on the other hand, stressed the importance of other channels of information, in particular peers but also research findings, while expressing some lack of confidence that the agencies were listening or even open to information exchange. This fits with the work presented in the introduction to this chapter, supporting the view that communication with peers allows new information to be better understood and more effectively disseminated throughout the industry (Boyd and Richerson, 1988; McMahon, 1997; Howe, 1998; Palincsar, 1998; Derry, 1999).

The evidence presented here indicated that individuals associated with governmental agencies believe that the primary information flows lie in one direction – from the top down. Even when it is acknowledged that site information is relevant, it is only so in the context of matching the current habitat condition to the desired habitat condition. This is based on legislative policy which aims to ensure the 'Natural Heritage' of Scotland, presumably meaning the viability and functional integrity of these ecosystems. The role of governmental agencies, from the perspective of those within, is to enact policy and to provide best practice guidelines to practitioners. Landowners are seen as making decisions based on the location and type of land which they own and their own management priorities, but in the context of generic guidance, unless the government intervenes with a Section 7 or there is a site designation (i.e. SSSIs, etc).

By contrast, estate-affiliated respondents had very different views of information flow in the red deer industry. Three individuals: a factor, a landowner, and a gamekeeper provide easily comprehensible models of information flow. The factor suggested there are three pillars: experience, research, and development, which are consistently flowing between each other, enhancing and informing the other pillars. The landowner and gamekeeper collaborated to generate their information model. They concluded that there are four main aspects (best practice guides; deer numbers; habitat monitoring; and practical considerations: weather, estate aims, clients, etc.) which always inform management decisions and these information sources are continually interacting with each other in a continuous multi-dimensional feedback loop, where each aspect influences the others and collectively informs decisions. This model seems to suggest that the aspects provide a real-time view such that decisions are made with the best information possible.

The different perceptions of the information flows illustrate the disconnect between the perception of people working for government agencies, who often have very little first-hand knowledge of estate workings and that of those responsible for the day-to-day decisions on the estates. Understanding this disconnect and its implications for communication is important in order to

maximizing information flow and dissemination (in particular, for example, sharing the findings of pertinent empirical research) to ensuring that both legislation and guidance for red deer management are informed by evidence. The management of wild animals in other contexts has been found to benefit from scientific evidence. In Scotland, Thirgood and Redpath (2008) studied the conflict between red grouse and hen harrier management aims. They found that evidence-based management that involved a dialogue between stakeholders, policy-makers, and scientists is necessary to guide management, especially in areas where human livelihoods are at stake and legal issues are involved (ibid, 2008). However, scientific evidence can also be used as a source of conflict in animal management. Regarding the elephant culls in South Africa, Dickson and Adams (2009) found differences between pro and anti-cull supporters, who both use science as a source of authority, albeit with different interpretations of the evidence. In addition, there was also a perception of political and economic motivations for elephant culls, which promotes more distrust between these two groups (Dickson and Adams, 2009). Although elephant culls resumed in South Africa, these challenges are still on-going (ibid, 2009). More broadly, perceptions of climate change, and specifically the science it is based on, has varying degrees of trust (Weber, 2010). Forsyth (2003) suggests that all environmental science is influenced by the society and political landscape in which it originates, while Clayton and Opatow (2003) indicate that community identity, both personal and collective, over any form of science, determines if values of sustainability, and thus sustainable behaviour are adopted.

Rose (2010) concluded that for sustainable management of red deer in Scotland, there was a need to minimize governmental bureaucracy; increase available public funding; and use independent facilitators who were both trusted, and knowledgeable. This study emphasizes the need to develop monetary indicators to measure cultural and environmental benefits relating to ecosystem services. However, there are also the values of aesthetics and the emotional benefits to the public to consider, neither of which are easily identifiable in monetary terms (Pullin, 2002). Rose (2010) also calls for better information, guidance, and advice as to the roles of individuals, so that they may take ownership of the information and thus perform actions. The importance of practitioner knowledge has been acknowledged in other areas of environmental management (see Chapter 1). Nevertheless, even while acknowledging the experience and knowledge of practitioners, there is a legal framework within which they operate.

A potential basis for the differences in perception between governments and practitioners in management conflicts may be a lack of clearly defined aims. For example, conservation aims might state habitat conservation, rather than specific goals of percentage of specific vegetation across a certain area. O'Leary and Bingham (2003) suggest that while governments approach environmental concerns in a 'value for users' manner, there is little evidence regarding what the value of

environment, or conservation, goals really are and how it might correspond to social desires (or public interest), and what management actions contribute to, or correlate with, real outcomes. While wildlife conflict mediation is the focus of their discussion, they do emphasize the need for stakeholder parties, including practitioners, researchers, and agencies, to have active discussions about desired outcomes and agreement on how measurements are to be determined (ibid, 2003).

Additional examples of animals having a socio-cultural value to segments of society that are not included in decision making include Kangaroo management for commercial meat production in Southern Australia (Thomsen, et al., 2006) and wild horse management in Western Canada (Bhattacharyya and Larson, 2014). In these cases, it is indigenous communities, rather than practitioners who are excluded from influencing management practices. These communities have a vested interest in the management of these species and their exclusion causes conflicts.

Chapter 5: Legislation and Implementation - voluntary or not?

5.1 Introduction

Management of red deer, or of any wildlife species, is usually a combination of government legislation, legislatively-created management organizations, and individual practitioners who perform the actual management of the species. In an ideal situation, the legislation would reflect a consensual view of how the animals should be treated, however there is often a disconnect between legislative framework and the practices of management. Policies based on legislation may attempt to bridge this gap, but there are additional complexities arising from differing objectives such as the conservation of landscapes. Interpretation of the law and what it aims to achieve is another area that may result in difference or conflict.

The first legislation solely concerned with Scotland's deer was the Deer (Scotland) Act 1959. The aim of the act was 'to further the conservation and control of red deer in Scotland; to prevent the illegal taking and killing of all species of deer in Scotland; and for purposes connected with the matters aforesaid.' Parts of this act were highly beneficial for deer managers as it clearly sets out poaching laws and penalties and sets closed seasons (stags 21st October – 30th June; hinds 16th February – 20th October). This act also created the 'Red Deer Commission (RDC),' which was set up for 'conservation and control of red deer' and were granted extensive powers, including: power to deal with marauding deer, control schemes, liability of owners, enforcement, recovery of expenses, disposal of carcasses, and land entry. Interestingly, within these powers, the 'control scheme' section stand out because it provides the commission the ability to 'specify whether the red deer in that area or any part thereof are to be reduced in number or exterminated.' However, if deer numbers are to be reduced, 'how' the reduction numbers are to be determined is conspicuously absent. Furthermore, within a control scheme, the commission cannot 'impose ... a requirement to construct a fence...' Both the word 'exterminate' and the restriction of using a fence, seem to be in conflict with the ideas of 'conservation and control.' The Deer (Amendment) (Scotland) Act 1982 revised the functions and the composition and operation of the Red Deer Commission as well as adding provisions for game dealing, revising penalties, clarification of terms, and provisions for deer farming and firearms and ammunition. The Act also specified offenses. These restrictions appear to support the aim of the previous legislation of 'conservation and control.'

Table 5.1: Other Relevant Animal Related Legislation

Year	Legislation
1822	Martin's Act
1828	Night Poaching Act
1862	Poaching Prevention Act
1981	Wildlife and Countryside Act
1987	Animals (Scotland) Act
1990	Environmental Protection Act
1991	Agriculture Holdings (Scotland) Act
1994	The Conservation (Natural Habitats) Regulations
2002	Protection of Wild Mammals (Scotland) Bill

Interesting changes occurred at the end of the 20th century. Much of the previous legislation was repealed in favour of new legislation in the form of the Deer (Amendment) (Scotland) Act 1996, c 44, passed 18 July (DASA 1996). The 1996 amendment changed the name of the regulation body from the Red Deer Commission (RDC) to the Deer Commission for Scotland (DCS). Additionally, the 1996 amendment limited the board members to nine people, one-third of which were to have 'knowledge or experience' of 'deer management,' which appears out of proportion considering the board members are there to manage deer. Though prevention of damage to woodlands and agriculture land were still its primary focus, a new section was introduced for management of deer in relation to 'natural heritage.' In DASA 1996, s6(A)(A), 'natural heritage' is specified as woodland, and can be managed only if the 'presence on the land in question of a significantly higher density of the deer population than is usual in all the circumstance.' Furthermore, DASA 1996 s 7, Control Agreements and Control Schemes, was greatly extended from five brief points in the 1959 legislation to a lengthy, 10 criteria with many defining sub-points. Section 7 states 'any such scheme, before it comes into operation shall require confirmation by the Secretary of State.' However, this 'does not apply ... to any control agreement ... for the purpose of altering or enhancing the natural heritage.' Essentially, this last excerpt seems to suggest that red deer can be greatly reduced or even exterminated as determined most appropriate by DCS, as long as it is justified for natural heritage purposes. Furthermore, the government does not even need to approve these extreme management operations.

This act does not indicate if the control agreements are to be based on scientific evidence, or if it is solely down to the perception of the governmental organizations tasked with enforcing this legislation. Interestingly, 'including their welfare' is added into this amendment in relation to 'driving' deer and 'moving vehicles' which was changed and confined to mean 'aircraft, hovercraft, or boat.' Additionally, 'enclosures' replaced 'fence' and is only used when describing 'enclosed land or un-enclosed land.' This piece of legislation appears unfavourable to red deer, especially in

regards to their interaction with the natural heritage of Scotland. However, it can be argued that red deer are a valuable part of that heritage.

Six days later, the Deer (Scotland) Act 1996, c 58 was passed (DSA 1996). It has four extensive areas totalling 48 sections or statutes along with six schedule sections, and it repealed much of DASA 1996. The first part deals with the Deer Commission for Scotland (DCS) as the regulatory body regarding Scotland's wild deer. This section broadly defines who should be board members, advice to the Secretary of State, the power of DCS to facilitate exercise of functions, and the appointment of panels. The second part, entitled 'Conservation, Control and Sustainable Management,' is in four main sections and defines closed seasons, control agreements and control schemes, emergency measures, as well as supplementary provisions for control agreements, control schemes, and emergency measures. The law indicates that:

'(a) the taking or killing is necessary –

to prevent serious damage to any unenclosed woodland which forms part of that land, or serious damage, whether direct or indirect, to the natural heritage generally; or in the interests of public safety; and

(b) no other means of control which might reasonably be adopted in the circumstances would be adequate.'

The 'other means of control' is not clearly defined, nor is 'reasonably adopted.' The mention of fences or enclosures as potential 'means of control' is conspicuous by its absence. Additionally, there is no mention of the need to use animal welfare standards within this section on 'taking or killing is necessary.'

DSA 1996, s 6 provides little assistance in relation to the definition of 'control areas.' This section simply states, 'In this Act the area to which a control agreement or a control scheme relates is, in relation to that agreement or, as the case may be, scheme, referred to as the 'control area.'" DSA 1996, s 7, 'Control Agreements,' expands on the reasons to take or kill deer. This section actually refers more towards the powers of the Deer Commission for Scotland (DCS) and the ways in which control agreements are to be created. Section 7 does, however, define 'natural heritage' – 'For the purposes of subsection (1) above the "natural heritage" includes any alteration or enhancement of the natural heritage which is taking place, or is proposed to take place, either naturally or as a result of a change of use determined by the owner or occupier of the land in question, and "damage" shall be construed accordingly.' Further to Section 7 is DSA 1996, s 8, 'Control Schemes,' which states that DCS may carry out the taking or killing of the deer themselves, but places no provisions on how this is to occur, or if animal welfare is to be taken into account while the DCS operations are ongoing. Section 9 refers to the ability of DCS to recover expenses from landowners should they have to act on

a Section 8. Section 10, 'Emergency measures to prevent damage by deer,' again defines DCS powers and allows for DCS to take or kill deer as they deem necessary regarding 'emergency' situations. But again, specified provisions, such as the need for scientific evidence or any need for animal welfare, are absent. Section 11 describes the 'Application of a Section 10 in relation to natural heritage,' which here, is defined only in terms of forestry and deals with enclosed and unenclosed forestry. Section 13, defines 'Offences in relation to Part II.' Section 14 refers to 'Limitation of Criminal Liability' for DCS staff or contract employees. This limitation of criminal liability is in direct contrast with the need for accountability as identified by Cash et al. (in review), Cash et al. (2003), and Ghosh et al., (2005). DSA, s 15 allows DCS staff to enter private land at '... any reasonable hour,' and Section 16, 'Service of Notices,' states that all control agreements and control schemes are to be put in writing. Sections six through 16 essentially provide DCS unrestricted power to kill, or force other red deer practitioners to kill as many red deer as they decide. There is no apparent balance of power, nor does there appear to be any repercussions available to the landowner to prevent a slaughter. Additionally, the focus on the exceptions and exemptions for individuals to circumvent the law not only appears rather unfriendly to the Scottish deer species, it also brings into question the accountability of the government organization in charge of managing these animals, any concern for animal welfare, or any type of real protection of these animals from prosecution.

Finally, the last section of the 1996 Act deals with enforcement, licensing of venison dealing, and miscellaneous provisions. These sections cover everything from providing kill numbers to regulations regarding farmed deer and court cases. DSA 1996, s 45, 'Interpretation,' defines meanings of words used within the Act: deer, deer management, enclosed, natural heritage, red deer, vehicle, woodland, etc. Of the Schedules, two are of considerable interest. DSA 1996, sch 2, 'Provisions as to control schemes,' states that control agreements and schemes must be issued to landowners and published in newspapers, along with other basic provisions. However, within sch 2, number 13 is interesting in that it states, '(1) Subject to sub-paragraphs (2) and (3) below, a control scheme or any variation or revocation of such a scheme shall not at any time be questioned in any proceedings whatsoever.' This part of DSA 1996 allows the Deer Commission for Scotland (DCS) to manage the deer in Scotland completely uncontrolled and beholden to none. They do not have to justify their actions, nor the extermination of deer, and any management they choose to perform cannot be questioned in any legal proceedings. The unchecked power appears circumspect, especially in a democratic society. Furthermore, it creates the question of who is to be held accountable for responsible management of this resource if the law itself removes all accountability from the agency in charge of deer management. Finally, in DSA 1996, sch 6, under 'Transitory Provisions,' the closed seasons are defined.

The Deer (Scotland) Act 1996 is a rather interesting law. It firstly and primarily defines the Deer Commission for Scotland (DCS) powers. While it briefly covers offences, there has been considerable effort dedicated to create exemptions for the regulatory offences. Furthermore, there is little in regards to rights of landowners, deer managers, or regarding the humane dispatching of the doomed deer. Based on other legislation of a similar nature – Wild Mammals (Protection) Act 1996 and Wildlife and Countryside Act 1981, one would possibly expect more regulations, rather than the high number of exemptions. Although the second part of the 1996 Act is entitled, ‘Conservation, Control and Sustainable Management of Deer,’ conservation and sustainability are neither defined nor discussed. There is also no mention of animal welfare or welfare standards for dispatching, nor the Best Practice Guidelines. DSA 1996 holds a general tone of being antagonistic towards all deer species. It would appear as if this legislation was functioned to provide DCS with as many options and powers regarding their role as a regulatory organization as possible, while removing any possible reprisal for their actions and all accountability of responsible management of this natural resource. Interestingly, as discussed in chapter one of this thesis, accountability is very important for sustainability, environmental management, and for getting practitioners to accept and assist with necessary management action (Cash et al., 2003; Ghosh et al., 2005).

The research in this thesis was being carried out while The Deer (Scotland) Act, 1996 was in effect, prior to the creation of the Scottish Parliament’s The Wildlife and Natural Environment (Scotland) Act (WANE) which was out for consultation. Thus, the following results and discussion focus on the differing views surrounding The Deer (Scotland) Act, 1996. WANE is noted in the Introduction (Chapter 1, Section 1.6.1, number 2) since it has become the newest legislation focusing on red deer management in Scotland.

Deer Scotland Act (DSA) 1996 shows the steady development of deer legislation where previous legislation focused more on deer, this act focuses on ecological protection. Deer Commission for Scotland (DCS), as the enforcers of DSA 1996, have initiated forced, large culling exercises due to designated site degradation. Most of the priority sites are also joint-working, which means that there is agency cooperation to determine condition status of the designated sites as well as creating a management plan for them. The forced culls were located on designated sites, and the most well-known of these forced culling exercises took place at Glen Feshie and at Caenlochan. Glen Feshie took place in 2004. According to a governmental report, Glen Feshie is a Special Area of Conservation (SAC) as well as a Special Protection Area (SPA) within the Cairngorms due to the Caledonian Pine forest (SEERAD: LURP, 2004). It is also a special protection area relating to the EU Habitats and birds directive. It was concern for the regeneration of the Caledonian Pine forest which initiated the management action. Initial, emergency culling took place, with subsequent culling

throughout the next few months. Although DSA 1996 does not allow judicial reprisal, practitioners were able to motivate the Scottish government to investigate the Deer Commission for Scotland (DCS) action. The SEERAD:LURP report (2004) does acknowledge that there were occurrences of compromised animal welfare and that best practice guidelines were not adhered to. The report indicated that as the regulators of legislation, and being a government body, the DCS should set the standards and embody best practice. The Glen Feshie cull was the first time the DCS enforced legislation. This chapter aims to explore how practitioners perceive the legislation and Section 7 Agreements through Caenlochan, which was an enforced cull ongoing at the time of this research.

5.2 Methods

The semi-structured interview (n=19) provided the platform for the participants to discuss in detail their perceptions of red deer management across Scotland. Question 6 asked participants their opinion on red deer management decisions being made in their area (outside of their own decisions and estate). Questions 7 and 9, which asked about influences on management decisions and the biggest challenge to red deer management, were designed to allow practitioners to discuss conflicts and areas of concern. This section considers both governmental and estate-based participants perceptions on The Deer (Scotland) Act 1996, specifically practitioners perceptions of Section 7 Agreements and the basis for large culling exercises.

5.3 Results

5.3.1 How is Section 7 perceived by government agency participants?

While four participants of the semi-structured interview were governmental organizational employees, two specifically worked for the Deer Commission for Scotland (DCS), which was the governmental body responsible for implementing the 1996 Deer (Scotland) Act. This section focuses primarily on these two employees and their accounts and understanding of Section 7 Agreements.

5.3.1.1 Why are Section 7 agreements made?

First, the two Deer Commission for Scotland (DCS) participants explain a Section 7 Agreement. One governmental employee described Section 7 agreements, ‘...[they are] very focused on deer management and looking at reducing deer densities ...it’s very prescriptive and legally binding ...’ A benefit to a Section 7 agreements, as indicated by the other governmental employee is that ‘...as well as the estates being legally bound to carry out the management, DCS is legally bound to carry out this programme of management which might would include deer census and habitat impact assessment...’ The two governmental individuals believe that Section 7 agreements provide a

useful management framework when they expressed, '... [they] give a legal framework and give both the agencies and the landowners some comfort in that ... either side will hold up the bargain and carry out the work that's prescribed ...'

These two participants explained in detail the various aspects of The Deer (Scotland) Act 1996. One participant explained:

'... the section 7 is a legally binding document ...so, between SRD (Scottish Rural Development funding) and section 7 there is a 'memorandum of agreement' option ... so that's a more informal type situation ... then there's the section 7 option, the control agreement, and then we can also require them, under section 7, to carry out that control, so that's not voluntary ...'

He also explained a Section 8:

'...we can also take action under section 8 of the deer act, which would be DCS carrying out the control for them and possibly providing them with the bill for it ... so that would be a very last resort... we would always try and go for something where we had landowner's commitment and agreement to carry out the work that was necessary...'

Additionally, other agencies have a great deal of power to enforce legislation as well. One governmental participant stated:

'... our other sister agencies, like Scottish Natural Heritage, have other options that they can use as well ~ land management orders and then they actually have the option to purchase land compulsory as well ... but that would be in extreme circumstances ...'

The Deer Commission for Scotland (DCS) employees explained how Section 7 Agreements are drawn up. One participant explained, '...it's only in areas where the DCS has an interest – section 7 agreements, joint-working sites, that we'll set cull targets...' He said that DCS will have an interest in designated sites, SSSI sites, or where other organizational bodies, such as Scottish Natural Heritage (SNH) have interests. One participant explains how Section 7 Agreements are drawn up:

'... within all of these management agreements we would consult with ecological advisors at SNH, as well as the estate and look at ... the minimum population they would accept ... and then we would speak to an ecological advisor within SNH and say, what is the appropriate deer densities for each habitat, or appropriate levels of herbivore impact for each habitat ... and the estates would sign up, not necessarily to culls, but to sign up to an agreed population level or an agreed density ... as well as agreed herbivore impact - targets ... well I mean we always work with SNH to try and kind of set those herbivore impact classes ...'

The other Deer Commission for Scotland (DCS) participant explained:

'... so [estates] are really signing up to two things: the primary one being the herbivore impact targets and then the secondary one being, the deer population or the deer density levels ...'

5.3.2 The view of the estate-based participants

The estate-based practitioners held a different view of Section 7 Agreements. The majority of the estate-based participants (10/15) were not involved with a Section 7, but they shared their concerns regarding animal welfare (see Chapter 6). The five estate-based participants that were either geographically close or were participants in the Section 7 share their perceptions. One participant stated,

'... but you are being threatened by the Deer Commission ... that if you do not kill this deer, they will get a Section 8 ... come in and do it for you and bill the estates ...'

Two other participants, also involved in the Caenlochan culls, who were interviewed together said,

'... [DCS] threatened us with a section 8 – which is basically getting the government in and helicopters and obliterating everything that moves, walks, breaths, whatever ...' The other participant agreed, stating, '... and they would – they've done it before – in other places ...'

These two participants continue, with the second saying,

*'... I think the East Grampian Deer Management group really has **no** say in what we do ... a lot of us have a natural suspicion – and resistance to what we've been told to do ...'*

This participant went on to discuss animal welfare issues (see Chapter 6). The first of these two said,

'...I disagree with the way that they are doing it, and going about it – and the way that they are pressurising us ... I understand that some people needed a push ... BUT, there are more estates that are prepared – and attempt – to toe the line – and try to do what they can, than not ... and when somebody turns around and starts threatening you – then that's when all the other estate people start to think [with that attitude] why should we bother doing anything for you ...'

The estate participants (5/5 involved in Caenlochan cull) also noted another issue that arose during the culls, that of cull targets (i.e. number of deer to be culled) changing within a single season. They also recounted how a deer commissioner acted in a meeting between DCS and estates,

'...well, the deer commission meeting ... they walked out eventually ...' which suggests that there might have been a breakdown in communication.

5.3.3 Perceived success of Section 7 culling

The large culling exercises initiated by the Deer Commission for Scotland (DCS), at the time of this research consisted of two areas – Glen Feshie and Caenlochan. All 19 interview participants were aware of both exercises, however, only 8 had personal interaction or were geographically close to Caenlochan. Of the 19 interview participants, 15 were from estates (5 had personal experience of Caenlochan), four were from governmental organizations, three (of 4) interacted to some extent in Caenlochan and held a generally positive view of the cull. The remaining governmental employee did not participate in Caenlochan, but provided explanations that assist with understanding the reasons behind the culling action. A Deer Commission for Scotland (DCS) participant stated:

'... Caenlochan has been successful ... well the public and private sector working together to achieve something ...'

The other DCS participant noted the impact the red deer herds had on the nature reserve, specific to the Caenlochan cull *'... what they've done, is they've just changed the habitat from being heather habitat to grass ...'* This perspective indicates the statutory forces on habitat, and management practices focused on deer numbers rather than individuals and herd health. The other governmental participants also appeared to perceive the Caenlochan cull as successful and that the reduction in deer was a significant achievement. Another governmental participant explained,

'... Caenlochan is a top site – it's one of the top sites in Europe – but the big problem is that [Scottish Natural Heritage] SNH only own – the triple SI site's something like 6,000 hectares ... it's SPA and SAC now, but it's 6,000 hectares – but SNH are only 164 of that – the rest is all done through agreements ... SNH did a national nature reserve review – there was 3 initial criteria: security of tenure, primacy of nature, and research and education ... we didn't score on security of tenure, because we didn't own the land ... and we didn't score on the primacy of nature because this is the most densely populated area of deer in Britain ... so, we've got a section 7 on this now ... and I think that the East Grampian Deer management group is one of the most progressive – they're good, they're good ... and that was down to leadership ...'

This participant continued discussing specifically the Section 7,

'... I think it should be compulsory – and I think it should be more ... I think we should be shooting all deer ... from a culturist and naturalistic point of view – that they are degrading a lot of the habitats ... and that's a problem – and it's getting the numbers down ... getting them – right, right down! ... the big problem is – is that the deer come in ... we've got fences up – but, if you put a fence up – all you're doing is excluding deer from one area – so you're increasing the grazing

pressure on the other ... there's what we call a serpentine area – it's heavy metal – and it's a unique landscape – and there's a little plant in there ... there's only two sites in Britain for this plant ... and, you know, the deer – will pile through it on a regular basis – and it's not so much that they graze it – it's that they run through it and tear it up – you know, trample it ... and it's that trampling pressure that's the problem ... it's getting the balance ... actually 115 go into this enclosure, the second year – and they ran through – and one of the things is the rare plants are pioneer species – they come in pretty early in the succession stage – they need open ground ... and these deer run through – and they actually opened up an area – and within the area, the colony doubled its size ...'

As Scottish Natural Heritage (SNH) has an interest in the Caenlochan area, a SNH participant explained,

'... the primary function [of SNH] is quite often to protect the habitats that occur – occur on them and one of the criteria by which these national nature reserves are designated - is that they have to be managed for the primacy of nature ...'

This participant went on to explain that there are also social and economic factors, including public access. This participant also explained the concept of 'primacy of nature',

'... if it comes to weighing up environmental objectives and other social and economic ones then it would be the environmental ones that would take – take the upper-hand in making those decisions ...'

This participant also noted that while deer have an ecological function, SNH's primary aim is to balance the impacts of deer on other species or communities.

The estate-based participants (5/5 who had personal experience) perceptions appear to accept that the deer numbers needed culling. However, the participants question how the culls were carried out (see Chapter 6) and the exact reason the cull was initiated. One estate-based participant stated,

'...I don't know Caenlochan enough, but I've seen it from the air, I've seen the tracking, and seen the production of heather – we've all got to deal with it ... the heather in Scotland has produced a lot of it – but I mean a lot of it is sheep – Caenlochan was sheep – but, there were a lot of deer ... and however unattractive it may be – to people round about who were needing the Caenlochan deer to stock themselves up – it's been a cash bonus for them ... it's helped them enormously, and now they haven't got it – so, it's gone back to what it was ... but, you know, let the place recover and see how we get on ... I wasn't in favour about the way it was done but, it was done for good management reasons ...'

This participant continued his interview focusing on animal welfare, see Chapter 6. Another participant, who was part of the cull, said,

'...I think we have to accept – and I do – that there were too many deer in this area – 5 years ago, 6 years ago ... and they were, in fact, destroying heather ... especially where they winter ...'

Another participant, who was part of the cull, shared,

'...– Caenlochan, that was another disaster area – Caenlochan was thinned out because of the damage that was supposed to be doing to the alpine plants, the deer were eating the alpine plants – when this all started, and they showed us the plants in the rock face – aye, it was a great show ... but, the deer couldn't get down to the alpine plants, they were safe where they are ... but, SNH wants to see them expanded ...'

This participant then went on to question the value of this plant over red deer, and the focus of his interview moved on to focus on animal welfare issues of the cull (see Chapter 6). Other participants (6/10 who did not have personal experience) also noted the protection of the 'alpine plant' as the basis for the Caenlochan cull. Two (of 19) participants questioned the value of the plant, and wondered if it was introduced during the UK's botanical age, and if it was, asked if should it, as a non-native plant species, be protected over an iconic, native animal species, the red deer. These participants perceived a hierarchy of protection implied by The Deer (Scotland) Act 1996, which could be why most estate-based participants transition into an animal welfare focus. For example, one participant said, *'... The deer are being persecuted ...'* And another participant noted that, *'... nature works together – there doesn't need to be one thing prioritized over another ...'*, which was a view that was shared by six others. This hierarchy then forces a question about how many deer are too many which then becomes a focus on animal welfare, which will be dealt with in Chapter 6. Five (of 15) estate-based participants felt that the government organizations were anti-deer, anti-sport, and anti-landowner and that deer were being persecuted in many areas which negatively affected landowners, the traditional sporting estates, the aristocracy, and their livelihoods.

A governmental employee summarized both of the Glen Feshie and the Caenlochan culls, indicating habitat management is the primary focus of government action and specifically, Section 7 Agreements:

'... I think the Caenlochan thing is a big thing in deer management ... has been a big thing for deer management throughout Scotland, so to speak ... a change ... from Glen Feshie in 2005 through to Caenlochan in ... well Glen Feshie was regulatory action by the deer commission ... a section 10 ... that's emergency action ... to prevent damage ... and the deer commission just went in and shot deer ... to prevent damage ... so, Glen Feshie was in a section 7 agreement, but they weren't ... in terms of the big change in deer management, with Glen Feshie

[it] was a massive change, DCS was showing its regulatory powers ... it showed that the powers could be used ...'

This quotation, from a Deer Commission for Scotland (DCS) employee, goes some way to explaining why some of the estate practitioners conclude that the government is concerned with wielding regulatory power with a focus on ecological aims and less interest in deer.

5.3.4 Political influences

On a broader scale, the political parties who are in control of the government, whether at community, Scotland, or UK level, influence deer management. Nine (of 19) participants indicated politics played a role in red deer management. Eight of these indicated politics had a negative effect. One of the DCS participants, who has the longest employment, discusses the role politics plays how politics influences his organization:

'... so anytime the party changes, because of an election, we can expect changes as well ... what they find in deer management, in most of the government departments, there won't be a huge shift overnight so, it might be a different policy change or certain issues ... we're a government organization so, it depends on the policies of the government of the day ... essentially the DCS's work is derived from what the minister wants us to do for the year ... we're the devolved administration ... we agree with the Scottish government and the Scottish government agree with us, the deer commission, and they do with [Scottish Natural Heritage] SNH as well, what our priorities are in terms of the year ...'

This participant continues to explain how politics can affect deer management through specific examples. While many changes might be small, some are quite large. He states,

'... there's bigger examples in terms of wider environmental policies, but in terms of deer management ... it's data based, most of the work that's done through deer management ... except the red deer commission [which] was always seen, or seen to be, closely linked with the land management, landownership interest ... and in the Deer Scotland Act came in 1996, which kind of shifted towards more environmental because the basis of deer management is to do with environmental impacts, damage assessment, serious damage, preventive damage ... so that was quite a shift in, in 1996 ... and that's when we got renamed the Deer Commission for Scotland, from the red deer commission ... and obviously introduced the other species of deer into it, the roe and sika, fallow, but, um, you know, that was a fundamental change in achieving change and the work that we do and ... it was a change in direction ...'

This participant explains that politics has a broader impact than just on governmental organizations. He says,

'... the influence of that politics is, has quite a big effect on land management itself, or landownership in particularly, so that, you know, politics may have an influence on that ... so throughout Scotland it's different ... the influence of the

local politics, so it may be community interest ... we have community council type of issues, deer on roads, it might be community issues in Sutherland – crofting interests ... you've got quite a chunk of Scotland is now in community ownership and their need to get ... essentially a return from deer management ... they don't often have the finances to support deer management without bringing money in from deer management ... so, that's quite big changes that was brought about by the right to buy land from whatever administration brought that in now, in the last 10 years ... the Scottish government, essentially, since it devolved ... that was a change, you got access legislation which impacts on how people manage their deer and how the interaction between management of deer and people taking access to the land ... you've got far more interest in terms of the strategy to do with climate change and the legislation of that's been brought into the forestry grant schemes, SRDP money's geared towards development of forestry and this 25% increase in forest cover ... so all these things affect deer management and how deer managers, short term, have to manage their, their land ...'

Another participant, who is estate-based, relayed a conversation he had with a client who worked for the EU. He said he asked this client about some of the regulations being passed by the government as having come from EU directives. The client told him that '*... the regulations [being implemented] are how the government chooses to interpret EU directives ... but that is not what the aim of those directives were...*' This participant relayed this story as supportive proof that political agendas had a major impact on red deer management in Scotland.

5.4 Discussion

This chapter aimed to explore the perception of the participants regarding The Deer (Scotland) Act, 1996 and the enforcement of this legislation through Section 7 Agreements, how it was perceived, and how it fed into the management of red deer. The two Deer Commission for Scotland (DCS) participants explained the legislative act in terms of the Section 7 Agreements, including what they are and how they are created. All governmental employees indicated the aim of the legislation is the protection of the landscape. There were differences in perception regarding the value and benefit of Section 7 agreements between the two main practitioner groups – estate-based and governmental organization participants. Governmental participants see these agreements as a tool for management, but estate-based participants feel threatened by the government. While both groups agree red deer numbers were high in the Caenlochan area, estate practitioners remain unsure what prompted the enforced cull. Governmental employees indicated that the cull was implemented because the red deer were changing the habitat from heather to grassland or due to how the deer were affecting the alpine plant. Politics plays a role in red deer management, but to what extent is not clear and should be researched further. In addition, it is not clear how much knowledge politicians have regarding the topic they legislate upon. Furthermore, legislation arising from Westminster or Holyrood is significantly removed from the practitioners and practitioner

understanding of deer management and this dichotomy creates contention between government enforcement and estate-based practitioners.

Whereas it was expected that legislation would be interpreted and put into guidelines for people to follow, the interviews indicated that, while the participants held an understanding of the law and what it was supposed to do at one level, there were disagreements about: how the law was stated, the intention of the law, and how it was implemented. Animal welfare issues were repeatedly raised in the context of legislation implementation. What became clear from the results was that while the government participants focus on effectiveness in terms of ecology (specifically the statutory impact on habitat, deer numbers and ecology), the estate practitioners focused on animal welfare. This is explored further in Chapter 6, however, from the point of discussion of legislation, it is clear that The Deer (Scotland) Act, 1996 is about deer in name only: the focus of this act is the protection of habitat by limiting deer impacts. This legislation, because of the way it is framed, named, enacted, and enforced is perceived to have negative consequences and produces an interpretation of a hierarchy of protection where habitat and plants are protected over and above the deer of Scotland. It is reminiscent of the hierarchy of species that arose out of Cartesian logic, in the 17th century, which sets humans above nature and denies animals characteristics of sentience and moral respect (Nelson, 2008). The hierarchy concept is also similar to the three pillars of sustainable development concept in which the values of one pillar is higher than another and may often be considered a reasonable exchange, but this is weak sustainability (Dietz and Neumayer, 2007) and environmental values are not truly exchangeable (Dietz and Neumayer, 2007; Rockstrom et al., 2009).

This hierarchy has also led some practitioners to question whether a plant is really more valuable than a sentient, native animal species. In any case, this concern was expressed as being an issue; animal welfare and considerations of animal welfare are therefore the specific focus of the following chapter. What is perceived to be a 'hierarchy of protection' is made more complex by the differences in perception of the deer, in particular whether they are icons – and part of a culture which includes sporting estates and hunting as a 'traditional' and a very-Scottish pass-time – or pests to be controlled. These issues have been researched in other context (e.g., see Bradshaw and Bateson, 2000) and the issues around good animal welfare practice in the context of conservation management initiatives that have an ecological focus influenced by organizational efficiency are dealt with. Furthermore, the management of deer is a cultural issue, i.e. managing a cultural icon rather than a pest (ibid) so it will require a different approach. In fact, the legislation cannot be considered outside of the cultural context in which it exists, which includes the British public's attachment to animals and the deer being a cultural icon.

Although this chapter focuses on Scottish legislation to which comparisons can be made to other legislation across the globe, another way to consider the findings of this chapter is, more broadly, in the context of human-wildlife conflict. Some key issues arise in discussions on human-wildlife conflicts which highlight the distance between legislation or policy and management that needs to be overcome. Hellstrom (2001) indicates that each society has a 'cultural' way of managing environmental conflicts, which are determined by the economic, social, and political characteristics of the society as well as the value and characteristics of the resource. In order to truly understand the conflicts, one must first understand the social aspects which impact them and recognize the conflicts as a cultural phenomena (ibid, 2001). Messmer (2000) explains that the phrase 'human-wildlife conflict' tends to involve negative interactions between humans and wildlife. He also states that while these conflicts may be real or perceived, social or political, or even economic or aesthetic, the conflicts may include damages to the (human) individual resulting from federal, state, or local wildlife policies, regulations, or legislation that aim to protect property rights, public benefits, or conservation (ibid, 200). Redpath, et al. (2014) states that terminology is an issue, as in their review of articles on human-wildlife conflicts, 97 out of 100 were between conservation and human activities that were associated with livelihoods, rather than between humans and wildlife. They suggest that conservation interest need to consider their roles and objectives while also aiming for long-term solutions which benefits the people involved and biodiversity equally (ibid, 2014). Meanwhile, Barua, et al. (2013) found that human-wildlife conflicts negatively affect the wellbeing of the communities, i.e. rural peoples, that are most closely involved with wildlife. They also found that there are considerable hidden costs to wildlife management that include food insecurity, livelihood impacts, and the psychosocial wellbeing of individuals and communities (ibid, 2013). Redpath, et al (2004), in their study on red grouse management in Scotland, found that stakeholders and local communities must be involved in formulating management decisions and that dialogue amongst these groups led to both a decrease in conflict and an increase in finding common areas of agreement. Although there are deer management groups (DMGs) in Scotland, finding a balance between, and integrating, stakeholder interests continues to be a challenge. Inclusion of stakeholders, especially practitioners, appears to be the key factor in reducing legislative and implementation conflicts.

Chapter 6: Issues of Animal Welfare

6.1 Introduction

With diverse stakeholders, environmental management is fraught with conflicts and, even when there is agreement about the nature of the issue, there may not be agreement on the solution (White et al., 2009). In part, this could arise from the fact that different stakeholders fulfil different roles: for example, those involved in governance ('what to do') and those involved in management ('how to do it') are have different backgrounds, knowledge and perspective (see Chapter 4) resulting in incompatible values and beliefs (Marshall et al., 2007). As a result, the potential for disconnect is, if not inevitable, certainly unsurprising. In the case of environmental management in general, and red deer management in particular, social and cultural factors also influence practice. This chapter aims to explore how the experience and backgrounds, as well as the different roles of the participants in red deer management influences their attitudes and, in turn, their practices regarding animal welfare.

Environmental management begins with the development of policy in response to a perceived need. From policy, comes regulatory guidelines and legislation. The influence of guidelines (which may be voluntary) and legislation (which is not voluntary, but is subject to interpretation) is overseen by statutory government organisations but directly implemented by practitioners. Furthermore, in the case of animal management, the extent of regulatory guidance is highly species-dependant, with the management of some species (such as red deer (*Cervus elaphus*)) attracting more regulatory attention than that of others (such as rats) (Bradshaw and Bateson, 2000). Therefore, there is a great deal of scope for disconnect or differing interpretations, including between public policy and the public's understanding and between the intent of regulatory guidelines and reality of practice.

As discussed in Chapter 3, the red deer is an icon of Scotland and the animal holds a special cultural status, notwithstanding having characteristics of 'a pest' that requires to be controlled. Although no specific line of questioning raised 'animal welfare' as a topic, it nevertheless was a pervasive theme that was raised by most respondents and often in several contexts. As animal welfare considerations have important implications for red deer management and was extensively commented upon, in this chapter, animal welfare will be used as an example of the principle of the potential for disconnect between policy, governance and management.

Animal welfare considerations have a long history in the UK and discourse on the topic is very much a part of British culture. Darwin (1859), in '*On the Origin of Species*', argued that animals

had complex emotional lives and mammals could experience a full range of emotions. Others have gone further, suggesting that the difference between humans and other animals is not qualitative, but rather is 'a difference of degree' (Whitehead, 1938, p38; Pacelle, 2011). However, comparative psychologists are still researching emotions and emotional understanding of animals, which is difficult as emotions are a latent state which must be inferred from behaviour (Bekoff, 2000), which may or may not have similar origins as within humans (Shettleworth, 2010). There is a presumption in UK culture and law that custodianship of animals entails responsibility for their welfare, at least to the degree that humans care for particular species through cultural, social, or emotional attachments. Furthermore, animal interactions may provide practitioners with a perception of these animals having a mental state that may also influence their perception of animal welfare (Dawkins, 2003; Spence et al., 2017). Animal welfare makes reference to the physical and psychological well-being of individual animals (Hewson, 2003), with consequent importance attached to immediate and measurable indicators of well-being, such as the physiological activation of the autonomic nervous system (i.e., the 'fight or flight' response). There are also more long-term indicators of the well-being of individual animals, which may be seen at the population level (for example, longevity and fecundity) (Broom, 1991; Webster, 1995). Animal welfare considerations also extend beyond what is good for any particular individual, but also what is good for the population or even what will be good for future populations of both humans and animals. Overpopulation is a source of stress in itself and therefore there will be circumstances when the welfare of an individual animal must be balanced against the welfare of the population (Bradshaw and Bateson, 2000). The question addressed in the current chapter is, therefore, how the participants in the enterprise of red deer management see their role in terms of managing and protecting the animal's welfare.

Bateson and Bradshaw (1997) reported that the practice of controlling red deer populations by hunting with hounds resulted in indicators of significant stress in the deer, including extremely high cortisol levels and damaged muscles. This led the same authors (Bradshaw and Bateson, 2000) later to consider, more broadly, how animal welfare considerations influence environmental management: they noted (ibid, p 13) that, for non-endangered species, concern for the survival of an individual animal is "*primarily prompted by concern for their welfare*". Rather than holding a particular belief that the animal has rights (including a 'right to life'), they note that many individuals concerned for the animal's life actually "*derive their motivation from a sense of responsibility*" for the animal. Citing work by Caughley and Sinclair (1994), Bradshaw and Bateson (2000: p 10) stated that "*the wildlife manager's paramount responsibility is to ethical conduct rather than operational efficiency*", while also referring to Rawles (1996) who said that conservationist's goal was to get rid of "*unwanted animals as quickly and efficiently as possible*" (ibid: 10).

Bradshaw and Bateson (2000: 22) state that “*practices that combine good conservation with good welfare*” are ideal but this might also be difficult to achieve. Notwithstanding this ideal, they (ibid: 22) note that in different times and places, the same animal might be a pest or resource, and this will impact on attitudes to its welfare. Similarly, factors such as whether an animal is assumed to be sentient or not, whether it is endangered, whether it is domesticated or wild, will also impact on attitudes to its welfare. Bradshaw and Bateson (2000) note that while there are examples where conservation and welfare considerations are aligned, such as some eco-tourism initiatives, there are many cases where it is necessary to cull animals. In these cases, although the animal is killed, this should be done as humanely as possible, necessitating ‘clean kills’. Citing work by Wood (1983) and Given (1993), Bradshaw and Bateson (2000: p 23) emphasise, irrespective of time or financial constraints, conservationists should refrain from “*crisis or remedial management*” which has implications for animal welfare, if only by introducing measures that compromise the implementation of a conservation plan that otherwise incorporated animal welfare considerations.

Therefore, the issue addressed in this chapter is how animal welfare considerations impinge on red deer management practices and whether there is a shared understanding of animal welfare amongst practitioners. Of particular interest is whether, as Bradshaw and Bateson (2000) would predict, the people who actually undertake the killing of the deer feel a particular sense of responsibility for the animals’ welfare.

6.2 Methods

Neither the questionnaire nor the structured interview explicitly included items about animal welfare. Nevertheless, the topic repeatedly arose spontaneously. In particular, questions that focused on management actions and decision-making, elicited comments about animal welfare. For example, in the questionnaire (n=22) in response to Question 10 (important areas) or 13 (primary influences on decisions), seven (of 22) practitioners referred explicitly to ‘animal welfare’ and another five named ‘the deer’ as important or impacting on decisions. Similarly, in the semi-structured interviews (n=19), participants discussed animal welfare in responding specifically to Question 5 (which deer to cull/culling procedures), Question 6 (management practices in the wider geographic area, which indirectly impinged on them), and Question 7 (challenges faced by red deer management). In addition, two other questions (Q1, participants background, and Q7, influences on decision-making) also occasionally elicited animal welfare as a topic.

From these comments about animal welfare, three clear (although inter-related) themes were identified for qualitative analysis, namely: the status and influence of animal welfare guidelines; practitioner views of what are the animal welfare issues; and how practical choices

regarding which animals are culled are made. In addition, there were some lengthy discussions concerning the animal welfare implications of the creation of Wildlife and Natural Environment (Scotland) Bill (WANE) (2011), which had been the subject of wide consultation during this research. Participants expressed strong views about welfare implications of the proposals (which were subsequently dropped) to remove closed seasons. The welfare implications around and during Section 7 culls, instigated by The Deer (Scotland) Act 1996, were of significant concern to estate-based practitioners.

6.3 Results

6.3.1 Status and influence of animal welfare guidelines

The Deer Commission for Scotland (DCS) published new welfare guidelines in 2008, as part of their Best Practice scheme for deer management. These have subsequently been expanded in/incorporated into Scotland's Wild Deer, A National Approach (WDNA) and the Code of Practice on Deer Management (Scottish Natural Heritage, 2011) (see Chapter 1, section 1.6.1). Over half (10/19) of the interview participants – three employed by government agencies and seven practitioners – made explicit reference to these DCS guidelines, indicating that there is general and widespread knowledge of the existence of Best Practice Guidelines. One gamekeeper did explicitly state that gamekeepers had assisted in the creation of these guides. However, more than half of the sample (10/19) – all of whom were estate-based practitioners – volunteered the opinion that there was a difference between the views of government organizations and estate-based practitioners when it comes to animal welfare. In the words of one participant: *“what DCS considers welfare is **not** what stalkers/practitioners consider to be welfare.”* This topic is expanded on further below (see below: Conflicts Specific to Section 7 Agreements) but nevertheless it illustrates the important point that the status of the guidelines, as a descriptor of best practice for animal welfare, is questioned in principle.

Notwithstanding this possible disagreement, one of the agency employees explicitly stated that the Best Practice Guidelines were the “advised standard” for red deer management and, furthermore, all three of the agency employees indicated that they personally promoted the idea of best practice in animal welfare by advising practitioners to follow the guidelines. The attitude of the Deer Commission for Scotland (DCS) staff, which was also acknowledged by most practitioners, was that, as the governmental body responsible for red deer management, they were responsible for publishing guidelines and ensuring good animal welfare standards are followed. However, all of the seven estate-based participants who mentioned the best practice guidelines expressed the view that stakeholders, including DCS, did not always follow ‘best practice’ described in the animal welfare

guidelines. This was often raised as being a particular issue in the implementation of management schemes (i.e. Section 7 and 8 Agreements), where an organization may have specific deer-population aims or environmental issue and expediency may be prioritised over animal welfare. This suggests that the influence of the guidelines – as agreed best practice that everyone must follow – is also questioned in practice.

6.3.2 How do animal welfare considerations impact practice?

Given that at least some practitioners questioned whether there is a shared understanding of animal welfare and whether there is consistency in the way the guidelines are followed, it is important to know whether and how the guidelines do influence their management practice and also to understand how their views of animal welfare (as opposed to any stated views in government guidelines) impact their management practice. Half of the respondents (11/19) explicitly referred to the “*respect*” that practitioners hold for red deer, with five of the stalkers stressing that their aim was that neither the deer being killed, nor other deer nearby, were aware of what was happening; indeed, four of them noted that stalking is, by nature, about not being noticed by the animals. Most importantly, almost all (17/19) respondents made some reference to the welfare of the animals in the process of culling, referring specifically to either the animals’ awareness of the culling process (i.e., the psychological impact) and/or the importance of a clean shot (i.e., the physical impact). Eleven participants noted the importance of killing humanely and, in particular, skilful clean shooting. From these responses, it can be concluded that, irrespective of the content of official guidelines or whether the guidelines are explicitly adhered to, animal welfare is nevertheless an important consideration for, and directly informs, management practice ‘on-the-ground’.

6.3.3 Which animals are to be culled?

To develop this argument further, consideration was given to whether and how practitioners made reference to animal welfare (or ‘the deer’) in describing the process of selecting which deer to cull. Evidently, the person taking the shot is the one who makes the decision about which individual deer is culled. Therefore, it is important to establish how the decision comes to be made and what are the influences on it. Practitioners expressed strong beliefs about which deer are to be culled: all 15 of the estate-based participants stated that culling was ‘selective’ (for heard health, not a focus on trophies) and agreed that is the aging or “*diseased or in poor condition*” deer that are selected to be culled. Six participants went on to give further, more detailed explanation: ideally stags are taken around 10-13 years old, when the stag has the best head of antlers, but is not suffering from physical deterioration due to age. When considering hinds, if they look in reasonable condition, then the

condition of the calf is considered. Three individuals indicated they did not think there was any excuse or reason not to follow 'proper' culling procedure (from which it might be inferred that they meant 'as described in the best practice guidelines'), which involves minimizing stress, taking a clean shot and taking animals with least physical potential.

Interestingly, and in contrast to these views, although the Deer Commission for Scotland (DCS) employees agreed in general with regard to considerations about welfare in terms of the actual culling procedure, they nevertheless stated the principle determinant of which animal was culled was why they were being culled and, in many instances, no type of selection occurs. One DCS employee stated, '*... it's quite difficult to – you have to shoot whatever stops ...*' especially in large culls. Another DCS employee explained,

'... it depends what they're culling for, you know ... if you're looking to remove deer entirely from an area, perhaps, if you've got a woodland block going in then you're going to be a lot less selective than if you're doing it for sport, and that also depends on, ... you know, that'll depend on the numbers that you're shooting as well ...'

Of the five individuals who indicated that selective culling was not necessary: two were agency employees; two were stalkers, but were currently involved in carrying out Section 7 agreement requirements with DCS; and one was only occasionally involved in culling, in unusual or extreme conditions (i.e. property is not part of regular red deer territory). The remaining agency employees, who were not involved in actual culling procedures, also indicated their view that culling was not selective. Seven of the estate-based practitioners acknowledged that culling was not always selective, for example, choosing animals to cull might be determined solely by population numbers or their location in a sensitive habitat, but four of these individuals are estate-based participants involved in Section 7 agreements. Nevertheless, there was clear discomfort expressed by many of the estate-based workers who were required to engage in non-selective culling of large numbers of deer. For example, one participant explained it thus,

'... You're forced to comply with these Section 7 culls ... one year we'd already reached our targeted cull and I said I didn't really want to shoot any more, but the commission insisted ... so I sent my stalker to shoot a few more ...'

Another participant stated,

'... when you're in these big culls that's the problem, you don't get to be selective, you do get a first shot, but then after that it's – you just shoot any beast that stops – that's the big problem – that's what I'm against ... I mean, if they're doing these big culls, there's nothing really that you can do ...'

These comments provide evidence to show that estate-based practitioners regard non-selective culling as having the potential to compromise good animal welfare.

6.3.4 Closed seasons and exemptions for out-of-season culling

This research was being conducted at the same time that the Wildlife and Natural Environment (Scotland) Bill (WANE) was under consultation, prior to the creation of WANE which was passed in 2011 (see Chapter 1). Of great concern to the practitioners of red deer management was the potential abolition of closed seasons and the numerous exemptions that were granted to permit culling out of season. Ten participants, all estate-based, discussed the importance closed seasons, which, by ensuring that deer were not hunted all year round, had animal welfare implications. In the view of these participants, closed seasons provided an opportunity for hinds to birth calves without stress and for all the animals to improve their body condition after the winter. They expressed concern about the number and level of exemptions that have been “*indiscriminately issued*”, as these too had negative welfare implications: for example, an exemption might permit shooting at night, which would make a clean shot more difficult and therefore increase the risk of non-fatal injury. These individuals also expressed a great deal of concern regarding the possibility that shooting seasons might be removed, which was under consideration at the time of this research (subsequently, The Wildlife and Natural Environment (Scotland) Act 2011asp 6 (WANE 2011) did maintain the seasons). Of the two agency participants who discussed seasons, only one of them reiterated the estate-based view that closed seasons existed for welfare concerns (i.e., to protect hinds and their dependent young). The other suggested seasons merely signalled the right to shoot deer, which is based on landownership rights. This participant believed this was unique to Scotland, although in many other countries, even where deer are seen as a public resource, access to shooting deer remains with the landowner (private individual or state) who may choose to lease hunting rights.

6.3.5 Welfare implications of Section 7 agreements

The reduction of red deer stocks through Section 7 agreements has been a major source of contention between different stakeholders in recent years and often the issue of contention is expressed in terms of animal welfare. The concern around how the agencies determine deer numbers, deer densities, and ecological impacts did extend beyond just Section 7 Agreements. This section therefore considers specifically the attitudes to animal welfare in the context of large culls, including but not limited to Section 7 agreements.

Eight participants specifically mentioned Section 7 Agreements: two were employees of the Deer Commission for Scotland (DCS), which is responsible for carrying out these agreements, and a further four (three estate-based and one agency (Scottish Natural Heritage (SNH))) were directly involved with a Section 7. The remaining two were familiar with Section 7 due to geographical proximity, rather than direct personal involvement. The governmental participants specifically mentioned two major culls that they were involved with and which were prompted by DCS, namely: Glen Feshie and Caenlochan. Speaking about the Caenlochan cull, one participant made clear that the cull was simply about reducing deer numbers for ecological reasons:

'... well we were involved at the ... at the point where they were taking the first reductions, when the big culls were being done ... we shot 4,500 deer, in the first year and then, just above 4,000 the second year ... and just essentially working with the estate to see what they wanted taken, so ... the hinds, we assisted with the hind cull, which essentially was less of a ...it was just reducing numbers at that stage ...'

Other participants (11/19) were aware of the Section 7 actions, even if they were not personally involved. They did not necessarily use the term 'Section 7' (for example, one referred to *'these big culls'*). The concerns that were expressed around large culls in general and Section 7 Agreements in particular were often expressed as discomfort about the management of such culls. For example, one interview participant said,

'... whether they were correct in the way it was done, and whether the means can justify the aims – I'm not really qualified to answer ... but, I wouldn't want to have been part of it ...'

Others expressed similar views, in particular emphasizing the nature of the cull, sometimes making reference to the fact the culls were not 'sporting' or were an 'attack' on deer.

Twelve (of 19) participants questioned how the numbers are determined by governmental agencies because these 'numbers' often determine if there will be a Section 7 Agreement. Eight participants said they were not aware of how the number of deer to be culled is determined. Some estate practitioners said the information was not shared with them and requests for information about how numbers were determined were rebuffed or only vaguely answered (an example of an answer was given as: *"from our population model"*). As a result, practitioners expressed the view that *"the figures are not justified."* Another participant (specifically referencing a Section 7 he had been involved in) said:

"... we don't really know where they pulled this figure of 19 per square kilometre out of – it's a funny figure – I would've thought they could've said 20 ... or if they

would've said 15 it would have been around figure either way ... but, 19 is what they've said – and they stick to that 19 ...”.

It should be noted that this view of an estate-based practitioner is in direct contradiction to the view of the Deer Commission for Scotland (DCS), which is that they work with landowners to determine deer reduction numbers. Furthermore, the agencies do not perceive that numbers per se pose a welfare issue:

‘... we were targeting big groups of 4 ... 500 deer at a time ... and we were shooting what we could to best practice standards, so it was just making sure that the welfare of the deer wasn't compromised and ... just reducing the deer numbers ...’

Six (of 19) individuals specifically stated that the thought the way the red deer are treated during Section 7 culls go against the Best Practice principles, in particular those concerned with animal welfare and animal stress. One participant stated:

*‘... they have **no** idea the welfare issues they are putting on deer ... and they have **no** idea the pressure they are putting on stalkers to comply with this ...’*

Seven (of 19) participants describing Section 7 Agreements or referring to the ‘*big culls*,’ used phrases such as “*hired guns to slaughter deer*” or a “*massacre*” to describe governmental culls, with the (4) participants who were present during the culls reporting seeing deer being “*shot horribly*”, “*surrounded on all sides by guns*”, “*chased with helicopters*”, showing signs of significant physical injury and in “*severe distress*”. One said that a Deer Commission for Scotland (DCS) report had looked into the different culling methods and associated stress levels, which was relevant to the Section 7 culls because,

*‘... when I went down to gralloch them [S7 culled animals], I had never, never, **never** seen flesh the colour of that in my life! ... it was **pink**! ... and I've asked one or two folk – vets and all that about it – and they said that beast was **highly stressed!**’*

Two participants also noted that the carcasses of the deer from this particular cull had been dropped in fields where the meat became unusable. Although not a welfare issue, it does nevertheless indicate a perception that the animals are not being treated with the respect that they deserve.

The mandatory participation of gamekeepers in Section 7 (or 8) Agreements allows these participants to provide insight into their opinion of the process through their own words. One estate-based participant strongly expressed his view of the Section 7 cull:

*'... it's unbelievable! ... it's **unbelievable!** ... it's **madness!** ... the hired guns that DCS uses are just interested in pulling the trigger ... **No** concern for welfare at all! ... those things have no business in the Scottish countryside – **No, none!** ... the animals deserve a **lot** more respect than that! ... I don't understand how those types of things are allowed! ... and that's all brought in by the Deer Commission! ...'*

Another participant, who was forced to participate in the cull, described his experience:

'... I never went back after it ... I was involved in the early stages ... and I seen that collaborative cull ... and we stalked, and stalked, and stalked these deer into the wind ... they went into a corrie at the far end of Glen Shee and it was fenced ... so they had to come back through the rifles ... it was like a Western ... [the deer] were in a circle in the middle of this corrie – and there was actual steam coming from the deer ... and they just didn't move anymore ... they went this way and got shot ... they went that way and got shot ... and eventually some came out past myself – and I was looking at all of them ... and I could see a wounded beast coming last ... I shot those ...'

This participant appeared upset by this experience. He continued, reflecting on the entire experience and clearly defined his current stance:

*'... now possibly we could have said enough is enough when the deer went into the corrie ourselves ... but you are being threatened by the Deer Commission ... I'm **not** going back ... and I just can't believe ... I just can't believe that any animal [is] treated like that! ... I mean, there must have been about 600 deer in one big lot ... and they were **so terrified** ...'*

Another participant appeared more removed from the process when he explained his involvement:

'... in some of the bigger culls I've been involved in – like Caenlochan, which is a DCS cull – where there were thousands of animals killed ... you just shoot whatever stands still, whatever stands at the side of a big group of deer ... you just shoot what you can ... and as fast as you can, and as many as you can ...'

Although this participant did not express the same level of emotional reaction, he was nevertheless critical of the process. One interview participant, whose estate is located on the fringes of this culling exercise, attempted to provide an objective perspective,

*'... look at Caenlochan in a different light ... it was in quite a mess ... I think a reduction in deer – of that sort of magnitude ... was probably, was probably required ... But it's the **way** they went about it! ... with helicopters ...'*

Though this participant recognized the need to reduce numbers, he challenged the method. He continued to explain,

'... it was done for good management reasons ... whether they were correct in the way it was done, and whether the means can justify the aims ... I wouldn't want to have been part of it! ... I think that all of the people that were involved in it got thoroughly sick of it ... it was desperate ... a lot of those stalkers were absolutely fed up – to their back teeth with having to do what they were doing ... I wouldn't like to see it done again – and not using helicopters! ... I'm not in favour if it – I wasn't in favour about the way it was done ...'

All estate participants had views on the Caenlochan cull and many practitioners cited ethical conflicts, especially in regards to animal welfare. One stalker firmly pointed out,

'... the whole thing becomes very controversial – from the sort of professional stalker's point of view – we're constantly being made aware of codes of practice that we have to adhere to ... and then we see the government flouting all the codes of practice that they're trying to get us to abide by ... so it becomes then, a question of ethics ... from an ethical standpoint I wouldn't want to do it myself ...'

This quotation also suggests that, under situations of inferred high deer pressure, some participants feel that pursuit of broader ecological goals may compromise individual animal welfare. In addition, perceived negative experiences may lead individuals to have a reluctance to work with the governmental organizations.

6.4 Discussion

The results presented above indicate that animal welfare is a sufficiently salient topic that it was raised spontaneously by participants, even though not explicitly questioned about it. The reason questions were not explicitly included is that there are Deer Commission for Scotland (DCS) guidelines. There is a general agreement that the guidelines describe best practice and DCS and practitioners alike agreed that the guidelines should be followed. However, what came out of the interviews suggested a lower degree of consensus about animal welfare than had been assumed.

The most obvious divergence of views can be characterized as a differential emphasis on respect for the individual deer. In the case of estate-based practitioners, they expressed views suggesting that they regarded themselves as custodians of the iconic animals and, as a result, responsible for the welfare of the animals. From this, they conclude their responsibility extends to consideration of animals as individuals (requiring selective culling) and also consideration of each animal's experience (requiring measures to reduce stress, such as clean kills and a lack of awareness of both the stalker's presence and the animal's own death). By contrast, Government employee participants note that there may be many reasons to cull deer and consideration of animals as individuals is not appropriate or necessary. This is not to suggest a lack of concern for animal welfare, but rather that the animals are considered collectively. The fact that DCS issues and

promotes adherence to best practice Guidelines is evidence that there is acknowledgement of animal welfare, but that the understanding and implications are different.

Section 7 agreements in particular highlight the divergence of these positions. The way in which large culls are carried out is of concern to stalkers largely due to their 'typical' method, which is to remove targeted individuals skilfully and with a deep understanding of hunting technique. While it might be argued that the animal's welfare is not a prime concern given that the outcome is still death, the stalker's view could be characterized as that the hunt (and attendant acquisition of hunting skills) is done in partnership with the animal. The human-animal bonds these estate individuals exhibit, as discussed by other authors (Baker, 2001), is powerful and emotional and this was well evidenced in the course of the interviews reported here.

To further emphasize this point, it should be noted that targeting 400 to 500 deer at a time, in a single day, is a rather different practice – and is likely to require different skills – to sporting estate management, where at most a few animals a day are dispatched. Most estate affiliated participants express strong dismay over the way the culling exercise was performed, with the bulk of participant's responses revolving around animal welfare concerns for the red deer and indignation on 'double standards' regarding best practice. Some estate employees believed that the governmental organizations ignored the established codes of practice in order to reach their culling targets, as they have in previous exercises (SEERAD: LURP, 2004). It should be acknowledged that, in theory, culling 400-500 deer at a time does not *necessarily* compromise animal welfare. It is the way that the actions are carried out which will determine if welfare is compromised. Importantly, large culls are unlikely to be consistent with the view of the stalkers, whose livelihood involves a partnership and an emotional bond with the individual deer.

Cash et al., (2003) has raised the issue that evidence-based practice must be based on evidence which is credible, valid, salient, and legitimate if it is to be supported by practitioners (see also Parris and Kates, 2003; Ghosh et al., 2005). Some practitioners raised as an issue the justification large culls, largely based on the fact that they did not feel they had been given sufficient explanation of how a specific number to be culled had been determined. It may be that there is a lack of transparency in the models the government use or possibly even an inability to communicate how the models work. However, if large culls are to be supported by practitioners, it would seem important to ensure that the scientific evidence on which they are based is presented to estate practitioners in the terms suggested by Cash et al. (2003).

Many of the issues brought up by the individuals participating in this study are also reflected in culls of elephants in South Africa. Dickson and Adams (2009) discuss the complexity of the culling

debate. They begin by explaining the need to mitigate environmental damage by reducing the elephant density and how this contrasts with the animal welfare issues and moral complexity of culling of elephants (ibid, 2009). Interestingly, van Aarde, et al. (1999), found that densities decline naturally, and that culling becomes self-reinforcing as it causes population densities to return to the level where reproduction rates are at their highest. Specifically, for elephants at densities greater than 0.37 elephants/km² the population numbers declined without culling and in the years after a cull, densities rose as animals migrated into the 'reduced' population (van Aarde, et al., 1999). Thus, if the population densities decline without culling, is there validity in performing a cull? The ethical debate surrounding the need for culling continues (Dickson and Adams, 2009). However, animal welfare may have implications that extend far beyond the actual welfare of the individual or animal group.

Animal welfare is not a simple topic and in practice it is multi-dimensional (Botreau, et al., 2007). It is an issue that is becoming more prevalent in many societies and can have far ranging implications. Even where animals are considered pests, animal welfare is taken into consideration, for example in New Zealand where at least 50 introduced species are considered pests (Littin, et. al., 2004). Efforts continue to try to determine and assess animal behaviour, thus animal welfare, although most research relates to farm/domestic species (Botreau, et. al., 2007). Animal welfare can have economic impacts as well, outside of culling operations. Harper and Makatouni (2002) found that ethical concerns relating to standards of animal welfare play a significant role in the purchase of organic food, which is increasingly including wildlife products. Furthermore, two studies suggest that animal welfare standards can potentially impact tourism, which many countries depend upon. Parsons (2010) found that, on average, 60% of people polled did not believe seals in Scotland should be regulated, and 17% indicated seal culling would affect their decision to visit Scotland, which could lead to lost tourism funds in the area of £100 million. Meanwhile, Parsons and Rawles (2010) found that 80% of whale-watchers indicated they would boycott a country where whaling occurred, such as in Iceland, at a considerable loss of tourism funds (approximately \$12 million USD). Thus, there are far reaching impacts for how animals are treated and regulated that stretch beyond the most basic human-animal interactions.

Chapter 7: Implications for Sustainable Management

The aim of the thesis was to explore how differing views and perspectives of estate-based practitioners (including stalkers, land-managers and land-owners) and staff of governmental agencies influence the practices of management of red deer in Scotland. Using both questionnaire and semi-structured interview methodology, some surprising insights were gained, which extended beyond processes and practices. The most obvious divergence of views arose from what might be called the different cultural perspective of each group, and this is the overall contribution of this thesis. They include different perceptions of red deer and herd health (Chapter 3); the tradition of stalking and social norms (Chapter 4); different views regarding management goals and methodology (Chapter 5); and the perceived significance of animal welfare issues (Chapter 6). This discussion will focus on the findings of the research in an holistic framework with the intention of illustrating the implications for sustainable management. Ultimately, the divergence of views results in a lack of consensus about what 'sustainable environmental management' looks like in the context of red deer in Scotland even while sustainability goals have the potential to provide a unifying framework.

7.1 Summary of research findings

One of the more surprising findings of the research related to the attitudes to the deer themselves, which in part resulted from the different stakeholder perspectives. The attitudes to the deer were explored in depth in Chapter 3, in which it was clear that there is a tension arising from the fact that the deer are both iconic and yet are also managed as 'a pest'. Almost half of all interview participants spontaneously offered the view that that red deer are a Scottish icon and it was explicitly acknowledged that the estate-based practitioners – the people ultimately required to perform the act of culling – had a deep respect for the animals. Many of the estate-based participants described in great detail how they felt about red deer as a species, expressing feelings of a strong relationship to the deer and sometimes invoking 'spiritual' ideas in discussing their encounters or interactions with them. These strong feelings for the species went well beyond the desire to practice good management: the demands of good management were focussed on their perception that they were responsible for the stewardship of the deer as a cultural icon. Meanwhile, the newest publication of Scotland's Wild Deer, A National Approach (WDNA, 2014) a single sentence states both red and roe are iconic, with no more thought given to their status. Studies outside of Scotland, on other socio-cultural valuable species, such as elephants, wild horses, and kangaroo, indicate that the status of an animal does play a role in management (Thomson, et al., 2005; Dickson and Adams, 2009; Bhattacharyya and Larson, 2014).

The evidence presented in Chapter 4 concerned the dissemination of knowledge, how information flowed between policy-makers and practitioners and how decisions were made. The intention of the research had been to identify how practitioners gained the knowledge they required and, therefore, there were specific questions to enquire into the sources of information, how information was shared and how this information came to influence the decision-making of individual professionals. Unsurprisingly, the main influences on knowledge acquisition were learning from older generations and/or exposure to deer management practices at a young age as well as discussion with and learning from peers. The importance of research reports, including publications by Deer Commission for Scotland (DCS)/Scottish Natural Heritage (SNH), was noted, although there was also some scepticism about 'the science'. These findings support the idea of Cash et al. (2003) that science is not always perceived as credible, legitimate, and salient. Of particular note from the data in Chapter 4 came the observation that governmental organizations perceive information as flowing from top-down, often originating from the governmental agencies, whereas estate-based participants perceive feedback loops where peers, science, deer numbers, habitat aims, etc. all coalesce to inform practitioners for the sustainable management of red deer. Furthermore, practitioners raised concern that 'politics' (i.e., the views of people who are not necessarily well-informed or with attitudes that may not be evidence-based) has an undue influence on practices of red deer management.

In legislation, there is a formalization of the national approach to red deer management. Chapter 5, therefore, considered the perception of these stakeholders of the legal framework, how it is implemented and how it influences practice in red deer management in Scotland. While The Deer (Scotland) Act 1996 and WANE 2011 would appear, in name, to focus on the management of deer, in actuality they focus on limiting deer impacts upon habitat. In effect, this creates what is perceived as a hierarchy of protection which places plants above the deer. The evidence in Chapter 3 – in which it was clear that the estate-based practitioners regarded the focus on ecological damage, rather than on the protection of the red deer as a Scottish icon – was largely elicited in the context of considering issues related to legislation. Questions about the landscape evoked emotive reactions, which reflects the active debate in environmental management across the globe, where there is a division between those who think that landscapes should be preserved in their prevailing conditions, albeit reflecting millennia of human impacts, or should revert to natural 'wild' states (Monbiot, 2013). This relates to the issue of who decides what Scotland's landscape should be (see also McCrone, 1998): clearly, legislators (in this case, the Holyrood and/or Westminster parliaments) are also considering wider issues than red deer management, including landscape use and function and social concerns (e.g., food production; water quality; generation of renewable energy). Urbanization, combined with urban growth and loss of habitat, creates ecological instability and it has been argued

(Jordan, 2008; Brown, 2011) that a sustainability perspective may assist in unifying otherwise divisive interests. This research has highlighted the fact that divisions and conflicts do not necessarily arise only because there are competing interests: the divisions noted here were arising from different experiences and perspectives of the different stakeholders. Nevertheless, these divisions also may be unified by a sustainability perspective, which will be discussed further below.

The issue of a 'hierarchy of protection' resulted in an additional factor that was surfaced by this research, namely that of animal welfare. Crudely, this could be characterized as resulting from the conflict between protecting the habitat (i.e., plants) and protecting the deer. However, this is obviously far too simplistic, as highlighted in Chapter 6, focusing on issues of animal welfare. The hierarchy concept is also reminiscent of the weak sustainability concept of the three pillars (Dietz and Neumayer, 2007), which suggests that one value is equally exchangeable with another such that it is acceptable to value one environmental resource over another. The evidence presented in this Chapter illustrated what is perhaps the most significant area of difference between the stakeholder groups and one particular area of major conflict, namely, the culling exercises which aim to make large changes in deer numbers over a short-time. In the views of the estate-based practitioners, when a governmental agency requires a major cull, they are being forced to perform management actions which compromise animal welfare. The research participants contrasted the methods of these culls with the principal (and, for them, preferred) method of red deer management in Scotland, which is the quiet stalk and selective culling. Many of the concerns about the large culls were around the methods and whether they were adequately adhering to welfare guidelines published by the agencies. However, there were also concerns around the justification and perceived need, with scepticism about how cull numbers are determined and whether the culling could not be carried out over a longer-time frame. In fact, a recent compilation of research from the isle of Rum suggests that due to climate changes (increases in temperature and a longer growing season), a higher carrying capacity of a habitat may exist which then may lead to an increase in deer density but not necessarily a decline in habitat (Pemberton and Kruuk, 2015). While the governmental participants expressed their opinion that the cull at Caenlochan had been 'a success', other practitioners questioned whether the scale, speed, method, and reasons for implementation were appropriate. The views expressed about the Section 7 culls provide further evidence for Bradshaw and Bateson's (2000) observations that organizations prioritize efficiency and expediency and they do not necessarily consider individual animal welfare. The discussions around the Section 7 Agreements, and how the implementation process is perceived by the different red deer management groups (governmental organizations and estate-based practitioners) provided insight into the importance of understanding how differing goals and timescales can lead to conflict, as well as providing an example of what conflicts can occur when co-management reaches an impasse. This

becomes even more significant in this research because animal welfare issues emerged out of the semi-structured interviews without specific questions intending to elicit views on this topic. Although animal welfare concerns thread through most aspects of red deer management, and were discussed in other contexts, it was in discussions about Section 7 culls in general, and the large culling exercise of Caenlochan in particular, that animal welfare emerged as a key point of concern and contention. However, there were no direct questions regarding the subject of animal welfare. On the one hand, this means that 'demand characteristic' (i.e., eliciting expressions of particular views by the way the question is phrased) was not a major consideration here. On the other hand, it is also not possible to know whether, for participants who did not raise it as an issue, animal welfare concerns were unimportant or if the participants simply thought there were no issues or welfare was not compromised.

Management conflicts are exemplified in Chapter 6 by the contrast between immediate, individual animal welfare and the longer-term welfare of the herd and the habitat that supports the animals. This is reflected in other human-wildlife conflicts, where there is a tension between conservation aims and activities that negatively impact livelihoods (Redpath, et al., 2014). Governmental organizations have differing priorities and objectives (such as forestry, habitat, natural heritage, etc.) that influence their management aims and practice. In Scotland, governmental organizations can be generalized as having an environmental focus regarding land and landscape management, which can be in opposition to the estate-based practitioners, who see themselves as wildlife managers focusing on ethical conduct and animal welfare concerns (Bradshaw and Bateson, 2000). While the pursuit of broader ecological goals (such as governmental objectives), or even social and economic goals, may compromise animal welfare, as in many instances the focus is on removal of pest animals quickly. Nevertheless, as noted by Bateson and Bradshaw (2000), the best conservation initiatives balance conservation objectives with good animal welfare practices. Furthermore, through the food and tourism contributions to economies, there is a potentially broader impact for how animal welfare standards are perceived by the public (Harper and Makatouni, 2002; Botreau, et al., 2007).

7.2 Future Research

As with any interview-based research, there were issues that arose from the participants' responses that had not been anticipated. The semi-structured nature of the interviews offered some open-ended questions that allowed participants to embellish their answers. This provided a rich and broad set of data. It also revealed areas requiring further investigation. Chapter 3 is a good example of this: because it had not been anticipated that there would be such a clear statement and consensus about the perceptions of the deer, there were no specific questions about it and

therefore, not all participants did express a view. In addition, the views that were expressed were not probed in depth. This limits some of the conclusions that can be drawn from these observations. Furthermore, the implications for management decisions were not explicitly explored. Notwithstanding this limitation, the research project has highlighted areas that would benefit from further research.

7.2.1 *Protecting red deer*

Red deer are 'iconic' for Scotland, in the same way that the panda or the bald eagle are iconic of China and the USA, making them what Smith et al (2012) have termed a 'flagship species' (Dietz et al., 1994). The stark contrast between these examples, however, is that the panda and the bald eagle are both protected species. Indeed, even though the latter is no longer endangered, it retains its protected status with a specific federal act (the Bald and Golden Eagle Protection Act, 16 U.S.C. 668-668d). With natural predators, such as bears, wolves, and lynx, eliminated in Scotland, the red deer populations need to be managed. Nevertheless, this research has highlighted the fact that their iconic status has implications for the methods employed for their management. For example, the methods employed in Section 7 culling might be considered unacceptable by members of the general public if it were brought to wider attention. Furthermore, 'flagship species' have been utilized as a way to increase biodiversity through their conservation, which also results in conservation of both other species and habitats (Dietz et al., 1994). In Chapter 6, the importance of welfare concerns to estate-based practitioners was highlighted. It should be made clear that this is not an argument about 'animal rights': none of the respondents suggested that deer should not be culled. Indeed, it was frequently acknowledged that it was good welfare practice to cull rather than allow populations of deer to 'self-regulate', which generally would be by starvation. The issue is, rather, about methods of management. It was acknowledged that there were 'best practice guidelines' and that these gave appropriate consideration for the welfare of individual animals. Some research has been undertaken to address issues such as stress and distress of animals during culling (e.g., Macdonald et al., 2000; Grandin and Deesing, 2002; Keay et al., 2006; Loveridge et al., 2007), but much less attention has been paid to public attitudes to the actual practices of management of red deer in Scotland, although deer management has been discussed in other contexts (see: Johnson et al., 1993; Stout et al., 1996; Decker and Chase, 1997; Green et al., 1997; Kilpatrick and Walter, 1997; Bremner and Park, 2007).

The legislation pertaining to red deer management in Scotland (see Chapter 5) is generally regarded as reflecting positive management aims, however, implementation of Section 7

Agreements were viewed by some practitioners very negatively. The estate-based practitioners reported feeling as if they were not consulted and they also questioned the justification for the culls, which may simply be a transparency or inability to communicate government models effectively issue. Further research addressing habitat specifications and objectives, with consideration of soil, elevation, location, and so forth, would provide a stronger foundation for creating biodiversity goals. Furthermore, the trade-off between agriculture and wildlife in terms of grazing pressures are factors that can be measured and used to inform culling decisions. Independent research would potentially provide a clearer, more easily understood population model that would be acceptable to, and so accepted by, practitioners implementing the culling decisions. In summary, research that improved understanding of the deer would increase confidence that management decisions are taken with due regard for the protection of the deer, as well as population control.

7.2.2 *Improving the knowledge base*

Chapter 4 considered how practitioners became involved in red deer management, knowledge acquisition, information channels, and perceptions of scientific publications. This chapter highlighted the importance of peer-to-peer sharing of knowledge for red deer management. What was not explored in this research was the nature of knowledge generation, as opposed to knowledge sharing. Specifically, this is an issue about the involvement of the practitioners (so-called 'user groups') in determining the research agenda. Nightingale and Scott (2007) call this the 'relevance gap' – the mismatch between research which is undertaken and research which is required. Some of the participants in this research project expressed scepticism about the value of what 'science' has delivered in terms of its contribution to their practices of red deer management. Nevertheless, the same respondents also said that research was important and research papers were valuable. There would appear, then, to be an opportunity to reduce a relevance gap by working more closely with practitioners (and other stakeholder groups) to ensure that research that is undertaken is relevant and enhances practitioner knowledge in a way that will further environmental aims. Integration of knowledge and information channels has significance for all environmental management practitioners.

The practitioners also reported knowledge gained by experience of deer behaviour that they believed should inform decisions, but which often did not. For example, the deer might mass under some weather conditions which distort local density estimates. Research into natural deer behaviour and their response to weather conditions, human presence, stalking, etc should be undertaken in conjunction with practitioners who have an insight gained through years of observation. Since most people perceive animals to have a mental states and abilities based on their own experiences with animals and other knowledge sources that are integrated to form specific judgements and beliefs

(Spence et al., 2017) this is potentially even more true for these estate-based practitioners who work with red deer year-round. Therefore, a concept of an animal mind by an individual is likely to have wider relevance than animal welfare, ethical, or political and policy issues (ibid, 2017) and needs to be further researched.

7.2.3 *Protecting the land*

While most estate-based practitioners were satisfied with local management practices (notwithstanding challenges of funding and weather), issues of management on a larger-area scale (DMG-level management and higher) became apparent. Deer Management Groups (DMGs) were set up to cover territories of red deer herds and usually consist of many estates, communities, or governmental organizational run lands, which often have very different aims. For example, one DMG includes a National Trust property and a community-owned property where deer graze in summer in large numbers. Both would prefer fewer deer and therefore have held culls with higher numbers and have culled out-of- season. Meanwhile, a neighbouring sporting estate tries to increase numbers for stalking by increased investment in habitat creation to draw the deer to the estate for longer periods of time. The DMGs were established to manage the deer population across large areas and research has noted that these types of conflicts are an issue (e.g., Davies and White, 2012), but there is still no clear avenue or process to reconciliation of the differing management goals within the DMGs.

In the east of Scotland, deer are routinely fenced out of areas, for example, if the land is being managed for grouse shooting. However, in other parts of the country, culling is preferred over fencing. There is a large literature on the reasons and consequences (intended and otherwise) of fencing, noting that it can have both positive and negative effects (e.g., see: Watson, 1983; Catt, 1994; Staines, 1997; Summers, 1998; Scott et al., 2000; Hobbs, 2009; Gilbert et al., 2012; Stevens et al., 2012). Even where fences are used, gates or access points may be left open by, for example, walkers or workers. Some of the practitioners interviewed in this project suggested that a way should be found to balance all these interests and for nature to work together – not just species (Milner and Redpath, 2013) differences but management differences and Hanley (1996) has suggested that deer may have an active role to play in forest management. There is potential for more research into the development of unified management goals for Scotland, which would include clarifying fence use and purpose, such as use of fences for forest regeneration to a certain height of tree, but which might also limit the use of fences to restrict deer access in favour of grouse or other single-species management aims.

7.2.4 *Human impacts*

Tourists and local people alike enjoy seeing the deer: the aesthetic nature of these animals and the ability of people to view them is important (Mitchell et al., 1977; Hanley, 1996). Nevertheless, when deer are discussed, the damage they do to the landscape is invariably mentioned in the next breath, at least by many conservationists. However, many of the research participants pointed out that the impact of humans on the countryside is under-acknowledged (see also Goudie and Viles, 2013; Phillips, 2013). A Munro is 'scarred' by the walking trails, which are also heavily littered, arguably doing more damage than a herd of deer. Participants questioned how the 'Right to Roam' legislation is reconciled with the hierarchy of protection created by The Deer (Scotland) Act 1996 and The Wildlife and Natural Environment (Scotland) Bill (WANE) 2011, which conserves the environment and landscape over deer. Research could be directed to including greater consideration of managing human behaviour as a component of deer management plans. For example, Putman (1997) suggested lowering speed-limits, not just lowering deer numbers, would result in fewer road accidents.

7.2.5 A new framework for the sustainable management of red deer in Scotland

While there have been many advancements in collaborative deer management in Scotland in recent years (Davies and White, 2012), there remain challenges to overcome. Practitioners possess a large knowledge-base that could be harnessed to enhance management practices (e.g., see Cash et al., 2003; Ghosh et al., 2005; Ostrom, 2007; Irvine et al., 2009), and their inclusion and integration can reduce a key 'relevance gap' between scientific output and practical management needs (Nightingale and Scott, 2007). Reduction of the relevance gap and clarity on what kind of research holds value to practitioners should result in scientific studies becoming perceived as more relevant, legitimate, and salient as suggested by Cash et al. (2003). While some studies suggest that current legislation may assist in game management (Phillip et al., 2009), this thesis highlights a perception of an 'hierarchy of protection' that appears to be counterproductive for sustainable management and collaborative approaches because it divides the two main management groups. Thus, clarification on the 'hierarchy of protection' or potentially a more balanced approach, and how far the hierarchy extends (plants over animals, but human/human-use plants and animals), along with stakeholder inclusion is necessary. After all, estates in Scotland provide a conservation interests through their management as well as a significant financial contribution to the economy through an important cultural activity. In addition, unification of environmental and landscape goals, country-wide, including public input, or at least a discussion of such could be of value so as to ascertain what the 'public' and peoples of Scotland truly want their country to look like and what animals they want to see living within the landscape. Furthermore, clarification of nation-wide goals could further enhance management scenarios, such as when it is most appropriate to use fencing and for what duration. A reconsideration by the governmental agencies regarding the potential use of the red

deer and its value to society could only enhance landscape and environmental management, as a 'flagship species' focus could potentially assist with and support conservation efforts of other species, habitats, and ecosystems (Dietz et al., 1994; Walpole and Leader-Williams, 2002). The government must also consider the wider societal debates, such as land-ownership, and how changes can negatively or positively impact ecological and landscape goals, such as conservation efforts by gamekeepers or trying to appease hundreds of people because the landscape has been subdivided extensively. Finally, as Bradshaw and Bateson (2000) stated, the best conservation plan includes animal welfare considerations.

On a broader scale, this thesis concludes that the sustainable management of any environmental resource requires input from the practitioners who care for the resource (Kates et al., 2005), preferably in a feedback loop/sharing mechanism with resource regulators/policy makers (Cash et al., 2003) as they have valuable knowledge, and are themselves knowledge systems, that can enhance sustainable environmental management initiatives (Ostrom, 2007). True sustainable management requires resources to be understood as having a complete value of their own – and the value is not exchangeable, replaceable, or preferential to the value of something else (Parris and Kates, 2003; Dietz and Neumayer, 2007; Rockstrom et al., 2009). While culture influences how resources are perceived, there may be an emotional link between practitioners of animal management and their subjects due to the perception of an animal mind (Spence et al., 2017) that may influence the practitioners' morality and animal welfare standards which need to be accounted for, whether the animal is considered a pest or icon, in any management scenario. Many governments have not fully utilized the inclusion of landowners, workers, or other rural peoples to assist with local, regional, or national environmental goals and these individuals may be offer familiarity with the resource as well as conservation efforts they already employ/implement that enhance governmental programmes. Finally, resource models and environmental policy need to be refined and their application varied to different spatial scales to account for local or regional variations. Developing and communicating evidence-based policies, founded on scientific research, also requires the input of all stakeholders. Scotland's iconic deer deserve no less.

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Appendices

1.) Ethics Approval	II
2.) Pilot Questionnaire	III
3.) Participant Consent, Information, and Debrief Forms	VI
4.) Questionnaire and Semi-structured Interview Questions	IX

**Cultural Roots and Implications for the Sustainable Management of Red Deer (*Cervus elaphus*)
In Scotland**

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Pilot Questions

The following interview questions are for participants. The information, however, where appropriate will be collected and recorded by the researcher. The preambles are written, but will be spoken to participants as an explanation of the exercises. Additionally, specific goals of exercises will be discussed in relevant sections.

Section 1: Background/Demographics

Preamble: Before we begin the exercises, I'd like to gather some basic, though very generalized, background information.

1.) What is your occupation?

- Gamekeeper
- Estate Owner
- Factor/manager
- Other estate employee: (title) _____
- Organization employee: (title) _____
- Other: _____

2.) Age Bracket

- Under 20
- 20 – 30
- 30 – 40
- 40 – 50
- 50 – 60
- 60 +

3.) Where are you from? (i.e. primary location of influence while growing up)

4.) Where are you currently located?

DMG _____

5.) How many years at current position and previous?

Current _____ years

Previous _____ years

6.) What is your education level?

7.) Are you involved in continual professional development? i.e. training courses

_____ Yes _____ No

If yes, please list/give examples: _____

8.) Does education have a role to play in deer management?

_____ Yes _____ No

If so, how: _____

9.) In your opinion, what plays the most important role in deer management? Please number 1 – 6 in order of relevance – i.e. 1 is most important

_____ Education

_____ Politics

_____ Tradition

_____ Money (financing/availability)

_____ Culture

_____ Environment

_____ Other: _____

10.) Does the estate or organization have a red deer management plan?

_____ Yes

_____ No

11.) What are the internal and external influences on the estate's or organization's deer management plan?

_____ staffing

_____ DCS

_____ financial

_____ weather

_____ time

_____ recreation and access

_____ DMG

_____ other: please specify:

12.) What is the primary influence on the decision making regarding red deer management? Why? (influences: e.g. landowners, management plans, environment, DCS, DMG)

13.) Are there any other major influences on the red deer management decisions?

14.) Where do you find the information that influences the red deer management decision making?

_____ DSC _____ SNH _____ Owner _____ Factor
_____ Websites _____ Magazines _____ Research _____ College
_____ Peers (other stalkers, gamekeepers, etc within profession)
_____ Other: please list:

_____ -

Can you describe these flows of information? _____



Participant Information Sheet



Project: **Cultural Roots and Implications for the Sustainable Management of Red Deer (Cervus elaphus) In Scotland**

Sustainable development is traditionally based on three pillars – social, economic, and environmental. However, this project is based on the belief that culture, or rather the cultural context for implementation is also necessary to understand how to develop sustainable environmental management plans. For the purpose of this study, culture is defined as:

Culture refers to an individual's values and beliefs which are often shared by other members of the society in which they live (or were raised), with specific, individual variation of similarities and differences which may occur amongst the various spatial scales – from families, communities, regions to nationalism. Cultural values and beliefs are beliefs and values which arise from location specific landscape characteristics and are reinforced or changed through continuous environmental interaction, including interaction with organisms (plants and animals) and through interaction with other members of a society.

This research will take place in Scotland because of the complex relationships between its people and the natural resources, including red deer. This project aims to explore the views, beliefs and decision making processes of stakeholders involved in deer management.

Participants are asked to agree to an interview of up to one hour and in some cases to draw simple diagrams to illustrate their representation of deer management organisations and activities. The nature of this project requires that your responses to this interview and diagramming exercise means that, while I do not need to use your personal name I will need to refer to your position and so these may be identifiable in the final write-up.

I hope you will consider participating in this project.

Thank you for your time.

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Participant Consent Form



Cultural Roots and Implications for the Sustainable Management of Red Deer (*Cervus elaphus*) In Scotland

Researcher(s) Name(s)

Lorin Witta

Supervisor's Name

Dr. R White

Consent

The purpose of this form is to ensure that you are willing to take part in this study and to let you understand what it entails. Signing this form does not commit you to anything you do not wish to do and you are free to withdraw at any stage. Material gathered during this research will be treated as confidential and securely stored. Please answer each statement concerning the collection and use of the research data.

Interviews will be recorded and transcribed by the researcher.

A copy of your interview transcript will be provided, free of charge, on request.

Data collected may be processed manually and with the aid of computer software.

Please indicate your consent by completing the following:

- | | | | | |
|---|-----|--------------------------|----|--------------------------|
| I have read and understood the information sheet. | Yes | <input type="checkbox"/> | No | <input type="checkbox"/> |
| I have been given the opportunity to ask questions about the study. | Yes | <input type="checkbox"/> | No | <input type="checkbox"/> |
| I have had my questions answered satisfactorily. | Yes | <input type="checkbox"/> | No | <input type="checkbox"/> |
| I understand that I can withdraw from the study at any time without | | <input type="checkbox"/> | | <input type="checkbox"/> |
| having to give an explanation. | Yes | <input type="checkbox"/> | No | <input type="checkbox"/> |
| I understand that my position may be referred to in the final write-up: | Yes | <input type="checkbox"/> | No | <input type="checkbox"/> |
| I agree to my data (in line with conditions outlined above) being | | <input type="checkbox"/> | | |
| archived and used for further research projects / by other bona fide researchers. | Yes | | No | |

Name in Block

Capitals _____

Signature _____

Date _____



Participant Debrief



Thank you for your participation in my research project.

From your responses, and other participant's responses, I hope to be able to provide a clear portrait of current red deer management practices and decision making processes in Scotland today. I also aim to include various other aspects of red deer management that are relevant and may not be fully understood. This project has explored a wide range of views from the deer management sector. From the insights of participants, understanding and knowledge of decision reasoning can be gained in such a way as to aid natural resource management practices and sustainability goals.

Any questions or suggestions??

If you find you'd like to add anything further please feel free to contact the School of Geography and Geoscience at: gg@st-andrews.ac.uk.

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Pilot Questions

The following interview questions are for participants. The information, however, will be collected and recorded by the researcher. The preambles are written, but will be spoken to participants as an explanation of the exercises. Additionally, specific goals of exercises will be discussed in relevant sections.

Section 1: Background/Demographics

Preamble: Before we begin the exercises, I'd like to gather some basic, though very generalized, background information.

1.) What is your occupation?

- Gamekeeper
- Estate Owner
- Factor/manager
- Other estate employee: (title) _____
- Organization employee: _____
- Other: _____

2.) Age Bracket

- Under 20
- 20 – 30
- 30 – 40
- 40 – 50
- 50 – 60
- 60 +

3.) Where are you from? (i.e. primary location of influence while growing up)

- Scottish counties
 - urban or rural
- Non-Scottish UK
- Non UK

4.) Where are you currently located?

- Scottish counties
 - urban or rural
- DMG _____
- County _____
- Non-Scottish UK
- Other _____

5.) How many years at current position and previous?

Current _____ years

Previous _____ years

6.) What is your education level?

____ A levels/Highers

____ NVQ

____ Other college (none wildlife/gamekeeping)

____ Undergraduate degree

____ Post – graduate or higher

____ Other: please explain/list: _____

7.) Please list professional qualifications and memberships:

8.) Are you involved in continual professional development? i.e. training courses

_____ Yes _____ No

If yes, please list/give examples:

9.) Does education have a role to play in deer management?

_____ Yes _____ No

If so, how:

10.) In your opinion, what plays the most important role in deer management? Please number 1 – 6 in order of relevance – i.e. 1 is most important

____ Education

____ Politics

____ Tradition

____ Money (financing/availability)

____ Culture

____ Environment

____ Other:

11.) What is the primary influence on your decision making regarding red deer management? Why? (influences: e.g. landowners, management plans, environment, DCS, DMG)

12.) Are there any other major influences on your red deer management decisions?

13.) Where do you find the information that influences your red deer management decision making?

- DSC SNH Owner Factor
- Websites Magazines Research College
- Peers (other stalkers, gamekeepers, etc within profession)
- Other: please list:

Can you describe these flows of information?

14.) Does the estate have a red deer management plan?

- Yes No

15.) What are the internal and external influences on the estate's deer management plan?

- staffing DCS
- financial weather
- time Recreation
- DMG and Access
- other: please specify: _____

Section 2: Participation/Visuals: This exercise is designed to indicate presence of participants on the ground, followed by percentage of influence on management decision making.

1.) The following is a list of participants in red deer management. Please indicate – in approximate number or days – their presence on the estate.

- _____ Landowner
- _____ Factor
- _____ Stalker(s)
- _____ DCS
- _____ Other staff (e.g. Ghillies, trainees)
- _____ Guests

2.) The following is a list of who contributes in red deer management. It is broken into 3 scales: estate, Deer management group (DMG), and nationally. Please rank in order of importance and influence.

Estate: (1-6)

- _____ Landowner
- _____ Factor
- _____ Stalker(s)
- _____ DCS
- _____ Other staff (e.g ghillies, trainees)
- _____ Other: please indicate: _____

DMG: (1-4)

- _____ Estates
- _____ DCS
- _____ SNH
- _____ Other, please indicate: _____

Scotland: (1-6)

- _____ DMG
- _____ DCS
- _____ Other Conservation bodies (i.e. RSPB, SWT, etc.)
- _____ SNH
- _____ EU – via policy
- _____ Other, please indicate: _____

Section 3: Semi-structured Interview

Preamble: This exercise is a semi-structured interview. It is in two parts. Semi-structured interviews allow the interviewer to probe respondents for clarification and elaboration by combining pre-determined and open questions, encouraging a greater response from participants (May, 2001).

The first part will gather some basic information followed by questions you can answer freely. It is designed to draw out your perceptions and opinions with the least amount of influence from me. The second part consists of a few questions regarding your management techniques and is designed to draw out how you make decisions in deer management.

Part 1

- 1.) How/why did you become involved with red deer?
 - a. What sort of training?
 - b. How did you learn to manage deer?
 - c. Who taught you?
 - d. Where?
 - e. How?
- 2.) Please explain what the red deer management plan is for the estate where you work.
- 3.) How do you determine what actions to take in order to reach the management objectives with in your red deer management plan?
- 4.) How are desirable culling numbers determined? What are the numbers based on?
- 5.) Who determines which deer to cull? What is this decision based upon?
- 6.) Are you happy with decisions made concerning red deer and their management in your area?
- 7.) What influences the decisions you make? (use to pull out conflicts, ie. DCS)
- 8.) What is best thing about current deer management/stalking in Scotland?
- 9.) What is biggest concern/challenge deer management faces?
- 10.) How does culture influence what you do in the red deer industry?
- 11.) How do you think culture influences the red deer industry?
- 12.) How do you define culture in this context?