

Wild Deer, Multivalence and Institutional Adaptation: the 'deer management group' in Britain.

S. Fiorini¹, S. Yearley², N. Dandy³

Abstract

In Britain, wild deer can be conceptualised as a commons, although a complex institutional structure - founded largely upon land-ownership and notions of stalking rights - has evolved over several hundred years to regulate access to this resource. In recent decades, however, a number of socio-political, economic and ecological factors have fundamentally altered the nature of wild deer as a resource, introducing new impacts along with new interactions between them, their environment and an increasing variety of stakeholders. These drivers include, amongst others, mounting interest in the preservation of woodland habitats, agricultural reform and rising levels of traffic on British roads. Drawing upon evidence gathered through interview and case-study research, this paper investigates how established institutional arrangements have reacted to this increasingly multifunctional resource.

Specifically, this paper considers the 'Deer Management Group' (DMG). DMGs have existed for many years, in a variety of forms and with diverse memberships. They are primarily a response to the mobility of deer, which causes the animals to cross jurisdictions and boundaries thus demanding collaboration between neighbours, particularly landowners and their deer managers. Levels of collaboration, however, vary greatly. As the multivalence of wild deer is increasingly acknowledged, greater numbers and variety of stakeholders may demand a say in deer management. This paper shows how newly emergent stakeholders seek to engage with, influence and/or bypass existing institutions - including DMGs - and how the existing institutions adapt to the multivalence of this particular resource and/or can be used to define the boundaries of legitimate engagement with the resource. We conclude by considering how well DMGs 'deliver' multivalence.

¹ MaCaulay Institute.

² University of Edinburgh.

³ Forest Research.

Introduction

Multivalence: *The property of having many meanings, values or interpretations (Oxford English Dictionary).*

This paper illustrates ways in which Deer Management Groups (DMG), as communities of managers, work as institutions effective for developing adaptive management rules. The evidence presented also show that the working of communication and collaboration as institutions forces us to understand adaptation in terms of cultural change and collaboration, meaning not only working towards a common objective but also (see for example Tsing 2005) collaboration between diversity of objectives and diversity of cultural legacies.

Using secondary and primary data collected during interviews and participant observation we discuss institutional adaptation in deer management showing how newly emergent stakeholders seek to engage with, influence and/or bypass existing institutions - in particular Deer Management Groups (DMGs). We also consider how existing institutions adapt to the changing context and multifunctional requirements of management and/or can be used to define the boundaries of legitimate engagement with the resource. In the following section we discuss the theoretical context and elements that make deer an unusual common pool resource. Then we will describe a range of different values and objectives relating to deer in contemporary Britain. Subsequently, we provide an historical overview of Britain's institutions for deer management. This will supply the context for an in-depth discussion of DMGs and how they are adapting to change. We conclude by considering the role DMGs may have in the future of deer management and discussing communication and collaboration as core institutions for adaptive governance of natural resources.

Theoretical context: Deer as an unusual common pool resource

In Britain, wild deer can be considered a common in the sense that no single person can claim ownership over them and, only after they die or are captured, do they become subject to legal entitlements (Parkes and Thornley, 2000, DCS 2000).⁴ This does not mean that in Britain anybody can take or kill a deer; far from it; deer have been a well-guarded resource and over several hundred years a criticised but widely accepted institutional structure - founded largely upon land-ownership and notions of stalking rights - has evolved to regulate access to deer. Indeed, in Britain, wild deer are a rather unusual common as they are *res nullis* (that is they cannot be owned by anyone whilst alive) but 'excludable'; additionally, depending on the context, they may sometimes be 'rival' and sometimes 'non-rival' (that is, resource use by one user can sometimes, but not always, reduce the available resource for others). They are also unusual as a common because over-consumption of the resource is not necessarily negative for all stakeholders.

⁴ The present article focuses on wild deer in Britain. On the main island there are six different species of deer: roe (*Capreolus capreolus*) and red deer (*Cervus elaphus*) are native. Fallow (*Dama dama*), Sika (*Cervus nippon*), muntjac (*Muntiacus reevesi*) and Chinese water deer (*Hydropotes inermis inermis*) are not native species (Putman 1988).

As several scholars have noted, the usual basis for the exclusion of potential users from a resource is the allocation of private property rights and, consequently, resources that cannot be reduced to private property are usually non-excludable (see Vogler 1995). However, in Britain wild deer have *res nullis* status, but their consumption has long had rules of exclusion. In this case, these rules relate not directly to the resource but to the processes and methods by which the resource is consumed. A conceptual parallel might be drawn with, for example, the exclusion of potential resource users from high-seas fisheries (another *res nullis* resource) via the monopolisation of necessary technologies required for their exploitation. Further to this, wild deer can be both rival and non-rival (simultaneously in the same location even) depending upon the way in which they are used as a resource. Where, for example, sporting interests sit alongside natural heritage, forestry or other sporting interests, rivalry can occur as the activities of one set of interests can negatively affect the other. Where non-sporting interests co-exist, 'rivalry' is less likely. Finally wild deer are also perhaps unusual in the sense that, for some human interests such as forestry, substantial or even over-exploitation of the resource is a positive rather than negative phenomenon. Of course, this is because, in this context, deer are not in fact valued as a resource, but rather viewed as a pest. These dimensions are illustrative of the complex nature of British wild deer as a 'resource'.

Today, deer are an abundant and growing resource in Scotland and much of the rest of Britain - expanding both in population size, reaching dimensions close to what they were in Mesolithic times, and range of distribution, returning into areas where they had been absent for centuries (Ward, 2005: 172).

Dietz et al. (2003) defined human institutions in a nutshell as "ways of organizing activities" and highlighted the impact that this has over the resilience of the natural environment. The formal and informal rules adopted to regulate use of resources have even been used as an exemplar or definition of the term institution (Dietz et al., 2002 cited in Tucker and Ostrom, 2005). These rules-in-use can be formal, e.g. legislation, executive and court decisions, private contracts, or informal: "customary rules that may evolve over time or be designated in settings where they are not legally recognized" (Tucker and Ostrom, 2005: 82). Dietz et al (2003) identified five elements that facilitate the achievement of effective commons governance (i.e. preventing degradation of the resources by human population, consumption levels and the use of advanced technologies (Dietz et al. 2003: 1907)): i) monitoring of resources and uses, ii) moderate change of conditions, iii) face-to-face communication and networks, iv) exclusion of outsiders and v) users' support for the rules in use.

Deer management in Britain reflects the rules for effective common governance just outlined. Deer numbers and use are in many cases monitored, deer numbers are moderately changing (in terms of their impacts or in terms of the abundance of deer for stalking) - most often increasing in numbers and distribution. Various fora guarantee face-to-face communication and networks between managers and policy makers on various scales. Outsiders tend to be excluded from management decisions and from the resource, e.g. in Scotland's Crown Office and Procurator Fiscal Services' Case management database, during the reporting years 2002/03-2006/07, 19 charges were reported for unlawful killing, taking and injuring of deer, and 9 for taking or killing at night, compared to 290 charges for crimes against the

protection of wild birds, their nests and eggs (Mulholland 2007). Finally, there is overall support for the rules in use from established stakeholders often expressed in resistance to changes in the system⁵.

This is in contrast with the fact that deer management is often in the news, there is lack of satisfaction with the current management system, the need for changing legislation is widely discussed and resources are invested for assessing the performance of current governance to provide ecological answers to management conflicts and indications of how to maximize economic and ecological outputs of deer management. The roots of this lack of satisfaction with past governance arrangements can be found in a series of changes that have occurred in recent decades. A number of socio-political, economic and ecological factors have fundamentally altered the nature of wild deer as a resource and the relationship between people and deer, introducing alternative interpretations of their impacts, along with new perceptions and interpretations of the interactions between them, their environment and an increasing variety of stakeholders. These drivers include, amongst others, mounting interest in the preservation and regeneration of natural habitats, agricultural and land reforms, and rising levels of traffic on British roads. Deer are managed for multiple functions, responding to multiple needs, and as the multivalence of wild deer management is increasingly acknowledged; greater numbers and variety of stakeholders may have, and have to have a say in their management.

An institution may have to adapt governance to more complex systems in order to provide information; deal with conflict; promote compliance with rules and prepare for change (Dietz et al., 2003). Today, the multiplicity of interests surrounding deer management require its institutions to adapt and change, not only in order to accommodate economic and other interests to the ecological dynamics characteristic of deer and their impact on the landscape, but also to accommodate the changing social and cultural values attributed to this species and the environment.

The adaptation required in this case cannot be exclusively informed by a wholly materialistic understanding of deer and environment; instead it must account for tangible and intangible cultural, historical and political processes which affect the meaning and values attributed to deer and the way change can take place (the Attributes of the Community (Ostrom 2005)). In other words, institutional adaptation involves individuals' emotions and feelings; this derives from the connection existing between values and meanings, and the fact that meanings connect to feelings because they are known through the emotions that they induce (Milton 2002: 100). Institutions are also the result of historical and political processes being "the product of contested social practices that are culturally and historically embedded" (Scoones 1999: 494, see also the works by Mosse 1997 and Leach et al. 1999). These processes can be a constraint and impact upon the possible futures institutional arrangements.

⁵ This might take the form of lack of development of deer management plans agreed by all the members of a deer management group, or resistance to the proposed incorporation of the Deer Commission for Scotland (DCS) into Scottish Natural Heritage (SNH).

In the section that follows we will proceed in describing the range of different values and objectives relating to deer in contemporary Britain, i.e. those elements that constitute the multivalence of deer.

The economic, ecological, social and cultural multivalence of deer in contemporary Britain

In Scotland, part of the debate over the priorities that should determine the objectives for deer management centres around the preservation of the sporting industry, its traditional values, its importance in sustaining the livelihood of rural communities and the costs that private estates are already absorbing in order to achieve favourable habitat conditions. In this case, deer are valued in relation to the possibilities they afford for satisfying the broadest range of visiting 'sportsmen'. This, in good part, is considered to be dependent on the abundance and quality of the resource. Organizations with an interest in this sector have commissioned studies in recent years aimed at quantifying the economic importance of this industry in the UK, especially in rural areas of Scotland. In England, deer stalking is not as prominent nor a widespread estate activity as in Scotland – instead game bird shooting is more important and agriculture constitutes the dominant land-use.

Rural estates often balance a variety of activities such as agriculture, forestry and sport shooting, along with the management of residential and commercial properties. The Kerr report (2004) showed that estate management is commercially viable and particularly beneficial for local communities in Scotland. The estates investigated relied for most of their returns on agriculture and property letting. However, sport represented an important activity especially on estates of both small and large size, accounting for respectively 8% and 10% of the land use economic outputs⁶. Estates invest significantly in developing and managing on a daily basis their sporting assets. Shooting is "strategically important to the estate" so much that "[l]and and forestry management is sympathetic to conserving and enhancing shooting potential" (Kerr 2004: 9).

A study commissioned by the Country Sport Tourism Group (CSTG) in 2003 reported that expenditures by visitors who come to Scotland to engage in country sports (i.e. freshwater angling, shooting or stalking) are in the region of £130 million per year (TNS 2004). These figures were based on two previous studies, one on angling commissioned by the Scottish Executive in 2004 and another, undertaken by Cobham Resource Consultants in 1997 on shooting. This latter report estimated that in the UK shooting and stalking generated over £400 million to the rural economy and was practised by more than 700,000 regular participants (SAOS 2004).

More recently the current contribution of deer management and shooting for sport to the Scottish economy was assessed by Corporate Economic Consultants (PACEC) (2006). Based on this study, in 2005, £105 million was spent in deer management, £97 million of this related to sport shooting and stalking. Of the total spent, £70.4 million were retained in Scotland. Deer-related activities employed directly and indirectly a total of 2,520 full time equivalent paid jobs (FTE). Of these, 966 related to

⁶ Figures are per adjusted area see Kerr 2004 for an explanation of the procedure applied.

direct employment: 840 for sporting and 126 not-for-sport respectively. The respondents indicated that non-sporting management on estates was undertaken in order to avoid deer damage on the habitats; it mainly involved shooting, but also made use of fencing and muirburn. However, deer control was indicated by 82% of the respondents to be directly connected to the sporting activities provided on site (PACEC 2006). This survey also showed venison to be a by-product of deer management, highlighting the fact that the principal value of deer in this case resides in its potential to provide quality stalking. Quality stalking in Scotland was found to depend on the skills of the stalkers and ghillies, the quality of the services and facilities provided and the scenery and the landscape (TNS 2004). The quality of the service provided depends on the shooting opportunities and this is directly related to the abundance of the species. Hence, sporting management is function of the easiness of stalking, and not on the Kg of meat produced.

Deer carcasses (except for the trophy - which can cost up to twice the price asked for killing a deer) are primarily considered a by-product of deer stalking. Nevertheless, many actors are concerned with improving the venison market. Producers find it difficult to take advantage of Scottish and other UK markets, despite the existence of an evident demand for this product. The market is dominated by few processors that operate largely in the export market and the prices to producers have remained low. Requirements created by new legislation in this area are often a concern for the estates because they require considerable investments in new facilities for carcass preparation and for training (SAOS 2004). The current legislative requirements also make it difficult to start small-scale processing plants to serve the local market, even if some successful exceptions exist.

Deer and their management for stalking or sporting have a central importance for Scotland's society, culture and history. 'Red' and 'Roe' deer, 'Heather' and 'Hills' and 'Mountains' were categories selected by the Scottish public as among the most important species and habitats (Stewart 2006), that are "important for any reasons including for conservation, for their own personal enjoyment, as economically important (e.g. fishing), simply their favourite, as symbols of Scottish identity or just that they are nice to see".

Deer can carry additional and various significant positive values. They can be a symbol of royalty, nobility and their control over the land throughout Britain, at the same time they have been used as a symbol of the landed classes and foreign exploitation of Scotland's natural resources (see McGrath 1974). Today, they often symbolise natural beauty, particularly in Scotland, in publications, information booklets for tourists and even drinks commercials (see, for example, the recent Irn Bru (the "National" soft drink of Scotland) "The Snowman" commercial in which a child flies over Scotland's most famous landmarks and sees a stag immediately after having flown over a swimming Loch Ness monster). Direct engagement with deer, through stalking activities and/or watching and viewing can contribute significantly to human psychological well-being. Ecologically, native red and roe deer are important elements of Britain's biodiversity and likely perform important ecosystem functions such as the suppression of woody flora on heath and grassland, and seed dispersal across an increasingly fragmented landscape.

Alongside the positive values associated with deer there are a series of negative impacts deer have on the environment and on various human activities. Forestry enterprises have long controlled deer in order to protect timber crops. In a similar way, woodland areas managed for conservation (for example for the regeneration of native woodlands and habitats) or protected under national or international agreements (such as Natura 2000) sometimes need to control deer populations to reduce grazing impacts. In these cases deer carcasses are again a by-product of management because the value resides in the crop or in achieving natural regeneration and the deer are often considered and treated as pests.

Deer can become constructed as pests when they invade human spaces, e.g. enter someone's garden, or cross the road at the wrong time. In these cases deer are considered to have negative value because of the damage caused by crossing the boundaries between natural and human spaces, the material damage to private properties and the risks caused to human lives. Between 2000 and 2005, based on 32,000 reported Deer-Vehicle Collisions (DVCs), it has been estimated that in Britain about 46,000 vehicle collisions are caused by deer, of these about 8500 are in Scotland. This has caused about 550 human injuries and material costs estimated to be over £17 million (Langbein and Putman 2006, The Deer Initiative n.d.). This has generated a debate on the extent to which the responsibilities for deer control rest with those that have the right to hunt.

Institutions able to regulate the management needs dictated by each of the economic, social and cultural aspects of the multivalence of deer described above are already in place and rely greatly on estate boundaries or shooting rights boundaries. What is not yet clear is how the institutions currently in place are able to effectively address this multivalence in spatial terms and address the "anomalous status" of deer as a wild animal John Knight (2002: 14) describes this 'anomalous status' as deriving from a structural cultural ordering of the world into dichotomous classes. Based on this perspective phenomena are viewed as anomalous when they resist such classificatory schemes. One grouping of anomalous animals is based on physical cross-boundary; e.g. the whale that blurs the line between fish and mammal. The second form of animal anomaly identified by this author is in terms of space (Knight 2002: 14): "when space is culturally divided into different spheres, each of which carries a distinctive moral evaluation, it can serve as a basic classifier of animals." This process is also at the basis of the production of place. Land uses divide the landscape up into more or less discrete spaces in which economic, social and cultural spheres of human life materialize. The anomalous status of deer results from the fact that, unless they are fenced in or out, deer move across these spaces interfering with this spatial ordering.

The impossibility of maintaining the boundaries of this spatial ordering results in human social conflicts with and over deer (i.e. conflicts related to damages caused by this species and conflicts that emerge from people holding different interests and attributing different meanings to this species) and the consequent development of social divisions and social aggregations (Knight 2000 following Douglas 1992). This is a social-cultural process that, as we have discussed above, involves not just discussions over different uses that are made of deer (or of a resource); this process involves exchanges that are intimate to the actors involved, being linked to emotions,

feelings; meanings and values that emerge as actors relate and experience their society, culture, and environment (Milton 2002).

Institutional responses to deer vagility and multivalence can develop only where social contact and exchange is possible. We will see that in this case study Deer Management Groups (DMG) have the potential for facilitating such contacts and exchanges.

Institutions for deer management in Britain

“All deer are wild species and only become someone's property when they are captured or killed by persons entitled by law to do so - usually the owners of the land on which they are present. Landowners, however, also have a responsibility for the welfare of deer and their natural habitat” (ADMG 2008).

“Deer in Scotland are *res nullus* – they are not owned by anyone. Despite the lack of ownership deer are managed by various different organisations and individuals to meet a variety of different aims” (DCS 2008).

Formal legislation regulating access to wild animals in England was first issued in 1016 by King Canute within his *Charta de Foresta*. These ‘Forest Laws’ were subsequently greatly strengthened by William 1st in the mid 11th Century. Whilst a system of Game Laws had long existed, Scotland had its first deer-specific legislation only in 1424 under James I of Scotland. These legislative actions limited hunting rights to the King and nobility in “forests,” that is, reserves for wild animals for the purpose of providing game, and to land owners. Along with the limitation of access through hunting rights and land ownership, the other main concern addressed by the legislative acts that followed were with poaching, that is trespass with the illegal taking or killing of a deer, along with norms regulating the techniques allowed for killing deer.

Legislative development at the beginning of the 20th century introduced protection of agricultural interests, providing tenant farmers the right to compensation as the farmers did not have the right to kill the deer (Agricultural Holdings Acts 1906 [England] & 1908 [Scotland]). This is indicative of a changing perception of wild deer, of the broadening of actors entitled to discuss issues of deer management, and the broadening of priorities that should guide their management. The legislation regulating deer management in the second half of the twentieth century reflected this broadening of interests. For example, the *Deer (Scotland) Act* 1959, that predated by a few years the *Deer Acts* for England and Wales, had the objectives of conserving and controlling red deer in Scotland, preventing the illegal taking and killing of deer and defining rules for monitoring and achieving the above objectives (see Whitehead, 1980). For this latter purpose, the Red Deer Commission (RDC) was formed. Further legal developments in Scotland broadened the remit of the RDC, replacing it with the Deer Commission for Scotland (DCS). Under the *Deer (Scotland) Act* 1996, DCS now has duties to act on all species of wild deer promoting conservation, control and their sustainable management as well as to review all matters related to deer and their welfare (DCS 2000).

In England, there is no government body equivalent to DCS with statutory powers relating to deer and their management. Some organisations with interests in deer management meet under the auspices of the Deer Initiative (DI), established in 1995 - its objectives being to “ensure the delivery of a sustainable, well managed wild deer population in England.” Although it is funded almost exclusively by government, the DI is not a government agency. Instead, it is a partnership of organizations charged with achieving its objectives through the development of collaborative management (see The Deer Initiative Accord). In a similar way, the DCS embraces the diversity of objectives concerning deer management through the inclusion of a range of expertise, interests groups and organizations’ representatives as commissioners, and consulting on matters of priorities with groups of organizations – such as the Deer Management Round Table. Both the DI and the DCS have an important advisory role for the deer sector, collecting and sharing information related and relevant to deer management. In the past, DCS was responsible for counting deer throughout Scotland on a rotating basis, it collects estates’ cull numbers and, as the DI in England, is responsible for the collation and development of Best Practice guidelines and Best Practice Demonstration Events.

Where deer are causing damage to agriculture, natural heritage or are becoming a threat to public safety on the roads, DCS can set control areas and define control agreements with the manager(s) of the land in order to reduce the impact deer are having (Section 7 of the Deer (Scotland) Act 1996). This is a voluntary agreement the landowner or managers of the land stipulate with DCS. In case a control agreement is not possible or is not carried out, or in other cases requiring immediate intervention to reduce deer damage, DCS has the right to directly intervene in culling or taking the deer and can even demand the expenses incurred to be refund by the landowner (Deer (Scotland) Act 2006). Section 7 agreements have been the preferred approach taken in order to respond to conservation requirements put forward by Scottish Natural Heritage; in rare cases DCS directly intervened in culling deer, these interventions severely affected its image and reputation in the deer sector. An emergency intervention that occurred in Glenfeshie in 2004 to protect a control agreement in place to achieve favourable status of a Natura site was heavily criticized by organizations in the sector, made the news and even resulted in a ministerial inquiry (see ERAD 2004). In England, the Deer Initiative has no such powers and, being aware of their own voluntary status and the impact of these forced interventions north of the border, state explicitly their disinterest in obtaining them.

Direct external intervention in the management of deer by a public body on private property represents a substantial break with the perceived fundamental rights of landowners which, as noted, form the basis of deer management in Britain. In the past and still today, the breaking of this rule was called poaching and was treated like the stealing of private property. At one point in time, poachers could even incur capital punishment. The government’s direct intervention in the management of an estate has economic and symbolic implications.

Ownership boundaries generally represent the management unit and are virtually never crossed by neighbouring stalkers, unless special agreements are in place. Even when a management agreement, affecting an area under the control of different estates, is in place each estate remains responsible for achieving the

management objectives on its own land. For the same reason, neighbours have no control over the management of an estate even if this management has consequences for and an impact on their own management objectives.

A series of interviews with estate managers and stalkers in Scotland has revealed a significant variety of approaches for defining management objectives and how to implement and monitor them. Overall, management tends to be reactive to the deer population size and its impact, and the overall objectives are first decided internally (whether estate or organization) and eventually discussed in the DMG's formal meetings. DCS can be called in to provide technical advice. In recent years, SNH has been involved in the process for those areas under special protection status.

Managers of land controlled by conservation NGOs usually develop a management plan with the objectives of implementing the 'corporate' goals of their organization, although with significant local variations. Where culling is a chosen management technique, the intensity of deer cull is based on the observed impacts on habitat regeneration and habitat conditions and on the deer counts; for regeneration, it is widely accepted that in case of red deer densities need to be generally below five deer per square kilometre. The cull target would be the focus of the ranger (hunter) and it is generally assumed that no attention is paid to the characteristics of the individual animal culled, even if preference should be given to hinds. Managers and stalkers are generally responsible for the practical application of management goals. These latter are decided at other levels of the organization structure. Revenues from venison and sporting tend not to be among the objectives for management; sporting tends to go against the values of these organizations, even if this is much more a concern of the members than of those in charge of the management who might welcome the extra revenue that could come from sporting. Pests (e.g. foxes) are controlled in some of the conservation estates in Scotland, especially where there is also game-bird management. Conservation organizations in Scotland tend to resist the use of fences too because of the consequences they have on endangered bird species. In England, again, this has been less of an issue with several such organisations preferring to fence than take other management actions, especially where financial assistance can be obtained from government to erect them. A similar approach is followed by organizations with strong forestry interests such as government organisations including the Forestry Commission (FC). Here, the grazing impacts on trees are driving decisions over the culling intensity. Again, venison and sporting income are not a primary objective and deer are considered a by-product of commercial crop (timber) production. In this case fences are commonly used to protect the crop. Small scale forestry operations, however, may rely more heavily on sporting income to offset the costs of deer control and to provide an income between the planting and the harvesting, as emerged from an interview with a small forester in one of the Scottish study areas.

Similarly to the commercial woodland owner, the farmers interviewed were generally supportive of the sporting needs, focusing on the economic benefit brought by stalking. In Scotland, the farmers interviewed were all producing livestock with no arable crops and were not concerned about deer grazing impacts. The Scottish sporting estates involved in the research showed management approaches that differed from the above. Also in this case management was reactive, decisions were taken by the owners in consultation with the stalker or head-stalker based on the

past history of the estate for supporting a certain intensity of stag culls. The selective culling of stags and hinds (red deer females) are undertaken to maintain and/or improve the quality of the population, e.g. a high quality stag will not become a trophy until the end of its reproductive life, hinds are culled if too old, unhealthy or producing low quality calves. If the population increases, estates might decide to increase their cull for the year. Deer and habitat quality are often evaluated by the stalkers who base their judgement on the experience accumulated during years in the job. There are cases in which DCS guidelines for habitat assessment are followed by the stalkers on sporting estates and habitats are also monitored on areas that are under special conservation status (e.g. SSSI, SAC, etc...).

The rules for management described above can be summarized by the contrasts illustrated in management for population control versus management for individual deer. In the first case, the main interest is to make the deer population size compatible with certain specific habitat objectives or crops requirements. In the second case, the main interest is in reproducing individuals that respond to the expectations of the stalking clients. This contrast would not produce a conflict if it were not for the mobile nature of deer.

In order to address potential conflicts arising from the effects that the management on one land holding can have for another, the concept of deer management groups have been promoted and developed in both Scotland and England. A DMG has essentially been a forum at which land holdings that share a common herd of deer are represented and discuss management policies to reasonably meet the requirements of all the members (ADMG 2008). The composition of contemporary DMGs is beginning to include non-landed stakeholders such as government bodies, and may eventually include members of local communities.

The following section will provide an overview of the DMG as a management unit and discuss its potential as a forum for communication and institutional development despite its apparent lack of influence over the management of single areas.

Collaboration, institutional change and Deer Management Groups

In the 1980s, the Red Deer Commission was instrumental in setting up a network of voluntary deer management groups in Scotland to bring interested parties together to facilitate discussion and coordinate deer management of this resource. Whilst DMGs existed as early as 1968 and other forms of collaborative management were in place on Scottish islands prior to that date (Finnie 2004), the number of DMGs grew from a total of 10 in 1979 to about 45 in 2001 (Nolan et al. 2001). Today there are more than 70, between groups and subgroups, DMGs in Scotland (ADMG 2008). DMGs have existed in England for some time also with, for example, one group in our study area having been formed approximately 35 years ago. However, the DI has sought to follow the Scottish example and foster a similar expansion of the phenomenon in the decade since its establishment. This organisation is not, however, yet allocated resources equal to those of the DCS in order to achieve this mission.

The importance of the DMG's voluntary nature has been identified in a survey conducted between 2000 and 2001 (Nolan et al. 2001) in which more than three-

quarters of the DMGs responding to the survey did not believe that statutory powers would enhance the performance of the DMG; instead they were willing to receive public support in terms of information-gathering on habitat conditions, monitoring of deer numbers and habitats as well as the provision of technical advice in the form of Deer Management Plans. This same study suggested DMG membership was quite engaged with more than half the membership being active in the typical group's activities. Groups tended to have about two general meetings every year in which information relevant to the sector was shared or reported by representatives of relevant organizations, including for example the DCS and ADMG, and cull numbers, deer counts and other management methods would be discussed. During these meetings, minutes were usually taken, although in substantially differing levels of detail, and distributed before the following meeting. Nolan's survey (2001) showed that, in Scotland, on average more than two-thirds of the participants were represented by stalkers and owners, less than a quarter were represented by managers or factors and the rest by community representatives and representatives of other land-use interests. Among invited representatives from outwith the groups were – in order of importance - DCS, forestry interests, representatives of ADMG, SNH. Less frequently represented were NGOs and neighbouring DMGs, community interests and recreational interests.

The workings of the DMGs that participated in the present study reflect the general characteristics illustrated above. In order to better understand how collaboration contributed to the solution of deer multivalence and change we focused our investigation on DMGs that presented the broadest range of interests related to deer, from sporting, to conservation, including large and small scale forestry and farming. Figure 1 represents the location and the diversity of estates on one of the Scottish case studies under investigation in the present project. The DMG responsible for the area represented in the figure was set up by the DCS and has been active since 1988. The area it manages is quite fragmented; this is generally considered to make the interactions between management and members more difficult. The chairman pointed this out clearly during an interview:

“I mean as I said it was always going to be a problem area because of all of the disputes and land use interests. You know it's not like it's one of these areas where you can take about 100,000 acres and you have got four different estates all with the same interests. It's not like that at all.”

This notion was reconfirmed by the Chair of a DMG in England who noted that one significant reason that their group had operated so successfully for such a long period of time was the coherence and similarity of interests shared across all the participants and, specifically the absence of contrasting sporting interests from the area.

On top of the complication introduced by the diversity of land use interests, we could expect the group to be impaired by its voluntary nature, affecting its ability to generate binding and enforceable agreements, or to impose sanctions. In one of the chairmen's words:

“Basically it's purely a voluntary thing; you can't make anybody do anything that they don't want to do, so it's really about talking to each other [...]”

Talking to each other is among the key assets of DMGs. It provides a mean for sharing knowledge, for mutual learning and finding out the values and ideas of other stakeholders in the area and contributes to the building of trust. A lack of trust between actors has been identified as the crucial factor behind the occurrence of Hardin's 'tragedy of the commons' and similar constructs based on the 'prisoner's dilemma' (e.g. Vogler 1995). Trust has been showed to being important for achieving close to optimal results in action situations in experimental settings (Ostrom 1998, 2005). Therefore the development of these elements are fundamental for a community of stakeholders that is brought together to manage a commons in order to overcome its divisions and develop ways to accept and mediate diverse values and potential contrasting objectives.

Attendance at meetings is a fundamental step for building the community and is positively welcomed by the DMG attendees. At a recent meeting, in one of the study areas covered by this project, the first thing the Chairman did was to welcome into the group a couple who had recently purchased an estate in the area, and the representative of another estate who was attending the group meeting for the first time. Attendance at meetings can be primed by a perceived threat to a certain group of interests and this is what happened, for example, for on of the case study:

"[...] It was years before we started getting anybody to come along [...] [the DMG] wasn't real until Glen F. was sold and things started to change."

"[...] There was a period when the things got badly disbanded and it had much to do with the Deer Commission. The band of Glen F. was sold to the [NGO] and there were massive plans of culling deer, etc. etc. and the Deer Commission started holding meetings but it didn't involve the Deer Management Group. So basically we put our foot down and said you set it up. So what's the point of setting it up if that's the way you are going to handle things, you see. And I think after that we got back on track again."

In practice, things even improved for this DMG. In fact, attendance is now near to 100%, up from 50% of the time before Glen F. acquisition, and representatives of NGOs that manage land in the area and the FC attend meetings and openly discuss management issues. The diversity of interests does not preclude dialogue; instead it contributes to the clarification of motivations and positions, it clarifies the knowledge base for decisions and identifies areas in which work can be done to reduce management conflicts. In the recent meeting mentioned above, for example, members of the group enquired over whether the impact on the habitat of high culls to meet regeneration was monitored, or if the cull targets were decided based on habitat assessments. In the area it is believed that the cull targets set for recently acquired estates by conservation NGOs are neither properly motivated nor take account of the implications that intensive culling regime might have for the welfare of the deer. This is almost considered to be a form of persecution against the deer. A local crofter commented to one of the authors (SF) on two separate occasions that "today there is no more respect for the deer." During the mentioned meeting the DMG provided the opportunity to supply information, discuss an existing conflict as well as an opportunity for questioning the power that allows a land owner to independently set management targets, implying that decisions should be made

based on information and that managers should be able to publicly justify actions that have a potentially damaging effect on neighbours. At the same time, suggestions for alternative management of the land, specifically for improving the ground's carrying capacity, were made.

Communication not only provides more information and clarifies each actor's position and practices, opportunities for communication are used to test the boundaries and constraints of opposing factions. This knowledge can become an advantage in the process of mediation:

“Q: So, how is the relationship with the NGO right now?

A: Their relationship with everybody is quite good.

Q: Have you found an agreement similar to the one you have with FC?

A: Yeah, I wouldn't say that we have agreements as such, but we just try to get people to...

Interviewer: Understand the situation...

A: At the end of the day FC and the NGO, they are charities and government organizations... We play on that a little bit. They are quite susceptible to public opinion.”

As we have discussed above, DMGs were established to manage a shared population of deer. However, now that the complexity of deer multivalence has increased, DMGs are accepted as the institutions that should be involved in managing this changing complexity. This is the role that one of the DMG investigated took during recent years, when land ownership changed and the South side of the DMG went under the control of two separate NGOs, and then more intensely after discussion of the FC taking over the management of more than 11,000 ha in the same area. In response to these changes, the establishment of a deer fence was proposed, which would have prevented the deer from moving from the sporting estates south onto ground that historically had been favoured by stags in winter. Discussions, assessment and development of the proposed fence unfolded over nearly three years including within the DMG, between subgroups of the DMG, other organizations and actors, e.g. the National Park Authority, DCS, SNH, Animal Welfare Committees, public meetings, members of the Scottish Parliament and so on. The FC was the body with main responsibility for the development of the proposal and offered its expertise also for the development of a Deer Management Plan to go along with the strategic fence. During this period discussions were also made over the need for more information in order to evaluate the environmental impact of the fence and its economic impact, which would have also provided the basis for deciding who should have had to pay for the predicted £200,000 (+ £10,000/year) fence separating sporting from other estates (see for example Johnson 2004). The sporting estates in the DMG, even if willing to provide financial help in kind to the building of the fence, were not willing to pay up-front money for covering half of the cost of the fence. Even if costs for the project's execution and impact assessment might have contributed to its success, eventually, in 2005, FC pulled out of the idea of the strategic fence altogether, opting for a combination of cull and small enclosures, while continuing to work with the DMG by devising a management supportive of the objectives of the other DMG members.

The failure of the fence plan resulted in dropping the developed Deer Management Plan. But it did not result in an interruption of communication between stakeholders in the DMG, an interruption of the trust that had been built during the process or in an escalation of conflicts. Instead, it was accepted and the willingness of the FC to work with the DMG was explored further. Here is how the minutes reported that moment and how the opposing parties carried on their mediating work over management strategies and knowledge that should guide management decisions:

“[The Vice-Chairman (VC)] said that he was pleased to hear that FCS wanted to work with the group especially as almost all their neighbours were sporting estates whose main income came from deer stalking, but what he wanted to know was what happened if the deer started drifting down into [The Forest] [from which the fence would have excluded them]? [The representative of FCS] answered, firstly by saying that priority areas would be fenced and that if large numbers did move down that would not be the signal for FCS to start culling deer, the group would be consulted before any action was taken and hopefully be involved in deciding what should be done [a strategy that had been previously included in the Deer Management Plan], but it is very important for the group to realize that FCS will keep to the culls that will have been set and he felt that this should benefit the group. [VC] felt that this was a good attitude as it is well known that the deer do drift into these areas during bad weather, but equally moved back out again as the weather improved. He then asked if [the NGOs] would be adopting this same reasonable attitude. [NGO1] said that where possible ‘yes’. VC added that he did feel that in areas like M. which gives the deer shelter in the winter that this reasonable stance needed to be taken from a deer welfare point of view. FCS agreed but he did add that if the numbers kept building up they could not stand back and do nothing especially if it reached the extent where they were causing serious problems, again the group would be consulted but at the end of the day their cull quota would be met.”

The consultation agreement reached by the group, which requires parties to inform the group and allow 48 hours for the group to agree on a course of action in the case that deer are causing severe damage to certain areas, is an example of development of a rule that deals with potential conflicts over deer multivalency and enhances the group’s capacity to respond to changes in environmental conditions. The long quote from the minutes is also an example of the way discussions are at times played out during meetings with parties wanting the opposing side to accept their understanding of the implications of certain actions. In this case, on one side we see a party putting forward issues related to deer welfare (but at the same time economic damage) if deer are not allowed to move in certain areas during severe weather, and the opposing group re-stating the implication for the other side not contributing to the agreed acceptable level of deer population in the area.

Conclusions

This discussion of deer management in Britain allows us to open the debate on collaboration and communication as institutional forms with potential for the adaptation of governance of complex systems. The workings of DMGs indicate the relevance of collaboration and communication in providing information, dealing with

conflict, and responding to change (see Dietz et al. 2003). The process of institutional adaptation requires the acceptance by the parties involved of the fact that there is an issue that requires the group's attention. However it does not require all the members of the group to solve the issue by adopting common objectives for management. It needs the building of bridges that can allow the opportunity to follow different directions and allow consensus on the legitimacy of the range of objectives expressed by those that share the common resource.

This process does not necessarily develop in an orderly stepwise fashion, but it is successful if it is able to build social aggregation around the management of a common resource. In order to achieve this, communication is fundamental because it allows the group's members to understand the diversity of knowledge of the resource and the diversity of meaning and values held for this resource. In other words, collaboration and communication allow cultural exchanges, the development of new understandings that are at the basis for change and adaptation.

Land uses divide the landscape in more or less discrete spaces in which the economic, social and cultural spheres of human life are carried on. In some contexts, deer become anomalous animals because they interfere with the ordering set up by humans. However, the same humans that divided these spaces can come together and re-establish a certain degree of connectivity. This connectivity does not reduce the multivalence of deer or the economic, social and cultural diversity of an area.

This paper illustrates ways in which Deer Management Groups (DMG), as communities of managers, work as institutions effective for developing adaptive management rules. They are fertile grounds for social interaction and cultural production (see West 2006). The evidence presented also show that the working of communication and collaboration as institutions forces us to understand adaptation in terms of cultural change and collaboration, meaning not only working towards a common objective but also (see for example Tsing 2005) collaboration between diversity of objectives and diversity of cultural legacies.

Literature Cited

Association of Deer Management Groups (2008). *Deer Management in Scotland*. On the web at <http://www.deer-management.co.uk/dmg2.php> (Retrieved April 23rd, 2008).

Deer Initiative (n.d.) *Deer on our Roads: Counting the Cost*.

Deer Initiative 2004. *The sustainable management of wild deer populations in England: An action plan*. Available online at [www.forestry.gov.uk/pdf/deerstrategyengland301204.pdf/\\$file/deerstrategyengland301204.pdf](http://www.forestry.gov.uk/pdf/deerstrategyengland301204.pdf/$file/deerstrategyengland301204.pdf)

Deer Commission for Scotland 2000. *Wild Deer in Scotland: A long-term vision*. Available online at www.dcs.gov.uk/downloads/Vision%20Statement.pdf

Deer Commission for Scotland (2008). *Who Manages the Deer?* On the web at http://www.dcs.gov.uk/manage_whoManages.aspx (Retrieved April 23rd, 2008).

Dietz T., Dolsak N., Ostrom E. and Stern P.C. 2002. The drama of the commons. Pp. 3-35 In Ostrom E., Dolsak N., Stern P.C., Stonich S. and Weber E. U. (editors). *The drama of the commons*. Washington, DC: National Academy Press.

Dietz T., Ostrom E. and Stern P.C. 2003. The struggle to govern the commons. *Science* 302: 1907-1912.

Douglas Mary (1992). *Risk and Blame: Essays in Cultural Theory*. Routledge, London and New York.

ERAD (Land Use and Rural Policy Division) (2004). *Report to Ministers: Operations involving the Deer Commission for Scotland in Glenfeshie and Strathglass*. The Scottish Government Publications. On the web at <http://www.scotland.gov.uk/Publications/2004/06/19474/38560> (Retrieved April 23rd, 2008).

Finnie, Ross (2004). *Written Answer to the Scottish Executive S2W-9212*. Scottish Executive Tuesday 10 August 2004.

Johnson R.C. (2004). *Deer Stalking and the Balquhidder Community*. Mountain Environments Ltd. Callander (Perthshire), UK

Kerr Graham (2004). *The Contribution and Socio-economic Role of Scottish Estates: Summary Report*. SAC Rural Business Unit Consultancy Service Division. Penicuik, Scotland.

Knight John (2000). Introduction. In: *Natural Enemies: People – Wildlife Conflicts in Anthropological Perspective* Knight J. (Editor). Routledge: London and New York

Langbein j. and Putman r.j. (2006). *National Deer Vehicle Collision Project: Scotland (2003 – 2005)*. The Deer Initiative Ltd. Wrexham, UK.

Leach, M, R Mearns, and I Scoones (1999) Environmental entitlements: Dynamics and institutions in community-based natural resource management. *World Development* 27(2):225-247.

McGrath John (1974). *The Cheviot, the Stag and the Black, Black Oil*. Methuen Drama.

Milton Kay (2002) *Loving Nature: Towards an Ecology of Emotion*. Routledge: London and New York

Mosse, D (1997) The symbolic making of a common property resource: History, ecology and locality in a tank-irrigated landscape in south India. *Development and Change* 28(3):467-504.

Mulholland Frank (2007). *Written Answer to the Scottish Executive S3W-4138*. Scottish Executive Friday 21st September 2007.

- Nolan, A J, Hewison R L and T J Maxwell (2001). *Deer Management Groups: Operation and Good Practice - A report for The Deer Commission for Scotland*. The Macaulay Land Use Research Institute. Aberdeen, UK
- Ostrom Elinor (1998). A Behavioral Approach to the Rational Choice Theory of Collective Action. *American Political Science Review*, 92(1): 1-22.
- Ostrom Elinor (2005). *Understanding Institutional Diversity*. Princeton University Press. Princeton and Oxford.
- Stewart Duncan (TNS) (2006). *Scottish Biodiversity List Social Criterion: Results of a survey of the Scottish population. Research Findings No.26/2006*. Available online at www.scotland.gov.uk/socialresearch
- TNS (2004). *Country Sports Tourism in Scotland: Final Report*. TNS: Edinburgh, UK
- PACEC (2006). *The Contribution of Deer Management to the Scottish Economy*. Public and Corporate Economic Consultants.
- Parkes C. & Thornley J. 2000. *Deer: Law and liabilities*. Swan Hill Press
- Putman R. 1988. *The natural history of deer*. Christopher Helm, London
- SAOS (2004) *Scottish Wild Game: Feasibility Study*.
- Scoones, I (1999) New ecology and the social sciences: What prospects for a fruitful engagement? *Annual Review of Anthropology* 28:479-507
- Tsing A. 2005. *Friction: An Ethnography of Global Connection*. Princeton University Press.
- Tucker C. and Ostrom E. 2005. Multidisciplinary research relating institutions and forest transformations. In Moran E. and Ostrom E. *Seeing the forest and the trees: Human-environment interactions in forest ecosystems*. The MIT Press
- Vogler, J (1995) *The Global Commons*. London: John Wiley & Sons
- Ward A. (2005) Expanding ranges of wild and feral deer in Great Britain. *Mammal Review* 35 (2) 165–173.
- West Paige (2006). *Conservation Is Our Government Now: The Politics of Ecology in Papua New Guinea*. Duke University Press.
- Whitehead K. (1980). *Hunting and stalking deer in Britain through the ages*. BT Bastford Ltd, London