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# Deer Management in the Scottish Highlands: Change, Conflict and Finding Common Ground



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Submitted for the fulfilment of Doctor of Philosophy (PhD) Human Geography and  
Environmental Sciences

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## Declaration

I declare that the thesis has been composed by myself and that the work has not been submitted for any other degree or professional qualification. I confirm that the work submitted is my own, except where work which has formed part of jointly-authored publications has been included. My contribution and those of the other authors to this work have been explicitly indicated below. I confirm that appropriate credit has been given within this thesis where reference has been made to the work of others.

### Publications arising from the thesis

The work presented in Chapter 5 was published in the *Journal of Rural Studies* as “*Locking antlers: A ‘levels of conflict’ analysis of upland deer management in the Scottish Highlands*” by Callum Leavey-Wilson (student and author of the declaration), Janet Fisher (supervisor) and Sam Staddon (supervisor). This study was conceived by all of the authors. I collected the data, analysed the data and led the writing of the manuscript. All of the authors contributed critically to the drafts and gave final approval for publication. Publication link: <https://doi.org.eux.idm.oclc.org/10.1016/j.jrurstud.2025.103793>.

The work presented in Chapter 6 was published in *Conflict Resolution Quarterly* as ‘*Unlocking Antlers? An Evaluation of an Environmental Mediation Process in Scotland Based on Direct Observation*’ by Callum Leavey-Wilson (student and author of the declaration), Janet Fisher (supervisor) and Sam Staddon (supervisor). This study was conceived by all of the authors. I collected the data, analysed the data and led the writing of the manuscript. All of the authors contributed critically to the drafts and gave final approval for publication. Publication link: <https://doi.org/10.1002/crq.70007>.

The work presented in Chapter 7 was published in *People and Nature* as ‘*Views from the hill: Deer stalkers’ perspectives on land-use change in the Scottish Highlands*’ by Callum Leavey-Wilson (student and author of the declaration), Janet Fisher (supervisor) and Sam Staddon (supervisor). This study was conceived by all of the authors. I collected the data, analysed the data and led the writing of the manuscript. All of the authors contributed critically to the

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**Signed:**

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## Abstract

Conflicts over upland deer management in the Scottish Highlands have intensified in recent years, shaped by intersecting concerns relating to biodiversity loss, climate change, rural livelihoods and shifting expectations of land use. This thesis examines these tensions through drawing on data collected through the *Finding the Common Ground on Sustainable Upland Deer Management* (FtCG) mediation process and its successor, the *Common Ground Forum* (CGF). Drawing on 52 semi-structured interviews, extensive participant observation, estate visits, stalking experiences and survey data collected between 2022 and 2024, the research explores how land-use conflict, environmental conflict resolution and land-use change unfold within this changing socio-ecological and policy context.

The findings indicate that disagreements over deer management cannot be understood solely as a technical dispute over the environmental impacts of deer, as is commonly presented. Instead, conflict in this case operates at multiple, interacting levels. Surface-level debates over cull targets and habitat conditions were underpinned by deeper tensions relating to identity, legitimacy, historical grievances and competing understandings of land stewardship. Stakeholder groups were found to be internally diverse and often divided, challenging simplified depictions of polarised camps. In particular, the study reveals significant heterogeneity among deer stalkers, whose positions reflected varied combinations of professional identity, local attachments, ecological motivations and economic vulnerability.

A recurring empirical theme was a perceived loss of control amongst some stalkers and private land managers in the context of increasing state intervention and policy reform. This sense of diminished autonomy shaped responses to land-use change and influenced their engagement with the mediation process. The evaluation of FtCG suggests that whilst the process contributed to improved dialogue, relationship-building and opportunities for recognition, it did not resolve deeper structural disagreements. Rather than eliminating conflict, mediation reshaped the terms of engagement between actors and altered relational dynamics within the sector.

Conceptually, the thesis demonstrates how a layered understanding of conflict, combined with a critical realist approach, helps to illuminate the interaction between structure and agency in environmental governance. By analysing how values, rules and knowledge

intersected in this setting, the research further shows how collaborative initiatives operate within historically embedded patterns, institutional reform trajectories and asymmetries of authority. Overall, the study contributes empirically grounded insights into contemporary deer management reform in Scotland and offers broader reflections on the possibilities and limits of environmental conflict resolution within rural socio-ecological transitions.

## Lay summary

Deer management in the Scottish Highlands has become the focus of increasing debate in recent years. Concerns about biodiversity loss, climate change, woodland regeneration and public interest in land use have led to calls for changes in how deer are managed. At the same time, deer stalking remains an important part of rural livelihoods, estate management and Highland identity. This thesis explores these tensions through an in-depth study of the *Finding the Common Ground* mediation process, which brought together landowners, deer stalkers, conservation organisations, public agencies, forestry operators and many others in an effort to improve dialogue and reduce conflict.

The research shows that disagreement over deer management is not simply about the number of deer or scientific evidence about their ecological impacts. Whilst these issues are important, they sit within wider and deeper differences concerning land management, authority, responsibility and the future direction of rural Scotland. Many participants described longstanding mistrust between different parts of the sector. Stakeholder groups were also found to be more internally diverse than public debate often suggests. For example, deer stalkers expressed a range of views about environmental change, policy reform and the future of their profession.

A particularly important theme was a sense among some stalkers that they were losing control over decisions affecting the land they manage and their work and identity. This perception shaped how they responded both to proposed policy reforms and to the mediation process itself. The mediation process created opportunities for discussion and, in some cases, improved relationships and mutual understanding. However, it did not remove

disagreement or eliminate tension. Instead, it changed how people engaged with one another and provided a space where concerns could be voiced and acknowledged.

By examining how different values, rules and forms of knowledge interacted in this context, the thesis provides insight into why land-use conflicts can be persistent and complex. Although focused on the Scottish Highlands, the findings have broader relevance for understanding environmental conflict, rural change and attempts to use collaborative methods to manage disagreement in other parts of the world.

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*Sportsmen and farmers have been differing about it from the beginning; but within the last twenty years a great improvement has taken place in their relations.*

Deer stalker (then referred to as a 'forester') Alexander MacRae writing about deer management in the Scottish Highlands in 1880.

## 1. Introduction

Around the world, there are a growing range of demands and pressures being placed on the use and management of land and other terrestrial resources (Fienitz, 2023). Examples include actions to address climate change and biodiversity loss, such as enhancing carbon sequestration (Hao *et al.*, 2024) and restoring habitats (Wynne-Jones, Strouts and Holmes, 2018), the production of food for human and livestock consumption (Hanaček and Rodríguez-Labajos, 2018; Kim and Arnhold, 2018), urban development and housing (von der Dunk *et al.*, 2011), the planting and harvesting of forestry for timber (Buijs and Lawrence, 2013), wildlife management and control (Storie and Bell, 2017), the mining and extraction of minerals (Collier and Scott, 2009), renewable energy generation (Frantál, Frolova and Liñán-Chacón, 2023) and recreational activities (Skjeggedal, Flemsaeter and Gundersen, 2021), along with many others (Fienitz, 2023). Competing land uses often result in conflict, in turn hindering land-use change and the outcomes from this (Czarnecki *et al.*, 2023). There is therefore a need to better understand conflict over land use, as well as ways in which it may be managed, and how land-use change, as a trigger for conflict, is received by those most affected by it.

In Scotland, these dynamics of conflict and change in relation to land use are arguably more apparent than ever (Warren and Glass, 2024b). This has, in large part, been catalysed by recent Scottish Government policy to address climate change and biodiversity loss; most notably a target to achieve net zero greenhouse gas emissions by 2045 and an aim to halt and reverse biodiversity loss by 2030 and 2045 respectively (Scottish Government, 2024d, 2024a). Much of the changes in land use and management that are needed to achieve these goals concern Scotland's upland areas (Fletcher *et al.*, 2021; Glenk *et al.*, 2021), which cover nearly three-quarters of the country (Bunce, Wood and Smart, 2018), whilst alongside this there are increasing calls for upland management in Scotland to be geared more directly towards the 'public interest' in providing a wider range of economic, social and cultural benefits (Warren and Glass, 2020).

Deer management in the Scottish Highlands, the primary upland region in Scotland, has been a site of social conflict for nearly 200 years (Hare, Daniels and Blossey, 2021), whilst, over the past decade, it has been undergoing a significant period of change, owing to Scottish

Government reforms to reduce the environmental impacts of deer (Pepper, Barbour and Glass, 2019; Warren and Glass, 2024a) as well as other factors such as the evolving ‘natural capital’ market predicated on land-use change (Atkinson and Ovando, 2022; McMorran *et al.*, 2022; Glass *et al.*, 2025). This has, in turn, reignited contention between the various landholding interests involved in the management of deer, in particular ‘sporting’ estates, conservation sites and commercial forestry plantations, and the people who are responsible for managing deer on them (Kirkland *et al.*, 2021). This case therefore represents a useful and timely prism through which to explore contested land-use change.

Whilst geographically specific, the tensions surrounding upland deer management in the Scottish Highlands resonate with wider global struggles over the purpose and governance of land in the context of the climate crisis and biodiversity decline (Ellis, Pascual and Mertz, 2019; Abrahms *et al.*, 2023; Pascual, Balvanera and Christie, 2023). Across Europe and beyond, land managers are encountering increasing pressures to reorient productive landscapes towards carbon sequestration, habitat restoration and other forms of environmental public goods provision. These shifts often intersect with longstanding systems of property, identity and rural livelihoods, generating layered conflicts that extend beyond technical questions of ecological management (Calo, 2020; Skidmore *et al.*, 2021). In this sense, the Highlands provides both a local case of wildlife governance and an empirically grounded illustration of how global environmental transition agendas become contested within historically embedded land-use systems.

## 1.1 Overview of academic literature and research questions

This thesis draws on and contributes to the academic literature concerning land-use conflict (e.g. Fienitz, 2023), environmental conflict resolution (e.g. Fisher and Sablan, 2018) and land-use change (e.g. Kirk and Cradock-Henry, 2022), as well as work pertaining to deer management in the Scottish Highlands (e.g. MacMillan and Leitch, 2008).

Land-use conflicts have been studied in a variety of ways, resulting in a diffuse and interdisciplinary literature covering a wide range of cases. Such conflicts have been studied for many years (Havel, 1986), although there has recently been a proliferation in studies, with

the main focuses in land-use conflict research being on the management of conflict, the identification of conflict and the causes of conflict (Fienitz, 2023). Owing to the fragmented nature of the literature however, there is little consensus on these questions, whilst the term land-use conflict itself remains 'rather fuzzy' (Fienitz, 2023, p. 716).

In contrast, environmental conflict resolution (ECR) is arguably the most cohesive body of theory and practice focused on the management and resolution of environmental conflicts, including those over land use (Emerson *et al.*, 2003). ECR has its roots in Alternative Dispute Resolution (ADR), originating in the USA, but remains less well-established elsewhere (Fisher, 2014), with mediation the most widely-practiced form of ECR, premised on the goal of 'consensus building' (Dukes, 2004). More critical approaches to conflict resolution, such as those drawing on political ecology and agonistic theory, tend to be more sceptical of such aims, arguing instead for the accommodation of conflict as an intrinsic and productive part of environmental management (W. M. Adams, 2015; Kløcker Larsen and Raitio, 2023). Partly as a result, in recent years, ECR has shifted somewhat towards this disposition.

Like the literature on land-use conflict, studies of land-use change are very wide-ranging, such that there is no defined field. Despite this, research on this topic can be said to fall broadly into three camps; the first exploring the causes of land-use change (Lambin *et al.*, 2001), the second concerned with predictions of land-use change (Wu *et al.*, 2022) and the third on impacts of and social responses to land-use change (Kirk and Cradock-Henry, 2022). This thesis is situated within this latter category of work.

Finally, deer management in the Scottish Highlands has been the subject of varied research inquiry for a number of years, focusing on the ecological (e.g. Tanentzap *et al.*, 2013), economic (e.g. Bullock *et al.*, 1998), cultural (e.g. Lorimer, 2000) and social (e.g. Whitefield *et al.*, 2021) dimensions of deer management. However, more specifically, research concerned with social contention amongst stakeholders involved in deer management in the Highlands is much more limited (Kirkland *et al.*, 2021), with proposed conflict management methods dominated by economic rather than social solutions (MacMillan and Phillip, 2010), and the people arguably most affected by change within this context – deer stalkers – the recipients of scant research attention.

This thesis is broadly situated within the interdisciplinary field of environmental politics (Kenis and Lievens, 2014), drawing implicitly on insights from political ecology (Robbins and Fraser, 2003; W. M. Adams, 2015), but privileging a ‘grounded’, problem-focused empirical orientation (Hoddy, 2019). Rather than applying somewhat value-laden socio-political frameworks, which characterises much of the political ecology literature, the study adopts a critical realist perspective, which allows for the exploration of both objective environmental structures and the subjective experiences of stakeholders within a particular case of contested land-use change (Forsyth, 2001; Knudsen, 2023). This positioning enables the research to engage with complex socio-ecological interactions in Highland deer management, highlighting how empirical observations can inform theory while remaining grounded and sensitive to context-specific dynamics.

The overall aim of this thesis is to therefore explore the nature of land-use conflict, possibilities for conflict management and social responses to land-use change within the context of upland deer management in the Scottish Highlands.

This aim is pursued through the following three research questions:

1. How can conflict over upland deer management in the Scottish Highlands be understood?
2. How effective is mediation in ameliorating conflict over upland deer management in the Scottish Highlands?
3. How are deer stalkers responding to changes in deer management and land use in the Scottish Highlands?

## 1.2 Main contributions of the thesis

In answering these questions, the thesis makes a number of contributions to the body of literature on these topics. Firstly, this includes an in-depth, cross-sector analysis of recent and current social conflict over upland deer management in the Highlands, drawing on the largest and most diverse sample of stakeholders of any study on this topic to date. Secondly, an evaluation, based on direct observation, of an environmental mediation process focused on ameliorating conflict over deer management in the Highlands, representing the first study of

conflict resolution in this particular context, and one of the few observation-based evaluations in the ECR field. And thirdly, the first academic study centred on professional deer stalkers in the Highlands, which explores their perspectives on changes to deer management and land use in the region. In doing so, the thesis provides a fresh insight into the long-running debate over deer management in the Highlands, indicates possibilities and avenues for ways in which contention over deer management can be managed and sheds unprecedented light on the roles and views of deer stalkers in the Highlands. More broadly, the thesis contributes to current academic, policy and practitioner discourse on land-use change in the context of action to address climate change and biodiversity loss amid other competing land uses and how such tensions may be understood and managed.

### 1.3 Thesis structure

The structure of the thesis is as follows: the next chapter, Chapter 2, covers the theoretical background in relation to the literature on land-use conflict, environmental conflict resolution and land-use change; Chapter 3 details the empirical context of upland deer management in the Highlands; Chapter 4 gives an overview of the methodological approach taken in this thesis; Chapter 5 addresses the first research question, providing a conflict analysis of upland deer management in the Highlands; Chapter 6 addresses the second research question, through an evaluation of an environmental mediation process that sought to ameliorate conflict over upland deer management in the Highlands; Chapter 7 addresses the third research question by exploring how a range of current and former professional deer stalkers living and working in the Highlands are responding to changes in the management of deer and land in the region; Chapter 8 provides a general discussion of the thesis' findings, contributions to existing knowledge and the implications of these, the study's limitations and opportunities for further research; and Chapter 9 concludes the thesis.

## 2. Theoretical background

This chapter provides an overview of the theoretical background to the thesis, in relation to the literature on land-use conflict, environmental conflict resolution and land-use change to situate the research undertaken for this thesis. Whilst Chapters 5, 6 and 7 contain more focused literature reviews of their own in relation to the research questions they address, this chapter acts as an overall backdrop to these. The first section in this chapter covers the literature on land-use conflict.

### 2.1 Land-use conflict

The wide-ranging interest in land-use conflict is shown through its study in a range of disciplines including ecology (Zou *et al.*, 2021), economics (Smart, White and Termansen, 2007), geography (Henderson, 2005), policy studies (Dempsey, 2021), political science (Afrizal and Berenschot, 2022), planning (de Groot, 2006), information systems (Dawwas, 2014) and conservation (Young *et al.*, 2005). Similarly, there are a variety of terms that are used to describe different types of land-use conflict, including land conflicts (Wehrmann, 2008), land-use change conflicts (Jong *et al.*, 2021), land use disputes (Fienitz and Siebert, 2021), landscape conflicts (Garcia, Benages-Albert and Vall-Casas, 2018), conservation conflicts (Redpath *et al.*, 2013), environmental land-use conflicts (Kim and Arnhold, 2018), environmental conflicts (Wittmer, Rauschmayer and Klauer, 2006), biodiversity conflicts (White *et al.*, 2009), human-wildlife conflicts (White and Ward, 2010) and natural resource conflicts (Bond, 2014).

Of the studies that explicitly use the term land-use conflict (Havel, 1986; de Groot, 2006; Mann and Jeanneaux, 2009; von der Dunk *et al.*, 2011; Brown and Raymond, 2014; Steinhäuser *et al.*, 2015; Kim and Arnhold, 2018; Milczarek-Andrzejewska, Zawalińska and Czarnecki, 2018; Dong *et al.*, 2021; Fienitz and Siebert, 2022, 2023; Fienitz, 2023, 2025; Papadimitriou, 2024), the main focus is on examining the causes of conflict in reference to particular case studies, followed by the identification of conflict potential in other cases and, less commonly, conceptualising land-use conflict. This is broadly similar in other research

pertaining to conflict over land use, although there tends to be more focus on methods of conflict management in these studies, particularly in research concerning conservation conflicts (Redpath *et al.*, 2013; Madden and McQuinn, 2014; St John *et al.*, 2019; Ehrhart, Soliku and Schraml, 2022; Hodgson *et al.*, 2022).

Some of the main causes of land-use conflicts identified in the literature include social distrust (Davies, Bryce and Redpath, 2013), contested evidence bases (W. M. Adams, 2015), a lack of transparency (Wittmer, Rauschmayer and Klauer, 2006), reactive government engagement (Young *et al.*, 2016), spatial incompatibility of land uses (Zou *et al.*, 2021), land scarcity (Steinhäuser *et al.*, 2015) and wildlife transience (Smart, White and Termansen, 2007). These factors can be placed into categories, including *material* factors such as a lack of land (Mann and Jeanneaux, 2009), *ideational* factors by involving competing values over the use of land (St John *et al.*, 2019), *discursive* factors where frames and narratives are used to justify land uses (McEachern, 1992; Brummans *et al.*, 2008) and *cognitive* factors where different knowledge-types and worldviews clash (W. M. Adams, 2015). Moreover, land-use conflicts can occur at and between local, regional, national and international scales (Fienitz, 2023).

As a result of a relatively fragmented literature, there is no settled definition of what a land use 'conflict' is (Ehrhart, Soliku and Schraml, 2022), whilst most studies covering land-use conflicts do not define the term (Fienitz, 2023). The first definition in the literature was provided by Havel (1986, p. 147), who defined land-use conflicts as 'interaction[s] between groups of people with an interest in how land is used', whilst the most cited definition is that given by von der Dunk *et al.* (2011, p. 149): 'a land-use conflict occurs whenever land-use stakeholders (=conflict parties) have incompatible interests related to certain land-use units (=geographical component).' A more comprehensive definition was provided by Fienitz (2023, p. 726), who undertook a 'systematic mapping' of land-use conflict research and is also a prolific scholar of recent research on land-use conflict (Fienitz and Siebert, 2021, 2022, 2023; Fienitz, 2023, 2025): 'land-use conflicts are conflicts about how land should be used, that encompass spatial issues... social issues... normative issues... and political issues.'

Fienitz (2023) identifies these four land use issues (spatial, social, normative and political) as the main conceptual approaches through which land-use conflicts are framed and studied in the literature. The most common of these approaches is *social*, which focuses 'on actors who have or perceive incompatible goals regarding the use of land' (2023, p. 723). Since the

earliest days of research on land-use conflicts it has been recognised that, fundamentally, conflicts over the use and management of land are primarily social, rather than technical or scientific, in nature (Havel, 1986), so it is unsurprising that this remains the most influential conceptualisation. Social land-use conflicts are also sometimes referred to as conflicts of *interest*, over the ‘allocation, use or distribution of resources’ (Emery and Oughton, 2011, p. 12).

The second most common conceptualisation of land-use conflict is *spatial*, which concerns ‘competition between land uses or mutually obstructive land uses’ (Fienitz, 2023, p. 723). Examples of spatial land-use conflict studies in the literature include Brown and Raymond (2014), Dong (2021) and Kim and Arnhold (2018). Much of this literature stresses the finite nature of land and terrestrial resource-scarcity and the implications this may have for a range of economic, environmental, social and cultural outcomes.

Fienitz calls the third most prevalent approach ‘normative’, which is used to study ‘situations when the actual land use differs from a normatively desirable use’ (2023, p. 723). These types of conflicts could also be referred to as conflicts of *value*, concerning ‘deep seated differences in personal values, beliefs and culture’ (Emery and Oughton, 2011, p. 12). Examples of such studies in the literature include Chapman et al (2019), Collier and Scott (2009), Hiller and MacMillan (2021) and Trainor (2006).

The final, and least common, conception of land-use conflict is *political*, which refers to ‘competing political or planning goals, competing laws, or competing norms regarding land uses’ (2023, p. 724). Studies that have focused on these aspects of conflict include Skjeggedal et al (2021), Mann and Jeanneaux (2009) and de Groot (2006). However, stepping back from these demarcations, it is difficult to disentangle these issues from another in practice, in that, for example, political goals are inherently normative. Hence, a broader and perhaps simpler definition of land-use conflict is preferable in recognising the overlapping nature of these factors and the ways in which they, and others, will often manifest in such situations. For the purposes of this thesis, I define land-use conflicts as situations where two or more parties disagree over the use and management of land and/or land-based resources, which is similar to how Redpath et al (2013) define conservation conflicts.

## 2.2 Environmental conflict resolution

Perhaps unsurprisingly, the increase in interest in land-use conflicts and their causes has been accompanied by increasing interest in ways that such conflicts can be managed and resolved (Fisher, 2014; Young *et al.*, 2016; Fisher and Sablan, 2018; Walker and Daniels, 2019). However, because of the wide range of factors involved in land-use conflicts, there are few, if any, universally appropriate methods of conflict management. One commonly suggested approach is deliberation (Davies, Bryce and Redpath, 2013; Lundmark and Matti, 2015; St John *et al.*, 2019). The core practice of traditional deliberative approaches, inspired by Habermasian thinking, is allowing space for a range of people with different interests to discuss these in an open and inclusive way, in order to arrive at some form of agreement (Trainor, 2006). Deliberation is seen as particularly important where situations of conflict transcend material grievances, such as the loss of income, in the need to explore more deeply the ideological positions of those involved in disputes as well as broader dimensions of justice (Howarth and Wilson, 2006). Successful deliberative processes need to be designed carefully (Collier and Scott, 2009) so that they address the power imbalances at play (Trainor, 2006), share information transparently (Marshall, White and Fischer, 2007), go beyond the 'usual suspects' (Vargas, Moreno-Loscertales and Moreno-Jiménez, 2023), set realistic objectives (Walker and Daniels, 2019), avoid short-termism (Emery and Oughton, 2011) and have impartial facilitation (Fisher and Sablan, 2018).

Stemming from deliberative theory is the field of environmental conflict resolution (ECR), which explores methods for managing land use and other environmental conflicts (Barrow, 2010). ECR developed in the 1970s in the United States through a series of environmental mediation cases (the earliest and most enduring form of ECR), and began as more of a practice-oriented field rather than one concerned with theory and research (Dukes, 2004), with the key early scholars also being conflict resolution practitioners as well (Susskind and Weinstein, 1980; Susskind, 1981; Cormick, 1982; Susskind and Ozawa, 1985; Bingham, 1986). ECR has subsequently developed into a more cohesive and recognisable 'discipline' over subsequent decades, such that Emerson *et al.* (2009) were able to define it as: 'tools and processes to prevent, manage, and resolve conflicts involving environmental quality or natural resources management. In its broadest terms, ECR may be characterized as third-

party assisted deliberations over environmental issues among affected parties, intended to arrive at the best possible mutually beneficial outcomes.’

Such outcomes include an accepted and fair agreement, the maximisation of joint gains, an efficient and low-cost process, increased trust between participants, cognitive shifts in participant viewpoints and enhanced participant knowledge of the issues at hand (Holzinger, 2001; D’Estrée, Colby and Beck, 2004). ECR is argued to be an effective approach in situations characterised by a high degree of uncertainty (i.e. where the evidence base is contested) and where this cannot necessarily be overcome through the provision of further evidence or where this may in fact lead to more conflict (Ozawa, 2006; Clarke and Peterson, 2016).

Perhaps the key faultline within ECR, and between it and other forms of conflict resolution, concern the desirability or achievability of consensus. Whilst some have argued that consensus-building is a central pillar of ECR (Dukes, 2004; Sidaway, 2005b), others posit that, although the pursuit of consensus on the issues at hand is important, it may be a less valuable outcome than those such as relational improvements between parties, enhanced trust and empathic understanding (D’Estrée, 2003), a betterment of environmental conditions (Foley, 2007) as well as the quality (e.g. in terms of representation, participation and facilitation) of the conflict resolution process itself (Moore, 1996). ECR has therefore expanded to cover a wide range of ‘success’ factors, such that there are many ways an ECR process can be deemed effective (Orr, Emerson and Keyes, 2008). This is supported by most scholars working within ECR as a reflection of the very diverse range of cases and contexts in which ECR operates (Fisher and Sablan, 2018), as well as the subjective nature by which ECR is evaluated (D’Estrée *et al.*, 2001), although it is worth noting the risk that this may mask failure by presenting an ever-growing range of criteria by which processes can be deemed successful (Dukes, 2004).

ECR is often seen as a relatively ‘traditional’ approach, which has evolved in response to challenges from more critical literatures and practices, including those that draw on political ecology (Turner, 2004) and agonistic theory (Kühn, 2021). These stress that environmental conflict is often inevitable, intractable and may even be desirable as a productive force in catalysing change, and that the focus should therefore be on managing rather than resolving it (Zachrisson and Beland Lindahl, 2013; Brand, Blok and Verweij, 2020). This likely explains somewhat of a semantic shift towards environmental conflict ‘management’ in recent years (Fisher, 2014; Clarke and Peterson, 2016). Nonetheless, whilst ECR remains a recognisable

field, with core tenets and guiding principles, this cannot be said for environmental conflict management, hence why this thesis locates itself within the former.

### 2.3 Land-use change

Intersecting with both land-use conflict and ECR is land-use change (Jong *et al.*, 2021), which is sometimes referred to as ‘Land-use/land-cover changes’ and abbreviated as LUCCs in the literature (Liu *et al.*, 2014). At the broadest level, land-use change refers to various processes by which existing land use(s) alter as a result of environmental, economic, political, social, cultural and/or other factors (Lambin *et al.*, 2001). Examples of land-use change include the deforestation of areas for cattle ranching (Skidmore *et al.*, 2021), the afforestation of marginal land for climate mitigation (Zhang *et al.*, 2023), the urbanisation of agricultural grassland (Dadashpoor, Azizi and Moghadasi, 2019), the revegetation of former mining areas (Aili *et al.*, 2025) and the rewilding of abandoned farmland (Ceauşu *et al.*, 2015).

Similar to the research on land-use conflict, the literature on land-use change is scattered and incohesive. However, broadly speaking, there appear to be three main goals in land-use change research. The first and most longstanding of these concerns the identification of land-use change processes and the factors behind these (Geist *et al.*, 2006), which are typically undertaken through spatial analyses using remote sensing technologies over different timescales (Rogan and Chen, 2004) and focused on defined geographical regions (Lambin, Geist and Lepers, 2003). The second strand of research has concentrated on projections and predictions of future land-use change using models and simulations (Brown *et al.*, 2004; Veldkamp and Verburg, 2004; Verburg *et al.*, 2006). The third and most recent group of literature, which this thesis locates itself within, concerns the impacts of land-use change (Heald and Spracklen, 2015; Rogger *et al.*, 2017) and the social responses to this (Williams and Schirmer, 2012), which some of the literature refers to as ‘socio-ecological feedback’ as part of land use ‘transitions’ (Lambin and Meyfroidt, 2010; Meyfroidt, 2013; Long and Qu, 2018).

Research within this latter group of literature has shown how land-use change can elicit a multitude of responses from the people affected by it, depending on the resulting interaction between their identities, values, rules, beliefs, assumptions, knowledge, motivations and

preferences (Sorice *et al.*, 2014; Gorddard *et al.*, 2016; Iversen *et al.*, 2022; Kirk and Cradock-Henry, 2022; Chi *et al.*, 2025; McConnachie *et al.*, 2025; Plieninger *et al.*, 2025). Understanding these responses is, in turn, important for understanding reasons for conflict and ways in which this may be resolved, such that the management of conflict is also about the management of change (Newman, 2006; Lees *et al.*, 2023). This is why land-use change is an important additional but interrelated dynamic for this thesis to explore.

The way in which land-use changes are mediated and filtered through the perceptions of land managers has been the subject of a small but growing number of studies in recent years that are particularly relevant to the context under focus in this thesis. This includes Iversen *et al.*'s (2022, p. 6) research on the perspectives of upland farmers' in the Howgill Fells, in Cumbria, on woodland creation, which found, contrary to received wisdom, a general willingness amongst this group to accommodate this land-use change, providing that it did not erode the farmers' 'sense of identity' and 'way of life'. This was echoed by similar findings from McConnachie *et al.* (2025, p. 11) in their study of farmers' attitudes towards trees on farms in North Yorkshire and Cumbria, who argued that 'recognising and understanding [farmers'] values' is a necessary pre-condition for the uptake of tree planting. Finally, Lees *et al.*'s (2023, pp. 1289; 1293) work exploring the views of estate managers, gamekeepers and farmers in the Yorkshire Dales towards peatland restoration, highlighted how some of these people felt like this land-use change represented a loss of 'control' and 'ownership' in their self-professed 'stewardship' of the land, resulting in a considerable degree of resistance from them. This thesis is interested in exploring similar such themes that exist as a result of the interactions that take place between actual or proposed changes in land use and the land managers impacted by and/or responsible for delivering these changes. The empirical context, concerning upland deer management in the Scottish Highlands, through which these themes and others are examined, is given next.

### 3. Empirical context: Upland deer management in the Scottish Highlands

This chapter begins with an overview of the Scottish Highlands as the region of study. It then covers deer species in the Highlands, followed by an overview of deer numbers in relation to counting, populations, distribution and densities and a discussion of the environmental, economic, social and cultural dimensions of deer. This is followed by a brief history of deer management in the Highlands, an overview of deer management methods and a discussion of the recent and current policy context in relation to deer management in Scotland more broadly. The section concludes with a short review of the academic literature concerning deer management in the Highlands to situate the research undertaken for this thesis.

#### 3.1 The Scottish Highlands

The Scottish Highlands and Islands (hereafter the Highlands) are a primarily rural and upland area that cover around 10,000 square miles and over a third of Scotland, north and west of the Highland Boundary Fault, which stretches for roughly 150 miles from the Isle of Arran in the south west to Stonehaven in the north east (Bluck, 2010). Upland areas in a UK context can be defined physically, ecologically, agriculturally, legislatively and culturally (Mansfield, 2017). Physically, upland areas are commonly thought to begin at around 300m above sea level (Averis *et al.*, 2004), although others have suggested 240m (Jones and Essex, 1999) and 400m (Dobson, Calladine and Wernham, 2013), whilst mountainous areas are defined by the UK Government as areas that are 600m or more above sea level (*Countryside and Rights of Way Act 2000*, 2000). However, upland areas can also exist as low as sea level if they contain certain semi-natural ecological features such as bog, acid grassland and dwarf shrub heath (Thompson, 2009; Bunce, Wood and Smart, 2018). Upland areas have also been defined as land lying above the upper limit of enclosed farmland, which is demarcated by the 'head-dyke' in Scotland; typically a drystone wall separating better quality arable or grazing land from rough grazing (Robertson, 1949). This agricultural demarcation is the basis for the legislative designation of 'Less Favoured Areas' (LFA) which has been used since 1975 to target support payments to farmers and other land managers working in upland areas (Reed, 2009).

However, although LFA is widely recognised, it is also seen as flawed because it is subject to policy change (Mansfield, 2011). The final conception of upland areas is to define them as cultural landscapes (Warren and Glass, 2020), with Mansfield (2011, p. 50) stating that cultural understandings of the uplands relates to 'sense of place', characterised by features such as rotationally-burnt patches of heather as a product of muirburn (Barker, Poxton and Heavisides, 2017), peat banks from generations of peat cutting (Johnston and Soulsby, 2000), sheepfolds and drystone walls (Paterson, 2015). Because of this variety of definitions, a broader definition, such as that provided by Averis et al (2004, p. 15), is therefore preferable: 'areas of the country which have an upland type of environment, regardless of their altitude. As well as being wetter and cooler than lowland environments, these upland areas are generally more windy, and their soils are generally less productive than in the lowlands.'

Collectively, the Highlands contain the most extensive and diverse upland areas in the British Isles, including the Cairngorms plateau, Ben Nevis and Glen Coe, the Trossachs, the Cuillins, Knoydart, Glen Affric and Glen Shiel, Wester Ross and Assynt-Coigach. These areas vary from an Arctic-alpine climate in the east to oceanic in the west and range from 1,345m at Ben Nevis to close to sea level elsewhere. The dominant habitats of these landscapes are bog, acid grassland, dwarf shrub heath and coniferous woodland respectively, with the three most common plant species being Tormentil (*Potentilla erecta*), Ling Heather (*Calluna vulgaris*) and Purple moor-grass (*Molinia caerulea*) (Bunce, Wood and Smart, 2018).

The main land uses by area coverage in the Highlands are pastoral farming (primarily of sheep, especially Scottish Blackface and Cheviot breeds, but also cattle), forestry (particularly timber production from plantations of Sitka spruce [*Picea sitchensis*] and Douglas Fir [*Pseudotsuga menziesii*]) and field-sports (deer stalking and grouse shooting) (Mather, 1992; Morgan-Davies, Wilson and Waterhouse, 2015; Bunce, Wood and Smart, 2018). Other land uses include conservation, recreation, renewable energy and the supply of water (Glass, Scott and Price, 2013) and to a lesser extent mining (Macgregor *et al.*, 2015) and military activities (Spaven, 1991).

Most of the land in the Highlands is privately owned (typically in the form of 'estates', which are generally large [over 500 hectares] multifunctional landholdings), whilst public ownership (land owned by Scottish Ministers via public bodies and agencies), community ownership (land owned by legally constituted community groups) and Non-Governmental Organisation

(NGO) ownership collectively accounts for less than 20% of land owned in the region (Wightman, 2024).

There have been numerous episodes of land-use change in the Highlands since the earliest recorded settlement in the region around 12,000 years ago, including hunter-gatherer communities, forest clearance for agriculture, the development of the clan system, the Highland Clearances, the creation of sporting estates and 20<sup>th</sup> century afforestation (Jarvie, Jackson and Higgins, 1997; Mackinnon, 2017; Butler *et al.*, 2021; Bishop *et al.*, 2022; Durie, 2022).

In more recent years, land-use change has focused increasingly around environmental activities, such as woodland expansion, peatland restoration and habitat restoration, as part of efforts to address climate change and biodiversity loss (Deary and Warren, 2017; Martin *et al.*, 2021). This has, in part, been accompanied and facilitated by an increasing number of 'natural capital' projects, either through land acquisitions or partnerships, and the generation of anticipated carbon and biodiversity credits from these (McMorran *et al.*, 2022; Glass *et al.*, 2025). As a result, newer models of land use such as this are increasingly challenging traditional practices, including the management of deer.



**Figure 1. The Scottish Highlands.**

Map showing demarcation between the Highlands and Lowlands regions of Scotland.

Available at:

[https://commons.wikimedia.org/wiki/File:Scottish\\_Highlands\\_and\\_Lowlands.png](https://commons.wikimedia.org/wiki/File:Scottish_Highlands_and_Lowlands.png)

[Accessed: 25/08/2025]



**Figure 2. Upland landscapes in the Scottish Highlands.**

*Clockwise from top-left: Black Cuillin, Skye; Glenshee, Cairngorms; Cùl Beag, Stac Pollaidh and Cùl Mòr, Assynt-Coigach; Port nam Murrach, Arisaig; Sgùrr nan Conbhairean, between Loch Cluanie and Glen Affric; Ben Vrackie, nr. Pitlochry. These photos illustrate the variety of upland habitats in Scotland, from alpine to oceanic, as well as the similarities in vegetation cover, particularly heather. Photos my own.*

## 3.2 Deer species in the Highlands

There are four established species of deer in Scotland, all of which range across the Highlands as well; red (*Cervus elaphus*), roe (*Capreolus capreolus*), sika (*Cervus nippon*) and fallow (*Dama dama*). The red deer is the predominant species in the open-hill range of the Highlands, and therefore of primary interest to the empirical context of the thesis.

### 3.2.1 Red deer (*Cervus elaphus*)

Red deer are the largest deer species as well as largest wild land mammal overall in the British Isles. Males (called stags) average a height of around 120cm at the shoulder but can reach 137cm, can weigh up to 150kg and have a maximum lifespan of 20 years, although more commonly live between 14 and 18 years (Mitchell, Staines and Welch, 1977; Mitchell, McCowan and Parish, 1986; Hmwe *et al.*, 2006; Cairngorms National Park Authority, n.d.). Red deer first developed as a distinct species of deer during the early Pleistocene, between 2.6 million and 773,000 years ago (Mulville, 2010), and were present in the British Isles around 120,000 years ago, meaning that they are considered an 'indigenous' species, with the first postglacial records dating from around 12,500 years ago (Hmwe *et al.*, 2006). They have had a continued presence in Scotland since the end of the last glacial period around 11,000 years ago (Pérez-Espona *et al.*, 2013). There remains some debate as to whether Scottish red deer (*Cervus elaphus scoticus*) are a distinct subspecies (Hmwe *et al.*, 2006; Smith *et al.*, 2018).

Red deer are able to swim distances of up to 7km, likely explaining their presence on the Inner Hebridean islands, which they are believed to have colonised from the Scottish mainland between 7,500 and 5,500 years ago (Pérez-Espona, Pemberton and Putman, 2009; Mulville, 2010; Stanton, Mulville and Bruford, 2016). In contrast, their presence in the Outer Hebrides and, historically, Orkney and Shetland (on which red deer no longer exist), was most likely a result of translocation by humans between 5,500 and 4,500 years; although research has found that these populations did not originate from the mainland but from an unknown location, possibly Norway owing to genetic similarities (Stanton, Mulville and Bruford, 2016). On the mainland, there are distinct regional herds of red deer whose genetic characteristics have been shaped by barriers to and enablers of gene flow, including sea lochs, mountain

slopes, forests, rivers, railways and roads, with the primary geographical demarcation in the Highland red deer range being the Great Glen (Pérez-Espona *et al.*, 2008). Introductions of sika deer in the late 19<sup>th</sup> century have led to numerous instances of red-sika hybridisation, from South Kintyre to the North Highlands, which continue to pose a threat to the genetic integrity of Scottish red deer, whilst introductions of wapiti (*Cervus canadensis*), also in the late 19<sup>th</sup> century, are thought to have had a negligible genetic impact on red deer (Pérez-Espona, Pemberton and Putman, 2009; Pérez-Espona, Pérez-Barbería and Pemberton, 2011; Smith *et al.*, 2018).

Highly adaptable animals, red deer are widely thought to have originally been lowland and woodland-dwelling in Scotland. However, as a result of climatic changes and human actions over millennia, which reduced woodland cover, altered land use and created settlements, red deer became increasingly displaced to the upland moors and mountains of the Highlands, which remains their primary range in the British Isles today (MacNally, 1975; Mitchell, Staines and Welch, 1977; Grace and Easterbee, 1979). Because of the reduced forage quality and quantity as well as shelter in this range, red deer in the Highlands have considerably poorer performance in terms of their body and antler size and weight compared to both lowland and woodland red deer elsewhere in the British Isles and Europe (Nicholson, 1974; Grace and Easterbee, 1979; Mitchell, Grant and Cubby, 1981; Mitchell, McCowan and Parish, 1986; Goldspink, 1987). Red deer are selective browsers which preferentially browse on broadleaf species, such as aspen, ash, elder and rowan (Gullett *et al.*, 2023; Holl, n.d.), but will utilise nearly all plant types if necessary, including grasses, sedges and heather which dominate their upland range in Scotland (Mitchell, Staines and Welch, 1977; Goldspink, 1987). In particularly resource-depleted areas, such as the Isle of Rùm, where red deer have been studied since the 1970s in one of the world's longest-running scientific studies (Pemberton, Kruuk and Clutton-Brock, 2022), red deer have been observed consuming seaweed and even seen biting the heads off Manx shearwater chicks and chewing the shearwaters' legs and wings (Furness, 1988; Conradt, 2000).

Red deer are social, herding animals with the hinds (females) and calves living together in 'hefted' (limited, generationally-learned ranges) groups, whilst stags live alone or with other stags for much of the year prior to the breeding season, which is referred to as the 'rut', during which they will travel long distances in search of hinds (Mitchell, Staines and Welch, 1977;

Pérez-Espona *et al.*, 2008). The rut begins in September – the 26<sup>th</sup> is the traditional start date marked by the ‘roaring’ of stags, according to the noted Highland deer stalker and naturalist Lea MacNally – peaks in October and concludes in November (MacNally, 1975, p. 43; Mitchell, Staines and Welch, 1977). Pregnancy lasts over the winter following the rut, with most calves born between late May and late June, with single calves the norm and twins being the very rare exception (Mitchell, Staines and Welch, 1977). Stags are in their best condition (i.e., largest) in late September immediately prior to the rut, whilst hinds achieve peak condition in November, with both stags and hinds being most nutritionally depleted in March and April (Mitchell, McCowan and Parish, 1986). Both stags and hinds tend to shelter in the lower grounds during the winter, whilst stags in particular will move to higher ground, including the mountain-tops, during the summer, to escape the heat and midges and to maximise their energy intake (Mitchell, Staines and Welch, 1977; Pettorelli *et al.*, 2005; Arnold *et al.*, 2015). The impacts of current and forthcoming climatic changes on this behaviour and therefore the longer-term performance of red deer in Scotland is contested (Post *et al.*, 1997; Stopher *et al.*, 2014).



**Figure 3. Red deer.**

*Left: A red stag. Right: A group of red hinds. Photos from [Unsplash](#).*

### 3.2.2 Other deer species in the Highlands

Whilst red deer are the primary focus of upland deer management efforts in the Highlands, other deer species are also managed in the region as well and therefore merit discussion. This includes the roe deer, the other indigenous species of deer in Scotland, with the earliest postglacial records indicating their presence in the British Isles from between 10,050 and 9,600 years ago (Baker and Hoelzel, 2013). The Highlands represents the north-westerly edge of the roe deer's range in Europe and is likely to be one of the wettest regions in the world in which roe deer live (Latham, Staines and Gorman, 1997). Roe deer have benefited from the large-scale afforestation, in terms of shelter and forage, that has occurred in the Highlands over the past 100 years, and remain a primarily woodland and lowland-dwelling species of deer, in contrast to red deer, in part because they are less well adapted to the wetter conditions of the open hill and because of their high sensitivity to shooting pressure compared to red deer (Gibson and Macarthur, 1965; Latham, Staines and Gorman, 1997; Cederlund *et al.*, 1998; Baker and Hoelzel, 2014). Whilst roe deer tend to range within limited areas of less than 100 ha, significantly less than that of red deer, roe deer populations in the Highlands have benefited from their greater reproductive capacity, regularly producing twin fawns (Baker and Hoelzel, 2013).

Sika deer are of more importance than roe deer in terms of upland deer management in the Highlands. Native to Japan, they were first introduced to the British Isles in 1860 by the Zoological Society of London and, in the same year, Viscount Powerscourt acquired six sika for his deer park in Enniskerry, Ireland (Ratcliffe, 1987a; Swanson and Putman, 2009). From this population, sika deer were then introduced to Carradale Estate, Kintyre in 1893 and different areas of Ross-shire and Sutherland between 1889 and 1900 (Senn and Pemberton, 2009; Swanson and Putman, 2009; McFarlane *et al.*, 2020). In Kintyre, by 1925, escapes had resulted in a local population, whilst a further 11 escapes and releases across Scotland in the early 20<sup>th</sup> century are regarded as the initial catalyst for sika deer's distribution across the country (Senn and Pemberton, 2009; Smith *et al.*, 2018; Putman and Pemberton, 2022). Sika deer mainly live in coniferous forestry, and have benefited from the proliferation of plantations over the preceding century, but, more specifically, tend to prefer young plantations on heathland fringes, rather than mature, dense woodland (Mann and Putman,

1989a, 1989b; Putman and Pemberton, 2022). Living in groups of between two and eight animals, and with small home ranges, sika tend to remain hidden amongst forestry during the day and move into nearby heaths as well as agricultural areas for foraging at night (Ratcliffe, 1987a; Mann and Putman, 1989b; Swanson and Putman, 2009; Putman and Pemberton, 2022). Because of this secretive behaviour, stalkers and deer managers have found the species more difficult to control than other deer species, which partly explains their expansion (H.V. Senn *et al.*, 2010; McFarlane *et al.*, 2020) and, although they are less well adapted to the open-hill, benefit from more flexible feeding habits than red deer (Ratcliffe, 1987a; Mann and Putman, 1989a, 1989b; Swanson and Putman, 2009). Sika deer exhibit some unique behaviours, including bole scoring, which involves stags thrashing their antlers against tree bark during the rut to mark their territory, as well as ‘whistling’, rather than roaring (as is characteristic of red stags), during the rut (Ratcliffe, 1987a; Pérez-Espona, Pemberton and Putman, 2009; Swanson and Putman, 2009). Sika deer ruts coincide with that of red deer but tend to last longer, from the end of August until mid-December, with calves (usually single) born between early May and late June (Ratcliffe, 1987a; Swanson and Putman, 2009).

Much of the research on sika deer in Scotland has focused on their ability to hybridise with red deer, with whom they share 40% of their range with, and hybridised specimens have been found from Kintyre to Sutherland (Pérez-Espona, Pemberton and Putman, 2009; Smith *et al.*, 2018; McFarlane *et al.*, 2020; Putman and Pemberton, 2022). Research indicates that hybridisation between the two species can occur quickly, which is perceived by some as a threat to the genetic integrity of native red deer, with the risk that in the future ‘true’ red deer will no longer exist in Scotland (Ratcliffe, 1987a; H. V. Senn *et al.*, 2010; H.V. Senn *et al.*, 2010). Because of this, many landholdings in Scotland take a zero-tolerance approach to sika deer, however, some estates view sika stags as a valuable sporting commodity (Ratcliffe, 1987a; Pérez-Espona, Pemberton and Putman, 2009), which may increase in a future context with reduced red deer populations.

The least abundant established species of deer in the Highlands is the fallow deer which, like roe, tend to live more commonly in woodland and lowland areas and have limited ranges (Thirgood, 1996; Moore, Hart and Langton, 1999; Edwards and Kenyon, 2013). Often categorised as an introduced species, fallow deer are more accurately described as ‘naturalised’ and have a complex history in Britain, characterised by successive extirpations

and re-introductions over a period of about 400,000 years (Acevedo *et al.*, 2010; Karis H. Baker *et al.*, 2024; K. H. Baker *et al.*, 2024). Starting in the 1100s, fallow deer became important symbols of nobility amongst the landowning elite and were kept within deer parks across Britain, including Scotland, with subsequent escapes and releases over successive centuries resulting in local populations from which their modern ranges descend (Edwards and Kenyon, 2013; Sykes *et al.*, 2016; Karis H. Baker *et al.*, 2024).

A further two species of deer, Reeve's muntjac (*Muntiacus reevesi*) and Chinese water deer (*Hydropotes inermis*), are established elsewhere in the UK but not in the Highlands, although there have been sightings of muntjac as far north as Inverness-shire (Ward and Lees, 2011). The smallest species of deer in the UK, notable for its facial glands, muntjac are originally from south-eastern China and were introduced to Bedfordshire in 1838. Now classed as an 'invasive non-native species' (INNS), it is thought likely that muntjac will become more widely distributed in Scotland in the future as it is the fastest spreading deer species in the UK, due to the difficulty of managing it compared to other deer species and because it is benefiting from the increasing afforestation occurring across the country (Ward and Lees, 2011; Chapman, 2021). Chinese water deer, which are now threatened in China, were introduced to England in the 1870s and are characterised by both the male and female of the species growing tusks rather than antlers. They have not been sighted in the Highlands and are thought less likely to spread to Scotland compared to muntjac (Cooke, 2009; The British Deer Society, n.d.).

### 3.3 Deer numbers: Counting, populations, densities and distribution

The management of deer in the Highlands has tended to focus on their numbers, although in recent years there has been an increasing shift towards management on the basis of their environmental impact, in the recognition that there is not a linear relationship between deer numbers and the level of impact, with additional factors, such as the presence of other herbivores, climate, topography, soil-type and altitude, all contributing to observed environmental conditions (Hope *et al.*, 1996; Clutton-Brock, Coulson and Milner, 2004; Putman *et al.*, 2011; Tanentzap *et al.*, 2011; Tanentzap, Kirby and Goldberg, 2012; Pérez-

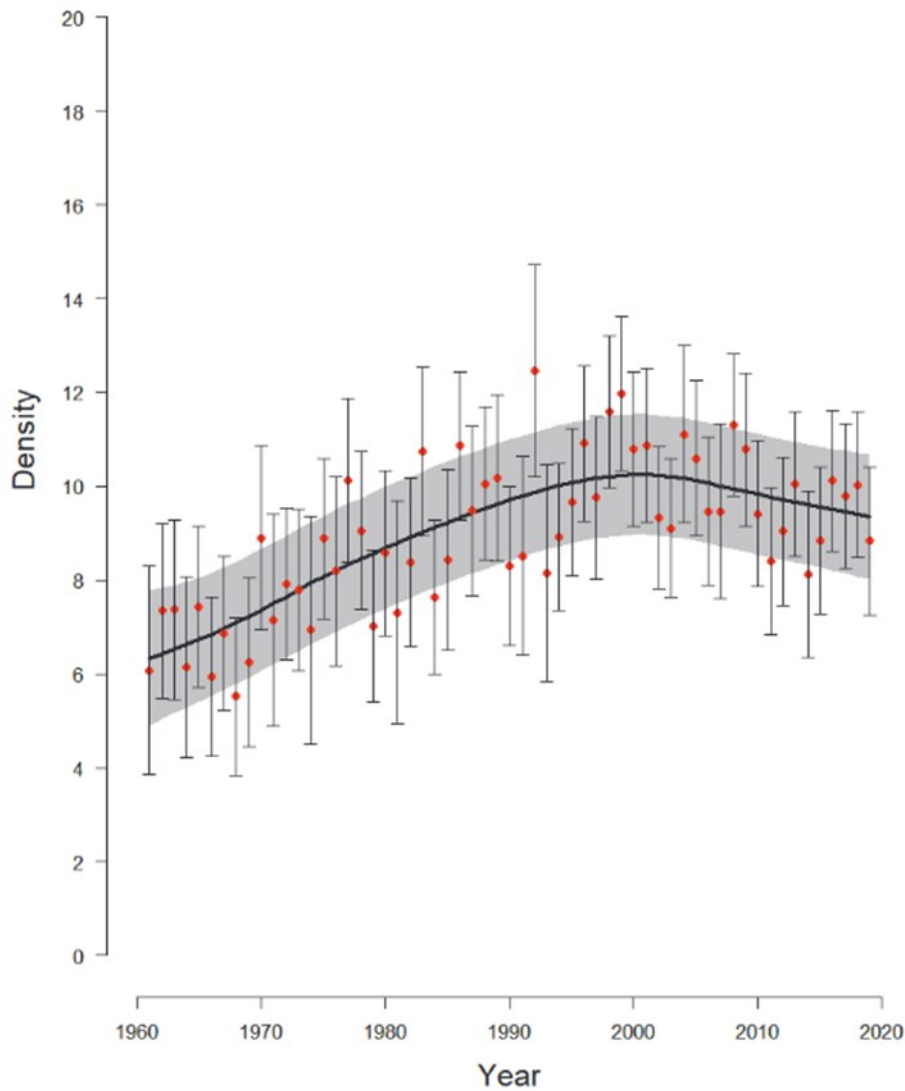
Barbería, Hooper and Gordon, 2013; Tanentzap, Zou and Coomes, 2013; Britton *et al.*, 2017; Spake *et al.*, 2020). Nevertheless, since the issue of deer numbers has been so central to the debate about deer management in the Highlands and Scotland more broadly (Hare, Daniels and Blossey, 2021; Kirkland *et al.*, 2021), some context is provided here.

Deer counting began at the national level in Scotland in 1961 following the enactment of the Deer (Scotland) Act 1959 and counts were initially conducted by the Red Deer Commission for Scotland (RDC), although deer had been counted on a more informal basis as early as the 1890s by some landowners, including on Jura (Mitchell, Staines and Welch, 1977; Albon *et al.*, 2019). Deer were originally counted by foot, which changed in 2001 when the Deer Commission for Scotland (DCS), the successor to the RDC, started to undertake helicopter counts, with foot counts sometimes carried out alongside this (Daniels, 2006; Albon *et al.*, 2019). Other counting methods include line transects, more commonly referred to as 'dung counts' (Mayle, Putman and Wyllie, 2000; Marques *et al.*, 2001; Campbell, Swanson and Sales, 2004; Dickinson, Millins and Biek, 2020) and, in more recent years, thermal imaging using drones (Forestry and Land Scotland, 2022b; Harrower, 2025), both of which are methods that are regarded as more useful in forested areas, where helicopter and foot counts are impractical (Smart, Ward and White, 2004; Albon *et al.*, 2019).

Counts are carried out to assess population levels in a given area, usually across a Deer Management Area (DMA), which broadly correspond to historic red deer ranges, and/or on individual landholdings (Albon *et al.*, 2019). Counting has tended to focus on red deer in the upland ranges of the Highlands, where counting is a significantly easier undertaking because of the open nature of the landscape. As a result, there is therefore significantly better knowledge about red deer numbers in the Highlands than there are of other deer species in this region and elsewhere in Scotland. Helicopter counts in the Highlands are typically conducted over the course of one day, usually during the Spring following the end of the hind culling season (from February 15<sup>th</sup> onwards). This time of year is chosen in part to assess the impact of culls that have occurred during preceding months and because it is easier to identify deer during periods of snow cover (referred to as 'white counts'). However, counts undertaken during this time of year can often be misleading as, during the winter months, deer tend to move to lower ground for shelter and forage, creating a non-representative picture of deer occupancy and movement in the area (Albon *et al.*, 2017, 2019).

As a result of the variety of counting methods, the partial picture provided by single-day counts, the long and often sporadic intervals between counts, inaccurate reporting and the high mobility of deer, the exact population of deer in Scotland is unknown (Daniels, 2006; Smart, White and Termansen, 2007; Albon *et al.*, 2019). However, Scottish Natural Heritage (SNH), which subsumed the DCS, now called NatureScot, estimate that, across Scotland, there are 400,000 red deer on the open-hill and up to 105,000 in woodlands, around 300,000 roe deer, 25,000 sika and at least 8,000 fallow deer (NatureScot, 2024b). This produces a total estimate of 838,000 deer across Scotland.

At a more granular level, deer populations are typically measured by density per 1 km<sup>2</sup> or 100ha (Putman *et al.*, 2011). Between 1961 and 2001, red deer densities were estimated to have grown from 6.8 to 10.6 per km<sup>2</sup>, a 55% increase. Since then, largely as a result of increased culling, national red deer densities are believed to have remained stable at around 10.0 per km<sup>2</sup>, with a lower average density across the Highlands of 9.35 per km<sup>2</sup> (Albon *et al.*, 2019). In 2019, the DMA with the lowest red deer density was the Trossachs (1.65 per km<sup>2</sup>) and the highest was Glenartney (31.4 per km<sup>2</sup>) (Albon *et al.*, 2019). In general, red deer densities tend to be highest in the eastern and central Highlands and lowest in the north and west owing to climatic and ecological conditions (Pérez-Espona *et al.*, 2008).



**Figure 4. Red deer density.**

*The overall trend (black curve – grey shading shows 95% confidence intervals) in red deer (stags, hinds, calves) density estimated across the Highlands and Islands, since records began in 1961 until 2019. The red dots show the annual estimates and the thin lines show the 95% confidence intervals based on the subset of Deer Management Areas counted in each year. Source: (Albon et al., 2019, p. 5)*

In terms of the distribution of deer, red deer occur nearly everywhere across the Highlands and Islands of Scotland, except the Northern Isles. Roe deer are also widely distributed in the region, with the exception of the Western Isles, Northern Isles and some of the Inner Hebridean islands. The primary distributions of sika in the Highlands are, from north to south, Sutherland, Ross and Cromarty, Inverness-shire and Argyll, with a small population also found near Loch Morar (Ratcliffe, 1987; Smith et al., 2018; Swanson & Putman, 2009). Fallow are

the least widely distributed species of deer in the Highlands, with the main populations in Perthshire (Pepper, Barbour and Glass, 2019).



**Figure 5. Distribution of wild deer species in Scotland.**

*2016 data. Clockwise from top-left: red deer, roe deer, fallow deer, sika deer. Source: (Pepper, Barbour and Glass, 2019, p. 34)*

### 3.4 Environmental, economic, social and cultural dimensions of deer

As noted above, deer impacts are increasingly becoming the prism through which deer are viewed and managed, rather than numbers alone. However, the term 'impact' contains

implicitly negative connotations and so, instead, here the term ‘dimensions’ is used to describe the variety of ways in which deer interact with the environment, economy, society and culture (Côté *et al.*, 2004; Reimoser and Putman, 2011). This section provides an overview of these dimensions, focusing on red deer in the Highlands in particular, which is important for understanding reasons for deer management as well as the conflicts that exist between these.

#### 3.4.1 Environmental dimensions

Firstly, deer fulfil a number of important ecological functions in upland areas, by helping to sustain indigenous plant communities that benefit from sward control through grazing, browsing and disturbance, which helps improve local plant diversity (Virtanen, Edwards and Crawley, 2002; Pérez-Espona, Pemberton and Putman, 2009). Relatedly, deer also act as vectors for seed dispersal, which can help different plant species proliferate, whilst browsing can help maintain areas of open canopy in woodland, with benefits for invertebrates including butterflies (Feber *et al.*, 2001; Pérez-Espona, Pemberton and Putman, 2009). Plant species also benefit from the nutrients provided by deer dung and deer carcasses, with recent research suggesting that the removal of deer carcasses as part of deer management practices removed large quantities of nitrogen, phosphorus and calcium across the Highlands, which may be hampering woodland regeneration in some areas (Ferraro and Hirst, 2024).

However, much of the attention on deer has centred on where their browsing, grazing, trampling and thrashing impacts can be high, particularly in areas of existing woodland as well as those areas that are being restored or are regenerating. More specifically, broadleaf species of woodland, as those that are most palatable to deer, tend to be restricted in areas where browsing pressure from deer is significant (MacKenzie and Clifford, 2010). Scots pine, a coniferous species, has also been restricted and its growth suppressed partly as a result of browsing from deer in many areas of the Highlands (Miller, Kinnaird and Cummins, 1982; Miller, Cummins and Hester, 1998; Scott *et al.*, 2000; Palmer and Truscott, 2003a; Rao, 2017), whilst research has found that browsing by deer can have a compounding effect on soil nitrogen and litter decomposition (Harrison and Bardgett, 2003, 2004). As a result, over recent years, several landholdings, for example those that are part of the Cairngorms Connect

partnership as well as Corrou Estate and Mar Lodge Estate, who are pursuing woodland regeneration as part of conservation activities have reduced deer densities to below a threshold of less than four deer per km<sup>2</sup> in order to aid woodland recovery, with largely positive results (Reimoser and Putman, 2011; Rao, 2017; Hirst, 2021; Gullett *et al.*, 2023; Watts, 2024; Cook *et al.*, 2025). However, others have cautioned against drawing linear conclusions between reduced deer density and woodland regeneration, emphasising the role of other factors such as ground conditions, soil-type, altitude, climate and alternative herbivory pressure (Palmer and Truscott, 2003b; Palmer *et al.*, 2004; Tanentzap, Zou and Coomes, 2013).

After woodland, the impact of deer on peatland has received the most attention, albeit with significantly less research undertaken on this interaction (Campbell and Marchbank, 2013). It has been argued that deer exert pressure on peatland through concentrated trampling, which can contribute to its erosion and degradation, in turn limiting its ability to store and sequester carbon (Campbell and Marchbank, 2013; Edwards, 2020). Grazing and browsing on peatland habitats by deer can also negatively impact peatland vegetation and plant communities (Pellerin, Huot and Côté, 2006), although this is thought to be of less consequence than the effect of trampling (Headley, 2006; Edwards, 2020). Edwards (2020) has therefore suggested that a maximum density of eight deer per km<sup>2</sup> is needed in order to support peatland recovery in the Highlands, whilst compounding factors such as altitude, steepness, climate, alternative herbivory and past uses need to be considered (Campbell and Marchbank, 2013).

Finally, there has been attention drawn to the direct and indirect impact of deer on other plants, vegetation as well as animals. For example, in western areas of the Highlands, research has indicated that grazing and browsing by deer may be limiting the abundance and variety of mosses, lichens and liverworts (Moore and Crawley, 2014a, 2014b, 2015; Moore, Standen and Crawley, 2015). Whilst deer have commonly been thought to have a less significant impact on vegetation generally across the Highlands in comparison to sheep, it has also been suggested that this is only true when sheep and deer are grazing in the same area (Osborne, 1984; Clarke, Welch and Gordon, 1995a, 1995b; Hester *et al.*, 1999; Oom and Hester, 1999), with deer having an even higher impact than sheep when grazing alone (DeGabriel *et al.*, 2011). There has also been much research conducted on the direct and indirect impacts of deer browsing and grazing on other animal species, including birds, small mammals and

invertebrates, with it being found that deer, through direct competition as well as the cascading effects of their grazing, can reduce the abundance of these species, although much of this research has been undertaken in lowland areas (Baines, Sage and Baines, 1994; Feber *et al.*, 2001; Flowerdew and Ellwood, 2001; Fuller, 2001; Kirby, 2001; Perrins and Overall, 2001; Stewart, 2001; Bush *et al.*, 2012; Newson *et al.*, 2012; Holt, Fuller and Dolman, 2013, 2014).

### 3.4.2 Economic dimensions

Deer provide a number of economic benefits as well as challenges in the Highlands, although much of the research on this topic is inconsistent and dated (Putman, 2012). In terms of benefits, the commercial stalking of red stags in particular has long provided one of the few productive forms of land use in many areas of the Highlands, where alternative forms of production are often unviable owing to the terrain and climate (Mitchell, McCowan and Parish, 1986), despite the economic return from commercial stalking being relatively modest and in many cases loss-making for the landholdings that undertake it owing to the costs involved (Bullock, Elston and Chalmers, 1998). In the 1990s and early 2000s, the price charged per stag per day of stalking was on average £250 (Bullock, Elston and Chalmers, 1998; Bullock, 2001), which, based on conversations with many deer stalkers undertaken as part of research for this thesis, has increased to closer to £750 on average per stag per day in recent years, and as much as £1,500 in some cases. Moreover, hind stalking is increasingly commercially let out to guests, whereas in the past it would have been an activity undertaken by the stalker alone, with the price charged for a hind per day averaging around £300, up from around £120 previously (MacMillan and Phillip, 2008). These prices do not include additional revenue generated from tips for stalkers (usually at least 10% of the price charged) as well as the revenue from antler preparation for mounting. However, this revenue remains largely offset by the costs of employing stalkers and ghillies as well as fuel and other overheads; a report commissioned by the Association of Deer Management Groups (ADMG) found that deer management cost a total of £35m per annum (PACEC, 2016). In contrast, research by MacMillan and Phillip (2008), albeit conducted nearly 10 years earlier, estimated that commercial stalking generated only £5.2m.

It has been estimated that around 1,000 FTEs are directly employed in deer management (let and non-let stalking as well as deer management contracts), whilst deer management indirectly employs a further 1,554 FTEs in other roles, accounting for around 2,500 jobs across Scotland (Putman, 2012; Scott, 2023). Direct deer management employment is estimated to account for a total value of £15.7m, whilst indirect deer management employment accounts for £55m (Putman, 2012), with deer stalkers paid an average salary of between £15,000 and £25,000, with most living in tied-housing with access to an estate car and other 'perks' such as heating supplies, fuel and venison (Thomson *et al.*, 2020).

Venison is another economic benefit from deer and their management, although it is more of a by-product from stalking/deer management rather than a central aim or motivation (MacMillan and Phillip, 2010; Putman, 2012), whilst deer farming (which relates to non-wild deer) is becoming increasingly common because it can produce a more consistent product and reliable supply (Maffey *et al.*, 2015). Wild red deer culled in the Highlands comprises the vast majority of venison in Scotland which is either consumed domestically or exported elsewhere (particularly Germany), with approximately 60,000 carcasses, equating to around 3,400 tonnes of meat, produced annually (Fletcher and Sneddon, 2016). This was estimated to generate a total value of £2m per annum in 2008, with 1kg of venison fluctuating at around £1 for the past 20 years, a comparatively low price compared to beef for example (MacMillan and Phillip, 2010; Putman, 2012). The expansion in production, sales and consumption of venison has, however, been stymied for many years for a number of reasons, including inconsistent quality and supply from wild deer management, a lack of infrastructure to process and store carcasses, a concentrated market dominated by a small number of game dealers who are sometimes located far from estates and relatively low consumer awareness and appetite for venison and knowledge of how it can be used in cooking (Maffey *et al.*, 2015; Fletcher and Sneddon, 2016).

Finally, in terms of economic benefits, red deer, particularly stags, have long added capital value to estates in the Highlands. In the early 2000s, it was estimated by MacMillan (2004) that each stag shot (or likely to be available to shoot) on an estate contributes between £20,000 and £30,000, with this figure likely to be higher today (although other capital values, such as the potential to generate timber or carbon credits from forestry, for example, might have reduced this). Putman (2012), taking figures from the DCS in 2000 that showed a £22,000

capital value per stag and £2,200 capital value per hind, calculated that, across estates managed for red deer stalking, the total capital value in 2000 was around £450m. It can therefore be said that the capital value of stags is far more significant than the commercial value from stalking them and hence this, in part, explains the reluctance for deer reductions on some estates. Although, in practice, it is difficult to distinguish between the capital and stalking value of deer as they are co-dependent factors. However, research has consistently found that, whilst estate ownership is in part motivated by capital appreciation (Wightman and Higgins, 2000), private enjoyment is the primary motivation (MacGregor, 1985, 1988; MacGregor and Stockdale, 1994; Higgins, Wightman and MacMillan, 2002; MacMillan and Phillip, 2010).

Turning to economic costs, deer pose a number of challenges to forestry in upland Scotland. Through browsing on restocking sites as well as on the shoots of established trees and through bark stripping, as well as bole-scoring by sika deer, there are a number of ways in which deer can negatively impact both the quantity and quality of timber products (Ratcliffe, 1987b; Welch *et al.*, 1990, 1991; Scott and Palmer, 2000; Putman, 2012). Remedying this situation continues to come at a net cost for forest management, through deer management contracts as well as in the installation and maintenance of deer fencing (Gill, Webber and Peace, 2000; Putman, 2012). It was estimated by Scottish Natural Heritage in 2016 that, between 1990 and 2013, total public expenditure on deer fencing across Scotland was at least £100m relative to 2016 prices, with a further £23.3m publicly funded between 2003 and 2012; an average of £4.8m per year (NatureScot, 2016a). Two Freedom of Information (FOI) requests lodged in 2024 and 2025 further revealed that between 2018 and 2023, £31,365,403 was spent on fence installation and maintenance from Scottish Government grants (Scottish Government, 2024b, 2025a). On the National Forest Estate alone, which covers around 9% of Scotland, Forestry Commission Scotland (now Forestry and Land Scotland) estimated in 2015 that deer management cost between £6 – 7m per year, much of this on fencing (Forestry and Land Scotland, 2014). It is assumed that the economic costs of deer management are similar in private forestry, but there is scant data available on this (Campbell *et al.*, 2017).

The second economic cost presented by the impacts of deer concerns agriculture. However, this is considered to be relatively low in the Scottish Highlands, with impacts often localised and concentrated (Pérez-Espona, Pemberton and Putman, 2009). The main way in which

agricultural damage occurs from deer in the Highlands is during the winter, when red stags will occasionally move from the higher ground to arable areas and forage on crops (Scott and Palmer, 2000). More commonly though, it is roe deer that pose bigger problems for agriculture, by feeding on grass that is being grown for hay or silage as well as when deer graze fertilised grasslands that are being readied for livestock in the spring (Putman, 2012).

### 3.4.3 Social dimensions

The main way that deer interact with society more generally is through impacts related to public health and safety. The first of these concern the role of deer as vectors for ticks (*Ixodes ricinus*), which transmit *Borrelia* bacteria and can cause Lyme disease in humans. Tick abundance has been found to be positively associated with that of deer and in habitats most frequented by deer (Gilbert, 2010, 2013; Dickinson, Millins and Biek, 2020), particularly mixed and deciduous woodland (James *et al.*, 2013). Roe deer have also been found to host *Ehrlichia phagocytophil*, another tick-borne disease, that can cause Human granulocytic anaplasmosis (HGA) (Alberdi, Walker and Urquhart, 2000; Walker *et al.*, 2001). Aside from ticks, red and sika deer have been found to carry a number of endoparasites, including species of *Elaphostrongylus* and *Sarcocystis* which can affect humans (Böhm *et al.*, 2006). It is predicted that, owing to climatic changes that are increasing both temperature and rainfall in Scotland, parasitic abundance will increase in future, which has been cited as another reason for increasing deer culls (Böhm *et al.*, 2007; Dobson and Randolph, 2011; Gilbert *et al.*, 2012), whilst current woodland expansion efforts, as a result of more intensive deer management, may complicate this as the preferred habitat for parasites (Olsthoorn *et al.*, 2025). A final public health risk posed by the management of deer concerns the use of lead ammunition in the shooting of them, which can enter the human food chain through the consumption of venison (Knott *et al.*, 2009, 2010). The UK Government announced in July 2025 that lead ammunition was to be phased out across the country, including in Scotland, from 2026 (Walker, 2025), although it has been heard in the course of research for this thesis that many deer stalkers started to use copper bullets several years ago.

The other notable social impact from deer concerns that posed to public safety through deer-vehicle collisions (DVCs), with an average of 1,850 taking place per year in Scotland since 2016

(Lush and Lush, 2023). The largest number of DVCs happen in northern Local Authority areas in Scotland, including Highland and Perth & Kinross, although DVCs are increasing most in the Central Belt because of growing roe deer populations and human traffic (Langbein, 2017; Lush and Lush, 2023). DVCs are most common in May and June and more likely to take place at dusk when deer are most active and visibility is reduced (Lush and Lush, 2023).

#### 3.4.4 Cultural dimensions

The final dimension of deer in Scotland concerns their cultural role in their own right and in terms of their management. With red deer the largest wild land mammal in Scotland, it has long embodied the Scottish Highlands in particular, as a symbol of nobility and royalty as well as hardiness and adaptability, and has been consistently voted as Scotland's most 'iconic' species (Pérez-Espona, Pemberton and Putman, 2009). Deer more generally are a popular sight for Scottish residents as well as tourists, in terms of their aesthetic appeal and representation of wildness in a country that is increasingly nature-depleted (Hare, Daniels and Blossey, 2021; Whitefield *et al.*, 2021).

At a historical level, deer have been central to the imagery of the Highlands for centuries, and have featured in songs, plays, poems and paintings (Wiseman, 2009), whilst modern-day deer iconography in and of Scotland is ubiquitous on whisky bottles and short-bread tins. The act of stalking deer is almost as culturally significant as the deer themselves, bound up with complex dynamics of power, romanticism and heritage (Toogood, 1995; Jarvie, Jackson and Higgins, 1997; Lorimer, 2000) as well as skill, knowledge and fortitude (Mitchell, McCowan and Parish, 1986; Webb, 2024). Moreover, the existence of sporting estates used for deer stalking owes itself more to fashion, taste and the cult of the red stag than rational economic decision-making, as shown above (Wightman and Higgins, 2000; Wightman *et al.*, 2002; MacMillan *et al.*, 2010). The next section expands on this by providing a brief history of deer management in the Highlands.

### 3.5 A brief history of deer management in the Highlands

Deer management in Scotland has been described as a 'long and mutually dependent relationship' (Mulville, 2010), in the sense that both people and deer have, at different times and in different ways, benefited from their interaction. Deer have been hunted in Scotland for at least 10,000 years, whilst the oldest known animal carvings in Scotland, recently discovered in Argyll, are of red deer (Valdez-Tullett *et al.*, 2023). During the Neolithic period, deer were a common resource hunted and gathered for meat, clothing, weaponry and tools (Hart-Davies, 1978; Wightman *et al.*, 2002). This was altered by the emergence of Scotland's first farmers around 4,500 years ago and a shift in emphasis towards domesticated livestock (Lowe, 1961). Subsequent millennia, particularly during the Iron Age, saw significant forest clearance in the lowlands, along with climatic changes, displacing red deer to the uplands (Lowe, 1961; Boyd, 1984).

Although the Romans did not conquer Scotland, the basis for modern deer management lay with their arrival south of the border through the establishment of the legal principle *res nullius*, which roughly translates to 'ownerless property' (Benton and Straumann, 2010; Maffey *et al.*, 2013). Enacted much later in Scots law in the 18th century, this means that, in Scotland, deer are considered wild and are not owned until killed or captured (Phillip *et al.*, 2009). This right to kill or capture is held by the owner (or those who are given permission by the owner) of the land that the deer are on at the point of being killed or captured (Pepper, Barbour and Glass, 2019).

Under David I (1124 to 1153), Norman influence seeped into Scotland which transformed deer management into an increasingly private affair, particularly through the creation of deer parks and forests (Hall, Malloy and Oram, 2011; Malloy, Hall and Oram, 2013). The former refers to areas of enclosed land whilst the latter refers to areas where deer 'naturally' range unhindered. Unique to the British Isles, the original use of the word 'forest' denotes an area of hunting land rather than of trees (Whitehead, 1960; Mitchell, Staines and Welch, 1977). Deer parks and forests were the preserve of royalty and nobility for many centuries (Cameron, 2005), a system that was only formally legalised in 1424 (Fiorini, Yearley and Dandy, 2011), and the poaching of deer was closely guarded against and severely punished. This was facilitated through game laws such as close seasons, also introduced in the 1400s, as well as

penalties and numerous Acts of Parliament which continued to proliferate until the 16th century (Lowe, 1961; Phillip *et al.*, 2009). For much of this period, deer were hunted as part of ‘tinchels’, where deer were driven by groups of people into areas where they could be killed using bow and arrow as well as spears, and subsequently through deer ‘coursing’ using hounds (Hart-Davies, 1978).



**Figure 6. Deer hunting in the Middle Ages.**

*Photo of a sign at Castle Campbell, Dollar, explaining the use of the nearby Ochil Hills as a deer chase for the Earl of Argyll and his guests. Sign by Historic Environment Scotland, photo my own.*

The next major change in deer management came during the Industrial Revolution, the upland manifestation of which was the extensification of sheep farming for the wool trade (Dodgshon and Olsson, 2006). During the Highland Clearances, landowners converted much of their land to sheep pasture which served to reduce forage capacity for deer (Hunter, 1972). Partly as a result, along with increased hunting, deer were reduced to historically low numbers by the end of the century, to the point at which fears arose about their potential extinction (Nicholson, 1974). However, deer in this era were, for many landowners, of secondary management and economic importance to sheep (Orr, 1982). This period, generally thought to be sometime in the 1740s, also saw the extinction of the wolf, the last

major predator of deer, with the exception of humans, in Scotland (Hart-Davies, 1978; Manning, Gordon and Ripple, 2009).

During the 19th century, the profitability of the wool trade declined which was mirrored in sheep farming (Robbins and Fraser, 2003), with one consequence being that deer were able to reinhabit these areas for forage and shelter (Hope *et al.*, 1996). As a newly wealthy class of merchants emerged, contemporary Highland landowners, many of whom were impoverished clan chieftains (MacInnes, 2007), gave way to those from the cities (Jarvie, 1986). It is often assumed that this was catalysed by the lease in 1848 and subsequent purchase in 1852 of Balmoral estate by Prince Albert for his wife, Queen Victoria (Hobbs, 2009), although the vogue of buying land for recreational hunting began as early as the 1810s, whilst stalking did not peak in popularity until the 1910s, when deer forests covered over 3.5 million acres of Scotland (Hart-Davies, 1978).

Technological advancements were also crucial in this era. Improved and expanded railways, as well as the creation of canals, enabled owners, friends and clients to reach previously inaccessible areas of the Highlands (Hart-Davies, 1978; Fletcher, 2010). The development of breech-loading and longer-range rifles as well as the telescopic sight, also helped make shooting more efficient, accurate and therefore more appealing (Hart-Davies, 1978; Lorimer, 2000; Done and Muir, 2001). Such 'progress' was also supported by the cultural re-imagining of the Highlands as a land of aesthetic beauty through the paintings of Edwin Landseer and J.M.W Turner and the writings and poems of Walter Scott and James Macpherson (Rohde, 2004), replacing the hitherto dominant perception of the region as a violent and lawless wasteland (Byg, Novo and Kyle, 2020). Meanwhile, sportsmen began to publish their own accounts of stalking (Scrope, 1838, 1883; Grimble, 1886, 1896), converting the activity into an elite aspiration and commercial enterprise, putting it out of reach for most locals whom had long hunted deer relatively freely without cost and therefore 'bitterly resented the change' (Hart-Davies, 1978, p. 76).



**Figure 7. 'The Monarch of the Glen' by Edwin Landseer, 1851.**

*It is disputed whether the painting depicts Glen Feshie, formerly a renowned sporting estate but which in recent years has become a flagship 'rewilding' project where intensive deer culls have been undertaken, or Glen Affric, which has also been subject to increasing environmental 'restoration' efforts predicated on higher culls. Available at:*

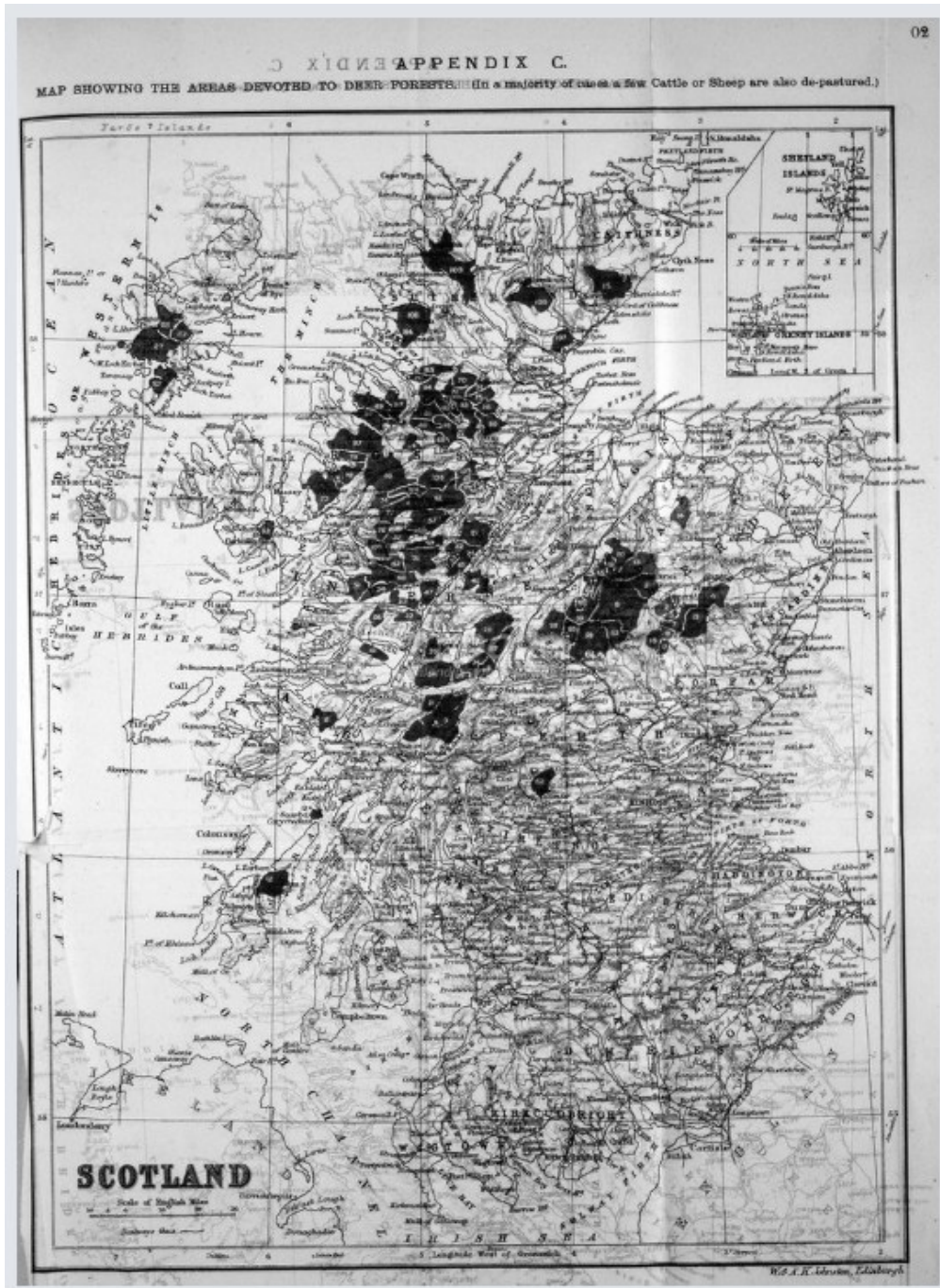
*<https://www.nationalgalleries.org/art-and-artists/159116/monarch-glen-about-1851>*

*[Accessed: 19/08/2025]*

The development of the 'sporting' estate fundamentally altered the way in which deer were managed. The emphasis shifted towards ensuring a viable quantity of deer, particularly stags, and the primary role of the stalker or gamekeeper, many of whom were former hill-shepherds (Hart-Davies, 1978), was to provide this through habitat manipulation like muirburn (Holden *et al.*, 2007) and diversionary feeding (Putman and Staines, 2004). Older forms of deer hunting, like deer coursing, died out, with it thought to have been last practiced on Culachy estate,

Inverness-shire, in 1912 (MacNally, 1970). The ‘trophy’ aspect of stag stalking was also established during this period, lasting until around the 1960s, which prized larger bodies and pointed antlers the most, with a 12-pointed stag referred to as a ‘royal’, a 14 pointer an ‘imperial’ and a 16 pointer a ‘monarch’ (noting that Landseer’s ‘Monarch of the Glen’ was in fact a royal).

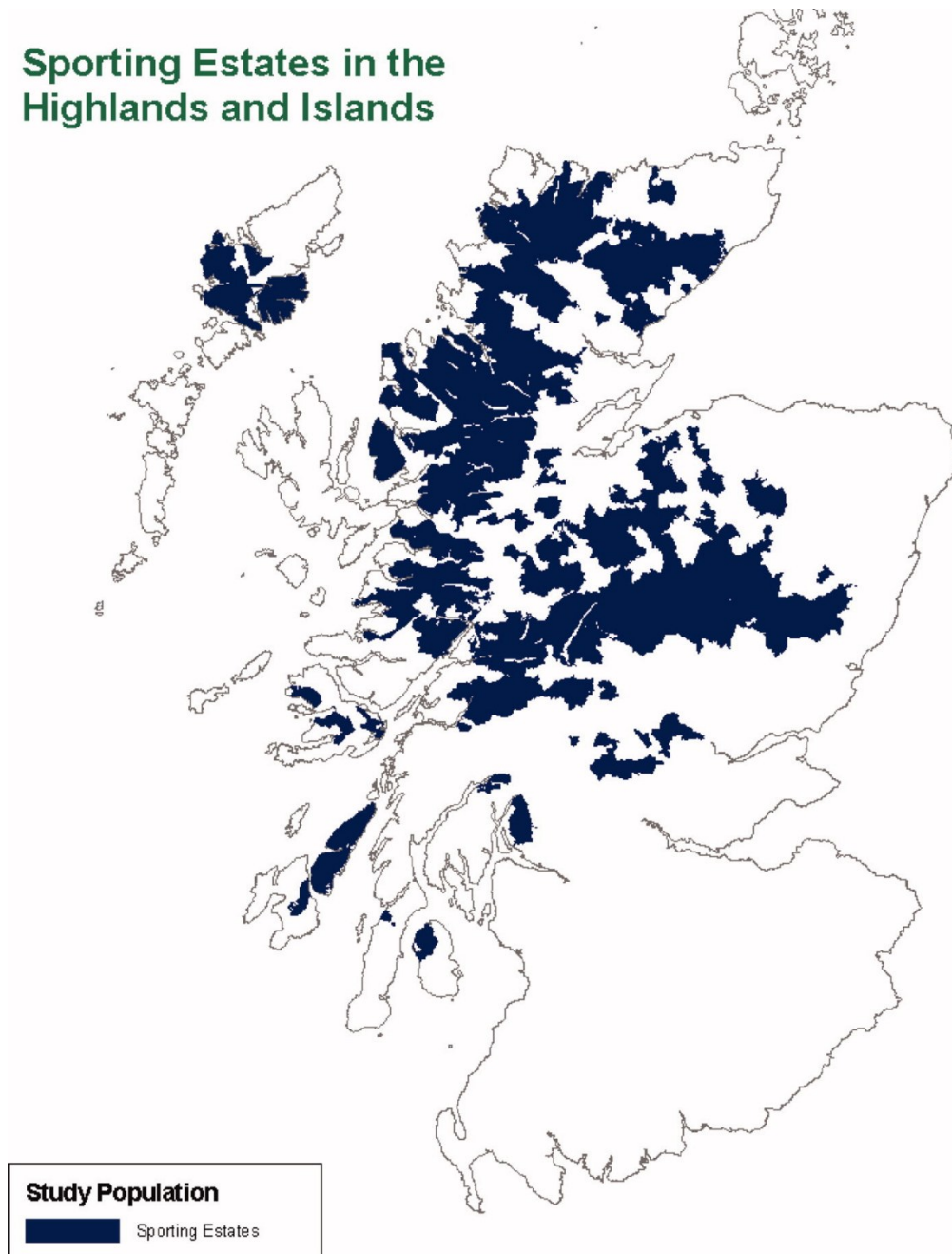
The geographical impact of this newfound emphasis was profound. In 1790 there were only 9 deer forests in Scotland – by 1912 there were 213, covering 30% of the country (MacMillan *et al.*, 2010; Pepper, Barbour and Glass, 2019), a process Hart-Davies (1978, p. 184) describes as a conversion of ‘5,500 square miles of the Highlands into a gigantic deer forest’. Perhaps unsurprisingly then, it was also at this time that the earliest recorded debates around deer emerged. Aided by sympathetic land management and further legislation, such as the Game (Scotland) Act 1832 which consolidated the absolute authority of landowners to exclude people taking deer from their land (Watson and Allan, 1986), deer numbers grew exponentially (Hobbs, 2009). This aggrieved many crofters and farmers, who had to contend with the foraging and trampling of deer (Orr, 1982). As Jarvie (1986, p. 51) notes: ‘to those existing on the very margins of subsistence, the destruction of crops meant the possibility of starvation. Conflict and struggle were constant factors... For instance... on Lewis... some 200 crofters and cottars... marched into the forest to take deer as a direct protest’. In 1872, a House of Commons Select Committee investigated the impact of deer forests on crofting communities. This would be the first of seven parliamentary and government inquiries over the next several decades (Hare, Daniels and Blossey, 2021). The remit of the Napier Commission, set up in 1883 in response to crofter agitation, also included the management of deer but concluded that deer forests were having little impact on crofting activities and depopulation – perhaps because three of the six commission members owned deer forests (Kidd, 2025; Macleod, n.d.).



**Figure 8. Map of deer forests in Scotland in the 1880s from the Napier Commission.**

Deer forests shown in black. Full title of the report: Report of Her Majesty's Commissioners of Inquiry Into the Condition of the Crofters and Cottars in the Highlands and Islands of Scotland. Available at: <https://www.ambaile.org.uk/asset/31307/> [Accessed: 19/08/2025]

## Sporting Estates in the Highlands and Islands



*Figure 9. Map of sporting estates in the Highlands and Islands of Scotland in the early 2000s.*

*Based on research conducted by Higgins et al (2002). Source: (MacMillan et al., 2010, p. 27)*

Following the outbreak of WWI, many estates were deprived of stalkers, gamekeepers, ghillies and beaters who had been deployed in the war effort, often as snipers (Hart-Davies, 1978). This played a key part in initiating the long and slow decline of both stalking and sporting estates over the 20<sup>th</sup> century. Another impact of the war was the rapid and near total

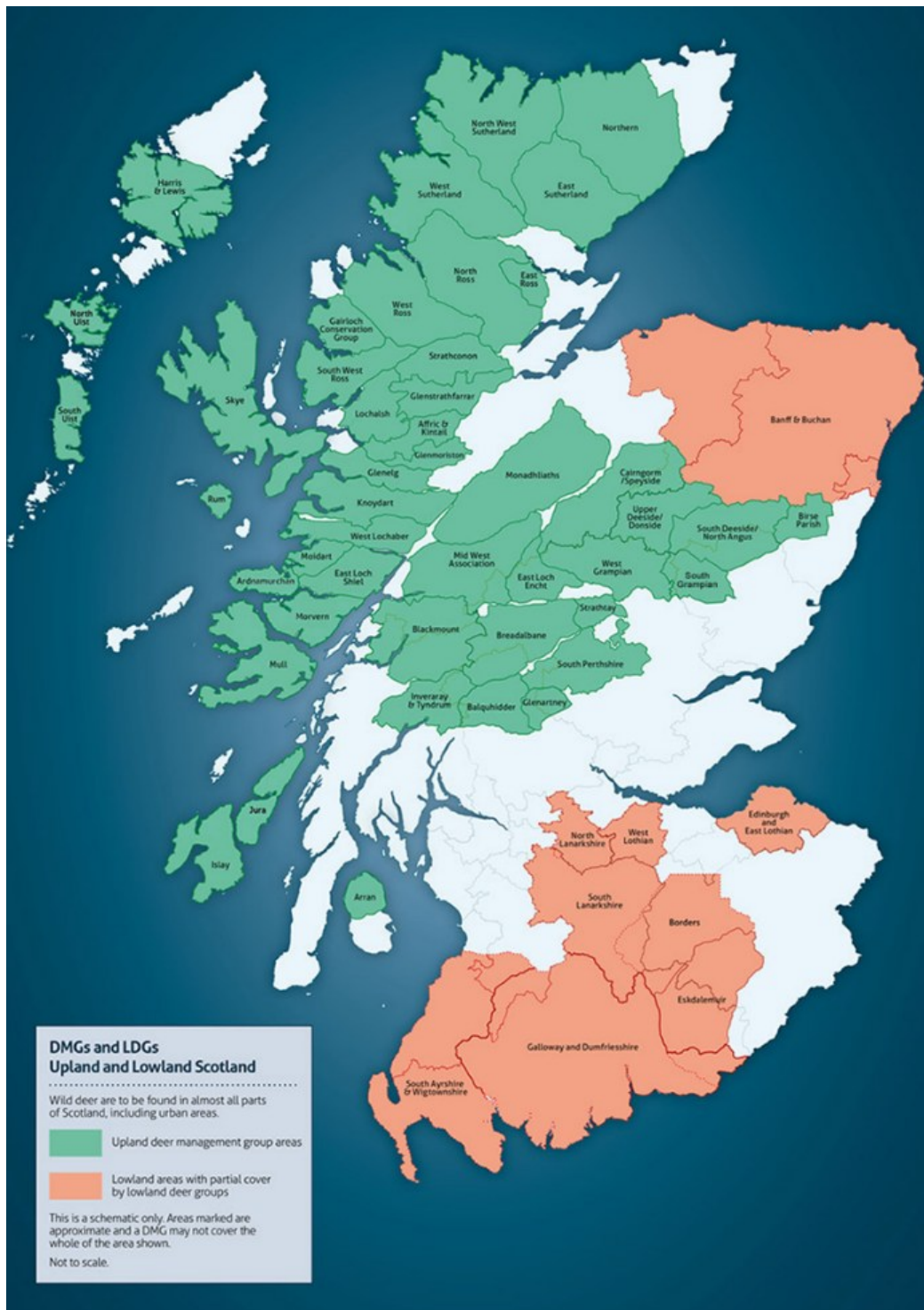
depletion of woodland and consequently timber stocks (House, 2018). Moreover, 97% of wooded land at the time was privately owned, greatly complicating resourcing (Raum, 2020). As such, post-war, the need for a secure state-owned domestic supply of timber was obvious, which led to the Forestry Act 1919 and the establishment of the Forestry Commission (Mather, 2004). This precipitated a frenzy of planting that would endure another world war – an effort that was, however, complicated by the presence of many mouths of deer (Scott and Palmer, 2000). Foresters consequently came to replace crofters in the deer struggle, whilst legislation and policy shifted away from agricultural damage towards protecting timber (Phillip *et al.*, 2009). Areas of land were now given over to forestry, further squeezing the presence of sporting estates and open-hill stalking.

The interwar decades also saw the foundations of modern conservation thinking emerge around deer impacts in the Highlands, most notably through the work of Frank Fraser Darling. First studying deer in An Teallach, Wester Ross, in the 1930s and subsequently publishing *Natural History in the Highlands and Islands* in 1947 (Darling, 2012), Darling was one of the first ecologists to cast a more critical eye over the landscape of the Highlands, infamously describing the hills and moors as ‘wet deserts’ (Marrs *et al.*, 2020). Much of the language heard today around the ‘restoration’ and ‘rewilding’ of the Highlands (Martin *et al.*, 2021) and, critically, the blaming of deer for environmental ills, can be traced back to this period.

Post-WWII, there were further inquiries into deer management as well as poaching, contributing first to the Agriculture (Scotland) Act 1948 and culminating in the Deer (Scotland) Act 1959 (Phillip *et al.*, 2009). The former established the right of agricultural and forestry occupiers to shoot deer if they were found to be damaging their crops and land, whilst the latter created the first statutory framework for deer management in Scotland (Pepper, Barbour and Glass, 2019). The 1959 Act also led to the establishment of the first statutory body for red deer management, the RDC, enshrined in law the already long-practised close seasons for the shooting of deer and made it illegal to kill deer unless by firearm (Pepper, Barbour and Glass, 2019).

In the 1960s, the first Deer Management Groups (DMGs) were formed as voluntary structures comprised of neighbouring landholdings covering upland red deer ranges or DMAs (Whitehead, 1996). Initially called Red Deer Management Association Groups, the first three were established over the Monadhliath, Balquhiddar and Mull red deer ranges (Whitehead,

1996). DMGs were primarily set up with a sport stalking focus as a forum for estate owners and managers to exchange cull and count information and in recognition that red deer move widely and regularly across landholding boundaries, necessitating collaborative management (Fiorini, Yearley and Dandy, 2011). Over time, the remit of DMGs has expanded considerably, covering areas such as forestry, conservation and public access (Davies and White, 2012). As of 2025, 45 DMGs are listed on the website of the Association of Deer Management Groups (ADMG), the national representative body for DMGs, although it appears that two of these, Rum and Skye, are no longer operational. The total area of the 43 operational DMGs is 2,931,845 hectares, equating to 36.53% of Scotland's surface area, with DMGs averaging a size of 68,182 hectares, the largest being North West Sutherland DMG at 168,960 hectares and the smallest Strathtay DMG at 6,087 hectares (see Appendix A for a full list of DMGs).



**Figure 10. A map of Deer Management Groups (DMGs) in Scotland.**

Upland DMGs are shown in green. Note that neither Rum nor Skye have an operational DMG at present, whilst Knoydart is now split into Knoydart DMG and West Knoydart DMG.

Available at: <https://www.deer-management.co.uk/dmgs/deer-management-groups/deer-management-group-map/> [Accessed: 18/08/2025]

Further regulatory developments in deer management came with the Deer (Amendment) (Scotland) Act 1982, the main impact of which was to widen the scope of the RDC to the management of all species of deer, and subsequent secondary legislation on seasons, firearms and venison (Pepper, Barbour and Glass, 2019). New tax incentives for tree planting were also created during this period, leading to the growth of the private forestry industry and reigniting conflict between forestry interests and sport stalking (Payne *et al.*, 2018).

By the 1990s, it was still felt in government that insufficient progress had been achieved on managing Scotland's deer population (Pepper, Barbour and Glass, 2019). In response, a new Deer (Scotland) Act was introduced in 1996. The most significant changes resulting from the Act were the conversion of the RDC to the Deer Commission for Scotland, with a widened remit that now included the management of all deer species, deer welfare, public safety and natural heritage as well as out-of-season authorisations, control agreements and schemes and emergency measures (Pepper, Barbour and Glass, 2019). In 2010, the DCS was absorbed into SNH, partly as a means to bring deer management into line with wider environmental and conservation policy. SNH was rebranded NatureScot in 2020 and remains the regulatory body responsible for overseeing deer management in Scotland.

### 3.6 Methods of deer management

This section provides an overview of the methods by which deer are managed in the Highlands, including culling, fencing and other means.

#### 3.6.1 Deer culling

The main way that deer are managed is through culling (Urquhart and McKendrick, 2006). On sporting estates, culling is normally conducted selectively, i.e. weaker, sicker and/or older individuals are culled, whilst healthier specimens are left to improve the genetic pool of the herd and therefore its survivability, so as to sustain stalking into the future (Milner-Gulland, Coulson and Clutton-Brock, 2004). This is often referred to as a 'maintenance' or 'management' cull (Bullock, 1999; Cockram *et al.*, 2011). On other landholdings, such as in

forestry plantations and conservation sites as well as on an increasing number of sporting estates, culling may be conducted more indiscriminately, in order to achieve desired densities as part of 'reduction' culls (Gullett *et al.*, 2023). The method by which culls are undertaken varies according to topography, climate, the practice and customs of the landholding (particularly on estates), the individual preferences of deer stalkers and managers, whether the quarry is a stag or a hind and the time of year in which the stag or hind is being pursued owing to seasonal behavioural differences (i.e. during the rut) (Buckland *et al.*, 1996), although broadly speaking the overall approach remains the same; that is, the stealthy pursuit of deer until the point at which an accurate shot can be taken (Cockram *et al.*, 2011). Lea MacNally, who stalked at the National Trust for Scotland's reserve at Torridon for over 20 years and spent many more as a stalker elsewhere (Smith, 2019), and whom King Charles once guided on a stalk as mark of a respect (The Scottish Farmer, 2014), provides a vivid description of this process as still largely practised in the open-hill ranges of the Highlands, which is worth quoting in full :

*True deer stalking necessitates keen eyes and the ability to walk long distances (not necessarily at a fast pace, though there are undeniably times when fleetness of foot is a great asset), and to tackle patiently long, circuitous approaches; to crawl on hands and knees for lengthy periods over extremes of terrain from the relative comfort of dry, mossy ridges to the extreme discomfort of icy burn or mucky peat bogs; to wriggle forward belly flat, also under these varying conditions, flat indeed as the proverbial flounder, keeping pressed to the surface even when sharp rock or chilly wetness seems to penetrate to the very vitals. Above all it needs patience in walking to find one's deer, in spying them to select a suitable beast, in the final painstaking approach and, perhaps most difficult of all... in the last wait at the firing point until the painfully won situation is just right for the climax of the shot (MacNally, 1970, p. 92).*

The most common form of culling is by a single stalker during the daytime, with other forms of culling including night pursuits, collaborative stalking (i.e. more than one stalker) and helicopter-assisted culls for deploying stalkers and carcass extraction, with these latter two methods very rarely used where there may be deemed an urgent need for intensive and efficient deer management (Cockram *et al.*, 2011). Deer are typically shot with high-velocity 0.270 calibre rifles with telescopic sights, with 120 – 130g bullets that expand on impact to

maximise tissue destruction (Cockram *et al.*, 2011), although it is increasingly common for 0.243 calibre rifles and 100g bullets to be used (Lamont *et al.*, 2022), with a recent change in law allowing 80g bullets to be used as part of encouraging a move away from lead ammunition towards copper alternatives (*The Deer (Firearms etc.) (Scotland) Amendment Order 2023 No. 332, 2023*).



**Figure 11. Shooting.**

*Above: a typical rifle used to shoot deer. Below: target practice. Photos my own.*



**Figure 12. Deer culling.**

*Left: a culled hind. Right: the culled hind in the back of an Argocat. Photos my own.*

In Scotland, best practice guidance for culling states that, where possible, shots should be taken at deer when they are standing broadside, so that the bullet passes through both the heart and/or both lungs, in order to effect the quickest death (Urquhart and McKendrick, 2006). Neck shots are also commonly undertaken, although these present more risks to the animal such as paralysis (Urquhart and McKendrick, 2006). Similarly, head shots are discouraged, because of the smaller shooting area which may produce non-fatal wounds to the mandible and/or maxilla, although there may be more of an incentive for sufficiently skilled stalkers to take these shots in order to minimise spoilage of the carcass for the sale of venison (Urquhart and McKendrick, 2006). After being shot, deer are 'gralloched', which is when the internal organs are removed in order to lighten the carcass and reduce bacterial infection of the carcass. Carcasses are usually extracted using an All-Terrain Vehicle (ATV), commonly an Argocat, although during the stag season on more traditional estates garron ponies may be used.

Until the 1960s, hinds were deliberately under-culled in the belief that having more hinds would in turn encourage more stags into the area, to the benefit of commercial stalking (Buckland *et al.*, 1996; Milner-Gulland, Coulson and Clutton-Brock, 2004; Albon *et al.*, 2019). However, it has long been disproven to be the case, and since the 1980s, more hinds than stags have been shot, in the recognition that hind culling is more effective at reducing overall

deer populations than stag culling and that the recruitment rate is in fact higher with lower densities (Milner-Gulland, Coulson and Clutton-Brock, 2004; Albon *et al.*, 2019). Similarly, until the 1960s almost no calves were culled, whereas over the past 10 years, 35 calves per every 100 hinds are now shot (Albon *et al.*, 2019).

Cull returns (information detailing the number of deer shot on a landholding) first started to be collected at a national level in 1996 under section 40 of the Deer (Scotland) Act 1996, although culls have been recorded at a more sporadic level since 1961 (Albon *et al.*, 2019). Historically commercially sensitive and therefore closely guarded, cull returns remain inaccurate and cull non-returns have increased in number over the preceding decade (Albon *et al.*, 2019; Pepper, Barbour and Glass, 2019; Sutherland *et al.*, 2025). Since 1996 across Scotland, according to the available cull returns, 2,987,950 deer have been culled, with red deer comprising 1,790,859 (59.94%) of this. This equates to an average of 106,713 deer culled per year, of which red deer account for 63,959 on average. The most recent cull information available shows over the period 2023 – 2024, 138,534 were culled, although NatureScot note that the actual figure is likely to be closer to 200,000 because roe deer culls are poorly reported (NatureScot, 2024c).

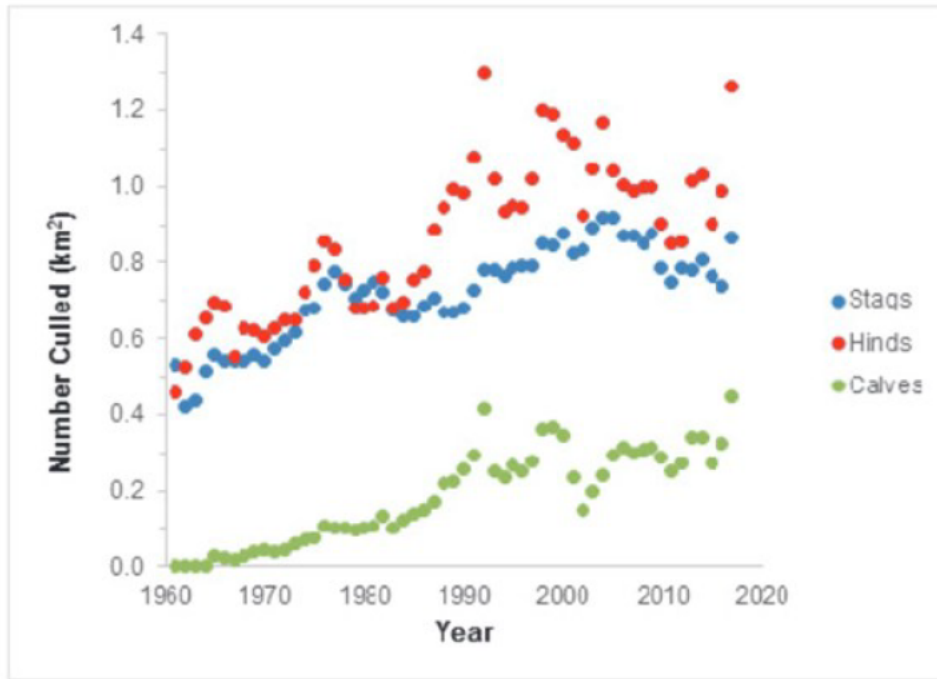


Figure 13. Trends in the mean number of (red) stags, hinds and calves culled per km<sup>2</sup> between 1961/2 and 2017/18.

Source: (Albon et al., 2019, p. 14)

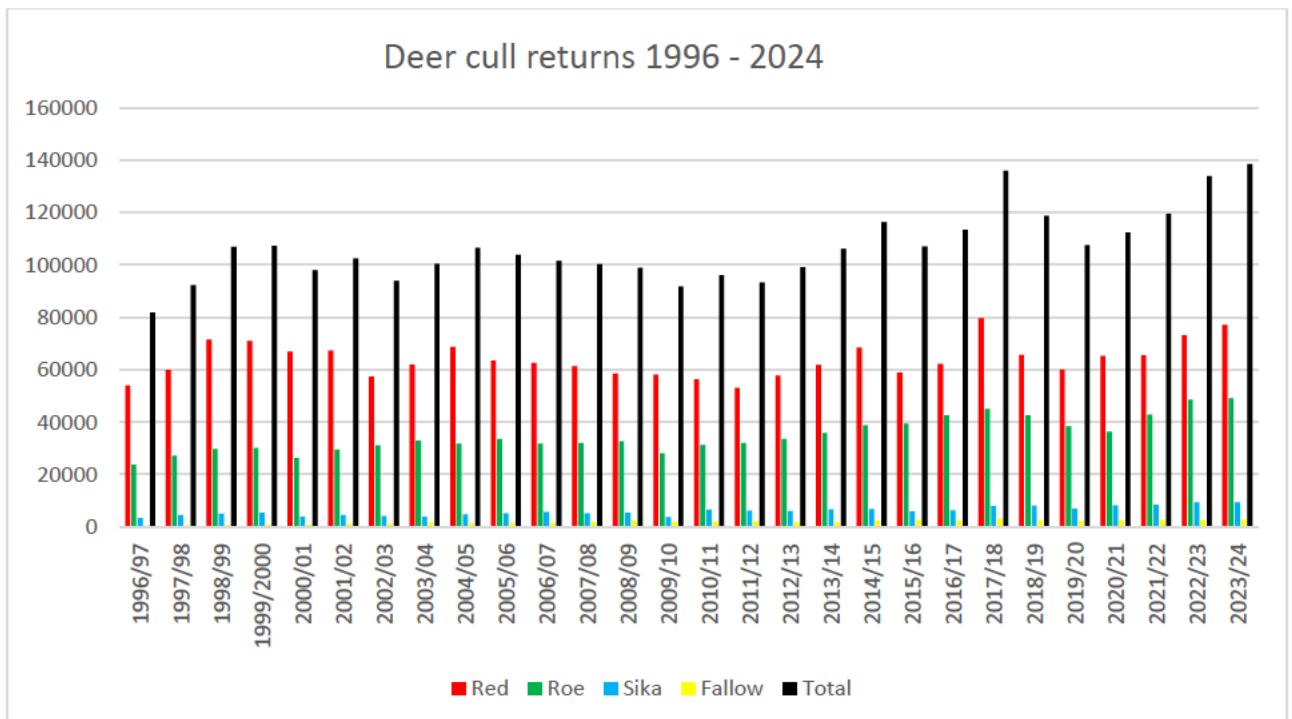


Figure 14. Deer cull returns 1996/7 to 2023/4.

Adapted and compiled from NatureScot (2024c). Available at: <https://www.nature.scot/doc/naturescot-deer-census-results> [Accessed: 07/10/2025]

### 3.6.2 Deer fencing

The other main way deer are managed is fencing. Fencing is used to exclude deer from an area without the need for culling (or in conjunction with it), and is most commonly used in areas of forestry plantation or woodland regeneration. Fencing is also sometimes used on arable fields and to protect gardens. Deer fencing is typically composed of high-tensile steel netting that is around 1.8 to 2.5m in height (Goddard *et al.*, 2001). In 2016, it was estimated by SNH that, between 1990 and 2013, at least 13,500km of fencing was installed through public grant schemes across Scotland (NatureScot, 2016a). Two FOIs in 2023 and 2024 further showed that between 2018 and 2024, 3,767,374 metres of fencing was either installed or upgraded (Scottish Government, 2024b, 2025a). This does not account for the additional amount of fence installation privately funded by landholdings.

Historically, sporting estates preferred neighbouring landholdings (often those managed by the Forestry Commission, now called Forestry and Land Scotland) to install fencing if they had issues with deer incursions on their land, rather than culling them and therefore reducing the number of deer available for stalking. However, whilst fencing can be effective in reducing the browsing and grazing impacts of deer, and can be particularly useful during the early stages of forest and woodland growth, fencing has been criticised for many years (Armstrong and Robertson, 2013).

The chief reason for this is that fencing has been found to increase the mortality of woodland grouse species through fence collisions, with attention concentrating on the impact on capercaillie, a highly endangered species of which there are estimated to only be around 540 left in Scotland, the majority of these in the remaining pinewoods of the Cairngorms (Baines & Andrew, 2003; Baines & Summers, 1997; Cairngorms Capercaillie Project, 2023). Other species killed in collisions with deer fences include black and red grouse (Baines and Andrew, 2003). Whilst marking deer fencing has been suggested as an option, in order to increase the visibility of fences to birds, this has been found to only reduce rather than eliminate the risk, and culling instead of fencing in these areas has been proposed as a preferable option, with many conservation landholdings in particular pursuing this (Baines and Andrew, 2003; Trees for Life, 2025). Fencing has also been found to negatively impact upon mosses, lichens and liverworts through increased canopy cover by reducing grazing in these areas (Moore and

Crawley, 2014a, 2014b, 2015; Moore, Standen and Crawley, 2015) whilst, more broadly, fencing creates an artificial habitat that can result in concentrated grazing, browsing and trampling through the displacement of deer on the surrounding land and along the fence line in particular (Armstrong and Robertson, 2013). Finally, fencing decreases in efficacy over time due to wear, may be of limited use in areas liable to heavy snow accumulation as deer are then able to jump over the fences, poses public access issues and is becoming increasingly expensive to install and maintain (Smith *et al.*, 2018; Hepburn, 2021; Law, 2024).



**Figure 15. Deer fencing.**

*Clockwise from left: a deer fence in Strath Brora; a deer fence in a garden in north Morar; a gate in a deer fence to allow public access in Knoydart; the sign on the gate. Photos my own.*

### 3.6.3 Other deer management methods

Aside from the two main management methods of culling and fencing, a number of other methods are used to manage deer. Supplementary or diversionary feeding is a method by which feeding stations, comprised of vegetables, crops, salt licks and other supplements are

made available to deer, typically between Spring and Autumn, on lower wintering grounds (Mitchell, McCowan and Parish, 1986). Most commonly undertaken on sporting estates, there are a number of motivations for doing this, such as maintaining higher deer densities for stalking by disincentivising emigration, increasing body weight and condition, improving animal reproductivity, boosting survival over the winter and diverting damage away from forestry, woodland or arable sites (Mitchell, McCowan and Parish, 1986; Putman and Staines, 2004). However, research has found little benefit from this practice, with a negligible impact on fecundity, bodyweight and mortality and instead it may increase the reliance of deer on supplements and reduce natural forage intake, increase their energy consumption during the winter months and increase the risk of parasitic infection between deer due to close contact at feeding stations (Putman and Staines, 2004). Another practice on sporting estates for deer management has been muirburn, more commonly associated with red grouse, in order to provide fresh heather shoots for deer grazing (Brooker *et al.*, 2019).

As part of managing deer for woodland growth, other methods may include sabre planting, natural protection using species such as gorse, bud protection using sheep wool, bud caps or mesh nets and chemical, odour-based, sound and light repellents (Armstrong and Robertson, 2013; McCallin, 2017; UHI, 2024). Additional methods that have long been proposed but not practised in Scotland include contraceptive control (Massei, 2023) and the re-introduction of predators such as lynx and wolves (Nilsen *et al.*, 2007; Manning, Gordon and Ripple, 2009; Bavin *et al.*, 2023; Spracklen *et al.*, 2025). Human disturbance, through recreational activities such as hill-walking, mountain-biking and skiing, has also long acted as a non-direct management method of deer (Jayakody *et al.*, 2008, 2011; Sibbald *et al.*, 2011; MacKay and Prager, 2021; Marion *et al.*, 2021).

### 3.7 Deer management policy in Scotland over the past decade

Whilst red deer numbers are believed to have largely stabilised in the open-hill range of the Highlands since 2000, deer management is still regarded by the Scottish Government as one of the country's main environmental challenges (Scottish Government, 2021). The government's stated aim is 'to reduce the impact of wild deer on the natural environment so that they can form part of a functioning ecosystem while maximising the benefits deer bring

to local communities and the rural economy' (Scottish Government, 2025b, p. 5). Deer management has, over the past decade, also been increasingly discussed in terms of securing the 'public interest' (Hare, Daniels and Blossey, 2021). This relates to the social dimensions discussed above. Most prominent, however, remains the role of deer management in relation to climate change and biodiversity loss, as part of Scottish Government targets to reach net zero greenhouse gas emissions by 2045 and to 'halt' and 'reverse' biodiversity loss by 2030 and 2045 respectively (Scottish Government, 2024a, 2024e).

As part of reforming deer management to pursue these goals, in 2017 the Scottish Government commissioned an independent 'Deer Working Group' who were tasked with reviewing the current approach and recommending improvements. In 2019, the group published an extensive report that included 99 recommendations for the reform of deer management, 92 of which were subsequently accepted by the Scottish Government (Pepper, Barbour and Glass, 2019; Scottish Government, 2021). Out of the many accepted recommendations, some of the most notable were an upper threshold density of 10 red deer per km<sup>2</sup> on the open-hill range, an end to the close season for male deer and a reduced close season for female deer, expansion of night shooting authorisations, stronger regulatory enforcement of deer management by NatureScot and a planned cull approval system (Pepper, Barbour and Glass, 2019).

Many of these recommendations have recently been or are in the process of being introduced, either through secondary legislation or through the Natural Environment (Scotland) Bill, which was introduced to the Scottish Parliament in February 2025 and become an Act in March 2026 (Scottish Government, 2025c, 2026). The male close season for all species was removed in October 2023 (*The Deer (Close Seasons) (Scotland) Amendment Order 2023*, 2023), whilst the legal minimum bullet weight for culling deer was reduced from 100g to 80g along with further provisions for the use of thermal imagery scopes for night shooting (*The Deer (Firearms etc.) (Scotland) Amendment Order 2023 No. 332*, 2023). The proposal to reduce the hind close season was, however, dropped by the Scottish Government in January 2025 (Swindells, 2025), largely because of advocacy efforts by some stalking interests who claimed that the culling and gralloching of pregnant hinds (something that was perceived at risk of increasing by these stakeholders as a result of the proposed change to the hind close season)

was negatively impacting the mental health of stalkers; efforts which were observed during the course of this research.

The area that has perhaps aroused the most contention concerns NatureScot's regulatory powers. Currently, NatureScot has three main regulatory powers in relation to deer management. The first of these are Control Agreements under Section 7 of the Deer (Scotland) Act 1996, which establishes a 'voluntary formal agreement' between NatureScot and landowners/occupiers, where NatureScot believes that deer are causing damage to natural heritage, agriculture, livestock or risk public safety and where owners/occupiers agree to manage deer to mitigate damage (Edwards and Kenyon, 2013). Where agreement cannot be found, Section 8 Control Schemes can be implemented. This compels owners/occupiers to manage deer where 'serious damage' is being caused and allows NatureScot to intervene if owners fail to do so (Edwards and Kenyon, 2013). Should Control Agreements and Schemes fail, NatureScot has powers under Section 10 to introduce 'emergency measures', which enables them to enter land without the consent of owners/occupiers and cull deer themselves (or through contractors), recouping the costs from the landowner in the process (Pepper, Barbour and Glass, 2019).

The most recent information available shows that 11 Section 7 Control Agreements have been or continue to be in place, the longest running of which is in Caenlochan, in the Southeastern Cairngorms, beginning in 2003 and re-imposed in 2014, with seven of these agreements introduced since 2010 (NatureScot, 2016b). A section 8 Control Scheme has only been used once, at Loch Choire, Sutherland, in April 2025 (NatureScot, 2025). Section 10 emergency measures were first used in Glen Feshie in 2004 (The Scotsman, 2004), but since then have been used twice; in Flanders Moss near Stirling in 2019 and also at Loch Choire in 2023 (Baynes, 2023b; NatureScot, 2023b).

The Scottish Government has created further intervention powers under Part 4, section 6ZB of the Natural Environment (Scotland) Act, which was originally referred to as Deer Management Nature Restoration Orders (DMNROs) in a consultation carried out in early 2024 (Scottish Government, 2024c). This will grant NatureScot the right to enter land and manage deer if they are satisfied that it would be beneficial for 'nature restoration', which remains broadly defined (Scottish Government, 2025b). This would therefore allow NatureScot to take a more proactive, rather than reactive, approach to deer management intervention. The

Scottish Government has indicated that it will use its regulatory powers, via NatureScot, more in the future, as part of supporting its ambition to increase the annual national cull by 25%, through an additional cull of 50,000 deer of all species, on top of the approximately 200,000 deer that are currently culled each year, for an indefinite period (Scottish Government, 2025b).

Finally, recent reforms to deer management cannot be understood in isolation from broader trajectories of Scottish land reform and environmental governance. Since devolution, debates over concentrated land ownership, public interest in land use and the responsibilities of private landholders have intensified (Hoffman, 2013; Macfarlane, 2023). Deer management has increasingly become a focal point through which these wider questions are expressed, not least because red deer occupy extensive areas of upland Scotland and are closely associated with traditional sporting estate models (Wightman, 2004; MacMillan *et al.*, 2010). Consequently, disputes over deer densities and environmental impacts intersect with longer-standing concerns about accountability, transparency and the balance between private property rights and public environmental objectives (Jarvie and Jackson, 1998; Higgins, Wightman and MacMillan, 2002; Wightman *et al.*, 2002). This wider political context is critical for understanding why contemporary disagreements have acquired renewed intensity.

### 3.8 Academic literature in relation to deer management in the Highlands

Finally, it is necessary to set out the academic literature that has focused on deer management in the Highlands, and, in particular, studies that have taken a social (rather than the more commonly ecological) angle, in order to situate the research undertaken for this thesis.

The earliest notable contribution in this regard is Mather's two-part study of '*Red deer land use in the northern Highlands*', published in the *Scottish Geographical Magazine*, the first of which discussed the spatial significance of red deer in the absence of other forms of land use in Sutherland, Ross and Cromarty and Inverness-shire (1972a) and the second which concentrated on the sport stalking value derived from deer management in these areas (Mather, 1972b). In concluding the latter, Mather (1972b, p. 99) made a plea for further

research attention on this topic as, he argued, there is 'no reason why deer land use should not be capable of comparative assessment on the basis of economic, social and ecological factors in the same way as sheep farming and forestry.'

This call did not appear to be answered until Toogood's (1995) study, which provided the first explicit discussion in the academic literature of social 'conflict' over red deer management as part of contemporary conservation efforts for woodland regeneration in the Highlands, and how this was increasingly challenging the longstanding dominance of the sporting estate. Examining these competing discourses by drawing on work from cultural geography, Toogood (1995, p. 103) observed that 'the dispute is not merely about trees or deer... but about how the ecology and tradition of the Highlands is represented simultaneously in different social worlds.' Further such work emerged following this which cast a critical eye over the cultural and historical endurance of deer stalking in the Highlands and its role in sustaining defences of landownership and land 'stewardship' in the region (Lorimer, 2000; Wightman *et al.*, 2002; Wightman, 2004).

At the same time, other studies undertook economic analyses of deer management and suggested solutions to perceived under-culling and the environmental impacts arising from this, whilst meeting the needs of sporting estates to maintain viable deer herds for sport stalking. The first of these was Bullock *et al.*'s (1998) paper which examined the preferences of commercial stalking guests and put forward alternative stalking packages that may result in higher culls. Bullock (1999) followed this with a study arguing for deer populations to be managed as a 'common property resource', whilst in a further study Bullock (2001, p. 114) reiterated that 'estates [should] experiment by offering more than the traditional stalking experience'. Another economic 'solution' to the perceived problem of a growing deer population was proposed by MacMillan (2004) which would involve a system of 'tradeable culling obligations', allowing landowners to trade their culling targets with those of neighbouring landholdings that may have different culling objectives. Subsequently, Smart *et al.* (2007) undertook a cost-benefit analysis of deer management and found that financial incentives would likely have limited impact on encouraging increased culls, a finding later corroborated by MacMillan and Phillip (2010).

Since the late 2000s, research has turned more explicitly towards social analyses of deer management. This included studies by MacMillan and Leitch (2008) and MacMillan et al (2010) exploring landowners' motivations for owning estates managed primarily for deer stalking, both of which found that landowners were motivated by private enjoyment rather than financial benefits, which were found to be minor because of the costs involved in running estates. A number of studies then followed these which honed in on the 'collaborative' model of deer management in the Highlands, principally through Deer Management Groups (DMGs), and discussed the perceived successes and failures of these institutional mechanisms and ways in which they may be improved (Austin *et al.*, 2010, 2014; Fiorini, Yearley and Dandy, 2011; Davies and White, 2012; Dandy, Fiorini and Davies, 2014; Eastwood *et al.*, 2022).

More recent years have seen this focus on the social aspects of deer management continue and proliferate, including Mustin et al's (2017) study of shooting management models and the motivations behind these, whilst others have focused on public attitudes towards increased deer culling, with particular attention paid to the differences in views between rural and urban publics, which were found to be largely negligible (Hare, Daniels and Blossey, 2021; Whitefield *et al.*, 2021; Frater, Daniels, *et al.*, 2025). Meanwhile, a review commissioned by Scottish Natural Heritage (now NatureScot) of wild deer research argued that there was a need for 'a wider understanding of different stakeholder perspectives... to underpin conflict management processes' with further research required to 'better understand the factors that influence collaboration and conflict' (Holland *et al.*, 2017, pp. 4; 5). Finally, Kirkland et al (2021, p. 1) tried to grapple with the question of what 'successful deer management [would] look like in Scotland', arguing that 'conflicting interests and incentives among people involved in deer management mean a common definition of success... remain[s] elusive.' This paper provides somewhat of a rationale for the research undertaken for this thesis, highlighting the need to explore more deeply what these 'conflicting interests' are, how they may be reconciled and the views of those affected by any processes of change towards achieving 'successful' deer management (noting that this term is itself deeply contested).

Critical realism underpins my research approach to exploring these issues and themes, providing a framework to connect theoretical and empirical work on contested land-use change in the Highland deer management context. Critical realism emphasises the interplay between structure and agency, recognising that social and ecological realities exist

independently of observation but are interpreted through human experience (Forsyth, 2001; Knudsen, 2023). This perspective supports the adoption of a 'grounded', empirical approach to my data collection and analysis, ensuring that theoretical conclusions emerge from observed realities rather than imposed frameworks.

By situating the study at the interface of empirical environmental conflict research and an (implicit) environmental politics framing, the thesis engages with debates about socio-political determinants of land use while privileging the specificity of local practices in the particular context under study. For instance, the diverse stakeholder perspectives on Highland deer management that this thesis explores highlights how local knowledge, social norms and ecological constraints interact, illustrating the value of a critical realist lens in capturing these multiple dimensions and drawing inferences and conclusions from them.

Overall, this theoretical positioning anchors the thesis, by linking the research questions, methods and analysis to a coherent conceptual approach. It also lays the groundwork for understanding contested land-use change over deer management in the Highlands not simply as an ecological problem, but as an emergent social and political phenomenon shaped by both material conditions and human agency. The next chapter details the methodological approach of the thesis towards pursuing this objective.

## 4. Methodology

This chapter describes the methodological approach of the thesis. It begins with an overview of the ontological and epistemological stance taken, followed by a rationale for the use of a case study approach and qualitative methods, an overview of the ‘vehicle’ for data collection in this thesis, with ethics and positionality then considered. The chapter then details the data collection and analysis methods used.

### 4.1 Ontology and epistemology

As noted above, critical realism provides the philosophical basis for the research undertaken in this thesis. Critical realism is a philosophy of science that adheres to a realist ontology and a relativistic epistemology (Bhaskar, 2013; Stutchbury, 2022), which recognises the existence of an independent, observable world but argues that understanding that world relies on subjective, and fallible, examination (Lawani, 2020). It therefore sits between the dominant philosophical paradigms of positivism and interpretivism (Yucel, 2018), but rejects the former’s absolute focus on empiricism and the latter’s theory-determined view of knowledge production (Gorski, 2013). Instead, critical realism borrows elements of both positivist and interpretivist thought to understand causation and the relationship amongst and between social structures and agents in social scientific research (Radulescu and Vessey, 2008; Hoddy, 2019). By taking a critical realist approach to the research questions that are posed in this thesis, I have therefore focused on examining the subjective perspectives of agents operating within the particular ‘real’ world under study (upland deer management in the Scottish Highlands), how they behave within this context and how they interact with other agents and structures within it. Pursuing this type of critical realist-guided research is well-suited to a case study approach that employs a combination of qualitative methods, as the next section explains.

## 4.2 Rationale for case study approach and qualitative methods

A case study approach is used in this thesis to explore land-use conflict, environmental conflict resolution and social responses to land-use change in the context of upland deer management in the Highlands. Case studies are common methodological approaches in critical realist research because they are suited to its philosophical stance (Easton, 2010; Wynn and Williams, 2012; Mingers and Standing, 2017; Eriksson and Engström, 2021; Cabote *et al.*, 2024). Cabote *et al.* (2024, p. 3) define a case study as ‘an in-depth empirical inquiry of a contemporary phenomenon within its real-world context set within a boundary without manipulating the behaviour of those involved in the study.’ Case studies are therefore ‘*inclusive of the subjective perspective of the actors in the phenomenon under study*’ (Cabote *et al.*, 2024, p. 5) in their aim ‘to explore and depict a setting with a view to advance understanding of it’ (Cousin, 2005, pp. 421–422). The emphasis in case study research is on depth rather than breadth and, when written up, case studies often contain a significant amount of description (Houghton *et al.*, 2013). Case studies are further argued to be most effective when the researcher has minimal control or influence over the study situation, so as to achieve as ‘natural’ a setting as possible for undertaking research on it (Cousin, 2005; Flyvbjerg, 2006; Heale and Twycross, 2018; Yin, 2018).

Qualitative methods, including interviews, participant observation and surveys which are employed in the research for this thesis, are aligned effectively to case study research, because they allow for actors’ subjective perceptions of the situation under study to be more accurately and fully captured than through quantitative methods, which may neglect more subtle findings or inferences (Gammelgaard, 2017; Mishra and Dey, 2022; Cabote *et al.*, 2024). This is necessary in research focusing on land-use change, conflict and conflict resolution, where such factors are prevalent and therefore central to understanding these phenomena (Foley, 2007; Fienitz, 2023; Plieninger *et al.*, 2025).

### 4.3 Finding the Common Ground on Sustainable Upland Deer Management process and the Common Ground Forum

This section describes the *Finding the Common Ground on Sustainable Upland Deer Management* (FtCG) process and *Common Ground Forum* (CGF), which provided the ‘vehicles’ for data collection for this study in understanding land-use conflict, environmental conflict resolution and land-use change in the context of upland deer management in the Scottish Highlands.

The FtCG process was initiated in early 2021, when ADMG approached Plantlife, an environmental NGO, to discuss deer management issues in the temperate ‘rainforest’ region on the west coast of Scotland. Conversations developed into the broader need to reduce conflict and improve working relationships in upland deer management between different stakeholders, particularly conservationists, sporting estates and foresters. This appeared to be particularly pertinent in the context of the recently published DWG recommendations and the Scottish Government’s commitment to implementing the majority of these. It was subsequently agreed between ADMG and Plantlife to explore the possibility for a conflict resolution process to improve collaboration within upland deer management, which, although had been tried at a local scale before in Assynt and Caenlochan, had never been attempted at a national level.

ADMG and Plantlife then approached other potentially interested organisations to scope out this work further, which subsequently evolved into a Steering Group. This Steering Group initially consisted of representatives from Scottish Land & Estates (a representative body for private landowners), Trees for Life (a rewilding charity) and the Woodland Trust (a woodland conservation charity), in addition to ADMG and Plantlife, with Cairngorms National Park Authority (CNPA) and NatureScot fulfilling advisory roles. Funding for the project in its early stages was provided by ADMG, CNPA, NatureScot and Trees for Life.

The Steering Group then contacted the Centre for Good Relations (CfGR), an organisation that practises ‘civic mediation’, to have initial conversations about the service they could provide, the methods they used and to draft a provisional plan for the process. CfGR define civic mediation as: ‘mediative processes [that] seek constructive ways through societal challenges. It values the role of building relationships within a system to bring about effective change,

and works to transform conflict to achieve long-term positive outcomes' (Centre for Good Relations, n.d.a). CfGR were subsequently contracted by Plantlife, on behalf of the Steering Group, to carry out the FtCG process.

CfGR began their work by conducting an initial 'conflict assessment' of stakeholders involved in upland deer management in May 2021, which consisted of conversations with 46 individuals from different sectors within upland deer management, including private landowners and managers, deer stalkers, public landowners, statutory agencies, environmental NGOs and community trusts. The aims of this assessment were to:

- Understand the relationship dynamics between stakeholders with an interest in deer management.
- Build an understanding of the perspectives of different stakeholders on the different issues relating to deer management.
- Assess the effectiveness of structures and mechanisms currently in place to undertake deer management.
- Identify potential interventions for building collaborative leadership to enable sustainable deer management in future.

This resulted in a report which identified 12 key issues within the upland deer management debate: deer management's place within wider land management; deer management infrastructure; traditions, culture and class; science vs lived experience; politics and policy; economics; landownership; climate change and biodiversity loss; animal welfare concerns; the public interest; communication and messaging; and relationship dynamics. CfGR noted in their report that:

*to build collaborative working across stakeholders it is important that stakeholders at different levels have a good understanding of each other's perspectives and that any processes developed to address issues are seen to be fair and relevant to the 'lived context'. If a system does not place sufficient value on building relationships there will be a lack of trust and understanding of different perspectives at different levels, making effective policy development and implementation challenging.*

They subsequently argued:

*the assessment identified that currently relationships in the deer management sector are largely transactional and focus on the technicalities of managing deer and proposed: that by focusing on building better relationships and understanding between stakeholders across the sector, there will be more support and buy-in to collaborative working. We propose that the Steering Group consider the potential of planning a series of facilitated workshops focused on building understanding of stakeholders' intentions, objectives and concerns set around a common purpose/goal and identifying collective responses for addressing these.*

They suggested the following as the overall aim of any such process: 'Building the common ground on sustainable deer management to support a healthy, and vibrant rural economy in Scotland' (Centre for Good Relations, n.d.b).

It was subsequently agreed amongst ADMG and Scottish Environment LINK (an umbrella body for Scottish environmental NGOs which includes Plantlife, Trees for Life and the Woodland Trust) to pursue a civic mediation process facilitated by CfGR, with funding provided by ADMG, CNPA, NatureScot, Scottish Environment LINK, the Woodland Trust, Future Woodlands Scotland and Loch Lomond & The Trossachs National Park Authority. I was recruited by the Steering Group in April 2022, with whom I had been put in contact with by my primary supervisor, Janet Fisher, to undertake a *pro bono* independent evaluation of the mediation process as part of my PhD research.

In the early stages of my evaluation of the FtCG process, I drafted potential methods which I then checked with the Steering Group, which, to a limited extent, influenced the methods I eventually utilised and the focus of data collection that I conducted. This primarily concerned the need to avoid overly onerous methods that the Steering Group thought might discourage participant involvement (for example, avoiding excessively long surveys). Beyond this, I was given significant freedom in choosing the most appropriate methods to use. Nevertheless, whilst my research for this thesis focused on answering the overarching research questions explained above, certain elements of data collection were specifically conducted to support the Steering Group's needs, for example asking participants for feedback on what topics should be discussed at future FtCG/CGF workshops. Therefore, this section focuses on research that I conducted for the purposes of this thesis, or where this overlapped with that required by my evaluation for the Steering Group, except where noted.

This dual role provided me with both opportunities and constraints. Of greatest value was that it enabled me to engage deeply and widely with such a range of stakeholders to an extent which arguably would not have been achieved otherwise, but it also required careful delineation between the focus of my evaluation and the aims of my research for this thesis, to ensure methodological clarity and transparency. It also required me to clarify what constituted ‘success’ in evaluative terms. Rather than adopting a narrow outcome-oriented definition, I approached evaluation through a broader process-based lens. Effectiveness was understood in terms of relational change, the quality of dialogue, shifts in mutual recognition and the extent to which the process created space for the articulation of competing perspectives. In a context characterised by historically embedded disagreement and structural asymmetries, the absence of consensus does not necessarily indicate failure. Instead, my evaluation focused on whether the process altered the terms of engagement between participants and whether it contributed to more constructive interaction within the deer management sector.

Table 1 below provides an overview and timeline of the five workshops that were held as part of the mediation process.

**Table 1. Overview of FtCG mediation process workshops**

<b>Workshop</b>	<b>Location</b>	<b>Date</b>	<b>Number of participants</b>	<b>Main purpose</b>
1	Stirling	29 <sup>th</sup> to 31 <sup>st</sup> August 2022	41	Introducing the mediation process
2	Online	3 <sup>rd</sup> November 2022	37	‘Stock-taking’ after first workshop
3	Birnam	23 <sup>rd</sup> February 2023	46	‘Knowledge exchange’

4	Invergarry	7 <sup>th</sup> June 2023	33	'Stalkers' event'
5	Stirling	20 <sup>th</sup> to 21 <sup>st</sup> June 2023	43	Concluding the process and agreeing next steps

Steering Group meetings were held regularly in-between the workshops, at which achievements as well as areas for further improvement were discussed. The first workshop was regarded as being largely successful but had a notable lack of representation of 'traditional' deer stalkers employed on estates who were more resistant to changes in deer management policy. The second workshop was seen to be less effective because it was held online, meaning there was limited social interaction, and it was also noted at this point that the process could benefit from further involvement of stakeholders in the forestry and agricultural sector. The third workshop was regarded as mixed overall because, whilst it involved several new participants including more 'traditional' deer stalkers, as well as forestry and agricultural stakeholders, many participants said that the stated aim of the workshop of 'knowledge exchange', between the lived experience of deer management and scientific evidence pertaining to deer management, was not achieved.

In between the third and fourth workshops I, along with two of the mediators, visited six estates in April 2023 in the North Ross Deer Management Group, as part of complimentary work to explore conflict resolution in deer management at a local level. This was a useful experience to gauge 'on the ground' issues pertaining to deer management, whilst also recruiting further stalkers to the broader FtCG process.



**Figure 16. The western portion of the North Ross Deer Management Group area.**

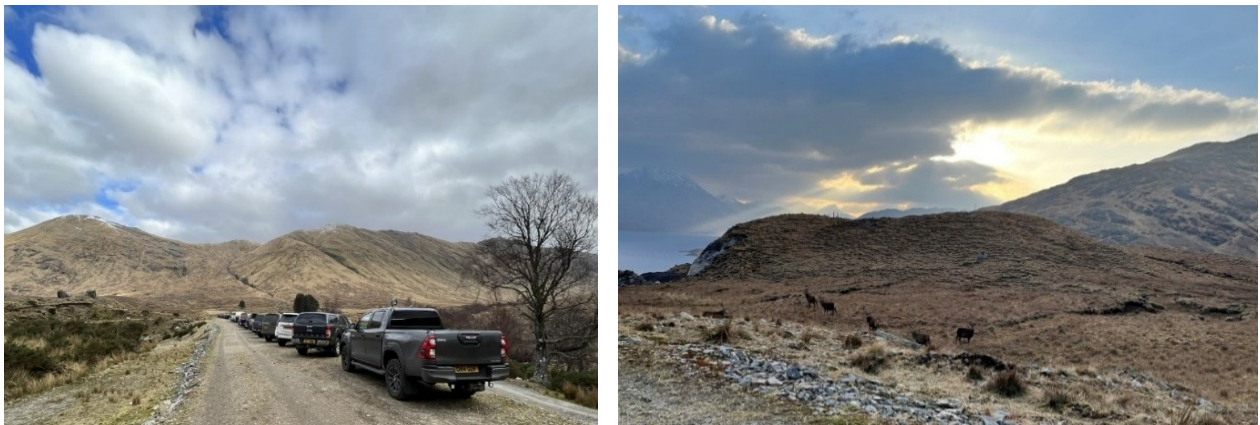
*Photo my own.*

Following this, the fourth workshop was regarded as more successful because it involved a large number of ‘traditional’ deer stalkers, who were seen throughout the mediation process as the key target group, and it allowed for some of the most important issues, such as stalkers’ worries about their employment in the face of changing deer management policy, to be discussed in greater detail. The final workshop was also largely successful, resulting in a number of outputs including the ‘Common Ground Accord’ – a set of principles for ways of shared working on upland deer management – as well as the creation of a number of sub-groups to take forward different areas of work, including the development of a shared vision, aims and objectives.

Following the final FtCG workshop in June 2023, it was decided that the process should evolve into a more formal entity, which became the *Common Ground Forum* (CGF) later in the year. The aim of the CGF was stated as working towards a situation where: ‘stakeholders across the deer management sector are working constructively together to help ensure that sustainable and integrated deer management can be implemented effectively on the ground for the benefit of people, nature and the climate’ (The Common Ground Forum, n.d.b). The CGF was defined as ‘a network of individuals from across Scotland’s upland deer management sector who have committed to work together to look at how a more collaborative approach to deer management, based on mutual respect and consensus building, can contribute to a vision of a greener, healthier and economically vibrant future’ (The Common Ground Forum, n.d.c). It

was agreed amongst the Steering Group that there should be particular focus during the early stages of the CGF on bringing more traditional stalkers into the conversation through a series of stalkers' events, like the one held in Invergarry. A lot of discussion during this period also focused on the recently published *Managing Deer for Nature and Climate* consultation launched by the Scottish Government in January 2024, and the implications this might have for the CGF and its work. I produced my interim evaluation report (Leavey-Wilson, 2023) in August 2023, following the conclusion of the FtCG process.

The first stalkers' event of the CGF was held at GlenQuoich Estate, near Kinloch Hourn, western Inverness-shire, on 8<sup>th</sup> March 2024, which was attended by 101 people, 76 of whom were stalkers. The day involved different activities including a discussion led by NatureScot on reforms to deer management, a drone piloting session, a peatland restoration session and a session that revolved around the topic of 'doing more with less deer'.



**Figure 17. GlenQuoich Estate.**

*Location of first CGF stalkers' event. Photos my own.*

A meeting was then held at the Scottish Parliament on 3<sup>rd</sup> May 2024, which involved three MSPs and one MSP aide, along with 25 participants including two of the mediators. This workshop focused on stalkers expressing their thoughts about reforms to deer management to the politicians and the aide present, including playing a video recorded as part of the CGF work. Small-group sessions were used.

Three Steering Group meetings occurred before the next stalkers' event which was held at Fealar Estate, north Perthshire, on 8<sup>th</sup> August 2024. This event was attended by around 100

people, including 62 stalkers. Activities were the same as at the first stalkers' event in GlenQuoich, with the addition of a whole-group panel session involving senior Scottish Government civil servants at the end.

In December 2024, I produced my final evaluation report (Leavey-Wilson, 2024) for the Steering Group, which marked the end of my involvement with the CGF.



**Figure 18. Fealar Estate.**

*Location of second CGF stalkers' event. Photos my own.*

#### 4.4 Ethics

The primary ethical considerations for this research concerned the anonymisation of data, the confidential handling of data, data management and sharing. All participants involved in the FtCG process were provided with a participant information sheet and asked to sign a consent form as part of their inclusion in this research. This explained the ethical issues around anonymity and confidentiality in relation to their involvement in the research. As the FtCG process proceeded and eventually the CGF developed with new participants joining, consent from participants was received either verbally or by email. All participants were informed of the terms of their involvement and the risks from doing so. All contributions from participants, either in the form of interview transcripts, during participant observation and in surveys, were anonymised and handled confidentially. Participants were informed of the risk that, should anonymised quotes or comments from them appear in published work, it may still be possible for them to be identified if these comments are easily attributable to them. Participants were informed of their right to withdraw from the research at any point prior to

the publication of work and their ability to redact their contributions, as well as to request copies of interview transcripts and field-notes to ensure that their contributions were accurately reflected. Data was stored on the University's DataStore system via a University of Edinburgh laptop, connected with a secure VPN connection. On this basis, ethical consent for conducting this research was granted by the School of GeoSciences Research Ethics and Integrity Committee on 28th July 2022 (see Appendix C for documents relating to ethics).

Another ethical consideration that arose during this research concerned my decision to undertake deer stalking; ethical issues involved in this included the killing of an animal as well as attaining consent from the stalkers who guided me on these stalks. In relation to the second issue, I was invited on the stalks by stalkers who I had interviewed, who wanted to show me what deer stalking was at a practical level, because they felt this would better inform me about the practice, the contention around it as well as demonstrate the day-to-day role of stalkers. I believed it was important to accept these invitations to build trust with these participants as well as to gain practical insight into stalking, in order to enhance the legitimacy of the research I was undertaking on this topic. All stalkers who guided me on the stalks were aware of my position as a researcher involved in the FtCG process and the CGF. Verbal consent was attained from each of the stalkers at the beginning of each of the three days of stalking for me to write notes at the end of these days about the experience and what the stalkers had said during the course of them. For practical reasons, I was unable to take notes during the stalking itself.

In respect of the first issue – killing an animal – over the three days of stalking (two days on one estate and a separate day on a different estate) I shot and killed two deer; the first of which transpired to be a one-year-old male deer rather than a hind and the second a three to four-year-old hind. I was assured and it was explained to me by the stalkers on these days that both deer would not have survived the rest of the winter owing to their physical condition and health, and that the humane option was to cull them rather than for them to most likely die a much slower death as a result of starvation. Another ethical argument in favour of undertaking hind stalking, put forward by Jenna Watt in her book *'Hindsight'* (2022), is that the culling of hinds generally has a more significant effect on reducing deer numbers in a given area compared to stag stalking, and therefore helps in reducing overall herbivore pressure in an unpredated ecosystem, to the benefit of the broader ecological whole; although I note

that this is not an uncontested point of view and something that is explored throughout this thesis.

#### 4.5 Positionality statement

Holmes (2020, p. 1) defines positionality as ‘an individual’s world view and the position they adopt about a research task and its social and political context’, whilst Goundar (2025, p. 5) further states that ‘a researcher’s positionality is multidimensional and influenced by the power relations between the researcher and their participants’. Positionality stems from a combination of the epistemological and ontological stance taken to research, the methods employed in undertaking research as well as the researcher’s values, assumptions, beliefs, values and pre-existing knowledge and/or experience in relation to the topic being researched, as well as their personal characteristics and background (Holmes, 2020; Goundar, 2025).

Using Holmes’ (2020) framework, I provide the following positionality statement:

I am a white, British, male researcher with no prior lived experience or background in deer management in the Scottish Highlands or connection to those involved in this context before undertaking this research, although I do have some prior knowledge and experience of other overlapping land use issues in the region (e.g. land reform, grouse moor management). My perspective on the topic under study has therefore been shaped by my position as an ‘outsider’ to this specific context. As such, I approached the topic with a commitment to ‘listen well’, learn and accurately and respectfully represent the diverse viewpoints that I encountered and reflect upon my position in relation to those involved in this research (Staddon *et al.*, 2021). I was aware throughout the research process that my interpretations will be shaped by my assumptions and background, but I have aimed to remain critically reflective and open to the complexities of the local context and those involved in it throughout.

## 4.6 Data collection

This section gives an overview of the data collection methods used in the course of this research and the data collected from this. These methods included participant observation, interviews and surveys, which generated mostly qualitative data as well as a small amount of quantitative data.

### 4.6.1 Participant observation

Participant observation is a method of qualitative research used to understand people in a naturalistic setting, which is commonly undertaken as part of case study research (Kawulich, 2005). Researchers undertaking participant observation usually aim for a high level of objectivity and critical distance (as is possible) whilst at the same time being engaged in the activities of the people under study (Phillips and Johns, 2012). It is premised on the assumption that researchers can understand people by learning from observations of them (McGrath and Laliberte Rudman, 2019). More so than interviews and surveys, participant observation is useful for understanding the context in which people live, work and act as well as who else they interact with and how (Zhao and Ji, 2014). As such, participant observation is often used to complement interviews and surveys in helping to contextualise participant views. Another important aspect of participant observation is how the researcher is perceived by participants (Bryant, 2014). In my case, all participants included in this research were aware of my position as a researcher who was recruited both to undertake an independent evaluation of the FtCG process, and subsequently the CGF, and to use these projects as the 'vehicle' for my PhD research. Participants were made aware through my early contact with some of them, such as the Steering Group and the Centre for Good Relations, and subsequently through the distribution of participant information sheets and consent forms during the course of the FtCG process, as well as through online and verbal communication with additional participants to the FtCG process and later on in the CGF too. My visibility as a researcher was demonstrated through me taking notes during the workshops, where I would typically sit out the activities (unless requested to join by the mediators) and observe and write. During these workshops, I would get into conversations with many of the participants,

some of whom would ask further about my role and the purpose of the evaluation, as well as my PhD research more broadly, which gave me the opportunity to explain my role to them in greater depth.

#### *4.6.1.1 FtCG and CGF events*

Participant observation was undertaken throughout the FtCG process and during my involvement with the CGF, between April 2022 and December 2024. I attended the vast majority of events that were held as part of this work. During the FtCG process, I attended five in-person workshops, eight Steering Group meetings (all held online except for one) and eight other meetings (all held online). During my involvement with CGF, I attended four workshops, seven Steering Group meetings (all held online except for one) and two other meetings. In total, this involved engagement with and observation of more than 150 people. Field-notes were recorded by hand during observation at all of these events and activities and subsequently typed up.

#### *4.6.1.2 Deer stalking*

I undertook three days of deer stalking on two different estates. I was invited to go hind stalking by two deer stalkers I had interviewed, both of whom were keen to show me the practical side of deer stalking because they believed it would greatly improve my understanding of it. These visits involved me being guided by the stalkers on the stalks, shooting two deer myself (as one day was a 'blank' day, with no deer shot), observing the gralloching process, spending time in the estate larders watching carcass preparation and having informal conversations with stalkers as well as the estate owners on one of the visits.

Hind stalking is usually undertaken by stalkers alone and it is therefore often in their power to invite people, whereas stag stalking is much more of an income generator for estates and therefore often determined by the owner or factor/estate manager. Hind stalking is generally regarded as more challenging than stag stalking, because hinds are more alert (particularly compared to stags during the rut), and because hind stalking takes place during the winter months where the conditions can be more challenging and the daylight much reduced.

Since the vast majority of the national deer cull in Scotland is undertaken on private landholdings, most of this accounted for by private estates in the Highlands, visiting and staying on estates and participating in the activities undertaken on them was a very valuable opportunity, not least because they are arguably 'difficult to access' spaces for research. Moreover, 'traditional' sporting estates perhaps represent the central loci for social conflict over upland deer management in the Highlands, as well as the primary subjects of recent and forthcoming reforms to deer management, and therefore being able to access these sites allowed me to gain additional insight into these dynamics, as the key topics of interest in this thesis, that would not have been provided elsewhere. These insights included observation of stalkers' decision-making including how wind direction, terrain, herd composition and seasonal conditions shaped their cull decisions. Second, it provided me with access to embodied forms of knowledge that were difficult to capture through interviews with stalkers alone. And thirdly, it illuminated how stalkers' professional identity, ritual practices (e.g. 'blooding' – where blood from the first deer I shot was smeared on my face) and informal interactions contributed to the reproduction of legitimacy and authority within the culture of Highland deer management. In a critical realist reading therefore, whilst interviews provided me with accounts of deer management rationales, observing stalking revealed how those rationales were enacted in particular material contexts.

#### *4.6.1.3 Estate visits*

I visited 11 private estates in total as part of this research. Estates ranged from what could be described as more conventional and 'traditional' sporting estates, as noted above, with recreational deer stalking the primary land use, to more diversified estates that included other land uses such as grouse shooting, livestock farming, forestry, renewable energy and tourism and to estates at the other end of the 'spectrum', which were focused on conservation and 'rewilding' initiatives. The diversity of the estates visited provided me with a more varied insight into the different types and objectives of deer management and how these sit aside other land uses. All estates were visited as part of the FtCG process and the work of the CGF or for the stalks described above. Estate visits typically involved meeting with the owners and/or other staff including the estate manager/factor, stalker, gamekeeper or ghillie. Visits were held at the estate lodge or in other buildings on-site, such as the estate

office, the stalker's house and sheds. Visits often involved a tour of the estate, both by foot and car. Estate visits varied in length between two hours and two days. Notes were recorded during estate visits where possible or afterwards if not, with these subsequently digitised.

#### 4.6.2 Interviews

Semi-structured interviews are a qualitative research method where the researcher typically engages in a one-to-one conversation with a respondent, using a mixture of open and closed questions to elicit responses (W. C. Adams, 2015). An interview guideline is often used to help stimulate and structure the conversation (Kallio *et al.*, 2016). Semi-structured interviews are a useful way to gather deeper insight from participants, by providing them with the necessary flexibility, time and space to reflect on and express their thoughts on a particular topic or theme (Magaldi and Berler, 2018). This therefore aligns well with a critical realist epistemology in seeking to explore the subjective perceptions, views, values and beliefs of actors within a given setting.

All interviews were conducted online or by phone, according to participants' preferences, which enabled me to engage with a geographically diverse sample of people across the Highlands, ensuring that data reflected the breadth of regional variation in deer management and land-use practices. However, whilst there are practical and logistical benefits to undertaking interviews this way (in terms of reach and scope), different types of insights may have been generated from conducting in-person interviews and I note this could be perceived as a limitation of this research. All interviews, except two where notes were taken, were recorded with the permission of participants. An interview guideline was used to help loosely structure conversations. Four different interview guidelines were used corresponding to the different rounds in which interviews were conducted. The first interview guideline was used for the first round of interviews conducted between January and February 2023 (see Appendix D.2). This interview guideline contained 12 questions, the first five of which focused on topics pertaining to deer management, the following six related to the mediation process and the final question was a general open question asking interviewees about any issues or topics not covered during the interview. The second interview guideline (see Appendix B.2) was used for a round of interviews conducted between March and April 2023, with these

interviewees being those that had newly joined the FtCG process at this point. This guideline contained 18 questions, the first four of which focused on the most recent workshop which had taken place in Birnam in February 2023, the next nine on the mediation process more generally and the final five on topics relating to deer management. An updated version of this guideline was used for the interviews conducted during the final stages of the FtCG process and following its conclusion, between June 2023 and January 2024. A new guideline (see Appendix B.3) was then used for the interviews of current and former stalkers, which mostly took place between March and April 2024, with some other current/former stalkers being interviewed during earlier interview rounds. This guideline contained 17 questions and covered topics relating to the CGF and stalkers' event at GlenQuoich estate, their role as a stalker, their thoughts on current reforms to deer management, the future of deer stalking in the Highlands and other topics such as NatureScot, carbon credits and the sport stalking model. A final interview guideline (see Appendix B.4) was produced for interviews of the mediators which were all undertaken in April 2024. This guideline also contained 17 questions and covered topics such as the theory and practice of mediation, the mediators' thoughts on the efficacy and success of the FtCG process and the reasons for this.

Overall, I interviewed 52 people for this research which consisted of 14 deer stalkers, six land management consultants, five mediators, four conservationists, four landowners, three ecologists, three estate managers, three wildlife management regulators, two community foresters and one of each of the following: a forestry regulator, game processor, policymaker, private forestry consultant, private woodland manager, ranger, shooting organisation representative and wildlife management consultant. These were the main employment positions occupied by the interviewees at the time of interview, whilst some of those not described in the list as stalkers had formerly been employed in this role. 36 of these interviews were conducted by video call and 16 by phone, according to the preference of participants. Interviews lasted an average of 55:31 minutes, with the longest lasting 89:34 minutes and the shortest 8:09 minutes. Together, all interviews lasted 2,876 minutes or nearly 48 hours. The first interview was held on 16<sup>th</sup> January 2023 and the last on 25<sup>th</sup> April 2024. Further information on the interviews is available in Appendix B.1.

### 4.6.3 Surveys

Surveys are a research method that often incorporate both qualitative and quantitative aspects and may include both open and closed questions. They are typically used to study the views and attitudes of a particular population (Rubinfeld, 2004). Three surveys were undertaken as part of this research, with responses to the open questions in these surveys analysed and used in this thesis, whilst other sections of the first two surveys were conducted for the purposes of the FtCG evaluation and are therefore not discussed here (but are available to view in Appendix B.5 [question 1] and B.6 [question 1]).

#### *4.6.3.1 Survey 1 – Entry survey for the FtCG process*

**Survey title:** *Entry survey - Finding the Common Ground on Sustainable Upland Deer Management Survey*

The first survey conducted during the course of research was the entry survey for the FtCG process. This survey was launched on 29<sup>th</sup> August 2022, the first day of the first workshop in the FtCG process at Stirling. The survey was available to complete online using Microsoft Forms, accessible via a QR code or URL, as well as in paper format. All 41 participants at the workshop were invited to complete the survey. 35 responses were received, giving a response rate of 85%.

The survey contained a single open question: ‘In your own words, what would you like the Finding the Common Ground process to achieve?’ The remaining eight questions sought to gather demographic data on age, gender, employer type, employment type, years involved in deer management, DMG membership, work area coverage and working location by Local Authority, to help contextualise the responses. In total, the survey contained 10 questions. A copy of this survey is available in Appendix B.5.

#### *4.6.3.2 Survey 2 – Exit survey for the FtCG process*

**Survey title:** *End of process survey - Finding the Common Ground on Sustainable Upland Deer Management*

The second survey conducted for the thesis was the exit survey for the FtCG process. This was launched following the fifth and final workshop of the FtCG process at Stirling on 21<sup>st</sup> June 2023. The same 41 participants who were invited to complete the entry survey were invited to complete this survey, 28 of whom did so, giving a response rate of 68%. The survey was conducted online using Microsoft Forms, with participants provided with a URL via email to access and complete it.

This survey contained four open questions: ‘What do you think the Finding the Common Ground process has achieved, if anything?’, ‘What do you think the limitations of the Finding the Common Ground process have been, if anything?’, ‘What would you like to see follow on from the Finding the Common Ground process, if anything?’ and ‘Do you have any other comments or reflections you would like to make about the Finding the Common Ground process?’. The same demographic questions as posed in the entry survey comprised the remaining questions. In total, the survey contained 13 questions. A copy of this survey is available in Appendix B.6.

#### *4.6.3.3 Survey 3 – Common Ground Forum Reflection Survey*

**Survey title:** *Finding the Common Ground process and Common Ground Forum - Reflection Survey*

The third and final survey conducted for this thesis was a ‘reflection’ survey launched towards the end of my involvement with the CGF. A Microsoft Forms survey link was sent by email to everyone on the CGF mailing list by the CGF project manager on my behalf (for GDPR reasons) in September 2024, in preparation for a final evaluation report which I produced in December 2024. 241 people were invited to complete the survey, which included all of those who had attended the FtCG process, who had been involved in CGF events as well as those who had signed up to the CGF mailing list. 46 responses were received for this survey, a response rate

of 19%. This lower response rate, in comparison to the other surveys, can likely be attributed to many of the respondents not having attended CGF events and simply being on the mailing list, and therefore being less aware of the evaluation.

The aim of this survey was to gather reflections from people who had been involved in the CGF, to understand the impact of the first year of its work as well as to understand the longer-term impact of the FtCG process. The survey was comprised of five open questions, which were:

1. What do you think the Finding the Common Ground process and/or Common Ground Forum have achieved so far, if anything?
2. What do you think the shortcomings of the Finding the Common Ground process and/or Common Ground Forum have been, if anything?
3. From your perspective, what work still needs to be done, if anything, by the Common Ground Forum to improve collaboration and produce positive outcomes in the upland deer management sector?
4. Are there any other comments you would like to make about the Finding the Common Ground process and/or Common Ground Forum?
5. What is your profession/employment industry?

A copy of the survey is available in Appendix B.7.

#### 4.7 Data analysis

I adopted a broadly 'grounded' approach to the data analysis in this thesis, guided largely by the principles of inductive inquiry, whilst also drawing on critical realism (Hoddy, 2019) and deductive reasoning informed by relevant conceptual (e.g., land-use conflict, ECR, land-use change) and topical (Highland deer management) literature. The overall analysis combined elements of grounded theory and thematic analysis. Inductive coding allowed salient themes to emerge from the data, while deductive and abductive approaches ensured the analysis remained conceptually informed by theoretical understandings of social-ecological conflict and change whilst being linked to the frameworks used in the thesis. In line with a critical realist ontology, observed patterns were interpreted as manifestations of underlying

mechanisms and structures, rather than as isolated phenomena. This hybrid approach to my dataset ensured that insights were both empirically grounded and theoretically coherent.

The total dataset comprised 50 interview transcripts, two interview note documents (for the non-recorded interviews), 53 field-note documents from participant observation (at workshops, events, stalking and estate visits) and three survey datasets. All qualitative data was managed and coded in NVivo 14, which supported the iterative development and refinement of my coding approach.

Specific coding approaches varied by chapter. In Chapter 5 an abductive method (Vila-Henninger *et al.*, 2022) was used, combining inductive identification of emerging themes with deductive coding based on a pre-existing codebook derived from literature on deer management and land-use conflict. In Chapter 6 the coding was inductive (Kyngäs, 2020), focusing on recurring and relevant themes for evaluating the mediation process through repeated readings of transcripts, field notes and survey responses. This chapter also concerns the nature of evaluative research, in terms of guiding my assessment of the mediation process. In this regard, evaluation theory emphasizes the importance of understanding both processes and outcomes (Rossi and Freeman, 1993; Patton, 2015) as well as the broader social and ecological context in which interventions operate (Pawson and Tilley, 1997). In line with these principles, the analysis in Chapter 6 evaluates how the mediation process was implemented, how participants experienced it and what outcomes were achieved. The research for this chapter therefore aligns with established practices in qualitative evaluation, such as the need to maintain 'critical distance' (Chong, 2013), whilst remaining sensitive to the specific social-ecological dynamics of deer management in the Highlands. Finally, in Chapter 7 the data was coded deductively (Fife and Gossner, 2024) using the Values-Rules-Knowledge framework (Gorrdard *et al.*, 2016) to assign the qualitative data to the framework's predefined categories. This approach allowed the analysis to remain responsive to the data, open to emerging insights and grounded in theory, providing a clear link between my empirical observations and broader conceptual understanding, in the chapters that now follow.

The work presented in the following chapter was published in the *Journal of Rural Studies* as:

Leavey-Wilson, C., Fisher, J., & Staddon, S. (2025). Locking antlers: A 'levels of conflict' analysis of upland deer management in the Scottish Highlands. *Journal of Rural Studies*, 119, 103793.

<https://doi.org/10.1016/j.irurstud.2025.103793>

*Note that the figure numbers have been changed from the published version to align with the rest of the thesis. References to supplementary material in the published version have also been replaced by references to Appendix D.*

## 5. Locking antlers: A 'levels of conflict' analysis of upland deer management in the Scottish Highlands

### 5.1 Abstract

Conflicts over the use and management of rural land, wildlife and other natural resources tend to involve multiple layers of contention, beyond the issues that are most readily observable. We illustrate this in the case of upland deer management in the Scottish Highlands, which has been the subject of fierce debate for many years. Drawing on the perspectives of a wide range of stakeholders and applying an adapted 'levels of conflict' framework, we show that whilst the superficial manifestation of this dispute concerns deer numbers, their impacts and methods of management, beneath this sit underlying factors of historical controversy, blame and mistrust between parties as well as tensions around the individual and collective identities of stakeholders in a changing rural landscape. The framework acts as a useful tool that reconfirms the complexities of this case whilst allowing them to be more easily understood, providing a fresh insight into this long-running issue.

### 5.2 Introduction

Conflicts over rural land, wildlife and other natural resources are increasing because there are a growing range of objectives, interests and pressures involved in their use and management (Campbell *et al.*, 2000; Young *et al.*, 2005; Davies, Bryce and Redpath, 2013; Redpath *et al.*, 2013; Guštin and Potočnik Slavič, 2020; Jong *et al.*, 2021). Some of the most significant of these include climate and biodiversity mitigation, in the form of nature based solutions like carbon sequestration and habitat restoration (Young *et al.*, 2010; Hunsberger *et al.*, 2017; Finch *et al.*, 2023). In turn, the conflicts that are, in part, precipitated by this activity, such as those between farmers and rewilders in agricultural areas (Weber Hertel and Luther, 2023), can create additional obstacles to their delivery (Corbera, Roth and Work, 2019; Zong *et al.*, 2021; Frantál, Frolova and Liñán-Chacón, 2023). However, the effective management of conflicts first hinges on understanding the complex factors involved in them (Andonegi, Garmendia and Aldezabal, 2021; Dempsey, 2021; Fienitz and Siebert, 2023) and a failure to build this understanding can lead to ineffectual or counterproductive results when conflict

management is pursued (Madden and McQuinn, 2014; Redpath, Bhatia and Young, 2015; Young *et al.*, 2016).

There are a wide range of observable and less easily observable factors that may produce conflict over the management of rural land, wildlife and other natural resources (White *et al.*, 2009; Steinhäuser *et al.*, 2015; St John *et al.*, 2019; Dempsey, 2021). Moreover, conflicts tend to be context-dependent and often defy generalisation and transferability across cases (Wittmer, Rauschmayer and Klauer, 2006; Zimmermann *et al.*, 2021; Hodgson *et al.*, 2022). This can make it difficult for practitioners, policymakers and researchers to gain a sufficient grasp of conflict scenarios in rural land use (Redpath *et al.*, 2013; Young *et al.*, 2016).

We believe that the 'Levels of Conflict' framework, initially developed by Madden and McQuinn (2014) and built upon by Zimmerman *et al.* (2020), provides a way to overcome this challenge by highlighting the different layers and factors of contention that nest within conflicts. We adapt the framework and illustrate its utility by applying it to a case study on upland deer management in the Scottish Highlands, a large rural upland area covering ~30,000 km<sup>2</sup> or 40% of Scotland. We show how the framework acts as a useful tool which reconfirms the complexities of this case, whilst allowing these complexities to be more easily understood.

We begin by conceptualising what we mean by 'levels of conflict', explain our adapted framework and provide a contextual overview of upland deer management in the Highlands. We then review the literature on deer management conflict in the Highlands through this 'levels of conflict' lens and describe some of the main stakeholder groups involved. We subsequently detail our methods and go on to structure our findings using the framework. We finish by discussing some of the main insights from our framework, as well as the paper's limitations pertaining to the framework and its application, as well as that of our methods, and look ahead to some potential solutions to this conflict.

## 5.3 Literature review and context

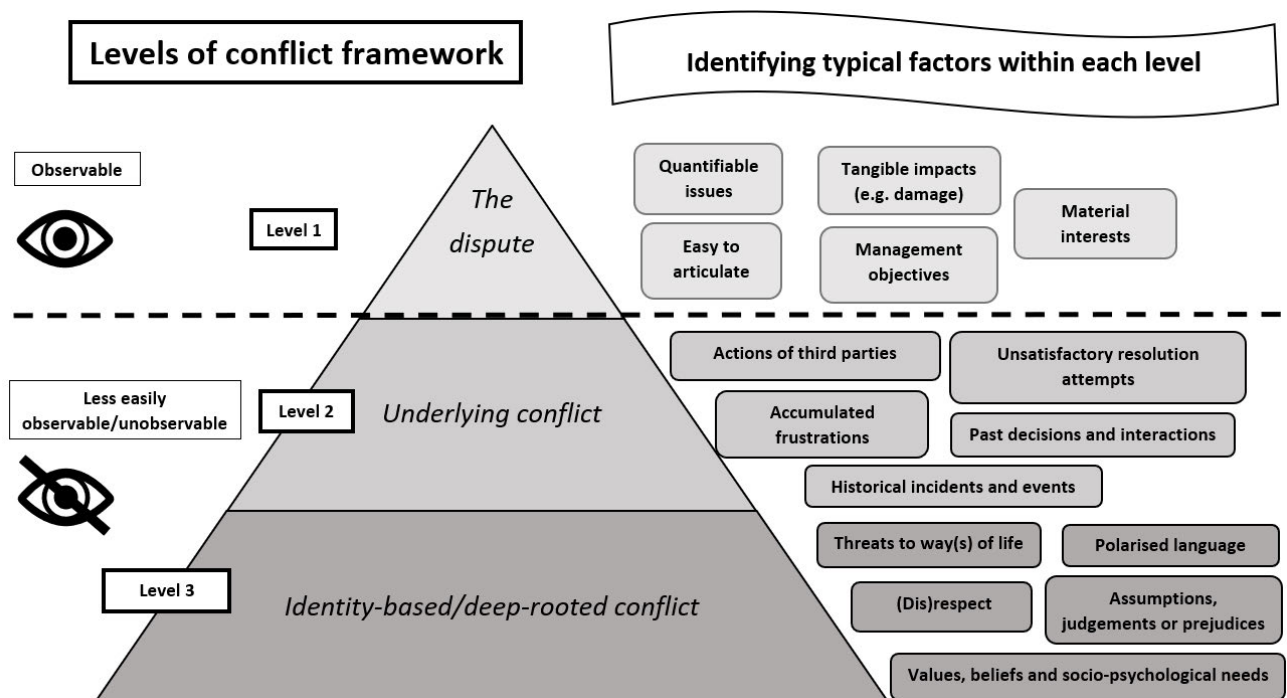
### 5.3.1 Conceptualising 'levels of conflict'

The conceptualisation of conflicts as being comprised of 'levels' was initially developed by political scientists and sociologists within the fields of conflict resolution and peacebuilding through studying the political, military and grassroots leadership hierarchies that shape conflict dynamics (Fisher and Keashly, 1991; Lederach, 1997). This conceptualisation has also permeated fields like psychology (Galtung, 2010) and business management (Cloke and Goldsmith, 2011). More recent years have seen this conceptualisation become increasingly utilised within land use, conservation and environmental management (White *et al.*, 2009; Davies, Bryce and Redpath, 2013; Redpath *et al.*, 2013; Madden and McQuinn, 2014; Young *et al.*, 2016; St John *et al.*, 2019; Zimmermann, McQuinn and Macdonald, 2020; Glikman *et al.*, 2022).

Within the field of conservation, Madden and McQuinn developed their 'Levels of Conflict model', adapted from earlier work by Moore (1986) and Daniels and Walker (2001), to 'enable [the] analysis of the complexity, scope and depth of conflict in a given setting' (2014, p. 101). Their aim in doing so is to account for 'deeper social conflicts' (2014, p. 98) between parties involved in and impacted by conservation to 'identify, understand, prevent and reconcile conflict' (2014, p. 97). They define the first level of conflict as 'the dispute', which is the 'obvious, tangible manifestation' (2014, p. 100) observable to those involved in the conflict as well as external actors. The second level is referred to as 'underlying conflict', which concerns the historical composition of the dispute and how actors engaged in conflict have previously interacted, which Madden and McQuinn say is "not necessarily obvious from the bare 'facts' of the current incident alone" (2014, p. 101). The third level of conflict is 'identity conflict', which refers to the 'values, beliefs or social-psychological needs that are central to the identity of at least one of the parties involved in the conflict' (Madden and McQuinn, 2014, p. 101). The wide-ranging relevance of the 'Levels of Conflict' model is demonstrated by its application in a diverse range of cases (Parsons, 2015; De Wit, Jani and Webb, 2020; Leong, Gramza and Lepczyk, 2020; Crespini and Simonetti, 2021; Iwane *et al.*, 2021; O'Rourke, 2019; Glikman *et al.*, 2022).

Zimmerman et al (2020) further developed the substance of the model in their study of human-wildlife conflict by populating it with the specific material (level 1), historical (level 2) and identity-related (level 3) factors that they identified in their work as practitioners resolving conservation conflicts. They suggest that these factors can be used to help provide ‘signs or indicators’ (Zimmermann, McQuinn and Macdonald, 2020, p. 4) of which level of conflict different context-specific issues should be included within. We believe this helps to strengthen the analytical precision of Madden and McQuinn’s model and, in turn, eases its empirical application.

We adapt and combine Madden and McQuinn’s (2014) model and the factors identified by Zimmerman et al (2020) to produce our own novel analytical framework (see Figure 19). The resulting framework renders more explicit the type of factors that are prevalent within different levels of conflict whilst also clarifying the distinctions between these factors and the degree to which both levels and factors can be considered more or less observable. The identification of issues at the different levels also improves the analytical functionality of this framework, providing a route-map for examining cases of conflict.



**Figure 19. A visualisation of the ‘Levels of Conflict’ framework.**

*Produced by combining and adapting work by Madden and McQuinn (2014) and Zimmerman et al (2020). The labelled pyramid structure was conceptualised by Madden and McQuinn with the factors on the right hand-side adapted from both Madden and McQuinn and Zimmerman et al.*

Within the literature on rural land use, wildlife and natural resource management, conflict is often viewed as intrinsic or inevitable (Upreti, 2001; Hill, 2021). Applying our ‘levels of conflict’ lens, we can see that this may be because of *dispute*-level material factors, such as the finite nature of usable land (Ramirez, 1999; Mann and Jeanneaux, 2009; Steinhäuser *et al.*, 2015), economic trade-offs owing to bounded or restricted resource use (Petrescu-Mag *et al.*, 2018; Jong *et al.*, 2021; Zou *et al.*, 2021) and the ecology and behaviour of animal species which makes their management inherently challenging (Smart, White and Termansen, 2007; Austin *et al.*, 2010). Below these material factors sit another level of *underlying* contentions which can be characterised as subjectively and relationally constructed, such as historic mistrust between parties (Davies, Bryce and Redpath, 2013), reactive or top-down government engagement in previous conflict management efforts (Young *et al.*, 2016) and contested problem definitions and evidence bases over the management problem (W. M. Adams, 2015; Hodgson *et al.*, 2022). For conflicts that are more entrenched, a third level of *identity*-related issues may apply that pertain to ideational and cognitive factors (W. M. Adams, 2015; St John *et al.*, 2019). These can include competing social positions, such as class (Cloke and Thrift, 1987; Shucksmith, 2012), different personal, political and cultural values (de Groot, 2006; Emery and Oughton, 2011; Ellis, Pascual and Mertz, 2019), clashing rationalities and knowledge-types (Collier and Scott, 2009) and the discursive frames and narratives through which actors view and interact with other actors and resources (McEachern, 1992; Brummans *et al.*, 2008). Fienitz’s (2023) systematic review of land-use conflict case studies suggests that conflicts may occur at and involve factors from one of these levels or across all three.

The next section provides some context to upland deer management in the Highlands and reviews relevant literature through a ‘levels of conflict’ lens to help situate our findings.

### 5.3.2 Upland deer management conflict in the Scottish Highlands

There has been debate over the management of deer in Scotland for over 150 years (Phillip *et al.*, 2009; Hare, Daniels and Blossey, 2021). Contention has centered on red deer (*Cervus elaphus*) in the Highlands, partly because of their range, population and impacts, but primarily because of their association with large privately-owned rural landholdings commonly referred to as ‘sporting’ estates which have, traditionally, sought to maintain sufficient numbers of red

stags (male deer) for recreational 'sport' stalking (hunting) through selective culling, habitat manipulation and supplementary feeding (Clutton-Brock, Coulson and Milner, 2004; Hobbs, 2009). There is also increasing attention being paid to the impacts of roe (*Capreolus capreolus*) and sika deer (*Cervus nippon*) as well, though more so in forested, lowland, arable and peri-urban areas, and to a lesser extent, fallow deer (*Dama dama*) which tend to be more geographically isolated (Dandy *et al.*, 2009; Swanson and Putman, 2009; Edwards and Kenyon, 2013). There is no definitive population figure of deer in Scotland because of their high mobility, the inconsistency in counting methods and the intervals between counts (Smart, Ward and White, 2004; Daniels, 2006) and discussions around deer populations are therefore highly contentious. However, NatureScot, the government agency responsible for regulating deer management and who undertake much of the counting, give a broad estimate of around 505,000 red, 300,000 roe, 25,000 sika and 8,000 fallow deer across Scotland (NatureScot, 2024b).

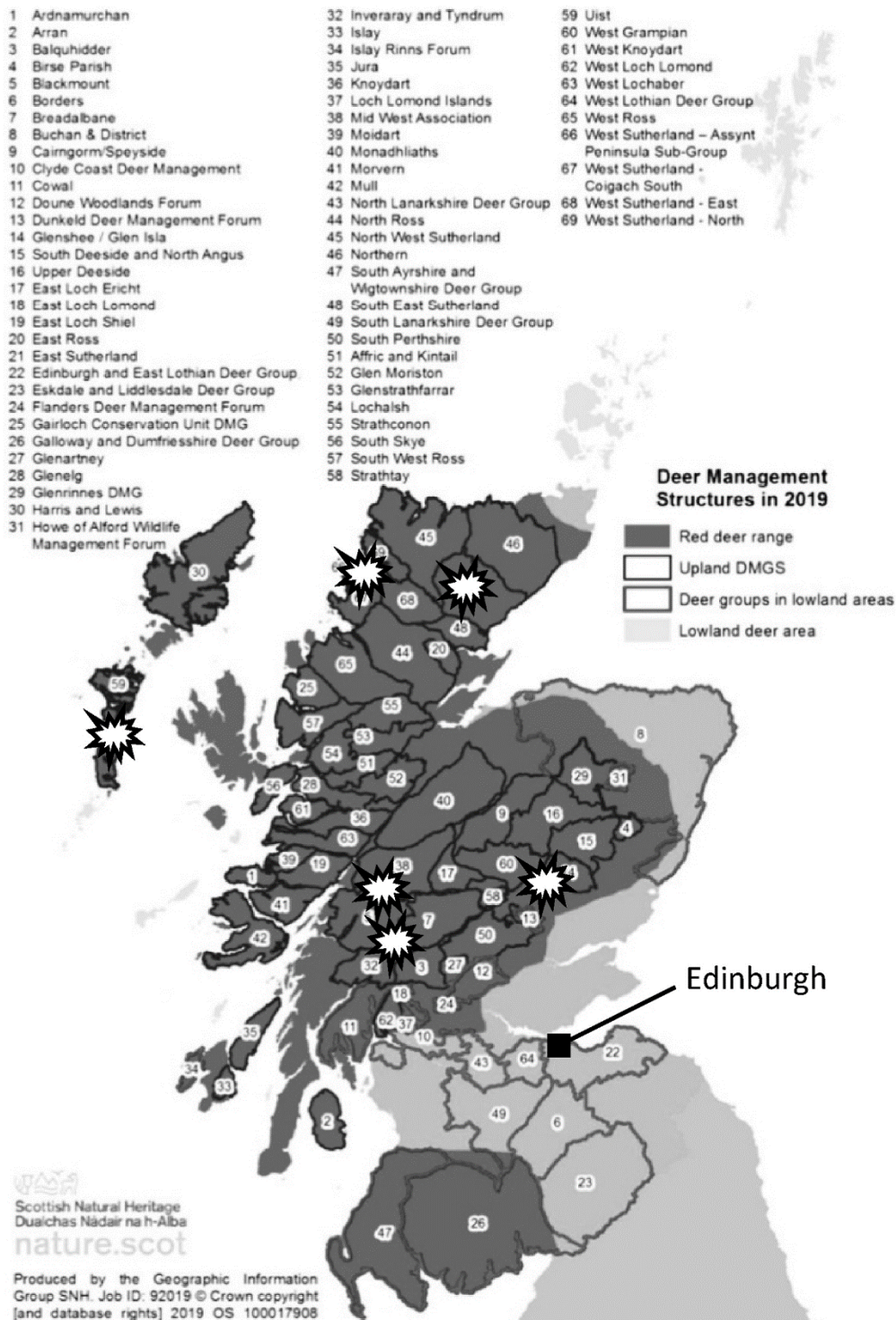
73% of Scotland is classed as upland, the vast majority of this lying within the sparsely populated Highlands and Islands region that covers the northern and western third of the country (Bunce, Wood and Smart, 2018). In the uplands, deer are managed for many reasons, including sport stalking, as well as to protect areas of conservation, forestry and agriculture from their impacts and to mitigate deer-vehicle collisions and the spread of ticks (*Ixodes ricinus*) which can carry Lyme disease (Lorimer, 2000; Scott and Palmer, 2000; Mather, 2004; Pérez-Espona, Pemberton and Putman, 2009; Putman *et al.*, 2011; Gilbert *et al.*, 2012; Langbein, 2017; Marrs *et al.*, 2020; Martin *et al.*, 2021, 2021). Deer are primarily managed through culling (shooting) and exclusionary fencing, with these practices occurring over more than three million hectares or 40% of Scotland (Baines and Andrew, 2003; Putman, Duncan and Scott, 2005; Pepper, Barbour and Glass, 2019). The most recent recorded national cull (2022 – 2023) was 133,922, 55% of which was red deer, although the actual cull total is estimated to be closer to 200,000, with unreported roe deer culls in the lowlands accounting for the discrepancy (NatureScot, 2024c, 2024b). Deer management in the uplands is generally undertaken by individual landholdings and/or as part of voluntary clusters of neighbouring landholdings called Deer Management Groups (DMGs), of which there are around 50 (Davies and White, 2012).

Upland deer management in Scotland is increasingly framed in terms of mitigating climate change and biodiversity loss (Kirkland *et al.*, 2021). Excessive grazing and browsing impacts from deer can contribute to the restriction of woodland regeneration (Fletcher *et al.*, 2021; Gullett *et al.*, 2023), whilst concentrated trampling by deer can contribute to peatland degradation (Pellerin, Huot and Côté, 2006). In turn, this can reduce the capacity of these land types to sequester carbon and provide habitats for other species (Hirst, 2021). To achieve its climate and biodiversity targets, the Scottish Government argues that deer impacts need to be reduced, through increasing the national cull by 50,000 deer (all species) per annum for an indefinite period and by setting an upper-threshold density of 10 red deer per km<sup>2</sup> across the Highlands, although the most recent (2019) red deer density estimate across the region was 9.35 deer per km<sup>2</sup> (Albon *et al.*, 2019; Pepper, Barbour and Glass, 2019; Scott, 2023), whilst NatureScot (2024b) note that ‘red deer populations have remained stable since 2000... with some indications that the national population has declined since 2000 because of increased culling.’

Open-hill sport stalking in the Highlands, underpinned by viable deer herds, remains very important for many of the estates that are estimated to cover around two million hectares, or 25%, of Scotland (MacMillan *et al.*, 2010). Moreover, sport stalking sustains the employment of around a thousand deer stalkers, as well as other estate employees, often in areas where alternative employment is scarce (Scott, 2023). Many estates are therefore reluctant or resistant to reduce deer numbers because of the perceived threat this poses to traditional forms of stalking that have existed for 200 years, estate employment and the wider social impact of employment loss in areas affected by historic and ongoing depopulation (Hanley and Sumner, 1995; Stockdale, Findlay and Short, 2000; Stockdale, 2002; Kirkland *et al.*, 2021). This, along with other factors which we explore, continues to ignite contention, with media articles in Scotland in 2023 alone highlighting disputes in Assynt, central Sutherland, Glen Coe and Glen Etive, the Southeast Cairngorms, South Uist and the Trossachs (Baynes, 2023a; Hay, 2023; McMorran, 2023; McNeill, 2023; Mitchell, 2023; Ross, 2023) (see Figure 20).

There have been a number of attempts over many years to address conflict and policy failures in deer management. Between 1872 and 1954, seven government inquiries were launched into conflicts between sporting estates, agricultural tenants and foresters over deer

management (Hare, Daniels and Blossey, 2021). The Deer (Scotland) Act 1959 was enacted to provide regulatory oversight of deer management through establishing the Red Deer Commission, which was followed 40 years later by the Deer (Scotland) Act 1996 in response to ongoing policy failures. More recently, the Deer Working Group was established by the Scottish Government in 2017 and provided 99 recommendations for reform in 2020. The majority of these recommendations are in the process of being introduced through secondary legislation and the Natural Environment (Scotland) Bill (Pepper, Barbour and Glass, 2019; *The Deer (Close Seasons) (Scotland) Amendment Order 2023*, 2023; *Natural Environment (Scotland) Bill*, n.d.).



**Figure 20. A map of deer management disputes.**

An annotated map depicting the upland red deer range (darker shade), Deer Management Groups (DMGs) (bordered in black), disputes over deer management reported in Scottish and UK media in 2023 (star shapes) and the location of Scotland’s capital city and administrative centre, Edinburgh. Adapted from (Pepper, Barbour and Glass, 2019). Permission obtained to reproduce here.

Deer management in the Highlands is often presented in the media as a number ‘problem’ (Flynn, 2018; Armstrong, 2023; Solomons, 2023). However, by applying a ‘levels of conflict’ lens to examine relevant literature, we can begin to complicate this picture by identifying some important preliminary factors which we subsequently build upon with our findings.

Several factors provide the conditions for what our framework refers to as the Level 1 *dispute* of this situation. These include the legally wild status of deer (Davies and White, 2012), the transience of deer on and across landholdings (Smart, White and Termansen, 2007), the ecological behaviour of deer (Holl and Armstrong, 2014; Gullett *et al.*, 2023), the right to manage deer resting in the ownership of the land on which the deer are on (MacMillan and Leitch, 2008), the absence of predators (except humans) to moderate deer populations (Nilsen *et al.*, 2007) and the different objectives that landholdings have (Austin, Raffaelli and White, 2013). The bulk of literature on deer management conflict in Scotland has focused on addressing the implications and trade-offs arising from these factors. These include the application of economic analysis such as the Coase theorem (Hanley and Sumner, 1995), choice experiments (Bullock, Elston and Chalmers, 1998; Bullock, 2001), common property resource management (Bullock, 1999), evolutionary game theory (Touza *et al.*, 2013), tradeable hunting permits (MacMillan, 2004) and incentives (Smart, White and Termansen, 2007; MacMillan and Phillip, 2010). Others have taken an ecological angle, examining the comparative effect of livestock grazing to deer (Clutton-Brock, Coulson and Milner, 2004), the increased uptake of habitat monitoring of deer impacts (Maffey *et al.*, 2013) and the potential for wolf reintroduction (Nilsen *et al.*, 2007; Spracklen *et al.*, 2025).

Other literature has explored what we classify as Level 2 factors pertaining to the *underlying* conflict within upland deer management in the Highlands. Much of this has focused on the institutional arrangements governing collaborative forms of deer management, principally by examining the efficacy of DMGs (Austin *et al.*, 2010; Davies and White, 2012; Dandy, Fiorini and Davies, 2014; Eastwood *et al.*, 2022). Additional studies contain historical analyses that provide context to persistent management challenges, such as red-sika deer hybridisation (Lowe, 1961; Pérez-Espona, Pemberton and Putman, 2009; Pérez-Espona *et al.*, 2013), whilst Phillip *et al.* (2009) examined the development of the regulatory framework in which deer management operates to help explain reasons for ongoing contention.

A final area of literature can be described as concerning Level 3 factors that shape the *identity* conflict present within this situation. This includes the role, motivations and attitudes of private estate owners which can have a strong influence on deer management decisions and conflict around these (MacGregor, 1988; Wightman and Higgins, 2000; Higgins, Wightman and MacMillan, 2002; MacMillan and Leitch, 2008; MacMillan *et al.*, 2010; Wagstaff, 2013). In contrast, Hare *et al* (2021) and Whitefield *et al* (2021) examined perceptions of and attitudes to deer culling amongst the Scottish public, whilst Irvine *et al* (2009) examined the integration of the differing knowledge-types of ecologists and deer stalkers as a means of enhancing the legitimacy of deer management decisions. Others have drawn attention to the cultural place of deer stalking in the Highlands (Jarvie, 1986; Jarvie and Jackson, 1998; Lorimer, 2000; Wightman *et al.*, 2002; Wightman, 2004; Adams, 2009), whilst MacMillan and Phillip (2008), Fiorini *et al* (2011) and Webb (2024) have explored the values associated with deer themselves. Finally, Kirkland *et al* (2021) place particular emphasis on the role of identity, arguing that ‘perceptions, values and expectations regarding deer management are multi-faceted, deep rooted and reflect cultures, traditions and preferences that extend far beyond deer’ (p. 4).

Our paper builds upon this literature by highlighting the connections between these factors, using our adapted framework. Rather than treating areas of contention as separate components, we contend that they sit together as part of a larger nested structure in which *disputes* over material and technical factors are *underlain* by historical interactions and events which are further shaped by the *identities* of the parties involved. As our findings draw on the perspectives of the main stakeholder groups involved in deer management in the Highlands, the next section provides a brief overview of some of these.

### 5.3.3 Main stakeholder groups involved in upland deer management in the Scottish Highlands

The primary role of deer stalkers is to cull a quota of deer as set by the landholding they are employed on (Warren and Glass, 2024a). Cull targets may be part of pursuing sport stalking activity, conservation, forestry and/or other objectives, depending on the landholding. There is little detailed data on the number of deer stalkers employed in Scotland, however Scott (2023) estimated that around 1,000 FTEs accounts for 95% of the annual cull in Scotland,

whilst a survey of gamekeepers (in which stalkers are usually bracketed) by Thomson et al (2020, pp. 1; 15) found that 95% were male, over 50% were aged over 50 and 52% of stalkers specifically had been employed by the same landholding for 20 years or more.

Private estate owners are nominally responsible for setting deer management objectives on landholdings, or delegating this to estate managers (often called 'factors') and/or stalkers (MacMillan *et al.*, 2010). Deer management on private landholdings accounts for 80% of the national cull (Scottish Government, 2024c), largely because of the extensive degree to which private ownership dominates rural Scotland (Wightman, 2024). Estate owners vary significantly in their levels of involvement in deer management, and this depends on a variety of factors including ownership motivations, the size and composition of the estate and the degree of absenteeism (MacMillan and Leitch, 2008).

Since the 1980s, an increasing number of landholdings in the Highlands have been bought by environmental NGOs and managed for conservation purposes (McMorran and Glass, 2013). Objectives typically include woodland expansion, peatland restoration, habitat provision and 'rewilding' and culls have tended to be higher on these landholdings to achieve these aims (Gullett *et al.*, 2023; Watts, 2024). In more recent years, land acquisitions in the Highlands have been dominated by corporate entities for 'natural capital' purposes to generate carbon credits from the planting of forestry or regeneration of woodland and the restoration of peatland, as well as for the anticipated establishment of biodiversity credits, with higher culls generally accompanying this (McMorran *et al.*, 2022; van Rooij, 2024).

The other main stakeholder group involved in deer management are public and private foresters. Forestry and Land Scotland (FLS), a public body, are, by far, the single largest landowner in Scotland, with the National Forest Estate, for which they are responsible, covering over 6,400 km<sup>2</sup> or 8% of the country and are also consequently the single largest culler of deer, representing around 30% of the total cull (Forestry and Land Scotland, 2014; Pepper, Barbour and Glass, 2019, p. 44) (noting that this percentage clashes with that given above for private deer management, indicating limitations and inconsistencies in the way cull figures are calculated). The primary objective of FLS is to produce a sustainable amount of domestic timber, typically using single-species coniferous plantations, though recent years have seen a shift towards more varied forest structures including native woodland species, which tend to be more palatable to deer and therefore require more proactive deer

management (Holl and Armstrong, 2014). Private forestry operators are also increasingly important actors in deer management, albeit over smaller blocks of land and with little available information on their cull levels (Wightman and Hollingdale, 2023).

Having laid the conceptual and contextual foundations for this study, the next section provides an overview of methods used in the collection and analysis of data.

## 5.4 Materials and methods

### 5.4.1 Research context

Data for this study was collected through the lead author's role as an independent evaluator of *Finding the Common Ground on Sustainable Upland Deer Management*, a civic mediation process (McAllister *et al.*, 2017) that ran between August 2022 and June 2023, and of the *Common Ground Forum*, a group which was established following mediation to continue work on collaborative upland deer management. Mediation was jointly initiated by the Association of Deer Management Groups (ADMG), the representative body for DMGs, and Plantlife, an environmental NGO. The aim of mediation was to improve working relationships amongst different stakeholders involved in upland deer management to support the implementation of the DWG recommendations. Participants in the mediation were selected by a steering group to represent different interests involved in upland deer management, including deer stalking, estate management and ownership, conservation and ecology, public, private and community forestry, wildlife management and forestry regulation, government, the National Parks, consulting, game (meat) processing, venison promotion and agriculture amongst others (see Appendix D.1). It is therefore important to note that because participants were selected by a steering group of individuals already involved in deer management, this placed boundaries around which participants were deemed legitimate to participate and whose views this study draws on as a result.

#### 5.4.2 Data collection

Data was collected between April 2022 and April 2024. In total, 103 participants were involved in this study, 85 of whom took part in the mediation, with an additional 18 participants involved in the Common Ground Forum during the course of the lead author's evaluation. Of this total, 47 (46%) were interviewed between January 2023 and April 2024 using a semi-structured format and interview guideline (Scanlan, 2020) (see Appendix D.2). A balance of sectoral representation was achieved in the interview sampling and interviews were conducted until data saturation, which refers to the stage when no new themes emerge from undertaking interviews, (Hennink, Kaiser and Marconi, 2017), was reached. This occurred in April 2024, at which point the interview process was concluded after the 47<sup>th</sup> interview. Interviews lasted one hour on average, with 30 held online and 17 conducted by phone depending on participant preference. All interviews except two were recorded with participant consent, transcribed using AI transcription software (Rev) and manually corrected against the original audio recording for accuracy.

Observational data in the form of field-notes was collected on all 103 participants across eight workshops, ten estate visits, 23 meetings and through informal conversations as part of the mediation and Common Ground Forum. Notes were recorded by hand and subsequently digitised. We reflect on the limitations of our methods as well as our positionality in the discussion. Where used in the results below, interview quotes are cited by the abbreviation I#X (interviewee number) and observational notes are cited using 'field-notes' and the date (MM/YY) they were recorded.

#### 5.4.3 Data analysis

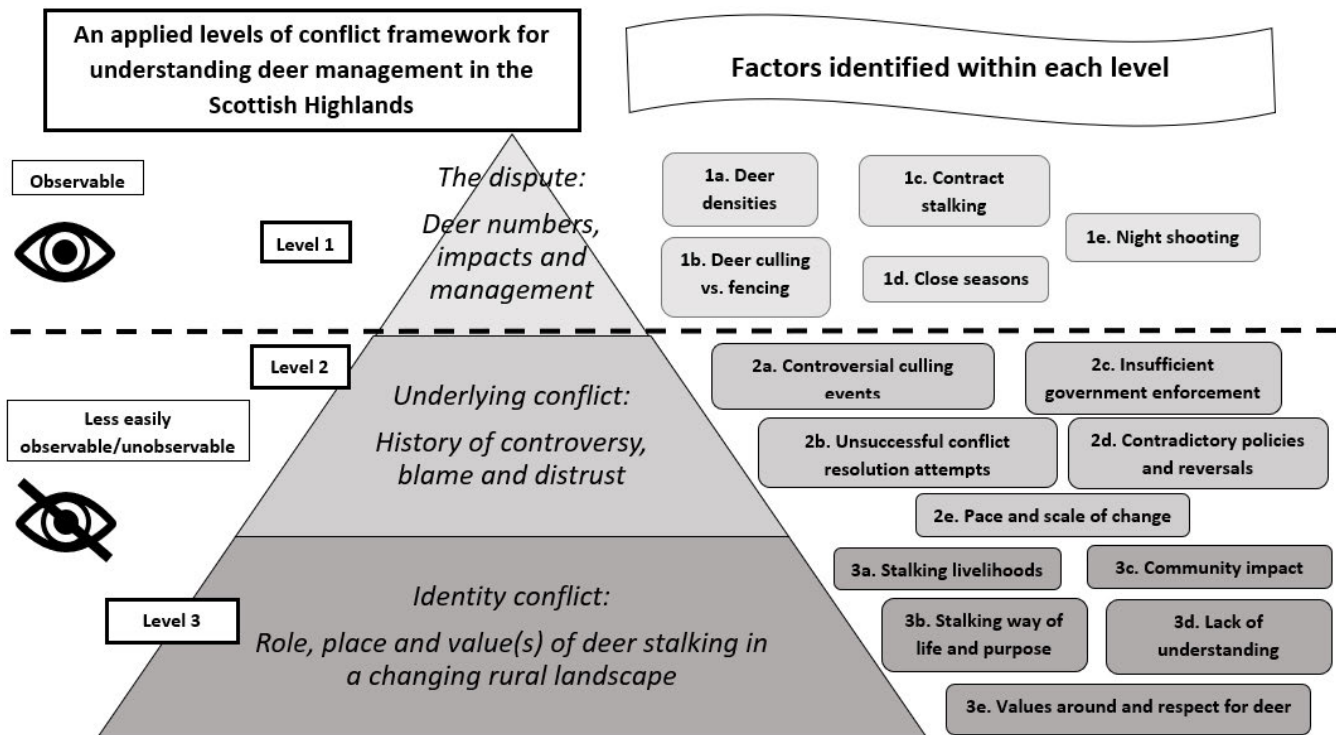
Data was analysed using NVivo 14 via a mixed deductive/inductive coding method (Fereday and Muir-Cochrane, 2006; Blair, 2015) which is sometimes called 'abductive' coding (Lipscomb, 2012; Vila-Henninger *et al.*, 2022). This meant that data was initially coded deductively using a codebook created from a literature review (Scott *et al.*, 2019) on deer management and land-use conflict. This codebook was then expanded through an inductive approach, where codes are identified through close and repeated reading of the data

(Hernandez, 2009). Interview transcripts and individual field-notes were coded three times each for consistency and to refine the codebook. The codebook was subsequently revised to remove duplications and to cluster codes via an axial process (Kendall, 1999). This produced a final codebook of 27 top-level codes with more detailed codes within these (see Appendix D.3). The codes were originally developed for evaluating the mediation and, as such, the 'Levels of Conflict' framework was not used in their development. Instead, the codes have been used as the basis for informing our adapted framework, which we turn to now in our results.

## 5.5 Results

In this section, we populate our adapted 'Levels of Conflict' framework, as introduced above, to articulate the main findings that emerged from our data, aligning our results to each level and the factors that sit within these (see Figure 21). These factors are highlighted on the right-hand side of Figure 21 and are labelled in the format of 1a. They are referred to in the written results in the format of (1a, Figure 21).

By applying this framework, we show that beneath the surface of a *dispute* around material issues such as deer numbers, their impacts and management, lie *underlying* factors of historic controversy, blame and mistrust amongst the involved parties and questions of *identity* around the role, place and values of deer stalking in a changing policy, cultural and environmental landscape. Taking these levels in turn, whilst highlighting the nested structure in which they sit, helps to illustrate and clarify this complex picture, as we move to next.



**Figure 21. Applied 'Levels of Conflict' framework.**

*Adapted from work by Madden and McQuinn (2014) and Zimmerman et al (2020), applied to upland deer management in the Scottish Highlands.*

### 5.5.1 The dispute (Level 1 conflict) - Deer numbers, impacts and methods of management

In speaking to and engaging with stakeholders, deer numbers emerged as 'the immediate [and obvious] material issue at the 'centre' of the conflict' (Madden and McQuinn, 2014, p. 100) which, in turn, 'frame[s] the apparent problem' (Zimmermann, McQuinn and Macdonald, 2020, p. 2) in this case. Deer numbers are typically discussed in terms of density (the number of deer per km<sup>2</sup>). The Scottish Government has set a maximum upland density of 10 red deer per km<sup>2</sup>, which many deer stalkers and estate owners disagreed with because it may mean reducing their numbers or they believe their land can sustain higher densities without a detrimental environmental impact (**1a, Figure 21**). One estate owner therefore summed it up as: 'a nonsense, meaningless figure' [I#18] with a stalker saying that: 'if the habitat's good we can support more than 10. So, what's the problem?' [I#46]. In contrast, most conservationists argued that deer densities should be reduced to significantly lower densities of less than 4 per km<sup>2</sup> to achieve woodland and peatland recovery. One conservationist therefore felt that

sport stalking interests were treating the 10 deer per km<sup>2</sup> as ‘a golden number’ [I#20] to avoid further reductions.

Debates over ‘methods’ of wildlife and land management are also identified by Zimmerman et al (2020, p. 2) as constituting the first level of conflict. In this case, for many with a sport stalking interest, there is a preference to fence deer out of an area rather than cull them (**1b, Figure 21**) as explained by one stalker referring to a neighbouring rewilding estate: ‘if they don’t want deer in their estate, they should fence it’ [I#40]. There was therefore anger at both conservationists and foresters for what another stalker felt was their tendency to ‘just annihilate deer’ [I#34] rather than use fencing. Conservationists instead overwhelmingly opposed fencing, with one contending that fences ‘treated the symptom and not the cause’ [I#2] and were ineffective protections against deer damage to habitats, whilst creating an artificial environment threatening species such as capercaillie.

Similarly, there was significant division between sport stalking interests and both conservationists and foresters over the use of contract stalking, which is when deer management is outsourced instead of in-house (typically estate-employed) stalkers being used (**1c, Figure 21**). One private forester argued that contract stalking was the most cost-effective way to manage deer because contractors are paid per deer shot, whereas estate-employed stalkers are salaried regardless of their cull: ‘the old keeper would go out, see six deer and shoot two. The contractor would go out, see 30 and shoot 15’ [I#24]. In contrast, many sport stalking respondents regarded contract stalking as improper deer management, or ‘shoot to kill policy’ as one estate manager put it [I#29], as well as damaging to local communities, as a stalker on a private estate explained: ‘it doesn't put kids in the school, it doesn't keep people in the glen, they just come in and they go again’ [I#17]. Several conservationists meanwhile felt there was too much hyperbole around contract stalking, with one observing that: ‘contract killer is a good soundbite, but it doesn't make sense given that they're not any different to any other deer stalker’ [I#35]. A stalker working for an environmental NGO also said there was ‘often jealousy’ [I#39] from estate stalkers towards contract stalkers, because as an estate-employed stalker explained, ‘they make a damn sight more money than the normal stalker’s making’ [I#40]. Asked about this debate, a contract stalker simply said: ‘all we’re doing is what we’re told’ [field-notes, 06/23].

Other areas of disagreement concerned the Scottish Government's recent removal of the close season for stags, meaning they can be shot throughout the year, and a proposed reduction to the close season for hinds (which was later dropped) (**1d, Figure 21**). For many involved in sport stalking, this was viewed with a mixture of indignation and incredulity, as argued by an estate manager: 'that's another bit of madness forced upon the deer stalking world by people who have no idea what they're doing' [I#29]. Reasons included the lack of protection that may be afforded to post-rut, weakened stags during the winter and that heavily pregnant hinds may be shot more often, which one stalker described as 'totally wrong' [I#44]. In contrast, interestingly, another stalker said that stalkers 'have done that to thousands of foxes and never batted an eyelid. It's deeply disingenuous and hypocritical' [I#47]. A government policymaker also said these changes would simply 'make it easier' [field-notes, 06/2023] for all land management interests to reduce deer impacts if they wanted to. Unease was also expressed by many sport stalkers about the increase in night shooting of deer, described as a 'total disgrace' [I#26] by one, which many conservationists and foresters claimed was necessary to suppress deer impacts on their land (**1e, Figure 21**).

In summary, returning to our framework, 'visible' issues pertaining to deer numbers, their impacts and methods of management appear to characterise the 'presenting dispute' level of this conflict, in which 'people's reaction[s] [to these issues are] obvious and tangible making problem[s] easy to identify' (Zimmermann, McQuinn and Macdonald, 2020, pp. 2–3). However, as Madden and McQuinn note, such issues are 'typically' the 'surface expression of deeper levels of conflict' (2014, p. 101), which we turn to now.

#### 5.5.2 Underlying conflict (level 2 conflict) - A history of controversy, blame and distrust

According to Madden and McQuinn, the second level of 'underlying conflict' is shaped by 'past interactions between, or decisions made by, parties that intensify or aggravate the present situation' (2014, p. 101). In this case, such interactions and decisions had produced an enduring climate of controversy, blame and distrust that continues to influence debate. This was most evident when references were made to events that had caused a rupture within deer management (**2a, Figure 21**). A frequently cited example included a government mandated cull of 540 deer at Glen Feshie – a formerly renowned sporting estate in the

Cairngorms, in the east of the Highlands, which is now regarded as a flagship 'rewilding' project – in 2004, that attracted protesters from 60 estates. Calling it a 'moment of shock in a sector that moves like a sloth', a land management consultant explained that those in the sport stalking world were aghast that 'an iconic species could be treated in such a brutal way' [I#15]. Other cases involving the perceived drastic culling of deer for conservation purposes that were mentioned by respondents included Abernethy and Mar Lodge, also in the Cairngorms, and Knoydart on the west coast. A forester claimed that because of these events, many sport stalking interests have a 'massive chip on their shoulder' [I#24] against heavier culls.

Zimmerman et al also note that underlying conflict is informed by 'the context of a history of unsatisfactory attempts to address previous incidents' (2020, p. 3). In this case, failed attempts to address deer management conflict in the past had clearly sowed doubt over current conflict management efforts amongst some stakeholders (**2b, Figure 21**). For example, a land management consultant referred to a 'totally disastrous' [I#27] attempt to resolve a dispute in Assynt, in the north-west Highlands, between a private estate, crofting group, environmental NGO and public body, which a former estate manager unrelated to but familiar with the area said: 'made things worse rather than better' [field-notes, 10/23]. In the southeastern Cairngorms, an estate manager also criticised what they regarded as a failure of government and NatureScot to enforce deer culling and find agreement between neighbouring landholdings, to protect a designated conservation area from deer impacts: 'government agencies are equally to blame, but there's a lot of arse-covering going on' [I#13]. A similar point was made by an environmental NGO stalker who said: 'people have not been treated hard enough by the Scottish Government and they've been allowed to take the piss when it comes to high deer numbers' [I#39] whilst an ecologist stated that 'the regulation of deer management has been toothless for 60 years' [I#38], with another ecologist saying that there had been 'institutional capture' of government agencies by sport stalking interests which had stymied reform [I#28]. Issues like these had therefore built antipathy and scepticism over several decades amongst many stakeholders from different sides of the argument towards the actions of government (**2c, Figure 21**).

References were also made to contradictory policies as well as historic 'mistakes' and subsequent reversals within upland management more broadly (**2d, Figure 21**). Notable

examples of the former included government incentives for sheep stocking, with some sport stalking stakeholders observing that sheep outnumber deer six to one across Scotland. This problem was explained by one forester sympathetic to sport stalking interests: 'there's no point having two or three red deer per square kilometre but having 30 sheep [in that area]. People in the deer sector are scapegoated whilst heavily subsidised livestock are ignored' [I#4]. An estate owner further berated the lack of public finance available for culling: 'all previous land management was incentivised. It needs to be the same for deer' [field-notes, 09/23]. An estate manager also highlighted 'U-turns' in government policy: 'all we've been doing is delivering policy assignments over the past decades, but we're all told to reverse things now and it's very, very difficult' [I#13]. Such factors had consequently reduced their confidence in the current government trajectory on deer management.

For those with a sport stalking or estate management interest, this was being exacerbated by what they saw as unclear government policy, with one estate manager simply stating: 'what exactly does the Scottish Government want us to do?' [I#9]. In stark contrast, a conservationist who agreed with the government's direction on deer management said: 'it's bloody obvious. It's just that they don't like it, not that they don't understand it. How do you work with people when they say they don't understand something because they don't want to understand it?' [I#2].

There was also a clear division between some stakeholders on the pace and scale of change in deer management (**2e, Figure 21**). Generally, sport stalking interests felt changes were being made too quickly, with one estate owner saying that: 'things are changing violently' [field-notes, 04/23]. A stalker concurred, saying: 'there's been a huge shift in five years, where we're vilified from all angles' [I#19]. A land management adviser provided a lengthier description of what they saw as a split in mindsets: "everyone's being rushed by, 'oh this is a terrible crisis, we've got to take action next year to stop climate change.' A lot of land managers say that's neither necessary nor realistic. Conservation NGOs are so keen to make tangible progress. It is very much their agenda and they're using this 'emergency' to do dramatic things in the short term. But it simply doesn't suit long-term land management" [I#16].

In contrast, many other stakeholders, particularly within conservation, were palpably frustrated about what they regarded as an inadequate response to the environmental

problems posed by deer impacts. This was expressed by one conservationist: '[estates] know there's very high [deer] numbers but they're happy with that. The thing is, you can't be happy with that, with the nature and climate emergency, you can't be happy with that' [I#1]. Similarly, an ecologist noted that the pace of government action was also insufficient: 'it's far too slow in terms of regulation. It's got to be a major change by the Scottish Government now in terms of carbon sequestration and biodiversity' [I#28]. Another ecologist also criticised government inaction on the issue of deer management: 'everybody writes strategies and work streams and sets targets and nothing changes. I've been in this for a few decades and precious little has changed' [I#6]. A wildlife management regulation officer agreed, simply stating: 'we're just not going quick enough' [I#30].

In sum, revisiting our framework, underlying conflict in this case is marked by ongoing controversy, blame and distrust amongst parties, which has been 'imbued' by 'unsatisfactory' attempts to resolve conflict as well as 'resentment' over previous flashpoint 'incidents' (Madden and McQuinn, 2014, p. 101; Zimmermann, McQuinn and Macdonald, 2020, p. 3). In turn, these events carry 'meanings' which continue to 'distort the dynamics' of the case in the current context, shaping competing perceptions around the pace and scale of change in deer management (Madden and McQuinn, 2014, p. 101). It is often because of this legacy of unsatisfactory resolution that Zimmerman et al note that 'underlying conflicts are left to grow', morphing into situations that come to concern the 'values' and 'identities' of the parties involved and perceived threats to these (2020, p. 3). The next section illustrates how this appears to have happened in this case.

### 5.5.3 Identity conflict (level 3 conflict) – Role, place and values of deer stalking in a changing rural landscape

'Identity conflicts' are described by Zimmerman et al as an 'escalation' of the prior stages of conflict (2020, p. 3), which, as Madden and McQuinn note, 'contributes greater intensity and complexity to the presenting situation' (2014, p. 101). In this case, 'deeply rooted values, needs and beliefs' that characterise identity conflicts (Madden and McQuinn, 2014, p. 101) were expressed by stakeholders, particularly around the place of deer stalking in a rural

landscape, the Highlands, that is perceived by many to be changing in unprecedented and fundamental ways.

The most frequently recurring issue in this respect concerned the livelihoods of deer stalkers, in terms of both employment and the identity of stalking (**3a, Figure 21**). Many stalkers worry that as deer numbers decrease owing to higher culls, and fewer deer are consequently available for sport stalking, their employment will no longer be viable. This sentiment was succinctly expressed by one stalker: 'we're shooting people out of jobs' [I#19]. Another stalker also expressed fears about the employment implications of reduced deer: '[deer] have gone down to a level now where estates are finding it very difficult to come up with the number that they usually get. A lot of estates on the west coast depend on deer as a living. And if there's no longer sustainable numbers of deer in these areas, there's no doubt about it, people's jobs are going to go' [I#26].

In contrast, others disputed the link between reduced deer numbers and less employment. This included a stalker, who said that: 'it's absolute nonsense. If you are trying to reduce the deer, they are so resilient, you'll almost always be employed' [I#47], referring to the general association between lower densities and higher recruitment rates and therefore the need for culling levels to be maintained or increased (Albon *et al.*, 2019, p. ii). A conservationist also felt that employment had not been affected, stating: 'I don't think jobs have been lost as a result of increased culls' [I#35]. Some stakeholders further argued that higher culls would mean a *greater* need for stalkers, with a government policymaker stating: 'the evidence is that there is more employment, not less' [I#25]. A shooting representative explained the reasoning for this in more detail: 'work that has gone on at places like Glen Feshie and Mar Lodge, where there have been large-scale reductions of deer, demonstrated that once you get the population down to a certain level, there's just as much work to maintain that low density' [I#22].

Other stakeholders, particularly those in favour of increased culls, stressed that the type of work stalkers do would change, rather than be lost, with a public forester saying that: 'people have got to see [deer reductions] as an opportunity for a different type of deer management' [field-notes, 10/22]. An ecologist expanded on this argument further: 'the stalkers would end up changing from their traditional role not that much because, in fact, a lot of the time when

they're taking people out stalking, they're giving them the experience. So, it's pointing out various bits of wildlife. It wouldn't be a massive change' [I#28].

For many of those with a sport stalking interest however, it became apparent that this issue does not solely concern matters of employment, but the 'communal identity' of stalking, as Zimmerman et al put it (2020, p. 3), and its place in the Highlands (**3b, Figure 21**). This feeling was expressed by one stalker: 'we want to protect our purpose' [I#43] with another more pointedly saying: "if my job changed and was less about deer management and more about being a 'tour guide' then I would leave" [field-notes, 06/23]. Another stalker compared this back to contract stalking: "there's something called 'communities of practice' and, if you are in that 'in' group, everything you do is the way to do it. And when you look at an outgroup, you say, 'oh no, they're terrible'. We're getting that now with contract stalkers and traditional stalkers" [I#47].

One estate owner called stalking simply: 'a way of life' [I#11], a factor identified by Madden and McQuinn as integral to shaping identity-based conflict (2014, p. 101). Another estate owner offered a longer explanation of what this meant to stalkers: 'people don't want to see change and it's hard to understand that unless you're in the industry. People are proud of their jobs and what they do. There's a great deal of pride taking people up the hill [to stalk]. But we don't take pride in shooting deer because they're eating trees' [field-notes, 02/23]. A stalker concurred: "I'm proud to be a stalker. For most stalkers, their entire identity is in that job role. But it's like 'stalker' is now a dirty word" [I#47]. Summing up their resistance to change, another stalker said: 'we were fighting against change 25 years ago. And we'll still be fighting it for years to come. As long as there is this way of life' [I#26].

Other stalkers pondered the ramifications of a loss of employment on rural communities (**3c, Figure 21**), with one saying: 'if I no longer have a job, I've got to move off [the estate]. That means taking my children, everything. We're at a point on the west coast, where we're trying to keep people in places' [I#34]. Another stalker pondered a sense of cultural loss: 'it's part of our heritage. There's an awful lot of history in the hills that's derived from stalking. I think it would be a shame to lose that' [I#45]. Similarly, another stalker drew an historical comparison: 'the whole rural way of life is under threat. It basically boils down to the Clearances [referring to the forced eviction of many people in the Highlands in the 18<sup>th</sup> and 19<sup>th</sup> centuries] all over again. I really do think it's a sad day. I think it'll all be gone' [I#19].

In sharp contrast, a conservationist was visibly angry about such statements: 'it makes my blood boil when I hear that, because my ancestors were cleared off. That was a whole community wiped out overnight. And that is not the same as having to adapt your job to become slightly more environmentally friendly' [I#35]. A community forester made a similar point: 'the reason [stalkers] have jobs is because of the first Clearances' and said that the romanticisation of stalkers as 'honest, gnarly handed sons of the soil' [I#7] was often used to stymie change. Another conservationist concurred, saying that: "they play the salt of the earth card, 'men on the ground' [compared to] all us 'townies': 'we don't know what we're talking about'" [I#2].

Many of those within sport stalking and private estate management, however, felt that there was a genuine lack of understanding from those not involved in deer stalking towards the implications of proposed changes (**3d, Figure 21**), which has created what Zimmerman et al term "a 'them versus us' perception' of the situation" (2020, p. 3). This was argued by one estate owner: 'we can't have people making decisions if they can't tell the back end of a deer from the front' [field-notes, 02/23]. A stalker made a similar point: 'I've got views from a lifetime of being a stalker. These people are telling us what to do and they've never even shot a bloody deer. Have they been out in the weather conditions, seen the topography? It's not as straightforward as the government thinks to kill more deer' [I#46]. A land management consultant further claimed that the government simply did not understand 'the Highland mentality' [I#27] with another consultant saying: 'decisions are being made by people that live in a 20-mile strip from Glasgow to Edinburgh. That's what most of us feel' [I#15]. One stalker simply said: 'I'm not daft, I know that the Minister for Environment won't understand what the deer sector is dealing with right now' [I#12]. Conversely, an ecologist argued that, in their experience, many stalkers were reluctant to listen to people outside of stalking: "you try getting them out of their little glen: [and they respond] 'you can't tell me anything young lad'" [I#28].

Finally, a crucial aspect of contention concerned, as Zimmerman et al note, 'deeply-held value differences over a symbolic animal' (2020, p. 3) which, in this case, is the red deer. Many of those with a sport stalking interest lamented what they saw as a loss of respect for deer (**3e, Figure 21**). One stalker saw it like this: 'the red deer has gone from the Monarch of the Glen [in reference to Edwin Landseer's 1851 painting] to treated as vermin. That's taken about 20

years to do that' [I#17]. Another stalker said deer have: 'been made out to be public enemy number one' [I#26] whilst an estate owner said: 'rather than being an iconic species, they became a problem' [I#18]. For these people, this lack of respect for deer was expressed through an increase in practices such as carcasses being left on the hillside after being shot, rather than, as one stalker said, 'respecting the carcass by putting it into the food chain' [I#45] for human consumption.

Refuting this, a land manager who undertook stalking on a conservation-focused estate said there was often hypocrisy around respect for deer: 'it annoys me how a lot of traditional stalkers talk about how it's good to be feeding their stags in the winters and you have one bad winter and they're losing hundreds of deer. If you really cared about your deer, you wouldn't allow hundreds to die. You'd have a lower number and a healthier herd' [I#32]. Other conservationists said sport stalking interests used deer welfare as an argument to avoid further culling, as explained by one: 'in our deer [management] group, it's always reframed around deer welfare' [I#1]. Summing up their position on behalf of their organisation, another conservationist simply stated: 'we are pro-deer, not anti-deer' [field-notes, 08/22].

Examining this case through the prism of identity conflict reveals that, as Zimmerman et al note, at this level 'conflict is no longer framed solely in terms of wildlife, but rather, through broader grievances or tensions over social beliefs' (2020, p. 3). In this case, many stalkers have 'come to feel that their identity or values differ fundamentally from those who are perceived as trying to address or "meddle" in [the] issue' (Zimmermann, McQuinn and Macdonald, 2020, p. 3). Moreover, as Madden and McQuinn observe, at this level, identities come to be 'defined in opposition to another's because of perceived threats to - in this case, deer stalkers' - way of life' (2014, p. 101). Applying this deeper level of analysis therefore produces a much more complex picture than that of simply a dispute about deer numbers. We next discuss the framework's utility and the study's limitations, and briefly look ahead to potential solutions to the conflict.

## 5.6 Discussion

### 5.6.1 Framework's utility

The framework has acted as a useful tool to demarcate the different layers of conflict in this case study and the issues that comprise each of these layers. For dispute level 1 factors, this included deer densities, deer fencing, contract deer stalking, deer stalking seasons and night shooting. Factors at level 2 of the underlying conflict included controversial culling events, unsuccessful conflict resolution attempts, insufficient government enforcement of deer management, perceived contradictory policies and policy reversals and the pace and scale of change in deer management. And factors at level 3 that we class via the framework as identity conflict included the livelihoods of deer stalkers, the purpose of deer stalking, the community impact of changes in deer stalking, a perceived lack of understanding of those outside deer stalking towards the sector and the values around deer themselves.

The framework's application reaffirms a number of findings identified in the literature. This includes criticisms of the regulatory model of deer management such as the inadequate enforcement of cull targets, as noted by Phillip et al (2009). Concurrently, we found that the 'voluntary' and 'collaborative' system of deer management in the Highlands is coming under increasing strain because of its perceived shortcomings in delivering habitat improvements at a faster pace and larger scale, something observed by Eastwood et al (2022) in their study of collaborative land management in the Cairngorms. We also note that the framework's application enabled us to identify new areas of contention not previously recorded in the literature, such as contention over contract stalking, whilst allowing us to assemble, in one place, many different factors involved in upland deer management which have so far remained scattered across a diffuse literature.

Additionally, the framework's application shows how some stakeholders, particularly deer stalkers, estate managers and landowners, often cast themselves as possessors of local, rural and therefore 'legitimate' knowledge in relation to deer management, which they contrasted with those they deemed to be 'external' to deer management, such as policymakers, regulators and conservationists. Whilst others have noted this performative dichotomy between stakeholders involved in upland deer management in the Highlands (Irvine *et al.*,

2009; Reed *et al.*, 2009; Davies and White, 2012), both Hare et al (2021) and Whitefield et al (2021) found no major differences between the attitudes of Scottish rural and urban publics across a range of aspects in deer management, perhaps demonstrating how this form of ‘othering’ is strategically deployed by some actors involved in upland deer management to delegitimise those with opposing views.

We also believe that a focus on identity conflict in the framework enables us to examine what VandeSteege calls a ‘particular sense of place’ (2021, p. 146), by demonstrating the extent to which many deer stalkers feel threatened by the current trajectory in deer management, in terms of eroding both their ‘purpose’ and the continued existence of what many stalkers regard as the cultural heritage of open-hill stalking in the Highlands. Antagonism can be therefore be viewed as a defensive response to perceived attacks on what Cox et al describe as a ‘ritualistic... rural institution’ (Cox, Hallett and Winter, 1994, pp. 190–191). This deeper level of analysis also provides space for the emotions of stakeholders to be captured, such as feelings of anger and loss around rural change (Burnett, 1998; Naumann and Rudolph, 2020; Turner *et al.*, 2020; Fienitz and Siebert, 2022; Vercher, Bosworth and Esparcia, 2023), something that is not always apparent when discussing seemingly technical management disputes over land and wildlife (Buijs and Lawrence, 2013). We feel that the framework allows for an examination of these type of factors that may otherwise go unnoticed, resulting in a potentially ‘*misleading*’ impression of conflict (Stinchcomb, Ma and Nyssa, 2022, p. 3)

The framework also enabled us to observe cases of what Madden and McQuinn describe as ‘intragroup conflict’ (2014, p. 101) even within the relatively small and homogenous (in demographic terms) industry that is deer stalking in the Highlands (Thomson *et al.*, 2020; Scott, 2023). Amongst this group there were a range of contrasting views, with deer stalkers expressing very different sentiments on the ramifications of deer reductions for employment as well as over the impacts of contract stalking and practices of and value positions on deer welfare. This is recognised by Madden and McQuinn, who elaborate that: ‘hunters, while often lumped together as a single group, often contain conflicting sub-groups’ and that ‘as diverse as human nature is, so are the possible manifestations of identity conflict’ (2014, p. 101).

The framework’s application further highlights the increasingly contested ‘multivalence’ of deer and their management, as described by Fiorini et al (2011) in reference to the different

ways in which deer are valued. This was evident in some stalkers' claims that deer were being afforded less 'respect', by being treated as 'vermin', and that practices like contract stalking, night shooting, the removal of the close season for stags and carcasses being left on the hill marked, for these stakeholders, negative qualitative shifts in the way deer are managed. Similarly, the framework demonstrates how many stakeholders engage in processes of 'agenda-setting', as observed by Dandy et al (2014) in their study on deer management, to determine the boundaries of legitimate debate and action. This includes, for example, discursive parallels drawn between current changes in deer management and the emotive legacy of the Highland Clearances by some stakeholders with a sport stalking interest to stymie change, as well as references to the climate and nature 'emergency' by some conservationists and policymakers to confer greater urgency on the need for higher culls.

Finally, we believe the framework's application to this case demonstrates its continued value for understanding rural land use and wildlife management conflict more broadly, as has been similarly evidenced through its application to other cases (O'Rourke, 2019; De Wit, Jani and Webb, 2020; Crespini and Simonetti, 2021; Glikman *et al.*, 2022). This is primarily because it can be used to translate and assimilate often complex factors into a more readily digestible format, whilst also providing a more rounded picture of conflict scenarios than that offered by analyses operating at a solely technical level. It has also been shown, through application in this case and in others, to be a flexible form of analysis that can be applied across very diverse contexts of rural land use and wildlife management, because of the tendency of dispute, underlying and identity-type factors to exist within such contexts, even if they are not always described or understood in this way. However, we also note that the framework does have some limitations which should be borne in mind in order for it to be used effectively, as we turn to now.

### 5.6.2 Study's limitations

Firstly, although the framework is primarily designed for analysing conflict, it does not highlight where commonalities between stakeholders exist, which may present a false picture of the case by over-emphasising contention. For example, areas of agreement between the different stakeholders, such as the need for greater investment in the venison supply chain

to support higher culls, are not captured by the framework. Similarly, the framework may underplay some of the participants' shared values, such as, in our case, a common belief in environmental stewardship of the land (despite differing views on how this is best achieved) as well as a shared appreciation of deer and their ecological and cultural role in the Highlands. The framework further assumes that identity-based issues are the roots of conflict, which will not be the case for all conflicts over rural land use and wildlife management where other issues, such as economic trade-offs or spatial incompatibilities, take precedence (Fienitz, 2023). Effective use of the framework, particularly when it comes to understanding level 2 underlying factors, also requires good knowledge of a case's historical context, which will not always be possible or straightforward to acquire. Finally, it is important to acknowledge that the application of the framework in our case and in other cases can only, ultimately, produce a subjective and partial portrayal of the situation, because like all frameworks, it encompasses a particular way of understanding conflict.

We also acknowledge limitations in our methods which have ramifications for our findings. These include the reliance on participants involved in the mediation process, recruited by a steering group of individuals from different organisations involved in upland deer management, which placed constraints around the type of participants we draw upon. For example, participants involved in the mediation were likely more willing to resolve conflict than those not involved and therefore are not necessarily representative of wider views in upland deer management. Relatedly, the participants that were involved could be regarded as the 'usual suspects', a critique that was in fact made by some participants, which may have influenced our study through the reliance on dominant perspectives, to the exclusion of others.

We attempted to address these limitations by purposively drawing on as wide a range of participants as was possible within the communities involved in the mediation and note that, to the best of our knowledge, this paper draws on the largest and most diverse sample of stakeholders involved in upland deer management in Scotland of any study on this topic to date. The lead author, during their evaluation of the mediation and in data collection, was also conscious of the need to maintain an impartial and independent position, and was recruited by the steering group in part because of their lack of prior involvement in upland deer management.

### 5.6.3 'Solving' the conflict?

Finally, it is worth reflecting briefly on what our analysis reveals about ways in which this conflict could be ameliorated. As Sidaway notes, moving from conflict towards 'cooperative relationships [requires] openness and trust', which begins 'with the analysis of the positions, interests, needs and fears of stakeholders' (2005b, p. 36). We contend that our application of the framework to this case has highlighted and assimilated these factors and indicates possible areas in which further progress towards openness and trust could be made. For example, greater identification of shared interests between stakeholders, such as increased venison production, promotion and consumption, could be used as a springboard for further collaboration; this has already been shown to be a direct outcome of this particular case through the joint signing of a letter to the Scottish Government between ADMG and Scottish Environment LINK (two organisations that have long adopted oppositional stances on deer management) advocating for a national venison subsidy scheme (ADMG, 2024). Relatedly, an increasing number of landholdings in Scotland, such as Corroul, Mar Lodge and Rothiemurchus to name three notable examples, are demonstrating that 'conflict' between the objectives of stalking and conservation need only be imaginary. Lastly, our analysis demonstrates that stakeholders from across upland deer management have their own needs and fears and are able to discuss these with one another given the right environment. Moving towards openness and trust, as a condition of conflict amelioration, therefore depends on the ongoing willingness of stakeholders to share such vulnerabilities, within an appropriately facilitated space like that provided by the Common Ground Forum, so that mutually agreeable solutions may be found.

## 5.7 Conclusion

In this paper we have produced a novel case study application of the 'levels of conflict' framework, adapted and combined from work by Madden and McQuinn (2014) and Zimmerman et al (2020), to upland deer management in the Scottish Highlands. To evidence our analysis, we undertook an in-depth, qualitative study, drawing on the perspectives of a wide range of stakeholders involved in Highland deer management. The applied framework

shows how contention over upland deer management in the Highlands extends beyond a dispute about deer populations and their impacts, towards underlying factors of historical controversy and distrust between parties as well as competing issues around individual and collective identity amidst rural change. The paper has reconfirmed the complexities and nuances of the case, but rendered them easier to comprehend through the application of the framework, providing a fresh insight into this long-running debate.

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*Note that the figure numbers have been changed from the published version to align with the rest of the thesis. References to supplementary material in the published version have also been placed with references to Appendix E.*

## 6. Unlocking antlers? An evaluation of an environmental mediation process in Scotland based on direct observation

### 6.1 Abstract

Environmental conflicts are increasing as is interest in ways they can be managed. However, evaluations of environmental conflict resolution (ECR) processes based on direct observation remain scarce, despite ECR existing for over half a century. Furthermore, there are few evaluations of ECR processes that have been conducted outside of the United States, which limits understanding about the different contextual applications of ECR. These significant shortcomings hamper the generation of practical and knowledge-based learning, as well as theory building in ECR. To address this, we use a subset of criteria from the ECR literature pertaining to 1) outcomes, 2) process and 3) relationships to assess data generated through direct observation of an environmental mediation process, alongside interviews and surveys of participants, focused on ameliorating conflict over upland deer management in Scotland. Our results indicate that mediation fostered positive relationships, was generally procedurally effective but achieved limited tangible outcomes. We then provide some longer-term reflections on the mediation process, discuss the strengths and limitations of our criteria, and note lessons from our experience conducting an evaluation of an ECR process. We conclude by calling for more evaluations of ECR processes based on direct observation to be conducted to build understanding of effective practice.

### 6.2 Introduction

#### 6.2.1 Overview

Environmental conflicts are increasing globally over the use and management of water (Gleick and Shimabuku, 2023), farmland (Czarnecki *et al.*, 2023), wildlife (Abrahms *et al.*, 2023) and other resources. As a result, there is an attendant rise in interest in ways such conflicts can be managed (Fisher, 2014; Clarke and Peterson, 2016; Zikargae, Woldearegay and Skjerdal, 2022; Agnese *et al.*, 2023). Environmental conflict resolution (ECR) is a field of practice and

research concerned with resolving conflicts over environmental resources (Fisher and Sablan, 2018). The most enduring approach within ECR is environmental mediation (EM), which involves a deliberative process mediated by a third-party (Dukes, 2004; Emerson *et al.*, 2009). However, despite fifty years of EM (Choquette and Fraser, 2018), there are a paucity of published evaluations of EM processes based on direct observation in the academic literature (Neuman, 1996; Holzinger, 2001), few evaluations outside of the US and a lack of evaluations conducted by independent researchers rather than dispute resolution practitioners (Sipe and Stiftel, 1995; Harrison, 1997; Sipe, 1998; Emerson *et al.*, 2003). These shortcomings constrain practical and knowledge-based learning as well as the development of ECR theory (Holzinger, 2001; Todd, 2001; Foley, 2007).

We address these shortcomings by undertaking an evaluation of an EM process focused on ameliorating conflict between stakeholders involved in upland deer management in Scotland (Leavey-Wilson, Fisher and Staddon, 2025a). Our evaluation is based on direct, real-time observation of the process and interviews and surveys of the participants and mediators involved over a period of two years. To conduct our evaluation, we use a subset of criteria synthesised from the ECR literature pertaining to 1) outcomes, 2) the process and 3) relationships, which we subsequently apply to our data from the EM process. Our results suggest that mediation fostered positive relationships between participants, was generally procedurally effective but produced limited tangible outcomes. We then provide some longer-term reflections on the EM process, discuss the strengths and limitations of our criteria and note our learning from conducting the evaluation. We conclude by calling for more evaluations of ECR processes based on direct observation to be conducted to strengthen the practice, knowledge and theoretical base around ECR. The next section defines key conceptual terminology for this study.

### 6.2.2 Defining environmental conflict, ECR and environmental mediation

We use Emerson *et al.*'s (2003, p. 4) definition of environmental conflicts as 'fundamental and ongoing differences among parties concerning values and behaviour as they relate to the environment'. Walker and Daniels (2019, p. 1) argue that environmental conflicts are characterised by 'complexity, controversy and uncertainty', whilst Capitini *et al.* (2004, p. 764)

highlight factors such as ‘biological intricacy, multiple parties and issues, unique values and worldviews, scientific and traditional knowledge and legal requirements’. ECR cases have related to waste management (Holzinger, 2001), public land planning (Moore, 1996), water usage (Neuman, 1996) and conservation (Reed and Sidoli del Ceno, 2015).

ECR is defined by Fisher and Sablan (2018, p. 9) as ‘a range of consensus-building approaches in which parties voluntarily participate to resolve environmental issues that are or could potentially be in dispute’. According to Dukes (2004), ECR processes tend to be face-to-face, deliberative in nature and use consensus-based decision-making as the foundation for agreements. EM is the earliest form of ECR, with the term coined during the 1974 Snoqualmie River dispute case in Washington State (Patton, 1983), with its development led by practitioners (Susskind, 1981; Cormick, 1982; Bingham, 1986; Smith, 1996). EM is characterised by the presence of a third-party mediator (Harder, 1995). As a field of research, EM remains US-centric, although there are increasingly more international examples, including from Canada (Doelle and Sinclair, 2010), Italy (Di Salvatore, 2019), Germany (Holzinger, 2001), China (Zhao, 2004) and India (Mishra and Tripathi, 2022). In the UK, our study context, EM has grown very slowly (Harrison, 1997; Tromans, 1999), although there has been a small increase in attention over the past 20 years (Sidaway, 2005a; Sidaway and Stark, 2009; Sullivan and Solomou, 2011; Reed and Sidoli del Ceno, 2015).

Despite the proliferation of EM, published evaluations in the academic literature of EM processes based on direct observation are scarce (Neuman, 1996; Holzinger, 2001) and, instead, retrospective case studies remain dominant (Talbot, 1983; Todd, 2001; Turkiewicz and Allen, 2014; Bingham, 1986). This is largely because of the difficulty researchers have in accessing mediation spaces, owing to ethical, logistical and cost-related challenges (Fisher and Sablan, 2018). Nevertheless, Hall (2013, p. 8) notes that ‘methodologically, the field would benefit from research based on direct observation of cases occurring in real-time’. Whilst there is little such work to draw on, this has not limited the development of a conceptual literature focusing on how ECR processes should be evaluated (Fisher and Sablan, 2018). In the next section, we explain how we identified our criteria from this literature to evaluate the process under study.

### 6.2.3 Evaluation criteria

We found 12 contributions in the ECR literature that specify evaluative criteria (Susskind, 1981; Bingham, 1986; Buckle and Thomas-Buckle, 1986; Moore, 1996; Neuman, 1996; Holzinger, 2001; Todd, 2001; Rowe, 2003; D’Estrée, Colby and Beck, 2004; Foley, 2007; Orr, Emerson and Keyes, 2008; Emerson *et al.*, 2009) and noted that these can be categorised as relating to 1) outcomes, 2) process or 3) relationships. We grouped the criteria that most frequently appeared amongst the contributions and were most appropriate for our case and condensed this into five themes and corresponding questions for the three categories (see Figure 22).

1. Outcomes	2. Process	3. Relationships
<ul style="list-style-type: none"><li>• <b>1a. Nature of the agreement</b> – Was an agreement reached which was acceptable to all parties and practicable for all parties to follow?</li><li>• <b>1b. Degree of conflict</b> – Has conflict over the issues decreased?</li><li>• <b>1c. Party knowledge</b> – Did parties increase their knowledge of the issues?</li><li>• <b>1d. Issue coverage</b> – Were most or all of the issues covered?</li><li>• <b>1e. Additional impacts</b> – What beneficial impacts resulted beyond the process?</li></ul>	<ul style="list-style-type: none"><li>• <b>2a. Parties and participation</b> – Were all relevant parties identified, represented and engaged in the process?</li><li>• <b>2b. Role of the mediators</b> – Did the mediators play an effective role?</li><li>• <b>2c. Perceived fairness and transparency</b> – Was the process perceived to be fair and transparent by the parties?</li><li>• <b>2d. Use of information</b> – Was information used effectively during the process?</li><li>• <b>2e. Ownership and accountability</b> – Did parties have ownership of determining solutions to the problem and were they accountable for delivering on these?</li></ul>	<ul style="list-style-type: none"><li>• <b>3a. Communication</b> – Has communication increased and improved between the parties?</li><li>• <b>3b. Understanding and empathy</b> – Has cognitive and affective awareness of different party values and assumptions increased?</li><li>• <b>3c. Collaboration</b> – Has collaborative working improved between the parties?</li><li>• <b>3d. Trust</b> – Has trust increased between the parties?</li><li>• <b>3e. Resilience and capacity</b> – Do parties now have a better ability to resolve future disputes?</li></ul>

**Figure 22. Evaluation criteria created from a review of ECR literature.**

*Adapted from: (Susskind, 1981; Bingham, 1986; Buckle and Thomas-Buckle, 1986; Moore, 1996; Neuman, 1996; Holzinger, 2001; Todd, 2001; Rowe, 2003; D’Estrée, Colby and Beck, 2004; Foley, 2007; Orr, Emerson and Keyes, 2008; Emerson et al., 2009)*

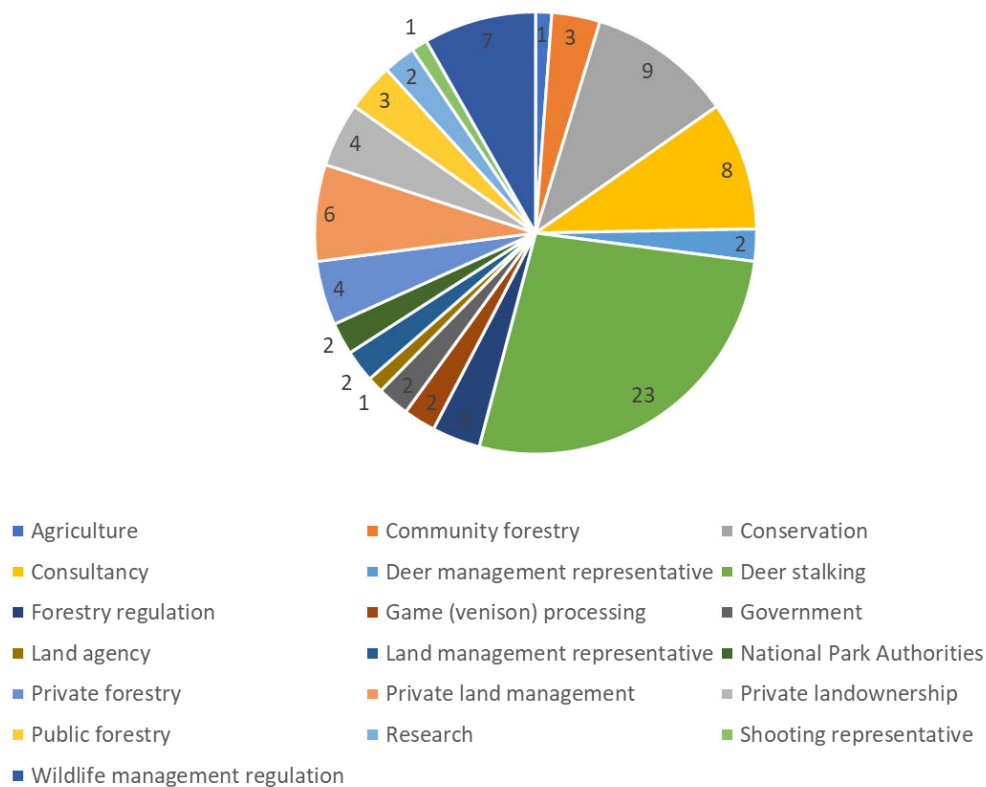
We note a caveat with our criteria by acknowledging that there are no universal measures of ‘success’ in EM, that measures are context-dependent and rely on the perspective and aims of the person(s) conducting the evaluation as well as the different judgements of participants and mediators (Holzinger, 2001; D’Estrée and Colby, 2004; Sikor *et al.*, 2014). Evaluation criteria should reflect the realities of what is a contested and subjective undertaking (Orr, Emerson and Keyes, 2008; Fisher and Sablan, 2018) and we have therefore attempted to balance the range of criteria within ECR, whilst selecting criteria that we believe are of value to the case under study. Appendix E.1 contains the full evaluation criteria we reviewed from the ECR literature and Appendix E.2 explains the rationale for our criteria. The next section details our methods.

## 6.3 Materials and methods

### 6.3.1 Case overview

This paper is based on an independent evaluation of an EM process called *Finding the Common Ground on Sustainable Upland Deer Management* (ADMG, 2023). The aim of the process was to ameliorate conflict between stakeholders involved in the management of wild deer in the Scottish Highlands in the UK, in the context of national policy change as part of reforms to deer management made by the Scottish Government focused on increasing deer culling for climate and biodiversity objectives (Pepper, Barbour and Glass, 2019; Scottish Government, 2021; NatureScot, 2024a; Leavey-Wilson, Fisher and Staddon, 2025a).

A conflict assessment was conducted by the mediators in May 2021 with mediation taking place between August 2022 and June 2023. The process comprised five workshops, involved 85 participants from 49 organisations, was conducted by seven mediators and led by a steering group containing cross-sector participants. Figure 23 below shows the number of participants involved by sector.



**Figure 23. Mediation participants by sector.**

*The pie chart shows the number of participants involved in the mediation by sector. N = 85*

### 6.3.2 Data collection and analysis

Data, collected between April 2022 and August 2024, included direct, participant observation undertaken throughout the process (as well as before and after it) at workshops, events and meetings using field-notes. The lead author interviewed 39 participants (46%) and five mediators (71%) between January 2023 and April 2024. We conducted an entry and exit survey at the first and after the final workshop. The entry survey received 35 responses (85%) and the exit survey had 28 responses (68%). All data was coded in NVivo 14 to identify relevant content for evaluation, using an inductive approach consistent with that used by Moore (1996) and Fisher and Sablan (2018) in their work on EM evaluations.

In the next section, we produce our results by applying our criteria to this data. Where used, quotes from or references to observations during process activities are cited as [field-notes,

MM/YY], interview quotes or references are cited as [I#X] and survey responses are cited as [S#X].

## 6.4 Results

This study provides an evaluation of an environmental mediation process in Scotland, focused on ameliorating conflict between stakeholders involved in upland deer management, based on direct observation as well as interviews and surveys of participants, using a subset of criteria from the ECR literature. Here we present our results according to that criteria in three sections relating to 1) outcomes, 2) the process and 3) relationships. Each of these sections contain five sub-sections labelled as 1a etc., corresponding to the criteria contained in Figure 27.

### 6.4.1 Outcomes

This first section presents results on five outcome-based criteria specified in Figure 22: 1a) nature of the agreement; 1b) degree of conflict; 1c) party knowledge; 1d) issue coverage; and 1e) subsidiary or additional impacts.

#### *6.4.1.1 1a) Nature of the agreement – Was an agreement reached which was acceptable to all parties and practicable for all parties to follow?*

An agreement was collectively written by the parties called ‘Our Common Ground Accord’ which contained seven principles for collaborative working on upland deer management. After an hour of discussion, including some disagreement over the principles, all parties present confirmed that they would be able to sign-up to and implement the agreement on behalf of their organisations. During the discussion, some parties expressed scepticism about how compliance with the principles would be monitored and enforced and by whom, and that the principles were overly general or, as one participant put it, lacking a ‘practical mechanism’ [field-notes, 06/23] for implementation. In contrast, others regarded the principles as a considerable achievement in the face of ongoing conflict and as a foundation for reaching

consensus on future issues, with one participant saying the agreement was of: ‘symbolic importance because organisations that used to be at each other’s throats are now on the Accord together’ [field-notes, 06/23].

In the months following the agreement, further organisations in the upland deer sector signed it, which, by August 2024, included the most significant stakeholders within the sector. However, there has been some ongoing confusion around the Accord’s compliance and enforcement, with one participant noting just three months after the conclusion of the mediation that: ‘some people are already not keeping to it’ [field-notes, 09/23] whilst another said that: ‘95% of people that have signed it have forgotten about it already’ [I#37].

#### *6.4.1.2 1b) Degree of conflict – Has conflict over the issues decreased?*

Amongst the parties involved in the mediation, we observed that, by its conclusion, conflict in the form of language used had improved, whilst substantive divergences on specific issues persisted, with one participant capturing this sentiment: ‘I think it has diffused some tensions... although differences remain’ [S#26]. Whilst mediation was proceeding, a flashpoint occurred in the wider deer sector between organisations represented in the process over a long-standing dispute in the north west of Scotland, which a mediator said almost derailed the process [I#43], whilst a participant expressed disappointment that the process did not sufficiently ‘address’ this incident [I#21]. A number of participants noted that the ‘real test’ of mediation would be Scottish Government reforms to deer management due to be implemented in the 18 months following the process’ conclusion, with one participant asking: ‘will the debate remain civil and constructive then?’ [I#38]. Time has shown that there remain ongoing public differences between organisations on issues including the close seasons for deer stalking as well as strengthened powers for government intervention on deer management. However, we have observed, through ongoing direct engagement with participants as well as further engagement with other stakeholders in the sector, and by monitoring discourse in online media on upland deer management in Scotland, that the level of contention generated by these disagreements has been relatively muted in comparison to that prior to and during the earlier stages of the mediation, perhaps indicating that the process and the Accord has helped to suppress this to some extent.

#### *6.4.1.3 1c) Party knowledge – Did parties increase their knowledge of the issues?*

Through observing participants during the process as well as in interviews conducted during and after it, there appeared to be limited learning generated by the process for most parties involved, for reasons we explain. More important was the increase in participant understanding about *why* certain views were held, which is discussed in more detail in section 3.3.2. The process was not information-heavy, perhaps largely because of the (intentional) lack of subject-expertise that the mediators had of deer management (discussed in sections 3.2.2 and 3.2.4). Whilst one of the workshop themes was ‘knowledge exchange’, it was widely felt that this was not achieved, with one participant saying: ‘we didn’t get that’ [I#28]. At the core of the dispute was not necessarily a lack of knowledge about the issues, but fundamental political disagreements about them. Finally, because of the relatively small size of the upland deer sector and the often-close working proximity of stakeholders, there was already a high degree of party familiarity, as one participant explained: ‘everybody pretty much knows everyone else in the deer world, it’s pretty small. They know each other’s positions; they’ve been made pretty clear’ [I#16]. Exceptions to this were the involvement of senior civil servants, one of whom said they had: ‘no technical knowledge [or] knew anything specifically about the deer issue before I came into [the job]’ and that their involvement in the process was therefore a valuable learning opportunity for them [I#25].

#### *6.4.1.4 1d) Issue coverage – Were most or all of the issues covered?*

Through interviews with participants at the end of the process and through observation at the concluding stages of the mediation, it appeared that by the end of the process, most of the salient issues involved in these debates were covered, though with varying degrees of pace and depth. The first two workshops were focused on (re)establishing relationships between participants, identifying party fault-lines and probing some of the values and assumptions behind participant viewpoints. Whilst most participants seemed to understand this rationale, a number of participants complained that there was a lack of ‘grit’, with two describing it as: ‘motherhood and apple pie stuff’ [I#4; 35]. Another said there were ‘10 wicked issues’ they wanted to see ‘tackled’ but said, after attending the first two workshops, that they: ‘didn’t think we’d taken any of those issues on in any way’ [I#2]. In part because of

this feedback, the third workshop had a more focused aim to deliver ‘knowledge exchange’, however many felt this was not pursued, with a number describing it as a ‘dip’ in the process [field-notes, 04/23], whilst one participant said they ‘walked out the door’ because of a lack of issue coverage [I#22]. The fourth workshop was received more favourably because it directly addressed fears around employment loss and rural change in the deer stalking community, which many participants felt was the central issue from the start. The final workshop was also deemed more successful by participants in addressing the thornier issues, although a number of participants bemoaned the amount of time it had taken to arrive at this stage, with one calling it a ‘slow burn’ [S#2].

#### *6.4.1.5 1e) Additional impacts – What beneficial impacts did the process produce or help to produce?*

Several impacts have resulted from the mediation. The first of these was the establishment of the Common Ground Forum (The Common Ground Forum, n.d.c) to continue work begun by the process and to maintain connections between participants. This forum has organised a number of events, including a meeting between deer stalkers and MSPs at the Scottish Parliament to discuss forthcoming legislation, as well as events at Highland estates to connect deer stalkers. One of these events included senior civil servants who were able to hear first-hand objections to reforms from some deer stalkers [field-notes, 08/24]. Other impacts include the Scottish Government’s announcement of a deer cull incentive scheme to pay deer stalkers additional funds to cull more deer in order to cover management costs, which was identified as one of the key barriers to increasing the national cull. One participant summed up their view by saying the process had: ‘made more difference than anything else I’ve been involved in in 30 years’ [field-notes, 05/24].

Some participants have, however, criticised a lack of tangible, ‘on-the-ground’ delivery, particularly in relation to ongoing conflict within Deer Management Groups (DMGs) [field-notes, 08/24]. Furthermore, others said that they had observed little indication that mediation has changed deer management practices or influenced a shift towards more ecologically restorative management. However, the pace and scale at which such change can feasibly be achieved means there may need to be more time allowed to demonstrate whether this remains the case in the future.

To summarise, according to our evaluation criteria, the mediation process achieved some limited outcomes, although there remain questions over the impact, practicability and durability of these.

#### 6.4.2 Process

This section presents results on five procedural criteria specified in Figure 22: 2a) parties and participation; 2b) role of the mediators; 2c) perceived fairness and transparency; 2d) use of information; and 2e) ownership and accountability.

##### *6.4.2.1 2a) Parties and participation – Were all relevant parties identified, represented and engaged in the process?*

The conflict assessment conducted by the mediators identified 46 stakeholders, including statutory agencies, environmental NGOs, private land managers and deer stalkers amongst others. This constituted the core group involved in the early stages of mediation. However, at the first workshop, some participants observed that there was insufficient representation of more 'traditional' deer stalkers and that this had undermined proceedings, as this was widely felt to be the key target group, with one participant saying the process was: 'preaching to the converted' [I#9]. This was addressed relatively quickly, with subsequent workshops involving this constituency to a much greater degree, along with representation on the steering group. A similar problem concerned the forestry sector, although the former soon came to be represented on the steering group as well, despite their earlier 'resistance' to the process [I#41]. Other groups that perhaps lacked adequate representation were the agricultural and venison sector, with one participant saying: 'it wasn't until the last [workshop] that they decided that a [game] processor should actually be at a meeting' [I#37]. There was also limited engagement of Scottish Government policymakers initially, in part because of their expressed 'scepticism' of the process [field-notes, 08/24], although this was later largely rectified. A small number of participants noted a lack of representation of community and 'public' interests, with one describing the process as 'exclusive [and] favouring people that can afford to be there' [I#7], which they felt undermined the 'public interest' dimension of deer management. Finally, there was arguably insufficient representation of private

landowners, who proved very difficult to engage to any significant degree throughout the process.

A number of participants exited the process, some because of time capacity and others because of objections to it, with one describing it as: 'party games' [I#22]. Others continued to be involved but noted a lack of progress at points: 'I just feel that we haven't progressed, I don't think we've done anything', as one participant put it [I#13]. A number of participants said they were impressed by the range of participants involved, with one saying that 'every different walk of the countryside was there' [I#26] and another about the workshops that: 'there was 40 people many of whom you would never get in the same room' [I#15]. This demonstrates the conflicting perceptions about the nature of participation during the process.

#### *6.4.2.2 2b) Role of the mediators - Did the mediators play an effective role?*

The mediators were selected by the steering group without seeking wider consent from participants. However, the mediators and their approach were received favourably by the vast majority of participants. The primary benefit of the mediators for these participants was their perceived independence, with one participant saying: 'it was refreshing... it's good having someone removed from the argument, looking with an unbiased, untainted view' [I#21]. Others were complimentary of the level of 'passion' [I#4] brought by the mediators to what they felt was a long-neglected issue. The mediators were also able to establish good relationships with participants and gain their trust, enabling them to ask participants quite personal questions [I#40]. It was also noted by participants that the mediators had cultivated 'respect' from parties across the upland deer sector over the course of the process [field-notes, 08/24].

A dividing issue amongst participants was whether the mediators' lack of subject-knowledge was beneficial or not to the process, in contrast to all of the mediators arguing it was an advantage because it reduced their bias [I#40-44]. This contributed to the iterative nature of the process and an impression that the mediators were 'winging it' according to one participant [I#11]. However, one mediator reflected that they: 'plan like crazy, but we always prepare to not get too hung up if we have to rip it up', and described their role as helping participants: 'get comfortable being uncomfortable' [I#43]. Other participants noted that the

mediators' lack of 'sector knowledge' at times meant they were not fully aware that certain proposed solutions 'were already being worked on' outside of the mediation [S#11]. A very small number of participants were highly critical of both the mediators and the process, with one participant describing it as a 'load of bullshit' as they felt the mediators were 'lightweight and not serious enough', which undermined their 'confidence' in mediation, influencing their decision to leave [I#23].

#### *6.4.2.3 2c) Perceived fairness and transparency - Was the process perceived to be fair and transparent by the parties?*

The process was regarded by the majority of participants as fair and transparent, with any contrary views being raised to a very limited degree by a small number of participants. Those that did said there was an overcorrection in representation of traditional deer stalking interests latterly in the process, and that an excessive focus on this group was hampering progress because they were: 'dominating the discussion' [I#27]. Others felt that this group actively avoided participating earlier in the process to undermine its aims; 'they're happy to complain, but don't engage' said one participant [S#22]. Similarly, some participants, particularly those working in conservation, felt that they were being asked to concede ground whilst those in deer stalking were not; one such participant therefore questioned: 'why the process would benefit us' [I#2]. For the minority that raised the issue of transparency, this mainly concerned a perceived lack of communication about how decisions were being made. For example, one participant described the process as: 'very opaque [as] it's not clear what the criteria is for setting the agenda' and, for them, it left an impression that the process was 'stitched up' [I#11].

#### *6.4.2.4 2d) Use of information - Was information used effectively during the process?*

The use of information was not raised as problematic by participants in general. As described above, the process was 'information-light', although information that was used included maps, habitat surveys and deer count and cull data. The most notable point at which a lack of data integration within the process was criticised was the third workshop which centered on

knowledge exchange. A majority of participants felt this focus was not achieved, in part because of the limited attention paid to different types of information that were deemed relevant within the context of this theme. As explained above, the lack of information use can in large part be explained by the mediators' unfamiliarity with the topic as well as, explained one mediator, their 'primary objective' [I#44] being to unpick what they saw as a conflict of values, 'rather than getting bogged down in the technicalities of the debate', as argued by another mediator [I#41]. A thornier issue was whether information was used accurately, as there were a small number of occasions when statements by some participants were rebutted by others as inaccurate. An example of this concerned an exchange between two participants about how policy on deer management was being made, with one of the participants saying that what the other one had said was: 'not true' [field-notes, 02/23].

*6.4.2.5 2e) Ownership and accountability - Did parties have ownership of determining solutions to the problem and were they accountable for delivering on these?*

This final procedural criteria can be regarded as generally met, although it took until the end of the process for this to become apparent. The approach that the mediators took to the process was, in part, guided by what they called 'accountable dialogue'; 'it's saying everybody in the room has to contribute to achieve a successful outcome as part of the process. It's about getting [participants] to recognise they have a responsibility' [I#43]. At the start of the process, there was considerable frustration from some participants that the mediation did not appear to be sufficiently outcome-oriented; 'when do we start discussing solutions here?' said one [I#4]. Some of this was borne out of a mismatch in expectations between the relationally-centered process adopted by the mediators, and a desire for more tangible results by some participants. Moreover, there was perhaps an expectation that solutions would be put forward by those leading the process, namely the steering group, rather than participants as a collective. As the process developed, more identifiable, specified actions became apparent, such as, for example, financial incentives for increased culling or the creation of alternative deer stalking models. However, there was reluctance on behalf of many participants to take forward these ideas as actions, largely because of capacity. At the final workshop, there was some visible frustration between the steering group and the wider group of participants about this [field-notes, 06/23]. This was, however, directly addressed by

the mediators, who were able to encourage participants to take more ownership of determining solutions through a concluding activity, resulting in a list of 47 actions. This was regarded as a major success of the process by many participants; ‘coming up with a set of joint actions to take the deer sector forward was beyond my expectations’ [S#22]. The extent to which those who agreed to deliver these actions have done so is more difficult to assess and will require longer-term monitoring. Some measures have been achieved, including limited deer cull incentives as described above, as well as the creation of a ‘joint vision’ for upland deer management. However other, perhaps more complex actions, such as DMG-level conflict resolution, remain outstanding.

To summarise, according to our evaluation criteria, the mediation process can be regarded as generally procedurally effective, although there were issues around participation, representation and accountability.

#### 6.4.3 Relationships

This final section of results evaluates the process against five relational criteria in our criteria: 3a) communication; 3b) understanding and empathy; 3c) collaboration; 3d) trust; and 3e) resilience and capacity.

##### *6.4.3.1 3a) Communication - Has communication increased and improved between the parties?*

Hostile communication between the parties was recognised as a major problem at the start of the mediation, despite the familiarity many participants had of one another. This was exemplified in online press releases, including one published during the first workshop by an invited organisation that did not attend, which resulted in visible consternation in the room: ‘because it was just absolutely counter to everything that had been discussed’ [I#35], as well as in face-to-face engagement, with one participant describing how staff from their organisation had been ‘bullied’ by those from another [field-notes, 08/22]. In addition, over the course of the process, as mentioned above, there was a widely publicised dispute between two of the parties over a local deer management conflict, which saw a succession of what one participant called ‘inflammatory’, ‘controversial’ and ‘outrageous’ articles produced

by one of these parties and a public rebuttal by the other [I#6; 2]. One of the key elements of the signed agreement committed parties to conduct respectful public-facing communications. However, subsequent months indicated this was not universally maintained, most notably when one party published an article announcing it would be boycotting a government consultation on deer management reform showing, according to one mediator, that the process had: 'by no means fixed everything' [I#41].

However, other elements of communication have improved. A joint press release published by two traditionally opposed organisations demonstrated cross-sector unity on a venison subsidy scheme to the Scottish Government, whilst it was noted that these organisations now: 'disagree better' [field-notes, 01/24]. Similarly, another two organisations who have a history of significant contention came to sit on the steering group together and consistently engaged in polite and respectful discussion. Finally, another significant gain was that individual deer stalkers, many of whom lacked a 'voice' because they were not tied to any particular organisation and owing to the isolated nature of the occupation, were able to establish connections with environmental NGOs, statutory bodies and government.

#### *6.4.3.2 3b) Understanding and empathy - Has cognitive and affective awareness of different party values and assumptions increased?*

An increase in understanding and empathy between parties has been observed to a considerable degree, with many participants saying they now understood the reasons behind others' positions. For example, one participant noted that, after listening to other participants, they came to understand: 'why the issue of leaving deer carcasses on the hill elicited fierce emotions' [field-notes, 06/23]. Another participant also highlighted how the process had enabled them to: 'question [peoples' assumptions] in a non-judgmental environment' [S#6]. Much of the increase in empathy concerned participants' understanding about why many deer stalkers felt worried about proposed government reforms, particularly the perceived threats to employment and 'ways of life' and the physical and psychological impact of increasing culls. Some of this reasoning was new to participants, whilst for others it was the first time that they had heard 'individual stories' directly from deer stalkers about the impacts of change [field-notes, 11/22].

The process also helped to demonstrate that as one participant said, parties have: ‘a shared understanding of the fundamental issues of the climate and biodiversity crises’ [S#6] although what action should be taken by whom, and at what pace and scale, remains far from agreed which, for one mediator, persisted ‘as an irreconcilable kind of conflict’ throughout the process [I#40]. Moreover, it appeared that the increase in empathy around deer stalkers’ worries about employment was not reciprocated for conservationists’ anxiety around perceived environmental inaction. Similarly, there appeared to be little empathic exchange towards the challenges faced by foresters to produce timber whilst diversifying woodland habitats.

#### *6.4.3.3 3c) Collaboration - Has collaborative working improved between the parties?*

Collaborative deer management is regarded as a practical necessity because deer move between landholdings and, in Scotland, are legally owned by no one, with DMGs representing the primary forum for cross-boundary management. However, ‘on-the-ground’ collaboration has been regarded as inconsistent across the Highlands for many years. In this respect, the process has had limited noticeable impact, as argued by one participant: ‘I’ve still yet to see conflict resolution at that DMG, cluster of estate level’ [I#21]. One mediator reflected that this was a limitation of the process to: ‘not have more capacity to be in the field [to] encourage the cascade of information’ to the ground-level [I#41]. Although it is worth noting that, as of July 2025, three DMGs had signed the Accord, whilst a new deer management forum was established in Moray using the Accord as a founding document (Findhorn Watershed Initiative, 2024; The Common Ground Forum, n.d.a).

At the organisational level, there are signs that elements of collaborative working have improved, such as in the joint advocacy pursued by two formerly oppositional organisations, as well as increasing face-to-face engagement between other organisational representatives, including public forestry and deer/private estate management, as well as deer stalking and policymakers [field-notes, 06/24]. There therefore remains a mismatch between progress at the organisational and local level in terms of collaborative working.

#### *6.4.3.4 3d) Trust - Has trust increased between the parties?*

Based on our observation of how participants engaged with one another by the end of the process and after it, and in interviews with participants at the end of the process, this criterion can be viewed as largely met, at least amongst the majority of parties involved, as there are a small number of parties where issues in this regard persist. Trust within the context of upland deer management largely concerned the motives of others. For some participants on the deer stalking/estate management side, they felt that reforms to deer management proposed by government and supported by conservationists were being used as a proxy for land reform [I#26]. Conversely, several conservation participants said the arguments put forward by deer stalkers and estate managers were about preserving what they saw as an antiquated land management model, rather than about genuine employment fears [field-notes, 03/23]. The process generally allowed for this kind of conflict to be excavated and, on the whole, it can be said that it produced a greater appreciation of the real motivations behind different party positions as a result. However, some participants did feel that the process was overly 'polite' [I#4] and did not permit a more direct and honest examination of underlying rationales; 'if anything, a lot of it didn't feel quite brutal enough' [I#1]. For example, there was reference by different participants made to the perceived lack of openness from government and regulatory bodies about their proposed reforms to deer management, as well as that some participants were 'hiding behind their organisation' rather than presenting their individual views [I#3].

#### *6.4.3.5 3e) Resilience and capacity - Do the parties now have a better ability to resolve future disputes?*

On the whole, the parties appear to have improved their capacity to resolve future disputes, in particular because of the establishment of a forum to continue the work begun by mediation, which one participant described as: 'groundbreaking' [field-notes, 08/24]. A number of participants have also undergone conflict resolution training subsequent to mediation, whilst others have, at minimum, been exposed to the option of conflict resolution. In addition, the agreement produced by the process provides a tangible reference point that could, if applied consistently, be used to avoid disputes arising. However, there also appeared

to be collective awareness that the coming years, in terms of the scale of policy change, has the propensity to, according to one participant, 'blow the process apart' cautioning that whilst: 'we have achieved a lot in terms of building better relations, this is only a temporary achievement' [field-notes, 08/24]. Yet, the 'sense of ownership and momentum' highlighted by one mediator indicated to them a collective will amongst participants to pursue longer-term conciliation [I#41]. Another mediator therefore felt that, because of the process: 'when we step away, things will hopefully continue in an upward trajectory, rather than going back to the cyclical nature that they were in' [I#43].

To summarise, according to our evaluation criteria, the process helped to foster positive relationships between participants, built on increased understanding, empathy and trust, which suggests to us a positive foundation for future conflict resolution.

## 6.5 Discussion

This paper presents an evaluation of an EM process in Scotland based on direct observation, interviews and surveys, using a subset of criteria created from a synthesis of ECR literature. In this section, we provide some longer-term reflections on the mediation process, discuss the strengths and limitations of our criteria and reflect on lessons from our experience conducting the evaluation.

### 6.5.1 Longer-term reflections on the environmental mediation process

Our evaluation shows that mediation improved the relationships between participants and was generally procedurally effective, whilst the outcomes produced were more limited and will require ongoing monitoring. At the concluding workshop of the mediation process and in post-process interviews, we observed a high degree of enthusiasm amongst participants to build on the work established during the process, which resulted in participants jointly creating the *Common Ground Forum* to continue to address conflict in the upland deer sector. We firmly believe that the relationships built between participants long perceived to be on 'different sides' (many of whom nonetheless continue to hold very different views) during

mediation has been critical to this. This therefore leads us to agree with Foley (2007, p. 500) that ECR evaluations should pay greater attention to the capacity of processes to ‘provide transformative opportunities’ for participants. This means not treating relational outcomes as matters secondary to the striking of formal agreements which, to a large extent, remains the dominant view in ECR (Emerson *et al.*, 2009; Fisher and Sablan, 2018). Relatedly, the establishment of a forum to build on the progress made during the mediation process indicates, to a degree, what D’Estrée (2003, p. 123) calls ‘social system transformation’ in that the ‘community’ of participants appear better able to develop ‘coordinated responses to new crises and challenges’. The extent to which this remains true will, of course, only be borne out by time, although early signs are relatively positive. Forthcoming legislation on deer management, and the prospect for more direct government intervention, will represent the primary litmus test in this regard. ECR evaluations should therefore demonstrate awareness that conflict resolution is not static but an ongoing effort, dependent on the commitment of participants, beyond formal mediation processes. We next reflect on some of the strengths and limitations of our evaluation criteria.

#### 6.5.2 Strengths and limitations of our evaluation criteria

Our evaluation criteria aimed to synthesise the range of criteria from the ECR literature, whilst being suited to the EM process we examine. Our criteria ensures that standard measures of efficacy within ECR, such as agreements being reached (Bingham, 1986) and party representation (Susskind, 1981), are accounted for, alongside more nuanced relational outcomes, such as inter-party empathy and conflict resilience (Foley, 2007). At the same time, we agree with Holzinger (2001, p. 424) that ‘some criteria are easier to assess than others’. For example, we found it much simpler to evaluate the creation and quality of an agreement (Emerson *et al.*, 2009), compared to whether a process improved ‘affective and cognitive awareness’ between parties (Buckle and Thomas-Buckle, 1986). It is therefore important to restate that, because evaluation criteria are essentially positivist heuristics, they necessarily depend on a high degree of subjective interpretation and results from their application need to be understood alongside this methodological caveat. Indeed, the criteria that we have used, rooted in ECR, such as ‘fairness and transparency’ and ‘ownership and accountability’ are

inherently terminologically vague and provide only limited guidance as to how they should be assessed. We therefore agree with Todd (2001, p. 99) that there are 'not hard and fast measures of success' within ECR but, at best, 'indicators' of what can be considered effective practice against the body of documented ECR processes.

We also acknowledge that our evaluation criteria are inexhaustive and exclude other important indicators of effectiveness; perhaps most notably the environmental outcomes arising from the process. Both Dukes (2004) and Foley (2007) have drawn attention to this shortcoming in ECR and, whilst noting the significant difficulty in tying causation between ECR processes and environmental outcomes, nonetheless argue for greater consideration of this within ECR evaluations. We contend, however, that for this to be achieved evaluations need to be undertaken for the long-term, which is, regrettably, often beyond the resources of practitioners and researchers. Relatedly, the criteria we use are, of course, selective and have, in part, been chosen on the basis of value judgements we have made in relation to the ECR process under study. This may contradict calls from others in ECR to establish consistent criteria that can be used to compare across ECR processes (Orr, Emerson and Keyes, 2008; Emerson *et al.*, 2009). However, we agree with the reflection provided by Holzinger, who published one of the few ECR evaluations based on direct observation, that 'one's perspective on evaluation determines the relevance of the criteria' (2001, p. 424). We add to this by similarly acknowledging that the chosen criteria, in turn, determines the extent to which a mediation process may be seen as producing limited or significant achievements, and that alternative criteria, or criteria selected by participants and mediators, may therefore produce an alternative picture. In building on such reflections, we next discuss our learning from conducting the evaluation.

### 6.5.3 Lessons from conducting an evaluation of an ECR process using direct observation

To the best of our knowledge, there are only two published evaluations of ECR processes based on direct observation in the academic literature, neither of which are recent (Neuman, 1996; Holzinger, 2001) and we therefore believe there is value in reflecting on some of the lessons from our own experience. The first is that conducting an evaluation of an ECR process through direct observation is time-intensive and additionally onerous for participants as well

as mediators, because of interviews, surveys or simply expressing consent to be involved in a research project, many of whom may not be familiar with such procedures (Holzinger, 2001). It is therefore important that roles and expectations are clearly defined at the outset.

Researchers must also be able to understand and empathise with participants to establish good relationships, such that they feel able to speak openly and honestly. Similarly, a positive relationship needs to be built with mediators and whilst, as Fisher and Sablan (2018, p. 14) note, evaluations can 'force [practitioners] to ask difficult, reflective and critical questions', they can also 'help build the case for ECR' through improving the practice's credibility. At the same time, researchers need to maintain 'critical distance' to ensure that evaluations remain as impartial as possible (Chong, 2013).

We also found a need for significant 'on-the-job' learning to grasp the range of technical issues and socio-political dynamics involved in what is a context-specific, multi-party dispute and we suspect this would be the case for researchers evaluating other cases. This was similarly challenging for the mediators, who did not possess any technical knowledge of the issue prior to their involvement, which they argued increased their neutrality, but which some participants felt made them less effective, and has been critiqued in ECR for many years because of this (Susskind, 1981; Amy, 1983; Sidaway, 2005a; Emerson *et al.*, 2009). We feel, from our experience, that there is a balance to be struck, for both mediators and evaluators, between having sufficient knowledge of the case so that it can be effectively mediated and evaluated, whilst maintaining distance by not having excessive knowledge-based 'baggage' that may lead to preferential weighting of certain issues and perspectives.

An important ethical consideration is the need to maintain and demonstrate confidentiality to participants and mediators, because of the 'sensitive and contentious information' involved (Fisher and Sablan, 2018, p. 14), and we note from our experience that some participants initially expressed reluctance to participate in the evaluation because of this. This is likely one of the reasons why there are so few published evaluations of ECR processes based on direct observation in the academic literature and is an obstacle in accessing mediation spaces for research purposes more generally (Cole, 2005; Agapiou and Clark, 2018).

Another challenge we experienced concerns how to balance the different perspectives involved in mediation, with no consensus on this matter within ECR. For Moore (1996, p. 168),

‘success must be defined and judged’ by participants. In contrast, Orr et al (2008) express scepticism about the merits of relying on participant satisfaction as a measure of efficacy because of its subjective nature. Additionally, Todd (2001) notes the problem of how to navigate the perspectives of mediators, who may have a professional incentive to characterise their work as successful, a problem referred to by Susskind (1981) as ‘the accountability problem’. Ultimately, we argue that this decision rests with the researcher, who must strive to include different perspectives whilst remembering that the evaluation is fundamentally and unavoidably their own interpretation.

A final issue relates to the timings of conducting an evaluation, at what point participants and mediators are interviewed or surveyed, and how long an evaluation proceeds for. We were fortunate to be involved prior to mediation formally beginning and were able to continue to engage with participants and mediators for more than a year after mediation had concluded. Ideally, evaluations should be undertaken for as long as practically possible, so that the full range of outcomes are captured, particularly those that take time to emerge such as environmental improvements (Foley, 2007) or policy changes (Orr, Emerson and Keyes, 2008). Similarly, claims to the effectiveness of ECR processes must be evidenced by the durability of any agreements reached and this necessitates longer-term judgement (Rowe, 2003). We therefore hope that our work has demonstrated the possibility and utility of conducting a longer-term evaluation.

## 6.6 Conclusion

As Fisher and Sablan note, ‘the dearth of evaluative attention on ECR in recent years is a concern, and also an opportunity’ (2018, p. 17). In this paper, we have grasped this opportunity by producing an evaluation of an environmental mediation process in Scotland, focused on ameliorating conflict over upland deer management, through direct observation alongside interviews and surveys of participants. We used a subset of criteria pertaining to the 1) outcomes, 2) process and 3) relationships synthesised from relevant ECR literature and applied this to our data from the case. Our results suggest that mediation fostered positive relationships between participants, was generally procedurally effective but produced more limited tangible outcomes. We subsequently provided longer-term reflections on the

mediation, discussed the strengths and limitations of our criteria and noted the lessons from our experience undertaking an evaluation of an ECR process. Better understanding of effective ECR practice is increasingly needed as environmental conflicts grow around the world, and we conclude by calling for further evaluations of ECR processes to be undertaken for practitioners and researchers to learn from, so that more antlers can be unlocked.

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*Note that figure and table numbers have been changed from the published version of this chapter to align with the rest of the thesis. A reference to Supporting Information in the published version of the chapter has also been replaced with a reference to Appendix B.3.*

## 7. Views from the hill: Deer stalkers' perspectives on land-use change in the Scottish Highlands

### 7.1 Abstract

- 1.** Land-use and wildlife management are changing globally as part of efforts to address contemporary environmental challenges. In the Scottish Highlands, the hunting – or 'stalking' – of deer has entered a period of considerable flux primarily because of national policy changes to mitigate climate change and biodiversity loss. However, professional deer stalkers, who manage deer, other wildlife and land across vast areas of Scotland have received scant research attention, with their views poorly understood as a result.
- 2.** Via an in-depth qualitative study based on unprecedented access to stalkers, through the lead author's involvement in an environmental mediation process focused on deer management, we apply the Values-Rules-Knowledge framework to explore how stalkers are responding to and influencing this changing context.
- 3.** We find that there is significant heterogeneity in perspectives amongst stalkers, with some highly resistant to and fearful of current and forthcoming changes, whilst others have more welcoming and adaptive attitudes.
- 4.** We also find significant interactions and overlaps between and amongst the changing values, rules and knowledge of stalkers and stalking, which is increasingly influencing stalkers' work in the Highlands.
- 5.** We therefore show how the Values-Rules-Knowledge framework can be used to identify linkages, that are both enabling and constraining of change, between values, rules and knowledge in a particular context and, in doing so, reconfirm the utility of the framework.
- 6.** Overall, the paper sheds light on a very significant but previously poorly understood group of people in Scotland and informs knowledge more broadly around the impacts of changes in land-use policy on traditional forms of land management as well as traditional land users.

## 7.2 Introduction

Land-use and wildlife management are changing globally as part of responses to address climate change and biodiversity loss (Lavorel *et al.*, 2019; Kirk and Cradock-Henry, 2022; Chi *et al.*, 2025; Plieninger *et al.*, 2025). The aim of this paper is to understand this in the context of deer hunting, known as ‘stalking’, in the Scottish Highlands, a practice that has existed for more than 200 years and occurs over 20% of Scotland, but is currently undergoing significant change (MacMillan *et al.*, 2010; Warren and Glass, 2024a). Various aspects of stalking have received research attention, including the landholdings, often called ‘sporting estates’, on which it is undertaken (Wightman and Higgins, 2000), as well as how stalking can conflict with other land-uses (Fiorini, Yearley and Dandy, 2011; Davies and White, 2012; Dandy, Fiorini and Davies, 2014). Additional research has explored the views of people who pay to go stalking (Bullock, Elston and Chalmers, 1998; Bullock, 2001), the often-romanticised history that stalking is bound up with, such as the British monarchy’s long-term use of Balmoral estate for stalking and the enduring cultural symbolism of the Highland stag (a male deer) through the paintings of Edwin Landseer (Jarvie, 1986; Jarvie and Jackson, 1998; Lorimer, 2000). More recent research has centred the place of deer themselves within the practice of stalking (Webb, 2024) and examined the potential for alternative stalking models such as ‘community hunting’ (Frater, Krofel, *et al.*, 2025). However, what has remained absent from this research are the views of the people employed to undertake stalking, who are called deer stalkers (hereafter ‘stalkers’). It is therefore long overdue that the perspectives of these people are explored, so that we can better understand their responses to ongoing processes of changing land management in Scotland and build a stronger picture of what the future of land-use in the country might look like. Moreover, at a global level, this can also contribute to furthering our understanding of how traditional land managers are interacting with land-use and policy changes as part of addressing the twin climate and biodiversity crises.

Few stalkers have produced written accounts of their own working lives (Macrae, 1880; MacNally, 1970), with most accounts of stalking written by stalking guests (Scrope, 1883; Grimble, 1886; Hart-Davies, 1978; Whitehead, 1996), and stalkers have not featured at the centre of any academic work. This contrasts with research exploring the roles of other upland land users in Scotland, such as private estate owners (MacGregor, 1988; Samuel, 2000;

MacMillan and Leitch, 2008; MacMillan *et al.*, 2010), estate managers (Dolton-Thornton, 2021), gamekeepers on driven grouse moors (Hodgson *et al.*, 2022), hill farmers (Gray, 1999; Morgan-Davies, Waterhouse and Wilson, 2012), crofters (Sutherland and Calo, 2020), conservationists (Staddon, 2021), foresters (Sharma *et al.*, 2023), community groups (Mackenzie *et al.*, 2004; Hoffman, 2013) and recreationists (Newland and Robertson, 2018; Munro, Innocenti and Dunlop, 2022).

Based on unprecedented access to stalkers, gained through the lead author's involvement in an environmental mediation process focused on deer management, we aim to address this by shedding light on the perspectives of this group, at a time when the management of deer and land in Scotland is undergoing significant change (Pepper, Barbour and Glass, 2019; Hare, Daniels and Blossey, 2021; Kirkland *et al.*, 2021), with potentially far-reaching ramifications for the practice of stalking and the individuals whose livelihoods depend on it. In doing so, the paper provides an empirically-grounded view of change from stalkers living and working in the Highlands, a predominantly rural, upland region covering approximately 10,000 square miles in the north-western third of Scotland.

Deer stalking was established as a leisure activity by industrialists in the 19<sup>th</sup> century (Phillip *et al.*, 2009), supported by a reduction in sheep farming (Hunter, 1972) and advancements in riflery and railways (Jarvie and Jackson, 1998; Lorimer, 2000). During this period, increasing areas of land were given over to deer 'forests' (hunting grounds); in 1811 only six existed (Hart-Davies, 1978), whilst by 1912 more than 200 had been created, covering over 1.5m hectares (Warren and Glass, 2024a). Both World Wars resulted in the loss of stalkers, many of whom were deployed as snipers (Hart-Davies, 1978), whilst post-war land-use changes – particularly state-led coniferous afforestation (Ratcliffe, 1987b) – reduced areas for open-hill stalking. Stalking became increasingly regulated through the Deer (Scotland) Act 1959, along with greater emphasis being placed on cross-boundary deer management through the creation of Deer Management Groups (Phillip *et al.*, 2009). A shift towards more conservation-focused land-use, such as woodland regeneration achieved through higher deer culls, has occurred in the Highlands since the end of the 20<sup>th</sup> century (Hobbs, 2009), placing additional pressure on the traditional deer stalking model, which has historically depended on larger deer herds.

In terms of current changes to deer management, the Scottish Government is introducing reforms it claims will reduce the environmental impact of deer as part of its climate and biodiversity goals (Scottish Government, 2024c). Changes have so far included the removal of the male close season (the time of year in which deer can be shot; male deer can now be culled year-round), the setting of a maximum density of 10 red deer (*Cervus elaphus*) per km<sup>2</sup> across the Highland open-hill range and a reduction in the legal minimum bullet weight for culling deer (to support a transition from lead to copper ammunition). The Scottish Government has also stated the national annual cull of all deer species (*red, roe [Capreolus capreolus], sika [Cervus nippon] and fallow [Dama dama]*) should increase by 25%, from 200,000 to 250,000 for an indefinite period, and has granted further powers enabling NatureScot, the public body responsible for regulating deer management, to intervene on private land under certain circumstances to pursue ‘nature restoration’ through increased culling (Scott, 2023; NatureScot, 2024b; Scottish Government, 2024c). These changes mark the most significant legislative and policy alterations to Scottish deer management in nearly 70 years and, consequently, have placed ‘deer issues in the public eye as never before’ (Warren and Glass, 2024a, p. 193).

There are an estimated 1000 stalkers employed full-time in Scotland who deliver 95% of the national cull, with each deer culled averaging 0.5 days of work (Scott, 2023). Research by Thomson et al (2020) on the employment rights of gamekeepers, stalkers and ghillies (junior estate employees who assist on, rather than guide, stalks) found that 95% are male, more than half are aged over 50, with the same portion having familial links to the profession, 58% earned between £15,000 and £25,000 (well below the median UK salary in 2020 of £31,461 [Office for National Statistics, 2020]), 60% lived in tied-housing (housing provided as a condition of employment), the average working week during peak shooting periods was 63 hours and 79% expressed a pessimistic outlook for their profession. Most stalkers are employed on privately-owned landholdings, with a smaller number working on NGO-owned properties, whilst others are self-employed and are contracted to work on different landholdings (Forestry and Land Scotland, 2014; Thomson *et al.*, 2020; Macfarlane, 2023; Scott, 2023). Data for 2023-24 shows that 138,534 deer were culled across Scotland (NatureScot, 2024c), although it is thought to be closer to 200,000 per year because of under-reported roe deer culls in the lowlands (NatureScot, 2024b). In this paper, we explore how

stalkers are responding to this changing context in the Highlands, with the next section providing an overview of the conceptual framework that we use to understand these responses from stalkers.

### 7.3 Conceptual approach – Values-Rules-Knowledge (VRK) framework

The Values-Rules-Knowledge (VRK) framework was created by Gorddard et al (2016, 2017), as a ‘tool’ to examine pathways for climate adaptation, by looking at how interacting values, rules and knowledge may enable or limit change in what they call the ‘decision context’, that is the arena in which actors operate in a given setting. In this paper, we see the decision context(s) that stalkers are operating in as the landholdings they are employed on and the landscapes they collectively manage, and are interested in looking at how values, rules and knowledge in deer stalking and land management in the Highlands are changing within these.

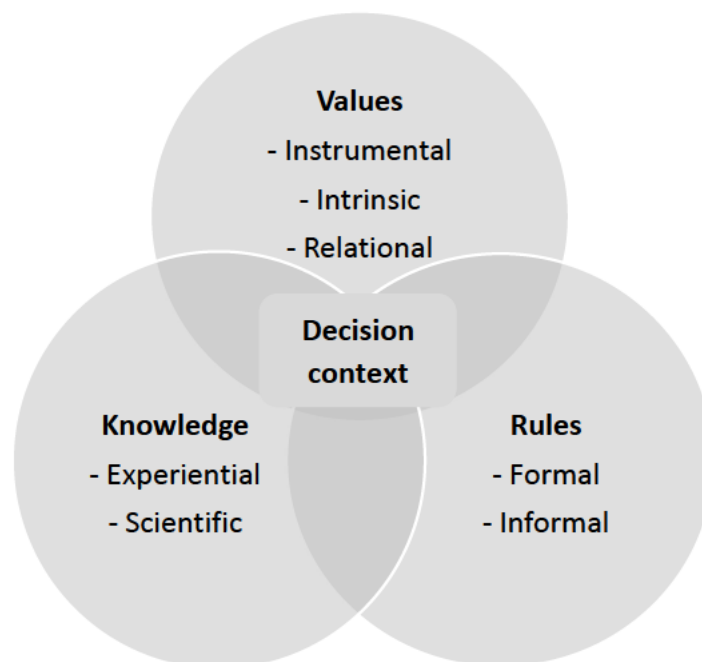
The VRK framework has been used in a range of cases by researchers with similar aims to ours; namely, Plieninger et al’s study on the endurance of traditional hunting in the Faroe Islands (2025), Chi et al’s (2025) research into the adaptive governance of dike-pond heritage landscapes in the Pearl River Delta region in China, Kirk and Cradock-Henry’s (2022) review of changing land management practices undertaken by agricultural producers and Lavorel et al’s (2019) examination of climate adaptation in the French Alps.

The most common Values discussed in applications of the framework, and the wider literature, are instrumental, intrinsic and relational (Chan *et al.*, 2025; Plieninger *et al.*, 2025). The concept of instrumental values has its roots in 18<sup>th</sup> and 19<sup>th</sup> century utilitarianism (Brown, 1984) and are defined by Himes et al (2024, p. 30) as ‘values of other-than-human entities, as means to achieve human ends or satisfy human preferences.’ Intrinsic values gained interest in the late 20<sup>th</sup> century with conservationists keen to recognise nonhuman nature in its own right (Batavia and Nelson, 2017), and is defined by Himes et al (2024, p. 29) as ‘values of other-than-human beings expressed independently of any reference to humans as valuers, including values associated with entities worth protecting as ends in and of themselves.’ Relational values were first conceptualised by Chan et al (2016) and gained prominence through its inclusion in the IPBES Values Assessment (Pascual, Balvanera and Christie, 2023), and is

defined by Himes et al (2024, p. 31) as ‘values of meaningful, and often reciprocal human relationships - beyond means to an end - with nature and among people through nature, where nature is often specified as a particular landscape, place, species, forest, etc.’

Rules are categorised in the framework as formal, such as legislation, regulation, subsidies, treaties and ordinances, and informal, such as customs, norms, habits, practices, taboos and heuristics (Kirk and Cradock-Henry, 2022; Plieninger *et al.*, 2025). The concept of rules stem from institutional and governance theory and is used to help explain capacities for and constraints on the actions of individual and collective actors in decision-making processes (Ostrom, 1990; Ansell and Gash, 2008).

Knowledge is demarcated in the framework as experiential and scientific (Gorrdard *et al.*, 2016). Experiential knowledge encapsulates categories such as traditional ecological knowledge (TEK), indigenous ecological knowledge (IEK) and local ecological knowledge (LEK), which describe ways of ‘knowing’ accrued through close and sustained associations with nature (Joa, Winkel and Primmer, 2018; Berkström *et al.*, 2019). Scientific knowledge refers to more formally recognised knowledge gained through education, training and scientific research (Cebrián-Piqueras *et al.*, 2020). Figure 24 below depicts the VRK framework and the next section details our data collection and analysis methods.



**Figure 24. The Values-Rules-Knowledge (VRK) framework.**

*Adapted from Gorrdard et al (2016), Plieninger et al (2025) and Kirk and Cradock-Henry (2022).*

## 7.4 Materials and methods

Stalkers involved in this study were recruited via the *Finding the Common Ground on Sustainable Upland Deer Management* (FtCG) process and *Common Ground Forum* (CGF), projects aiming to promote positive relationships between different stakeholders involved in upland deer management in Scotland (Leavey-Wilson, Fisher and Staddon, 2025a), which the lead author independently evaluated between April 2022 and December 2024 (Leavey-Wilson, Fisher and Staddon, 2025b).

This paper draws on interviews with 19 participants who were either stalkers, former stalkers or had stalking responsibilities (see Table 2). The transcripts arising from these interviews provide the empirical material for this paper. The lead author was also invited on and undertook three days of (red) hind (female deer) stalking; two days (with a different stalker on each day) at an estate in the north west of Sutherland (northern Scotland) in November 2023 and one day with a stalker at an estate in the east of Sutherland in February 2025. This was done to gain insight into the practical activity of stalking and the day-to-day roles of stalkers. In addition, the lead author conducted participant observation at a range of events as part of their evaluation of the FtCG and CGF projects which were collectively attended by ~150 stalkers (representing perhaps as much as 15% of all stalkers in Scotland). 11 estates in the Highlands were visited for the stalks and events. Whilst data arising from these activities is not used in this paper, we have noted it here for methodological transparency.

Ethical approval for this research was granted by the School of GeoSciences Research Ethics and Integrity Committee, University of Edinburgh on 28<sup>th</sup> July 2022. Informed consent was received from all participants either in written or verbal form, depending on their preference.

Our interview sample is broadly representative of stalkers (Thomson *et al.*, 2020): 95% were male, 71% had more than 20 years of experience as a stalker, 76% worked on private estates, 52% were over 50 and 42% had familial links with the profession. Stalkers in this study were also widely geographically distributed across the Highlands (see Figure 25).

Interviews lasted one hour on average and were conducted online or by phone according to participant preferences between February 2023 and April 2024, with interview guidelines used (see Appendix B.3). All interviews were recorded with the consent of participants, with

transcripts produced using Rev AI transcription software, which were then manually corrected against the original audio for accuracy. Interview transcripts were coded deductively (Fife and Gossner, 2024) using the VRK framework, as described above, with the sub-theme codes ‘emerging’ inductively (Kyngäs, 2020).

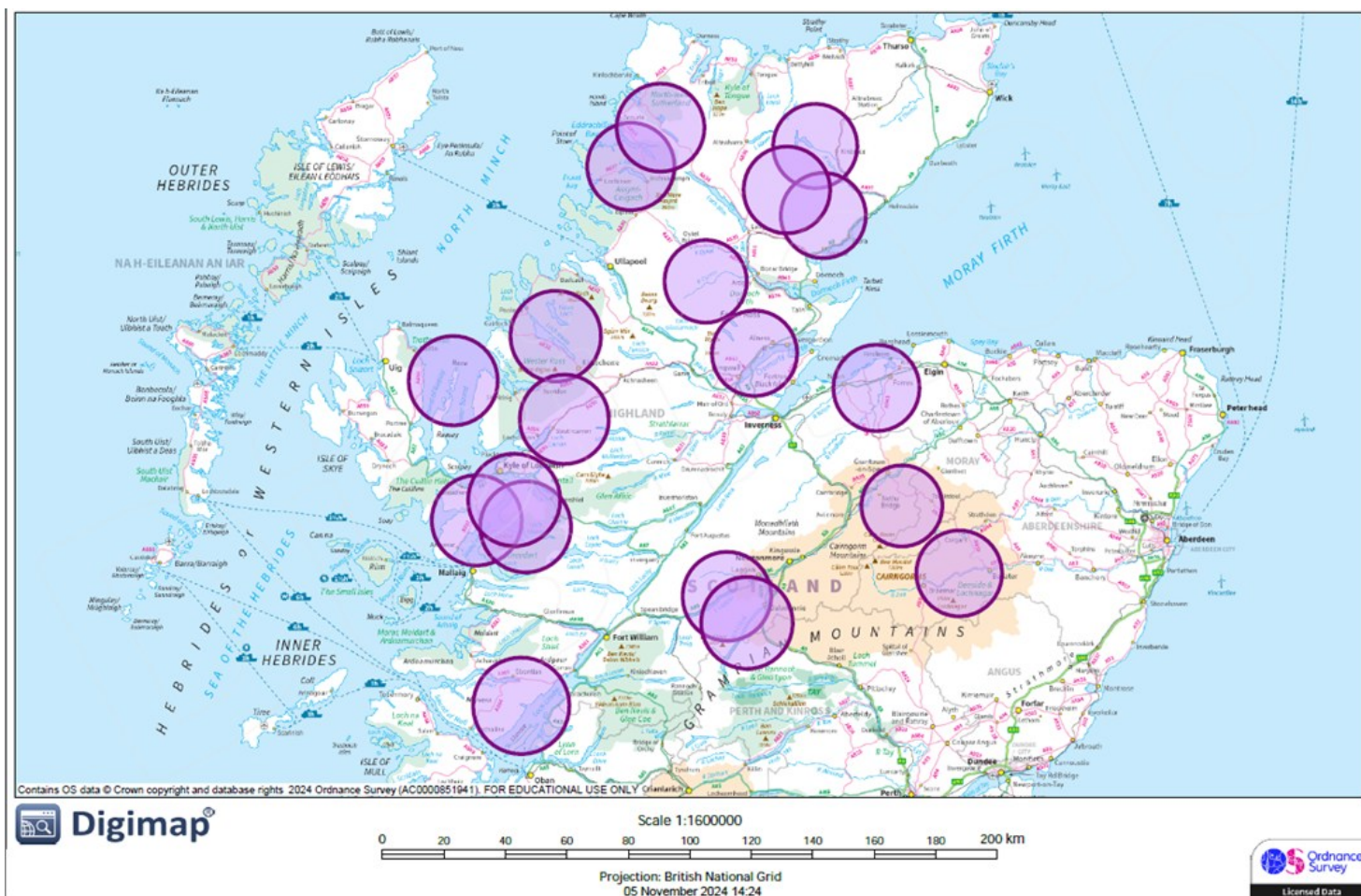
The next section uses the VRK framework to identify the values, rules and knowledge implicitly and explicitly discussed by stalkers, to understand how they are both influencing and responding to the changing decision context of deer stalking and land management in the Highlands.

**Table 2. Overview of interviewees**

Participant number	Pseudonym	Role	County	No. of years employed as a stalker	Stalking background? (Y/N)	Landholding type	Let (commercial) stalking? (Y/N)	Landholding size (in thousand hectares) *
1	Alastair	Head stalker	Sutherland	30 +	N	Private estate	Y	35 >
2	Angus	Retired stalker	Sutherland	~10	N	N/A	N/A	N/A
3	Bruce	Head stalker	Inverness-shire	~40	N	Private estate	N	< 5
4	Cameron	Head stalker	Inverness-shire	30 +	Y	Private estate	N	15 – 20
5	Colin	Woodland manager	Moray	~10	Y	Private estate	N	5 – 10
6	Donald	Retired stalker	Aberdeenshire	~45	Y	N/A	N/A	N/A
7	Duncan	Estate manager	Inverness-shire	~25	N	Private estate	Y	< 5

8	Fraser	Ranger	Ross-shire	~10	N	Private estate	N	5 – 10
9	Isla	Stalker	Inverness-shire	~10	N	Private estate	N	10 – 15
10	Jim	Head stalker	Inverness-shire	30 +	N	Private estate	Y	5 – 10
11	Kyle	Stalker	Inverness-shire	5 +	N	Nature reserve	N	10 – 15
12	Malcolm	Stalker	Ross-shire	~35	Y	Private estate	N	< 5
13	Murray	Estate manager	Argyll	~25	Y	Private estate	Y	5 – 10
14	Niall	Head stalker	Sutherland	~20	Y	Private estate	Y	5 – 10
15	Roddy	Stalker	Ross-shire	~30	N	Private estate	Y	15 – 20
16	Ross	Head stalker	Inverness-shire	45 +	Y	Private estate	N	5 – 10
17	Scott	Estate manager	Sutherland	~35	Y	Private estate	Y	< 5
18	Seumas	Head stalker	Sutherland	45 +	N	Private estate	Y	10 – 15
19	Stewart	Stalker	Sutherland	~20	N	Sporting lease on private estate	Y	20 – 25

\* Estate size data collected using <https://whoownsscotland.org.uk/>, (Accessed: 24<sup>th</sup> June 2025).



**Figure 25. Geographical distribution of interviews (current and former deer stalkers).**

Offset circles used to protect anonymity. Map created using Digimap Ordnance Survey Collection, <https://digimap.edina.ac.uk/>, (Accessed: 5<sup>th</sup> November 2024).

## 7.5 Results: The changing ‘decision context’ of deer stalkers in the Highlands

This section illustrates how the decision context of stalkers in the Highlands is changing, using the Values-Rules-Knowledge framework described above. Participants are referred to using pseudonyms and other identifying information has been redacted to protect their anonymity, whilst some quotes have been edited for clarity.

## 7.5.1 Values

### *7.5.1.1 Instrumental values*

18 of the 19 stalkers implicitly referred to instrumental values, that is the worth of nature as a means to satisfy human needs and preferences, which appeared to be changing, including the price of stalking, expectations around the number of deer that can be shot on stalks and the employment of stalkers.

Roddy thought that stalking will become more expensive as deer numbers decrease: 'Once numbers are down it'll just be supply and demand. If you've got half the deer coming in, it'll just take someone to put up the price to a £1,000 a stag.'

Relatedly, Bruce argued that stalking needed to accommodate lower deer numbers: "We need to get away from, 'we're going out on the hill, we're shooting three stags today'. We need to go out and think of getting one stag per day, one stag in a couple of days." Malcolm was much more sceptical: 'Guests will definitely stop coming if you had blank days [without a deer shot]. They come from Hong Kong, Colorado, South Africa. They're the big payers, they wouldn't put up with that.'

Cameron expressed worry for the impact of deer reductions on estate employment: 'If we reduce our deer by 70% there's no way our estate is going to be able to employ two gamekeepers and three ghillies during the season. They won't justify that.' Niall talked about how the role of a stalker was changing as a result of deer reductions: 'The job's changing. I'm a gamekeeper, [but also a] gardener, electrician, plumber, I do all sorts of things, because that's what the job is now.'

In sum, stalkers expressed different sentiments in relation to the changing instrumental values derived from stalking, with some identifying new opportunities whilst others were less optimistic.

### *7.5.1.2 Relational values*

Changing relational values, that is those that exist between people and nature and between people through nature, concerned stalkers' relationships with their guests, the connection between stalkers, the landscape and deer and public attitudes towards stalking. As with instrumental values, 18 of the 19 stalkers implicitly referred to relational values.

Alastair talked about the relationship between stalkers and guests and the threat posed to this by current changes in deer management: 'It's a really privileged position being a stalker because an ecologist in an NGO or a pen pusher in a government office is not in the position to share so much quality time with somebody enjoying a real, visceral experience for 12 hours a day in the most beautiful areas, great craic at the larder and a wee walk home after a dram. All of those things add up and we get the chance to be part of that. This is why it becomes such an emotive subject, because it's that fear, that sense of this being lost.' Cameron concurred: 'I've shot a lot of deer in my life and if I didn't shoot another one, I wouldn't lose sleep over it. But if someone told me tomorrow, I wasn't allowed to take people out stalking, I would really miss that.'

Three of the stalkers talked about landscape change, including Jim who, observing more wind farms in his area, said: 'I'm anti-wind farms. I didn't become a gamekeeper at the age of 15 to work in an industrial landscape. I wanted to be out in the wild.' Similarly, Isla felt that rewilding projects were eroding the remote feeling of many Highland landscapes: "Keeping places wild", this kind of branding; how can you do that whilst also encouraging so much ecotourism? If you provide all of these vehicles, this access to people that don't want to walk there, they want to be safaried, that takes away from the remote location that's been admired for hundreds of years. There's this cultural heritage of that side; why open up these places when it's a beauty in itself?" This sentiment was shared by Roddy: 'It's about being away in the middle of nowhere'. In terms of deer, discussing estates that had undertaken significant culls, Stewart, taking somewhat of an outlying stance to other stalkers, argued: 'I think some reduction in deer would bring our [stalkers'] worth back... the more requirement there is to keep deer under control, the more foothold we have.'

Noting changing public attitudes towards stalking, Malcolm said: 'You'd always be quite proud because it's such a hard job to do. But now you never let on what you do because you get so

much grief. People verbally attack you for it and it is scary.’ This was similarly felt by Fraser: ‘Even 10 years ago I’d be quite comfortable saying my job is to help control deer. Now it’s an uncomfortable thing to say I do, because there’s that much resentment to killing things nowadays. I would never say I’m a deer stalker now. I just don’t want that hassle’. Bruce felt the same way: “People turn their noses up. Both of my daughters have shot deer with me, been on the hill with me. But they don’t tell their friends because they get sneered at. That’s the world we live in now.”

Relational values, as implicitly expressed, therefore appeared to be changing in a negative way for most stalkers, in respect of changes in land use, deer management and public perceptions around this.

#### *7.5.1.3 Intrinsic values*

Changing intrinsic values, that is those which concern the worth of nature in its own right, were the values least expressed by stalkers, with 15 of the 19 interviewees mentioning them. These primarily concerned perceptions around deer being afforded less respect, expressed for some through more carcasses being left on the hill and through increased instances of inhumane culling.

Ross said: ‘Deer have become a big scapegoat and I think it’s wrong because a lot of people forget deer have been here since the Ice Age.’ In terms of carcasses, Kyle explained: “It becomes a moral value, the carcass, for some individuals. ‘I will not leave a deer on the hill’, because they’re worth a certain prestige. ‘I will respect this animal.” Malcolm thought that this practice was increasing and was strongly against it: ‘We don’t shoot deer, leave them lying. Some places are doing that now to get the numbers down, but that just goes against every grain of your body and everything we’re brought up to believe. It’s heart-breaking.’

Relatedly, others criticised what they saw as increasingly inhumane culling of deer. This was because, as Scott explained: ‘One of the aspects that I take most pride in is that if you’ve got to take the lives of these beautiful animals that I love, you do it in the best possible way for them.’ Similarly, Niall said: “I respect deer to the point where I don’t actually enjoy shooting

them, but I do get satisfaction knowing that when I do it, I've done my utmost to make sure that it's a quick death... It's a sacred thing."

In short, most stalkers seemed to suggest that the intrinsic value of deer was being eroded as a result of changing practices in deer management.

## 7.5.2 Rules

### 7.5.2.1 Formal rules

All 19 stalkers discussed changes in formal rules, such as legislation, regulation and policy, discussed by stalkers included new deer density targets, alterations to the close seasons and minimum bullet weight, as well as increased government intervention on private land to manage deer.

Four stalkers used the same term 'shifting the goalpost' when describing the Scottish Government's new deer density targets, including Malcolm: 'They wanted 12 [deer per km<sup>2</sup>], then 10 and then they wanted it down to six. Once you reached a target, they set another and another; it is just never ending.'

Roddy brought up the recent removal of the male close season after more than 60 years on the statute book, but thought it would have little practical effect: 'The traditional places will stick to the traditional seasons. I don't think it'll change much. It's just a way for [government] to reduce paperwork.' In contrast, proposed changes to the female season (which were later dropped) aroused much stronger views, as expressed by Malcolm: 'Getting rid of the hind season, my goodness. I've never heard anything so bad in all my life. You gralloch [disembowel] them and the calves are kicking in the womb.'

Seumas expressed significant reservations about the lowering of the legal bullet weight for culling deer: 'Lighter bullets are more liable to ricochet and lose energy so it will no longer expand and it'll go through the beast like pushing a pencil through paper, then it'll run for 400, 500 yards and could be out of your sight before you realise its lung is filled up with blood.'

Scott described proposed intervention powers, which will allow NatureScot to manage deer on private land to pursue nature restoration, as a 'sledgehammer to crack a nut'. Several stalkers thought that the government already had sufficient intervention powers, including Seumas: 'From section 6 to section 10 [of the Deer (Scotland) Act], NatureScot have the powers to do what they're trying to do.'

Changes to formal rules pertaining to deer management therefore appeared to elicit resistance from most stalkers.

#### *7.5.2.2 Informal rules*

Changing informal rules, such as norms, customs and taboos, were mentioned by 18 of the 19 stalkers and included the decline of sporting estates and the rise of other types of landholdings, as well as the perceived increase in indiscriminate deer management (where deer are shot regardless of their physical condition).

Duncan argued: 'It's to do with sticking the nail in the Victorian sporting estate, the concept of that.' Others, including Cameron, were resigned to this: 'We have to be more accepting of estates that don't want to be sporting. That's the climate we're in.' Stewart, in contrast, welcomed change in this regard: 'There'll always be an appeal for that sporting model, which everybody else has had to be comfortable with for 250 years. We're in the first 30 years of any other kind of land-use and we seem to be throwing our arms up in the air. We almost had it too good for too long.'

Angus explained this further: 'You've now got landowners over the last 20 years who've bought land with completely different management objectives than traditional objectives, which would be agriculture, sporting values, leisure. Now it's climate change and biodiversity mitigation'. Surveying his local area, Jim discussed how new owners had altered the region: 'Historically most of [the area] was private estates and stalking was very prevalent [here]. And then the Scottish Government and the Forestry Commission bought up estates. Now I'm the only gamekeeper left [in the area].'

Lamenting changing customs in deer management, Seumas said: 'If I came in with the wrong beast, I would get my fingers chopped. 'Why did you shoot that one?' It's not a case of

shooting the first thing you see, like now.” Similarly, Ross said: ‘It’s definitely going away from the traditional way we did it. The way we are going now, we’re told to do more and more. And I think what happens to stalkers, when you’re being pressured to shoot a lot of deer, you lose that professionalism because you’re not really picking anymore. You just shoot anything.’ In contrast, discussing the supplementary feeding of deer, a practice common on traditional estates, Niall said: “One place I worked on was spending £30,000 on stag feed. And if you asked the stalker why, his answer would be, ‘well I’ve always done it’. Well, see, that attitude in this day and age is not enough. You have to have a more clinical answer than it’s just what we’ve always done.”

In contrast to formal rule changes then, alterations in informal rules were received differently by stalkers, with some welcoming of changing practices whilst others were more regretful.

### 7.5.3 Knowledge

#### *7.5.3.1 Experiential knowledge*

18 of the 19 stalkers discussed their experiential knowledge, that is that which is gained through close and sustained associations with nature, including the longevity of their employment, generational knowledge of stalking, the impact of climatic changes on deer management and the perceived loss of rural skills. Some stalkers were also keen to contrast their own experiential knowledge with conservationists and policymakers, whom they felt had gained increasing influence over deer management.

First of all, most stalkers spoke about the length of the time they had worked as a stalker to evidence their experiential knowledge and skills. This included Ross: ‘I’ve been a stalker for 48 years and it’ll be 50 when I’ve retired’; Seumas: ‘I started in ’76 as a seasonal ghillie. I did that for two seasons and then in ’78 I came on as underkeeper. Then in ’96 I took over as head keeper’; Scott: ‘I’ve been involved with this kind of work all my life. I’ve been a stalker since I left school at the age of 16 and I’m 50 this year’; and Bruce: ‘I’m not an academic, so I knew quite early on that I had to look into doing something different and that’s what I chose. The deer stalking route. So, I’ve been at it for about 40 odd years.’

Relatedly, four stalkers also talked about their family background and how this had encouraged them into the profession, including Cameron: 'My father was a stalker before me on the same estate, he was here for 40 years.' Similarly, for Malcolm: 'My father was on the estate next door and my uncles are all roundabout and my grandfather too. We go back generations here.' Talking about his background, Ross said simply: 'I come from stalking stock' whilst Scott explained: 'It was in my family and, earliest memories, that was the only thing I was ever going to do.'

Ross spoke about the climatic changes he had experienced and the impact of this: "The last five years have been the worst. It's just wet and warm all bloody winter and the deer are not doing what they traditionally do. They stay high, they're miles out and a lot of stalkers are saying the same thing. The old stalker here used to say, 'don't go to the hill until the snows down on your doorstep.' And that's the way it used to be. You would get the first snow in November and the deer would start getting pushed down. They were easy to pick, easy to shoot, easy to extract. Now you don't have snow. So, the climate is affecting the actual logistics of stalking." This view was shared by Niall, who stated: 'we've not had a proper winter since 2010'.

Bruce said he had observed a decline in generational rural skills: 'I was brought up in a crofting community and every second person had been out on the hill stalking. And now I go up there years later and hardly any of them have got the ability to be able to even think about doing it. How many families now see their father go out on a Saturday, shoot a deer, come back, skin it and put it onto the kitchen table to be fed with that night? No, nowadays it's down to Tesco.'

Juxtaposing his experience as a stalker with conservationists, Duncan argued: 'The knowledge that I have of deer stalking, being out there in the field... I really honestly believe that conservationists have no idea what they're doing with deer. They do not know the story of deer. They don't understand the family unit, the hierarchy, the way that the hinds work with their siblings and how the grouping works and how the stag works. To them, it's just something that's eating trees.' Similarly, Seumas said: 'People [policymakers] are telling us how to do things and they've never fired a bloody rifle and they're telling you go and shoot more deer.'

In sum, stalkers took significant pride in their experiential knowledge and, as a result, many were therefore disturbed that others, in their view, without such knowledge were having increasing influence over deer management.

#### *7.5.3.2 Scientific knowledge*

Scientific knowledge, gained through training, education and research, was referred to by only eight of the 19 stalkers interviewed; far less than their experiential knowledge.

Donald felt that scientific knowledge was increasingly being put above that of stalkers' lived experience: 'Government never accept what we're saying. It's to be scientifically proved. But you cannot beat listening to somebody that's been on that ground all their life and seen nature in the raw.' Others, such as Stewart, appeared to take the opposite stance: 'When I go to deer meetings, there's still a stalker that refers to his grandfather as this oracle of knowledge. And you really think, oh Jesus Christ. No, no, no. It has been in peer reviewed literature. We know that isn't right, let's get up to speed.'

Younger stalkers tended to have a more scientifically-guided approach to deer management, including Kyle: 'Six years ago, when I trained to become a deer stalker, I was learning about tree growth, lichens, moss. This is why we manage deer. It affects the whole ecosystem.' Bruce, an older stalker, thought this was a good thing: 'The young brigade, they are very forward thinking. They have habitat monitoring skills. Rather than when I was young, it was about how many stags and hinds you had. It shouldn't be that way anymore.'

Alistair noted how, over the years, he had become more receptive of scientific evidence: 'A catalyst for my change of mindset was a project which took place between 1997 and 2000. The proprietor liked to challenge conventional thinking and liked to back it up with science too. They were just drafting this book, which discusses various options for managing deer, including the introduction of wolves, way back then. An entomologist came and stayed for two or three years and an ecologist did a bit of work too. The conversations were really insightful.'

In short, whilst scientific knowledge was the least discussed of all the aspects in the VRK framework by stalkers, with a minority being sceptical of the value of scientific evidence in comparison to their own experiential knowledge, the majority of those who did refer to scientific knowledge appeared to be increasingly strong proponents of it in their decision-making on deer management.

## 7.6 Discussion and conclusion

In this paper, we explore a range of deer stalkers' perspectives on land-use change in the Scottish Highlands, using the Values-Rules-Knowledge framework to understand their responses.

In relation to the VRK framework, like Plieninger et al (2025), in their study of traditional hunters in the Faroe Islands, we found that intrinsic values were those least discussed by stalkers, although we would also note that these values aroused more emotion than references pertaining to either instrumental or relational values, particularly where respect for deer was seen to be compromised by changing regulations and practices. We therefore observed interactions between formal rules, informal rules and intrinsic values, in that perceived negative alterations in both types of rules were seen by the majority of the stalkers to erode intrinsic values, culminating in significant resistance on the part of these stalkers. This demonstrates how the identification of such interactions, via the VRK framework, is useful for understanding the propensity for and likelihood of change, in instances where top-down rules collide with on-the-ground values and norms (Gorddard *et al.*, 2016; Kirk and Cradock-Henry, 2022).

Unlike Plieninger et al (2025), we did not observe much overlap between instrumental and relational values expressed by stalkers, which can perhaps be explained by our focus on professional hunters as opposed to recreational hunters. This is because professional hunters operate within a different decision context, with additional instrumental and rules-based pressures placed on them compared to recreational hunters. In this case, this principally concerns the need to justify their own employment through meeting cull targets, bringing in sufficient income to meet or at least contribute towards the landholding's management costs

and adhering to changing legal and policy contexts. We therefore note that our research contributes to the significantly smaller literature on professional hunters compared to recreational hunters and, in doing so, highlights some important differences between the two in terms of the regulatory and material environments in which they operate and the resulting options available to them (Thomsen and Davies, 2005; Feber, Johnson and Macdonald, 2020; Mannion *et al.*, 2025).

Our findings also highlight the fuzzy line that exists between intrinsic and relational values (Schröter *et al.*, 2020; Himes *et al.*, 2024), in that respect *for* nature in its own right (in this case, the life and humane death of deer; and indeed the way in which a deer carcass is treated) is difficult in practice to disentangle from the relational benefit it provides for people (the pride that stalkers take in humanely culling deer). There is therefore perhaps a mismatch in the existing values literature between the quest for neatly defined conceptual demarcations (Chan *et al.*, 2025) and the rooted, lived realities of how such values are embodied and practised. Moreover, we found that relational values construed as those *between people through nature*, rather than *between people and nature*, which is the way in which relational values are more typically understood (Pratson, Adams and Gould, 2023), appeared to be more important for stalkers, particularly in terms of guiding guests on stalks and the collective experience of stalking. Hence, appeals to environmental responsibility, which prevail in policy rhetoric encouraging changing practices in land management, may be less effectual in bringing people on board with change (Raymond *et al.*, 2016; Bennett *et al.*, 2018; McLeod *et al.*, 2024). Instead, assurances could be made that shared social experiences that occur in nature will be protected, which are important motivations for those undertaking hunting or wildlife management (Arnett and Southwick, 2015; Hinrichs *et al.*, 2021; Kontsiotis, Polychronidis and Liordos, 2024).

In terms of knowledge, a less surprising finding from our research was that stalkers spoke much more of their experiential knowledge than their scientific knowledge. This was observed by Webb (2024, p. 40) in their anthropological study of animal history pertaining to deer in the Highlands, noting: 'What characterises the knowledge of professional stalkers, above all else, is its practicality.' We would add to this that stalkers are becoming more receptive to scientific evidence, particularly those of a younger generation, as training and education in land and wildlife management appears to be becoming more responsive to changing

environmental policy; an example of an interaction between knowledge and rules (Topp, Loos and Martín-López, 2022). This therefore challenges the outdated perception that stalkers (and land managers in general) do not use scientific knowledge in their decision-making. We therefore suggest, as noted by both Austin et al (2009) and Irvine et al (2009) about deer management, that there is significant potential for the integration of stalkers' locally accrued experiential knowledge with scientific and technological advances in, for example, measurements of wildlife abundance using drone counts or more granular habitat impact assessment methodologies.

In short, by applying the VRK framework, our paper has shown how it can be used to identify linkages that are both enabling and constraining of change, between values, rules and knowledge in a particular decision context. This paper therefore reconfirms its utility, as similarly applied in other cases (Kirk and Cradock-Henry, 2022; Chi *et al.*, 2025; Plieninger *et al.*, 2025).

In terms of our findings in relation to stalkers, what stood out most was the wide diversity in stalkers' perspectives, with some having fearful or resistant attitudes towards changing land management in the Highlands, whilst others were more pragmatic and even welcoming of change. This may seem surprising, considering that professional deer stalkers in the Highlands, in demographic terms, are a very small and largely homogenous group, with long established roles and tightly-knit customs (MacMillan *et al.*, 2010; Thomson *et al.*, 2020). However, it is becoming increasingly understood that land and wildlife managers, including amongst more 'traditional' groups such as hunters, contain considerable heterogeneity in their views, with recognition of this important for informing more appropriate and effective policy interventions and in improving collaboration between different stakeholders (Barroso and Pinto-Correia, 2014; Swan *et al.*, 2020; Hodgson *et al.*, 2022). Our findings therefore show that stalkers have more nuanced and complex positions from the stances taken by organisations that purportedly represent them and that it is important that individuals' voices are heard amidst the noise of national policy debates.

Our research also supports findings that public acceptance of hunting is decreasing, owing to ethical concerns around animal welfare (Kupren and Hakuć-Błażowska, 2021), with 15 of the 19 stalkers interviewed in this study noting increasing hostility to their work. This, however, stands in contradiction with growing public demand for environmental action, highlighting

the tension that exists within the 'necessary evil' of culling for conservation (Johnson and Horowitz, 2014). It further demonstrates the gulf between stalkers' self-described 'pride' in selectively culling weak animals humanely for the individual animal's welfare and negative public perceptions around hunting, particularly 'trophy' hunting. However, all of the stalkers interviewed stressed that they did not undertake trophy hunting, nor do they condone it and claimed that it has become far less common across the Highlands, contrary to prevailing perceptions. There is therefore ample opportunity for further public education in this context, and more generally, about the environmental, animal welfare and societal aims and necessities of culling, to improve public knowledge, legitimacy and support and reduce some of the conflict that exists around culling and hunting more broadly (Park, Koh and Kim, 2022; Hare *et al.*, 2023; von Essen and Redmalm, 2023; Frater, Daniels, *et al.*, 2025). Indeed, studies by both Hare *et al.* (2021) and Whitefield *et al.* (2021) on deer management in Scotland found that increased public awareness of the environment and social benefits of culling correlated with increased support for it, indicating a possible avenue towards reducing hostility towards the work of stalkers.

Finally, stepping back to consider the wider context, whilst change is inevitable and constant in any particular decision context, our research shows how such change can feel particularly pronounced for individuals operating in traditional institutions, where long-established practices and principles are often fiercely protected (Cox, Hallett and Winter, 1994; Plieninger *et al.*, 2025). Recognising this is an important first step for ensuring that such individuals are supported through periods of change, so that their skills, knowledge and experience are not lost and instead remain valued, respected and utilised.

## 8. Discussion: Key findings, contributions and limitations

This thesis has explored land-use conflict, environmental conflict resolution and social responses to land-use change in the context of upland deer management in the Scottish Highlands. This chapter begins with a summary of the key findings of the thesis. It then discusses the main contributions made by the thesis in relation to 1) how instances of contested land-use change can be understood and managed, 2) knowledge about deer management in the Highlands and 3) the potential policy considerations from these. The chapter concludes by noting the thesis' limitations and highlights opportunities for further research.

### 8.1 Summary of key findings

Chapter 5 addressed the first research question of this thesis: How can conflict over upland deer management in the Scottish Highlands be understood? This question was tackled by employing an adapted 'Levels of Conflict' framework (Madden and McQuinn, 2014; Zimmermann, McQuinn and Macdonald, 2020), which provided a useful tool to help make sense of the different areas of contention within this context. By applying this framework, the chapter showed how conflict over upland deer management in the Highlands can be understood as multi-levelled in that, beneath the surface of a dispute which purportedly concerns material issues such as deer numbers, their impacts and management, lie underlying factors of historical controversy, blame and mistrust between the parties involved, as well as questions of identity around the changing role, place and values of deer stalking in an increasingly contested landscape. The wide range of factors identified through qualitative research undertaken for this chapter that contribute to contention over upland deer management in the Highlands include: deer densities, deer fencing, contract deer stalking, deer stalking seasons, night shooting, controversial culling events, unsuccessful conflict resolution attempts, perceived insufficient government enforcement of deer management, perceived contradictory policies and policy reversals, the pace and scale of change in deer management, deer stalkers' livelihoods, the purpose of deer stalking, the community impact of changes in deer stalking, a perceived lack of understanding of those outside of deer stalking

towards it and the values around deer themselves. The chapter assimilated these factors as part of one larger, nested structure of conflict, both reconfirming the known complexities of the debate and identifying new areas of contention (such as contract stalking), whilst allowing this situation to be more easily understood, with the levels differentiated analytically, through the framework's application.

Chapter 6 addressed the second research question of the thesis: How effective is mediation in ameliorating conflict over upland deer management in the Scottish Highlands? Using a subset of criteria focused on outcomes, process and relationships from the environmental conflict resolution (ECR) literature (e.g. Emerson et al., 2009; Foley, 2007; Holzinger, 2001 etc.), the chapter evaluated the efficacy of an environmental mediation process (*Finding the Common Ground*) in ameliorating conflict between stakeholders in this context. Findings from the evaluation suggested that mediation improved the relationships between process participants, by building mutual trust and respect between them, and by increasing the understanding of and empathy for different participants' viewpoints and the reasons behind these. On a procedural level, findings indicate that mediation was generally effective in terms of the role played by the mediators, its perceived fairness and transparency and the use of information but had more mixed results in relation to participation and engagement as well as ownership and accountability. In terms of outcomes, the evaluation found these to be more limited, such as the practicability and durability of the agreement reached at the end of the mediation, the extent of issue coverage and knowledge gain and the tangible, 'on-the-ground' impacts arising from the process.

Chapter 7 addressed the third and final research question of this thesis: How are deer stalkers responding to changes in deer management and land use in the Scottish Highlands? This chapter used the Values-Rules-Knowledge (VRK) framework (Gorrdard et al., 2016) to explore the perspectives of a range of current and former deer stalkers in relation to changes in the management of deer and land in the region. The changes identified concerned those of policy, legislation and regulation but also practices, customs and norms in land and wildlife management as well as climatic and environmental changes. The chapter illustrated how interactions between different values (instrumental, relational and intrinsic), rules (formal and informal) and knowledge-types (experiential and scientific) within the 'decision context' (or operating environment) of Highland estates and the landscapes of the Highlands more

broadly are impacting upon *and* being impacted by the work of stalkers. The primary finding in this chapter is that stalkers have much more diverse outlooks towards current changes in deer and land management than may be commonly assumed, given their small and relatively homogenous demography and against a backdrop of scant empirical research on stalkers in general. Some stalkers expressed welcoming and adaptive attitudes to changes in deer and land management, some were more resigned and apathetic to these changes and others were highly resistant and/or fearful of them. At a conceptual level, the chapter also demonstrated how the VRK framework can be used to identify how interactions between values, rules and knowledge, experienced and enacted by land managers, may enable or constrain changes within a traditional land management setting such as Highland deer stalking.

The next section reflects on these findings and others from Chapters 5, 6 and 7 at a broader level, in relation to the knowledge contributions they make towards understanding the primary topics of interest to this thesis.

## 8.2 Knowledge contributions and implications

### 8.2.1 Insights for understanding and managing contested land-use change

Firstly, the thesis has provided an empirical illustration of a land-use conflict that demonstrates the co-occurrence of the four primary factors of conflict (social, spatial, normative and political) identified by Fienitz (2023, p. 715) in a 'systematic mapping' of land-use conflict research. This therefore shows how such factors can exist within a single case and lends empirical weight to Fienitz's (2023) argument that conflict analysis should be attuned to the identification of multiple dynamics of conflict rather than pre-assigning a particular conceptual framing. Relatedly, the case has also highlighted how other common factors identified in the literature on land-use conflicts can co-occur within a single scenario, such as material disputes over the land use constraints imposed by land scarcity (Mann and Jeanneaux, 2009; Steinhäuser *et al.*, 2015), ideational debates concerning the competing desirability and normative valuation of different land uses (St John *et al.*, 2019), discursive claims founded on the narratives and frames used to (de)legitimise land uses by different actors (McEachern, 1992; Brummans *et al.*, 2008; Petrescu-Mag *et al.*, 2018) and the way in

which varied forms of cognitive reasoning, based on worldviews accrued through different ways of 'knowing', may be used to justify some land uses over others (Elsawah *et al.*, 2015; W. M. Adams, 2015; Zimmermann, Albers and Kenter, 2022). The case further illustrates the multi-scalar nature of land-use conflict (Fienitz, 2023) in that, for example, conflicts over national-level policy disputes in deer management filter down to the regional scales within DMGs and can further cascade down to the level of disputes between the land use objectives of neighbouring landholdings. Overall then, this suggests that land-use conflict analysis needs to try to identify and encompass the full range of factors that may produce contentious situations over land use, whilst being sensitive to the linkages that might exist between the different levels and scales of a conflict scenario.

The thesis can also lay claim to being somewhat innovative, in that it has provided a worked example of a conflict analysis undertaken alongside an evaluation of a conflict management process. Much of the literature has been split between these two objectives (Redpath *et al.*, 2013; Fienitz, 2023), and there is often a gap that follows analyses of land-use conflicts which are not then succeeded by further research into how such conflicts might be ameliorated or resolved (White *et al.*, 2009; Hodgson *et al.*, 2018). Whilst this is, of course, not always practicable for a range of reasons (that were discussed in Chapter 6) and I have been very fortunate in being able to draw on an environmental mediation process occurring in real-time, there is nevertheless significant value in conflict analyses being complemented by further research into the capacities for conflict resolution, because it helps to show how insights from the former can inform the latter and can be used to test whether these insights remain true during conflict management.

In terms of the mediation itself, several lessons can be drawn. Firstly, conflict should not be understood solely as a problem to be resolved, but as a site through which competing values, identities and land-use visions are articulated and negotiated (Everingham *et al.*, 2016; Mason *et al.*, 2018; Hodgson, 2020; van den Ende *et al.*, 2023). In the case examined here, disagreement was not simply about deer numbers or management techniques but instead reflected deeper divergences concerning land stewardship, rural livelihoods, ecological responsibility and public accountability. Attempts to treat the dispute as purely technical would have overlooked these underlying value-based tensions. The mediation process further revealed that conflict can function as a productive arena, in line with much political ecology

thinking (e.g. Turner, 2004), in which assumptions are surfaced, positions are clarified and institutional expectations are tested. From a critical realist perspective, this reinforces the idea that visible disagreements often reflect deeper generative mechanisms — including historical land uses, personal and professional identities as well as the governance mandates of regulatory bodies like NatureScot — that cannot be addressed through surface-level (e.g. deer density targets) compromise alone (Zimmermann, McQuinn and Macdonald, 2020).

Second, this research has shown that sustained dialogue processes can shift relational dynamics even where substantive disagreements remain. For example, even by the end of *Finding the Common Ground* process, participants did not arrive at a consensus for sustainable deer management. However, repeated engagement throughout this process and after it altered the tone and structure of stakeholders' interactions. Participants reported greater understanding of others' positions (e.g. on deer carcasses), and moments of informal exchange during meetings and estate visits appeared to reset some pre-existing perceptions. This suggests that relational transformation does not require consensus. Instead, it may involve the gradual reconfiguration of trust, recognition and communicative norms. Importantly, such shifts were not automatic and were contingent on continuity through the Forum's ongoing work as well as participants' willingness to remain engaged despite their occasional frustrations. This highlights the temporal dimension of conflict management, in that meaningful change in contested land use contexts often requires long-term relational investment rather than short-term procedural intervention.

Thirdly, legitimacy was shaped as much by the process design of the mediation and its perceived fairness as by its substantive outcomes. Participants frequently evaluated the mediation in terms of whether they felt heard, whether the facilitation by the mediators was balanced and whether institutional actors (namely policymakers and regulators) demonstrated responsiveness to them. Even where policy positions did not change (such as on deer management intervention powers), perceptions of procedural fairness influenced how these outcomes were interpreted. This aligns with environmental governance literature suggesting that procedural justice can be as important as distributive outcomes in shaping acceptance (Sikor *et al.*, 2014).

Taken together, these insights extend beyond just Highland deer management. Other contested land use contexts and cases, such as rewilding initiatives, renewable energy

projects or agricultural transitions, are similarly characterised by layered structural constraints and deeply held normative commitments (e.g. Calo, 2020; Martin, Fischer and McMorran, 2023). In such contexts, conflict management approaches that rely primarily on technical expertise or scientific evidence risk misdiagnosing the nature of disagreement and potentially exacerbating it in turn (Ozawa, 2006).

Ultimately, the mediation process observed in the course of this research illustrates that contested land-use change is less about achieving neat resolutions and more about navigating ongoing tensions within complex social-ecological systems. Therefore, recognising conflict (and change) management as fundamentally iterative allows for more realistic expectations of what such processes can achieve and for how they can better designed in other cases (Hodgson *et al.*, 2022).

It also makes sense here to reflect on the participant observation undertaken for this thesis and what was learned from this approach. Firstly, participant observation played a more significant role in shaping my understanding of the mediation process and this area of research more broadly than I had perhaps initially anticipated. Whilst interviews provided me with in-depth, structured accounts of peoples' positions, motivations and values, it was through the sustained observation of a wide range of people at many meetings and estate visits, as well as the few stalking activities that I undertook, that the social dynamics underpinning these accounts became more understandable. Being embedded within the mediation process allowed me to observe not only what participants said, but how they interacted with each other over time.

One of the most striking aspects of the mediation was the contrast between formal contributions and informal exchanges. For example, in plenary discussions, participants often articulated carefully framed institutional positions, drawing on policy language, ecological data or organisational mandates. Yet during breaks, side conversations and shared travel to estate visits, these same individuals frequently expressed other emotions, such as confusion, frustration or exasperation, which were often absent during mediation activities. Observing these differences highlighted the extent to which actors' institutional roles shape their public articulation.

Estate visits and stalking activities also provided me with further insight into the embodied experiential knowledge of different participants, namely stalkers and land managers, which was not immediately apparent during the mediation itself. Watching stalkers assess the condition of deer, as well as the terrain and the weather in real time revealed the depth of experience involved in their day-to-day work, enabling me to better understand what was at stake for many of these people and why they cared so deeply about any potential changes to it. For example, explanations offered in interviews about deer densities, cull targets or habitat impacts took on greater meaning when they were situated within the actual places interviewees lived and worked in. At the same time, I observed moments where policy actors responded cautiously or sceptically to these demonstrations of expertise, reflecting different epistemological commitments regarding what counts as legitimate knowledge.

The mediation process also revealed subtle shifts in relational dynamics over time. In early meetings, the body language and conversational tone of many participants was often guarded. As the process progressed, I observed increased instances of humour, shared reference points and acknowledgement of others' constraints. These changes did not eliminate the many substantive disagreements that remained, but they did alter how people interacted. From an observational standpoint, such shifts would have been difficult to capture through interviews alone, as participants themselves did not always explicitly recognise them. The embedded position I took made it possible to track these incremental relational changes as they unfolded.

At the same time, occupying a dual role as observer and evaluator required me to have reflexive awareness. Participants were aware that I was evaluating the process and this may have shaped how openly they expressed their dissatisfaction or resistance in front of me. Acknowledging this does not invalidate my observations, but it does reinforce that the mediation was a socially constructed arena in which legitimacy and credibility were actively performed. From a critical realist perspective, participant observation enabled engagement with multiple strata of reality. The empirical level consisted of observable interactions, for example who spoke, who remained silent and how disagreements were framed. Beneath this sat deeper mechanisms, such as institutional contexts which constrained individual flexibility, historical mistrust shaping their tone towards others and professional identities informing authority claims. Being embedded within the process allowed these layers to be interpreted relationally rather than abstractly.

In all, participant observation of the mediation process strengthened the analysis by situating interview narratives and survey feedback within lived interactions. This ‘strengthening’ occurred, in large part, by recording extensive field-notes as part of my observations, based on a wide variety of interactions with participants, for a sustained period during the research across a diverse range of events and activities. Undertaking this, alongside conducting interviews and surveys, revealed that conflict was not only discursive or structural, but embodied and relational as well. This depth of engagement gave me a more nuanced understanding of contested land-use change in relation to deer management, as an ongoing negotiation between structure and agency, played out in everyday practices as much as in formal policy arenas.

The dynamics observed in this research must also be understood within the evolving governance framework of deer management in Scotland. The period during which the FtCG process and the early stages of the *Common Ground Forum* unfolded coincided with heightened policy attention on deer impacts and the gradual implementation of the Deer Working Group recommendations. This context of reform formed a critical backdrop to participants’ engagement with both land-use change and the mediation process itself.

The findings suggest that stakeholder responses to the mediation were shaped, at least in part, by how these wider reforms were interpreted by them. For some participants, the process represented an opportunity to influence the future direction of deer management reform and improve dialogue with key stakeholders (such as civil servants and regulators) within a changing policy environment. In this sense, mediation did not take place in a neutral setting, but within an active governance transition. For example, the perception among some participants, such as stalkers, estate managers and owners, of diminishing control over deer management decisions reflects this broader policy trajectory. Voluntary arrangements via DMGs and established management practices (such as culling methods) were increasingly subject to scrutiny in light of evolving policy objectives. The tensions identified in this thesis therefore form part of a wider negotiation concerning the role of different actors in delivering environmental outcomes, the balance between voluntary and statutory approaches and the evolving expectations placed upon deer managers.

Situating the findings within this governance context helps clarify why mediation alone could not resolve deeper disagreement. The conflict examined here was embedded within ongoing

institutional and policy change. As such, the limits and possibilities of collaborative processes were conditioned by developments occurring well beyond the immediate boundaries of the FtCG initiative.

Findings from both the land-use conflict analysis in Chapter 5 and the subsequent evaluation of the environmental mediation process in Chapter 6 also demonstrated the persistence of both inter *and* intra-group divergence, in that stakeholder groups were far from monolithic in their outlooks, even amongst relatively small and demographically homogenous groups of people, most notably deer stalkers, which was further illustrated in Chapter 7. This chimes with findings by a number of others concerning cases of conflict over land use and, in particular, conservation (Madden and McQuinn, 2014; Staddon, 2021; Zimmermann *et al.*, 2021; Hodgson *et al.*, 2022) and shows how conflict analyses, conflict management and studies of land-use change should not proceed with the assumption that individuals can be neatly demarcated into different stakeholder interest groups, which has long been the dominant approach by which such research is undertaken (Reed *et al.*, 2009). Instead, it would be preferable, if more analytically cumbersome, for researchers to treat people involved in instances of contested land-use change as individuals in their own right, without the predetermination of their views and positions that often comes with assigning them to particular stakeholder groups.

In this regard, research in this thesis has indicated the impact of seemingly straightforward measures such as enabling neglected voices to be ‘heard’ and the value of listening to these voices (Staddon *et al.*, 2021; Fienitz and Siebert, 2023); for example, it was not necessarily the case that deer stalkers expected their grievances to be acted upon or addressed, but that they simply felt ignored by others, and in particular by those viewed as policy or ‘decision-makers’, and many appeared to be much more content once they had been able to have, to use Staddon’s phrase, ‘a blether’ (2021). It has also demonstrated why it is important to consider the different ways people value land and how it is managed, when seeking to unpick and find a way through instances of contested land-use change. It therefore adds to the growing chorus of recent literature that has sought to emphasise these matters in the context of upland land-use change in other cases across the UK (Iversen *et al.*, 2022; Lees *et al.*, 2023; Ratcliffe, 2024; McConnachie *et al.*, 2025; Syder *et al.*, 2025).

What perhaps stands out most strongly from the research in this thesis in this vein is a sentiment that Lees et al (2023, p. 1289) succinctly described as a 'loss of control' over the use and management of land on the part of some people (in this case most obviously deer stalkers, estate managers and landowners), in that their longstanding dominance over land use decision-making is coming under increasing strain from proposed land use policies, in turn partly helping to explain the resistance of many of these people to land-use change and therefore the existence of land-use conflict. This is arguably felt even more acutely by those undertaking 'traditional' land uses such as deer stalking, where it is often perceived that there is more to 'lose' from land-use change compared to other sectors, and where there also tends to be reduced institutional willingness and perhaps even the capacity to adapt in the way that other more policy-responsive land use sectors, such as agriculture, might (Cox, Hallett and Winter, 1994; Toogood, 1995; Cusworth and Dodsworth, 2021; Plieninger *et al.*, 2025). The main lesson from this is that, for desired land-use changes to be pursued both successfully and equitably in cases where traditional forms of land use persist, people working in these forms of land use in particular need to be met and understood at 'their level', and supported through periods of change rather than being treated as obstacles or hindrances to policy directives that are very often viewed by these people as remote and detached from their everyday lived realities. A failure to do this only serves to entrench conflict and stymie change as has been seen time and again in other cases (e.g. Hodgson et al., 2022; Redpath et al., 2013).

At a more theoretical level, the use of a critical realist approach has enabled this research to demonstrate how frameworks for understanding contested land-use change can account for both structural constraints and stakeholder agency in sustainability contexts (Harnesk and Isgren, 2022). By analysing empirical data through this lens, the study shows how complex socio-ecological dynamics, such as regional practices in DMGs and policy frameworks like those contained within the Natural Environment (Scotland) Act, interact with individual (i.e. at the estate/landholding level) and collective (e.g. through the Common Ground Forum) decision-making.

A critical realist approach further allows for a more nuanced understanding of deer management in the Highlands, showing that conflicts are not simply reducible to competing interests, but are emergent outcomes of interacting ecological, social and institutional

processes. The findings suggest that the three analytical frameworks (levels of conflict; ECR criteria; and Values-Rules-Knowledge) applied here can capture both objective and subjective dimensions of conflict and change, offering transferable insights for other contexts where multi-level dynamics shape environmental management.

Furthermore, although this thesis focuses on upland deer management in the Highlands, the dynamics identified here resonate with patterns observed in wider scholarship on land-use conflict and socio-ecological transitions (Davies, Bryce and Redpath, 2013; Young *et al.*, 2016; Abrahms *et al.*, 2023). As discussed throughout the earlier chapters, land-use change associated with biodiversity restoration, climate mitigation and rural transitions frequently generates contestation that extends beyond technical disagreements. The findings of this research suggest that the case of Highland deer management reflects similar multi-layered dynamics.

In particular, the analysis demonstrates that disagreement over deer management cannot be understood solely as a dispute over ecological evidence or management practice. Instead, it operates across relational, historical and identity-based dimensions. This aligns with research on environmental conflict which emphasises that surface-level disputes often rest upon deeper tensions concerning legitimacy, authority, recognition and belonging (Madden and McQuinn, 2014; Mason *et al.*, 2018; Zikargae, Woldearegay and Skjerdal, 2022; Zimmermann, Albers and Kenter, 2022). The persistence of mistrust between different parts of the deer management sector, as well as the importance participants placed on being heard and acknowledged, reinforces the view that environmental conflicts are as much social and relational as they are technical (Redpath, Bhatia and Young, 2015; Hodgson *et al.*, 2018).

The theme of perceived loss of control identified among some estate-based actors and deer stalkers can also be situated within broader discussions around rural transitions (Iversen *et al.*, 2022; Lees *et al.*, 2023; McConnachie *et al.*, 2025). Scholarship on land-use change highlights that shifts in governance and environmental expectations are experienced unevenly across different stakeholder groups (Martin, Fischer and McMorran, 2023). In the Highland context, policy reforms and the increasing scrutiny of deer impacts contributed to a sense amongst some participants that established practices and forms of expertise were being destabilised. This finding illustrates how responses to environmental reform are shaped

not only by material interests, but by concerns relating to autonomy, identity and professional legitimacy.

Highland deer management as a case therefore provides an empirically grounded example of how land-use conflict unfolds within a wider context of socio-ecological transition. It demonstrates that collaborative initiatives such as mediation processes operate within, rather than outside of, these broader structural and relational dynamics. While the specific institutional arrangements of deer management in Scotland are distinctive, the patterns identified here, via a critical realist lens, including layered conflict, contested knowledge claims, differentiated responses to reform and the importance of procedural recognition, are consistent with themes identified in international research on environmental governance and conflict resolution (Orr, Emerson and Keyes, 2008; Sikor *et al.*, 2014; Dinnie, Fischer and Huband, 2015; Sharma *et al.*, 2023).

Moreover, the conflicts examined in this case reflect global patterns observable across rural landscapes undergoing environmental transition. In many parts of the world, traditional land-based livelihoods are being reshaped by climate mitigation policies, biodiversity targets and the expansion of markets for ecosystem services (Williams and Schirmer, 2012; Löfqvist, Garrett and Ghazoul, 2023; Plieninger *et al.*, 2025). These shifts frequently generate tensions between established land managers and emerging policy or conservation agendas, particularly where changes are perceived to challenge local autonomy, identity or stewardship practices (Raymond *et al.*, 2016; Zikargae, Woldearegay and Skjerdal, 2022). The layered character of conflict identified in this study mirrors dynamics documented in other environmental governance contexts. Similarly, the finding that mediation processes may reshape relationships without resolving structural disagreement reflects broader debates within ECR literature regarding the limits of consensus-based approaches in contexts characterised by historically embedded asymmetries of power and competing normative visions for land (Fisher, 2014; Fisher and Sablan, 2018).

In this sense, upland deer management in Scotland provides an empirically detailed example of how global environmental agendas are negotiated, resisted and reinterpreted within specific cultural and institutional settings. Rather than representing an exceptional case, the Highlands illustrate how environmental transition unfolds unevenly across landscapes shaped by deep historical legacies. Importantly, these layered dynamics are not novel within the

Highland context. As outlined above, deer management has long been intertwined with concentrated land ownership, sporting estate culture and evolving state oversight (Phillip *et al.*, 2009). The contemporary sense of diminished control articulated by some stalkers and estate managers can therefore be read not merely as a reaction to recent policy reform, but as part of a longer trajectory in which the governance of deer has shifted incrementally from predominantly voluntary, estate-led arrangements towards increased public scrutiny and regulatory intervention (Eastwood *et al.*, 2022). Situating present-day tensions within this historical story helps to explain both their intensity and their persistence.

The next section discusses the thesis' empirical contributions to knowledge on deer management in the Highlands.

### 8.2.2 An updated understanding of deer management in the Scottish Highlands

The thesis makes three main claims of novel empirical knowledge to the body of literature on deer management in the Scottish Highlands. Firstly, the thesis provides the first qualitative analysis of social conflict over deer management in the Highlands, by drawing on, to the best of my knowledge, the perspectives of the largest and most diverse sample of deer management stakeholders of any study on this topic to date (Chapter 5). Secondly, the thesis has produced the first evaluation of an environmental conflict resolution process in relation to deer management in the Highlands (Chapter 6). And thirdly, the thesis contains the first empirically-grounded, qualitative study in the academic literature centred on professional deer stalkers in the Highlands, based on unprecedented access to this group (Chapter 7).

In addition to these main knowledge contributions, research undertaken for this thesis provides further novel insights into contemporary deer management in the Highlands. Collectively, the three chapters have shed light on the attitudes of a variety of different people involved in deer management at a time of arguably unprecedented reform to deer management, as well as the changing nature of land use and management in the Highlands more broadly. Within this, what stands out most is the strength of feeling exhibited by many deer stalkers towards these changes over issues such as their employment security and perceived threats to their 'way of life' in the face of reduced deer numbers, as well as often highly emotional responses to practices such as increased hind culling, night shooting,

contract stalking and deer carcasses being left on the hill after being shot. Relatedly, Chapters 5 and 7 provide an up-to-date account of the evolving and increasingly contested 'multivalence' of deer (Fiorini, Yearley and Dandy, 2011) in the Highlands, showing how deer have become a lightning rod for broader tensions and grievances around land-use change in the region. In doing this, what the thesis therefore strongly suggests is that contention over deer management in the Highlands is much more of a social, cultural, political and emotional issue than one concerning ecology and conservation science, which remains the dominant framing of the deer 'problem' in Scotland. Whilst Kirkland et al (2021) has intimated this before, I contend that the work contained within this thesis provides the first empirical illustration of how this is enacted 'on the ground', in a similar vein to Hodgson's (2020) work on the conflict between raptor conservation and grouse moor management in Scotland. Moreover, the thesis has arguably addressed some of the research needs identified by Holland et al (2017, pp. 126; 33) in a review commissioned by NatureScot (then Scottish Natural Heritage) on existing wild deer research, by providing an 'understanding of the values and motivations underlying deer management conflicts' as well as knowledge around 'the mechanisms of trust building within collaborative processes [in relation to deer management].'

In terms of the Highlands itself as the overall case study region for this thesis, research did in fact reveal some meaningful place-based variations between estates and local areas within the Highlands. Differences in landholding compositions, ecological conditions and historical governance arrangements shaped how changes in deer management and land use were perceived and responded to. For example, stalkers working on the west coast, where deer densities tend to be lower because of climatic and ecological reasons, and where there are fewer, other land uses as a result, tended to be much more resistant to deer management reforms because they saw themselves as being in a more precarious position than those in the east, where deer densities are higher and where other land uses provide alternative employment opportunities on estates.

Such findings reinforce the importance of place-sensitive approaches to environmental governance (Taylor, 2025). Conflict and change management strategies that may appear appropriate at a national or regional scale can take on different meanings within specific local contexts. This case therefore illustrates both the strengths and limits of place-based

environmental governance in that, whilst processes, such as *Finding the Common Ground*, are able to foster legitimacy and trust between stakeholders at a regional level, they also remain shaped by structural dynamics operating both beyond (i.e. Scottish Government policy) and within the locality (e.g. individual landholding activities).

Chapter 7 in particular and, to a lesser extent, Chapter 5 also demonstrate the significant amount of pride (the emotion that arguably stands out most prominently of all from this research) that deer stalkers take in their roles, knowledge and skills, and therefore why many of them have such strong reactions to current changes in the sector. Findings in these chapters, such as stalkers' opinions on the 'right' way of managing deer, provide insight into this sector similar to that of the concept of the 'good farmer' in agricultural studies (Burton, 2004; McGuire, Morton and Cast, 2013; Burton *et al.*, 2020; Sutherland and Calo, 2020). At the same time, the thesis has shown the wide variety of views that are held by stalkers on issues including the close seasons, ammunition type, supplementary feeding, animal welfare, the decline of sporting estates, the sport stalking model, employment, deer reductions and the powers of the state to intervene in deer management, such that arriving at a settled notion of a 'good stalker' may be more difficult than assumed.

New insight is also shed on how deer stalkers are coping with climatic changes in the Highlands, such that the practice of deer stalking, and therefore the reaching of cull targets, appears to be becoming more difficult because of increasingly warm and wet winters. This is an important finding for policymakers and regulators to understand in the context of demands for higher culls, which may in fact be less feasible than commonly thought and there may need to be increased support and understanding in light of this. Perhaps more encouragingly for those wishing to see change in Highland deer management, deer stalkers do appear to be increasingly receptive to the use and integration of scientific evidence in their work, in particular those of a younger generation, indicating the influence of an increased emphasis on ecological sciences by education and training providers. Nonetheless, local, experientially-acquired knowledge remained important for all stalkers, showing that the recognition and inclusion of this within deer management and broader land use decisions and policy-making is vital for attaining social acceptance and legitimacy amongst this group of land managers (Irvine *et al.*, 2009) who, ultimately, are some of the most important people for

implementing the land use and management changes desired by the Scottish Government and other stakeholders including conservationists and foresters.

However, although the thesis highlights the extent to which deer stalkers are seen as *the* key group by many *others* in deer and land management in the Highlands, because of their high degree of influence over the future land use trajectory in the region, it is also interesting to note that many deer stalkers feel that their influence is, instead, waning. This is exemplified in the perception held by many deer stalkers that sporting estates are no longer the dominant players in the Highlands, a decline that Toogood (1995) noted was already well underway 30 years ago, and that other competing identities and discourses, or what Toogood (1995, p. 103) describes as 'different social worlds', predicated on notions of conservation, restoration and 'rewilding', are in the ascendancy, albeit not perhaps as fast as those working in these 'worlds' might like.

Related to this point is the observation that issues pertaining to private land ownership and reform did not emerge as a significant topic throughout any of this research, despite its prominence in the literature on deer management in the Highlands (Wightman and Higgins, 2000; Higgins, Wightman and MacMillan, 2002; Wightman *et al.*, 2002; Wightman, 2004; MacMillan and Leitch, 2008; MacMillan *et al.*, 2010) and its foundational role as the legal basis (*res nullius*) for deer management in the region as well (Phillip *et al.*, 2009). Moreover, landowners were not involved to any considerable extent throughout the FtCG process and the CGF, with many landowners who were invited saying they did not have the time to attend, meanwhile the vast majority of other participants did not bring up the issue of landownership during this work. This is interesting because it clashes with the degree of focus afforded to the 'land question' in the literature on deer management and more broadly in relation to land use and management in the Highlands, and because of what it may signal. This may include the perceived declining power and status of sporting estates, such that landowners do not feel they possess the level of influence that they may once have had or, conversely, that landowners may not feel themselves to be as accountable for policy agendas as others, because, as much of the literature has stressed, estates are viewed by landowners as primarily recreational assets (Wightman *et al.*, 2002; MacMillan *et al.*, 2010) rather than mechanisms for the delivery of these agendas, and particularly so if landowners are unsympathetic to them. Furthermore, it may indicate the extent to which landowners' attitudes towards government

has shifted, representing a continuation of MacMillan and Leitch's (2008, p. 477) observation that many landowners felt that the-then 'DCS [now NatureScot] ... had altered dramatically in recent times from an owner-friendly organisation to one which is influenced by a conservation agenda.' As to why other participants, including conservationists, did not raise the issue of landownership and reform, this could be attributed to a desire from these stakeholders not to contest large-scale landownership because it seems to be increasingly viewed by those within conservation as one of the most effective mechanisms to achieve their aims, which is becoming more evident through the sale of land to purportedly environmentally-minded organisations (McMorran *et al.*, 2022), which, in turn, is producing even more concentrated landownership in the Highlands (Wightman and Hollingdale, 2023; Wightman, 2024). Finally, another explanation could be that the process only involved a very small number of individuals representing 'community' interests, which are often (though sometimes inaccurately) juxtaposed against those of estates, who might have raised issues concerning land reform had they been more involved.

Findings from this research also indicated that criticisms and wariness towards the Scottish Government and NatureScot was not limited to landowners but also came from conservationists and eNGOs who, in contrast, felt that these actors were not pursuing a strong enough line on deer management and, for some, that projects like *Finding the Common Ground* were to, some extent, letting landowners and other sport stalking interests off the hook or even shifting the debate in their favour. Perhaps above all, this demonstrates the difficult tightrope that NatureScot has to walk in navigating contention around deer management (and other land use issues), balancing the interests and demands of a competing array of stakeholders and agendas, resulting in what Kirkland et al (2021, p. 3) previously described as a 'reluctance to create political fall-out', whilst meeting the remit set by the Scottish Government to regulate and enforce introduced changes.

In relation to whether financial incentives (both in the form of government support and those that are market-based) may produce higher culls, research for this thesis contrasts somewhat with previous studies which have argued that deer management is not primarily motivated by pecuniary benefits but instead by cultural norms and habits (Wightman, 2004; Smart, White and Termansen, 2007; MacMillan and Phillip, 2010). Instead, many stakeholders from across the deer management sector involved in this research, including landowners, estate

managers and deer stalkers as well as conservationists and foresters, argued that the Scottish Government should increase financial support for deer management to boost the cull level, in order to reduce the negative economic difference between revenue generated from deer management (stalking and venison sales) and the costs involved in it (labour, fuel and other resources). Joint advocacy between some of these stakeholders helped to result in a deer cull incentive scheme which was first launched by NatureScot in August 2024 for three different areas of Scotland and has since been renewed, with a further such scheme introduced in Loch Lomond & The Trossachs National Park (Loch Lomond & The Trossachs National Park, 2025). This may tentatively indicate that deer management is slowly starting to operate under similar economic mechanisms as other land use sectors in Scotland, such as agriculture and forestry, and evolving away from a purely private affair guided by traditional customs. However, time will tell whether economic incentives have much of an impact on higher culls in practice, or whether other factors predominate.

As noted by MacMillan and Phillip (2010, p. 492), it was similarly observed throughout the course of research for this thesis, that ‘venison is useful to all the main stakeholders in the debate about deer management, serving as common ground in an historically fractious area of land use policy.’ It is interesting to note that this remains the case, despite it also being heard throughout this research that the wild venison market in Scotland continues to be beset by problems including low wholesale prices, limited and concentrated supply and fluctuating demand. There was palpable frustration expressed by many stakeholders from across the deer management sector about the precarious state of the wild venison market and therefore a strong desire to see positive outputs for venison emerge from the *Finding the Common Ground* process and the *Common Ground Forum*. This culminated in an announcement by the Scottish Government that it would develop a ‘national venison subsidy scheme’ (ADMG, 2024), only for this to later be dropped, owing to claimed budgetary constraints, and replaced by local schemes in the Cairngorms and the aforementioned deer cull incentive schemes elsewhere.

In terms of DMGs, research for this thesis indicated that these continue to be viewed by deer management stakeholders in mixed ways, with some noting that DMGs are longstanding and even pioneering examples of voluntary and collaborative landscape-scale management, whilst others felt they remained ineffective because they lack statutory oversight and

enforcement. This therefore aligns with previous studies on DMGs in Scotland, including Davies and White (2012) and Eastwood et al (2022, p. 1), the latter of whom argued that collaborative arrangements like DMGs should not be viewed as a ‘silver bullet for policy uptake or adaptation to change.’ In fact, DMGs appeared to be increasingly criticised not just by conservationists, foresters and those keen to see higher culls, but also by many deer stalkers who seemed to be growing increasingly impatient with them because they were perceived to be poorly facilitated, which some felt undermined efforts at finding common ground at the local and regional level of deer management. Nevertheless, the wariness towards any statutory intervention on DMGs, observed by Austin et al (2014), remains true for many other stakeholders, including landowners, estate managers and more ‘traditional’ deer stalkers, because of this being seen as additional government interference on top of an already increasingly crowded, interventionist system of deer management, such that it is unlikely that a consensus on the future model and operation of DMGs will be reached any time soon.

These reflections have important implications for the consideration, development and implementation of policy towards achieving the ultimate goal of ‘successful’ deer management in Scotland (Kirkland *et al.*, 2021), which are discussed next.

### 8.2.3 Policy considerations for deer management in Scotland

Firstly, echoing Eastwood et al (2022), successful and sustained collaboration between NatureScot and deer stalkers, land managers and owners hinges on greater interpersonal familiarity between these actors ‘on the ground’, rather than (solely) through top-down mechanisms such as Control Schemes, which may only serve to entrench conflict, or through institutions such as DMGs, which are very mixed in their efficacy. However, this is difficult to achieve in a constrained fiscal situation which limits the amount of time agency staff have available to engage with land managers, which is something the Scottish Government should seriously reflect on given the land-use changes it wants to see in the uplands of Scotland. Similarly, if Control Agreements and Schemes are to be expanded in use, as intimated by NatureScot, and new intervention powers (such as section 6ZB of the Natural Environment [Scotland] Act) introduced, these will likely be more effective where they build on already-

existing relationships, such that these powers act as catalysts for further action rather than being seen as draconian instruments implemented in a vacuum.

Secondly, although the beneficial impact of financial incentives from government on deer management has been contested by others, this research has found that the vast majority of stakeholders, from different land use sectors, feel that more public support should be made available for deer management. There are three main reasons why this should be considered and indeed why tentative steps have already been taken by NatureScot and the two National Park Authorities through the deer cull incentive schemes. First is that deer management is undertaken at a loss, such that any additional financial support may help to cover the costs of existing cull targets and contribute towards those of higher cull targets going forward, helping in the delivery of intended outcomes from new deer management regulations. Further to this point, funding for deer management should focus on culling and stalking rather than fencing, which remains the primary focus through the Forestry Grant Scheme, despite an increasing range of evidence demonstrating the environmental benefits of culling over fencing (e.g. Gullett et al., 2023) as well as the ever-increasing cost of fencing material and the installation and maintenance of it (Law, 2024). Secondly, deer management is somewhat of an outlier in upland land uses in Scotland in that it is not directly subsidised, in comparison to livestock farming (which arguably has a significantly more negative environmental impact than the sport stalking model of deer management), forestry and renewable energy (Shepherd *et al.*, 2021; Mvula, Prager and Geris, 2025; Scottish Forestry, 2025), the other main land uses, along with deer management, in the uplands. Financial support may therefore go some way to encouraging the evolution of deer management to operate along similar lines to these sectors in the delivery of 'public interest' objectives. Thirdly, and perhaps most importantly, it was apparent throughout this research that it is not simply about economic support but about what this indicates to those working within deer management. Numerous deer stalkers and land managers said that they would feel more valued and respected by government through the provision of financial support, which might then mean that they would be more sympathetic and receptive to the pursuit of government objectives in relation to higher culls, which is obviously critical given that these will be the people undertaking them. This may also help the Scottish Government go a small way in evidencing its stated aim to implement 'Just Transition' principles in its reform of deer management (Scottish Government, n.d.).

Related to this point is that the Scottish Government should consider ways by which the wild venison market in Scotland can be better supported, either through financial means or through the development of more robust markets as well as consumer awareness campaigns, for example, tying in wild venison consumption to the government's climate goals (Ortiz, 2025). As with deer cull incentives, the majority of stakeholders from across the upland land use sectors in the Highlands routinely expressed exasperation about the state of the wild venison market, and whilst there a number of important cultural, social and economic reasons why this is so (notably including the sport stalking model itself, where sport is prized above meat), wanted something to be done about the situation. This therefore remains a unifying issue between people involved in deer management in Scotland and why the joint signing of a letter calling for a national venison subsidy scheme between ADMG and Scottish Environment LINK was both symbolic in itself and one of the few tangible outputs to directly emerge from the FtCG process.

Similarly, there was a keenness expressed for more community-based models of deer stalking to be developed, such as that being trialled by NatureScot at Creag Meagaidh National Nature Reserve (NatureScot, 2023a) and like those previously run by FLS and BASC on the Isle of Arran (Ewing, 2021). This was felt to be important for numerous reasons, including increasing understanding amongst the public about the need for deer management, de-mythologising the practice of deer stalking and enabling more wild venison consumption. Whilst some people are wary about this, including professional deer stalkers who expressed scepticism about the efficacy of recreational stalking and the health and safety implications involved, the majority of stakeholders thought such initiatives to be desirable, and recent research has explored this possibility further (Frater, Krofel, *et al.*, 2025) .

There were also widespread calls for deer stalking to become more 'professionalised'; a debate that played out over government proposals contained within the-then Natural Environment (Scotland) Bill for all deer stalkers to have to undertake mandatory training through the DSC1 and 2 schemes (BASC, 2025), and for practices such as tied-housing, low and informal (through tips) pay and insecure contracts to be addressed. These issues were felt by many stakeholders, including a good number of deer stalkers, to be holding the profession back and producing a general sense of precarity amongst estate-employed deer stalkers, particularly where deer reductions are seen as threatening not only the viability of

their jobs but also their homes and those of their families. Whilst this is primarily an issue for estate owners and factors to consider and rectify, the public sector could lead the way by demonstrating best practice in the deer stalking profession through, for example, employing full-time, qualified, in-house deer stalkers rather than relying primarily on contract stalkers, which remains the main approach in FLS (Forestry and Land Scotland, 2022a), the largest landowner in Scotland; an issue which causes so much consternation as this thesis has demonstrated. Environmental NGOs and other organisations pursuing conservation aims should also follow this approach if they are to get more traditional estates, who tend to be their neighbours, on board with their objectives so that cross-boundary landscape-scale deer management can be achieved more harmoniously (Steers, 2024; Allan, 2025). Examples of good practice in this regard include Cairngorms Connect, Trees for Life at their Dundreggan estate and the National Trust for Scotland at Mar Lodge, the latter two of which offer guided deer stalking as well (Ward, 2025; Hole, n.d.; National Trust for Scotland, n.d.; Trees for Life, n.d.).

And lastly, whilst this thesis has concerned deer management in the upland range of the Highlands, it would be remiss not to note the extent to which many stakeholders felt that there should be much more attention placed on lowland deer management, especially in peri-urban areas of the Central Belt. Although this seems to have started to slowly change over the past year, with the Lowland Deer Network Scotland (LDNS) being relaunched (Bruce, 2025) and the possibility of lowland deer management incentive schemes being introduced (Scottish Government, 2025d, n.d.), there remains a mismatch between the focus on red deer culling in the Highlands and that elsewhere, despite the progress in the former (Albon *et al.*, 2019) and that lowland areas arguably face more significant challenges from expanding roe deer ranges, resulting in increased deer-vehicle collisions as well as localised environmental impacts (Lush and Lush, 2023), whilst there is also an opportunity here to produce more lowland wild venison from recreational deer stalkers. A recent initiative has been established to this end between the Scottish Agricultural Organisation Society (SAOS), NatureScot, the LDNS and Scottish Venison (SAOS, 2025).

The final section of this chapter discusses the limitations of this thesis and the opportunities for further research that might stem from these.

### 8.3 Limitations and opportunities for further research

First, data collected and analysed for the thesis relied solely on participants involved with the *Finding the Common Ground* process and *Common Ground Forum*, although these fora were themselves opened up beyond existing networks by deliberate efforts to involve more ‘hard to reach’ actors (as explained in Chapter 7). This therefore constrained the range of views that this thesis draws on as a result and has perhaps only represented the positions of individuals who were amenable to engaging with other actors on deer management issues. It therefore may not accurately present the full range of views of those in the wider upland deer sector and therefore may even underplay the degree of social conflict between individuals. Furthermore, as noted above, a number of individuals, such as landowners, people that are part of community groups and recreational stalkers were either not involved in this work to a significant degree or not involved at all, which may mean that some issues were not captured. Future research could therefore build on this by involving individuals who have not been represented in this work in order to compare the views of these constituencies, to see if a different picture of social conflict emerges or if other issues not discussed in this thesis appear more prominent.

Another issue relates to the length of time afforded to the evaluation of the FtCG process and CGF in this thesis, owing to constraints with the duration of this research. This therefore means that there has likely not yet been sufficient time allowed to observe the full range of outcomes from these projects, for example in terms of improved collaboration at the DMG level or perhaps even the environmental benefits from this, which has therefore influenced the degree to which these projects were seen to be ‘successful’ in this thesis. It would therefore be highly valuable for further evaluative research to be undertaken in the medium and longer term on these projects in order to monitor and assess additional outputs and to test the durability of those that so far been created. Similarly, it would be worthwhile for research to assess the longer-term implications from ongoing reforms to deer management, which may indicate how individuals, such as deer stalkers, are (or are not) adapting to these changes, as well as what effect these reforms are having on operational deer management in the form of cull levels, management methods and sporting models.

A further limitation may relate to my decision to go stalking on estates with a sport stalking interest, rather than perhaps try and undertake other activities related to deer management, such as an herbivore impact assessment on a conservation site or fence installation on a forestry plantation, which may have presented me with a different picture of practical, day-to-day deer management issues and therefore some of the contention that exists over the impacts of deer. An interesting future research project could therefore involve a more ethnographic focus that seeks to compare different deer management practices on a range of landholding types.

It would also be worthwhile for further research to be undertaken on the social dimensions of lowland deer management in Scotland, as this has so far received very little research attention compared to deer management in the Highlands. This could, for example, focus on the views and attitudes of lowland recreational deer stalkers towards recent and proposed deer management reforms or explore the capacity for increased culling in the lowlands in response to growing deer management challenges and the opportunities for venison production, promotion and consumption amongst urban and peri-urban publics.

More broadly at a conceptual level, this thesis may have benefited from relying on more than one sectoral context, thus enabling comparative insights into different cases of land-use conflicts as well as opportunities for the assessment and evaluation of conflict management efforts in different contexts. Further research could therefore compare the findings from this thesis alongside other or future cases of contested land-use change to build a more generalisable picture of ways in which land-use conflicts can be understood and managed and how those affected respond.

## 9. Conclusion

This thesis has explored land-use conflict, environmental conflict resolution and social responses to land-use change in the context of upland deer management in the Scottish Highlands. This was undertaken using qualitative research over a two-year period, gained through access to an environmental mediation process focused on ameliorating social conflict between a wide range of stakeholders involved in the management of deer in the Highlands.

From this research, the thesis has argued that contention over deer management is more complex and multi-levelled than often presented, with disputes over deer numbers and methods of management representing the surface-level expression of deeper debates over historic controversies between parties as well as the competing identities of stakeholders in a changing landscape. An evaluation of the environmental mediation process, as a method of conflict management in this context, indicated that this resulted in improved relationships between stakeholders, founded on increased trust, understanding and empathy, but which has not yet translated into tangible outcomes at the operational level of deer management. Finally, a study of current and former professional deer stalkers, who are arguably the group most affected by and responsible for the delivery of changes in the management of deer in the Highlands, but have so far received scant research attention, revealed a multitude of perspectives and views ranging from welcoming and adaptive, to fearful and resistant.

Overall, the thesis has shed light on the modern nature of deer management in the Scottish Highlands and hints at its future direction, whilst contributing to the understanding of debates about how land is used amid the environmental challenges of the 21<sup>st</sup> century.

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## Appendices

### Appendix A. List of Deer Management Groups (DMGs)

<b>DMG (Listed A – Z)</b>	<b>Approx. size (hectares)</b>	<b>Number of member landholdings/ 'deer management units'</b>	<b>Most recent red deer count data</b>	<b>Most recent red deer cull data</b>	<b>Most recent red deer density data (per km<sup>2</sup>)</b>
Affric & Kintail	34,194	8	3,566 (2015)	879 (2015/16)	c.13 (2015)
Ardnamurchan	21,843	36	1,803 (2016)	N/A	7.2 (2016)
Arran	43,000	4	1,873 (2016)	405 (2015/16)	10.1 (2016)
Balquhidder	42,717	10	3,919 (2023)	1,070 (2022/23)	10.2 (2023)
Black Mount	91,000	15	6,186 (2018)	752 (2018/19)	6.81 (2018)
Breadalbane	95,000	28	8,296 (2021)	2,395 (2020/21)	10.77 (2021)
Cairngorm Speyside	110,000	21	4,103 (2010)	N/A	N/A
East Loch Ericht	35,800	12	4,849 (2015)	N/A	16.5 (2015)
East Loch Shiel	46,233	21	3,821 (2016)	900 (2017/18)	8.3 (2016)
East Ross	20,000	7	1,827 (2022)	410 (2021/22)	13.6 (2022)
East Sutherland	123,000	17	12,410 (2014)	2,267 (2014/15)	12.4 (2014)
Gairloch	42,600	7	1,369 (2017)	323 (2014/15)	3.2 (2017)
Glen Strathfarrar	45,540	10	6,487 (2012)	913 (2015/16)	14.95 (2012)
Glen Artney	14,955	5	3,731 (2023)	635 (2023/24)	24.9 (2023)
Glenelg	42,463	13	4,197 (2016)	254 (2015/16)	c.11 (2016)
Glenmoriston	38,382	12	3,667 (2016)	230 (2019/20)	N/A

Inveraray and Tyndrum	59,137	23	3,084 (2022)	1,404 (2020/1)	6.58 (2022)
Islay	34,000	7	N/A	N/A	N/A
Jura	36,215	7	5,110 (2018)	N/A	14.1 (2018)
Knoydart	63,995	7	5,481 (2014)	464 (2015/16)	10.88 (2014)
Lewis & Harris	107,282	20	2,800 (2014)	477 (2016/17)	2.6 (2014)
Lochalsh	48,000	5	N/A	942 (2014)	N/A
Mid West	106,000	7	N/A	N/A	N/A
Moidart	20,000	12	2,292 (2016)	349 (2017/18)	N/A
Monadhliath	150,200	25	18,984 (2013)	N/A	15.0 (2013)
Morvern	47,000	12	N/A	N/A	N/A
Mull	88,170	23	5,907 (2011)	1,419 (2013/14)	10.47 (2011)
North West Sutherland	168,960	17	7,981 (2012)	2,251 (2017/18)	4.86 (2012)
North Ross	148,500	22	12,140 (2023)	1,889 (2018/19)	10.3 (2019)
Northern	150,678	28	N/A	N/A	N/A
Rum	N/A	N/A	N/A	N/A	N/A
Skye	N/A	N/A	N/A	N/A	N/A
South Deeside and North Angus	70,360	11	10,151 (2016)	1,652 (2014/15)	c. 19 (2013)
South Grampian	32,411	17	5,226 (2016)	N/A	c. 16 (2016)
South Perthshire	72,000	32	5,606 (2018)	N/A	c. 8 (2018)
Strathconon	55,045	6	8,147 (2016)	N/A	17.7 (2016)
Strathtay	6,087	9	1,227 (2016)	385 (2015/16)	20.2 (2016)
South West Ross	62,340	20	N/A	N/A	N/A
Uist	69,766	6	N/A	N/A	N/A
Upper Deeside and Donside	101,592	17	4,181 (2022)	979 (2021/22)	4.2 (2022)
West Grampian	75,849	23	18,468 (2010)	N/A	24.2 (2010)
West Knoydart	26,252	19	3,120 (2019)	416 (2015/16)	12.5 (2019)

West Lochaber	47,753	13	6,382 (2018)	N/A	14.5 (2018)
West Ross	97,527	14	9,164 (2018)	1,374 (2017/18)	7.53 (2018)
West Sutherland	140,000	26	10,795 (2016)	N/A	N/A

**Note:** The table contains the most recent available information (size, number of member landholdings and most recent deer count, cull and density) relating to all upland DMGs in Scotland. It also shows where information is not available or not accurate enough to be included, i.e., where cull returns are incomplete or count data is not available for the whole DMG area (denoted by 'N/A'). Sourced and collated from individual DMG websites and/or ADMG website. DMGs tend to only count red deer and some information may be inaccurate in terms of missing individual landholding counts and/or cull returns.

## Appendix B. Methods – additional information and material

### B.1 Interview list

Interview	Date	Length (minutes: seconds)	Online/phone	Recorded? Y/N
1	16 <sup>th</sup> January 2023	58:30	Online	Y
2	16 <sup>th</sup> January 2023	51:43	Online	Y
3	16 <sup>th</sup> January 2023	56:05	Online	Y
4	19 <sup>th</sup> January 2023	52:30	Online	Y
5	20 <sup>th</sup> January 2023	59:13	Online	N
6	20 <sup>th</sup> January 2023	67:33	Online	Y
7	25 <sup>th</sup> January 2023	69:22	Online	Y
8	25 <sup>th</sup> January 2023	46:36	Online	Y
9	25 <sup>th</sup> January 2023	49:27	Online	Y
10	26 <sup>th</sup> January 2023	52:39	Online	Y
11	26 <sup>th</sup> January 2023	65:47	Online & phone	Y
12	13 <sup>th</sup> February 2023	54:07	Online	Y
13	14 <sup>th</sup> February 2023	42:58	Online	Y
14	24 <sup>th</sup> March 2023	60:00	Online	Y
15	27 <sup>th</sup> March 2023	60:01	Online	Y
16	27 <sup>th</sup> March 2023	56:27	Online	Y
17	3 <sup>rd</sup> April 2023	54:51	Online	Y
18	5 <sup>th</sup> April 2023	59:35	Online	Y

19	6 <sup>th</sup> April 2023	52:07	Phone	Y
20	18 <sup>th</sup> April 2023	57:10	Online	Y
21	23 <sup>rd</sup> June 2023	32:15	Phone	Y
22	27 <sup>th</sup> June 2023	49:03	Online	Y
23	28 <sup>th</sup> June 2023	08:09	Phone	N
24	30 <sup>th</sup> June 2023	50:42	Online	Y
25	3 <sup>rd</sup> July 2023	39:02	Online	Y
26	4 <sup>th</sup> July 2023	69:09	Phone	Y
27	5 <sup>th</sup> July 2023	89:34	Online	Y
28	10 <sup>th</sup> July 2023	71:10	Online	Y
29	10 <sup>th</sup> July 2023	53:45	Phone	Y
30	11 <sup>th</sup> July 2023	47:36	Online	Y
31	13th July 2023 & 8 <sup>th</sup> August 2023	51:12 (in total)	Phone	Y
32	14 <sup>th</sup> July 2023	45:03	Phone	Y
33	31 <sup>st</sup> July 2023	27:50	Online	Y
34	7 <sup>th</sup> August 2023	63:12	Phone	Y
35	30 <sup>th</sup> August 2023	55:20	Online	Y
36	14 <sup>th</sup> September 2023	67:26	Phone	Y
37	15 <sup>th</sup> September 2023	59:38	Online	Y
38	28 <sup>th</sup> November 2023	63:16	Online	Y
39	19 <sup>th</sup> January 2024	59:58	Online	Y
40	18 <sup>th</sup> March 2024	54:07	Phone	Y
41	18 <sup>th</sup> March 2024	34:58	Phone	Y
42	2 <sup>nd</sup> April 2024	68:12	Phone	Y
43	3 <sup>rd</sup> April 2024	56:44	Phone	Y
44	4 <sup>th</sup> April 2024	47:03	Phone	Y
45	4 <sup>th</sup> April 2024	51:59	Phone	Y
46	5 <sup>th</sup> April 2024	62:24	Phone	Y
47	8 <sup>th</sup> April 2024	68:10	Online	Y
48	10 <sup>th</sup> April 2024	60:04	Online	Y
49	15 <sup>th</sup> April 2024	80:11	Phone	Y
50	16 <sup>th</sup> April 2024	55:14	Online	Y
51	24 <sup>th</sup> April 2024	51:36	Online	Y
52	25 <sup>th</sup> April 2024	56:30	Online	Y

## B.2 Interview guideline for new FtCG participants

### **Birnam workshop**

1. What did you think of the workshop in Birnam?
2. What did you think of the exercises/activities on the day?
3. What did you think of the topics of conversation on the day?

4. What did you think of the way in which the day was handled by Centre for Good Relations?

### **The process**

1. What do you think about the aims of the process and are they clear enough?
2. Do you see how this process relates to the DWG report and policy implementation?
3. What do you think the process should focus more on, if anything?
4. What would you like to see at the next workshop?
5. What would you like to see at the end of the process?
6. Have you been involved in similar processes before? How does this one compare?
7. Have you spoken to others involved about it? What do they think?
8. Do you think the process is inclusive and involves the 'right people'?
9. What areas of work do you think would be beneficial to follow on from the process when it finishes?

### **Topics/issues**

1. What are the main issues for you in terms of the debate on deer management?
2. What do you think are the main factors driving change in upland deer management?
3. What topics or issues require further work that you think can't be adequately addressed through the process?
4. What do you think of the state of relationships in the deer management sector?
5. Are you optimistic or worried for the future of deer management in Scotland?

### B.3 Interview guideline for current/former deer stalkers

1. What did you think about the event at GlenQuoich?
2. How long have you been a deer stalker?
3. Why did you become a deer stalker?
4. What do you enjoy about being a deer stalker?
5. What are the main challenges facing deer management in your opinion?
6. Are you optimistic or pessimistic about the future of deer stalking in Scotland?
7. What do you think about the reforms the Scottish Government are introducing to deer management?
8. What do you think the impacts of these changes will be?

9. What do you think about the 10 deer per km<sup>2</sup> target?
10. What do you think about the extra 50,000 deer cull?
11. What do you think about the removal of the stag season? What do you think about the proposals to extend the hind season?
12. Do you think the model of deer stalking needs to change? How do you think it needs to change? Should more be charged? Should more be made of the experience rather than expectation of getting a stag?
13. Do you think traditional open-hill red deer stalking has a future in the Scottish Highlands?
14. Do you think deer are being unfairly blamed?
15. Do you think carbon credits offer a potential opportunity for deer management?
16. What do you think about the role NatureScot play in deer management?
17. What do you think would help resolve some of the worries in the deer management industry?

#### B.4 Interview guideline for mediators

1. How do you think the process went overall?
2. What do you think went well?
3. What do you think could have gone better?
4. What do you think the main outcomes of the process have been?
5. What would you do differently if you could do it again?
6. How did it compare to other mediation processes you have facilitated?
7. Did you find it difficult to learn about some of the technicalities and complexities around deer management?
8. Do you think the process involved the right people in terms of number and representation?
9. Were there any things that happened during the process that surprised you?
10. Did you have any frustrations during the process and if so, what were these about?
11. Do you think the process achieved what you set out to do?
12. What do you think needs to happen next to continue the successes of the process?

13. What do you think enabled people to trust each other?
14. What do you think helped improve relationships between people?
15. Can you explain some of the theory/thinking behind the approach you take to mediation?
16. What do you think remain the key fault-lines between people involved in this debate?
17. Are there any other things that you think are important in relation to the process?

B.5 FtCG entry survey

## **Finding the Common Ground on Sustainable Upland Deer Management – Survey**

### **Privacy notice**

This survey forms part of the evaluation of the Finding the Common Ground on Sustainable Upland Deer Management process. Full details of the terms of your involvement in this research are detailed in the project information sheet (also available here: <https://bit.ly/3dEBB2v>). In brief, your completion of this survey is voluntary, your responses are anonymous and the data will be stored securely. Please email [info@ftcg.org.uk](mailto:info@ftcg.org.uk) if you have any questions.

- 1. Please score the following statements to the extent you agree or disagree with them (by ticking the appropriate circle)**

---

	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neither agree nor disagree</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>I don't know</b>
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- 1. Deer numbers need to be reduced in most parts of upland Scotland to minimise their environmental impact**

	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
--	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

2. Increased culling will negatively impact deer welfare
3. Science clearly supports the idea that deer numbers should be reduced for environmental benefits in the uplands
4. Reducing deer numbers in upland areas of Scotland threatens rural livelihoods
5. Upland deer management needs more regulation by government
6. Reducing deer numbers in upland areas of Scotland threatens local traditions
7. Local communities are not involved enough in decisions about deer management
8. It is problematic if government deer management policies ignore the local knowledge of land managers
9. There is effective communication between people in different sectors involving deer management
10. There is a good level of trust between people in different sectors involving deer management

**11. I think that people in different sectors involved in deer management understand my views**

**12. I think that people in different sectors involved in deer management respect my views**

**13. I think the Finding the Common Ground process will improve relationships between people involved in upland deer management**

**14. I think the Finding the Common Ground process might change my mind about some deer management issues**

**2. In your own words, what would you like the Finding the Common Ground process to achieve? (You may leave this question blank if you wish)**

**3. What is your age?**

- 18 – 24
- 25 – 34
- 35 – 44
- 45 – 54
- 55 – 64
- 65 – 74
- 75 +

Prefer not to say

**4. What is your gender?** (You can skip this question if you prefer)

**5. Which of the following best describes your main employer?**

- Private estate
- Public/governmental body
- Non-Governmental Organisation
- Consultancy
- Community body
- Prefer not to say
- Other (please describe in the box below)

**6. Which of the following describes your work?** (Please tick as many or as you few as you wish)

- Stalking
- Conservation
- Forestry
- Policy
- Consultancy
- Community development
- Prefer not to say

Other (please describe in the box below)

**7. How many years have you been involved in work with some relevance to deer management?**

- 0 – 5 years
- 6 – 10 years
- 11 – 15 years
- 16 – 20 years
- 21 – 25 years
- 26 – 30 years
- 31 – 35 years
- 36 – 40 years
- 40 years +
- Prefer not to say

**8. Are you a member of a Deer Management Group?**

- Yes
- No
- Prefer not to say

**9. Is your work mainly nationally-focused (for instance on national policy) or area-based?**

If you choose area-based, please tick the Local Authority area(s) in which you work in Q10 below. If you choose nationally-focused, please ignore Q10 and skip to the end of the survey.

- Nationally-focused
- Area-based (**please tick the Local Authority area(s) in Q10 below**)
- Prefer not to say

**10. Please tick the Local Authority area(s) which you work in (continued overleaf)**

- Aberdeen City Council
- Aberdeenshire Council
- Angus Council
- Argyll and Bute Council
- City of Edinburgh Council
- Clackmannanshire Council
- Comhairle nan Eilean Siar
- Dumfries and Galloway Council
- Dundee City Council
- East Ayrshire Council
- East Dunbartonshire Council
- East Lothian Council
- East Renfrewshire Council
- Falkirk Council
- Fife Council
- Glasgow City Council
- Inverclyde Council
- Midlothian Council
- North Ayrshire Council
- North Lanarkshire Council
- Orkney Islands Council
- Perth and Kinross Council
- Renfrewshire Council
- Scottish Borders Council
- Shetland Islands Council
- South Ayrshire Council
- South Lanarkshire Council
- Stirling Council
- The Highland Council
- The Moray Council
- West Dunbartonshire Council
- West Lothian Council

Other (if you work in areas outside of Scotland please detail them below)

**END OF SURVEY**

**Thank you very much for completing this survey. If you have any questions or comments please email .**

B.6 FtCG exit survey

**End of process survey – Finding the Common Ground on Sustainable Upland Deer Management**

**About the survey**

The aim of this survey is to measure change in participant views from the start of the process as an indication of its impact. As a result, most of the statements in the first section of this survey are the same as those in the original survey that you completed at the Stirling workshop.

The second section of the survey contains open questions to allow you to reflect more freely on the process.

The final section contains demographic questions.

This survey should take between 5 and 10 minutes to complete.



6. Reducing deer numbers in upland areas of Scotland threatens local traditions
7. Local communities are not involved enough in decisions about deer management
8. It is problematic if government deer management policies ignore the local knowledge of land managers
9. There is effective communication between people in different sectors involving deer management
10. There is a good level of trust between people in different sectors involving deer management
11. I think that people in different sectors involved in deer management understand my views
12. I think that people in different sectors involved in deer management respect my views
13. I think that the Finding the Common Ground process has improved relationships between people involved in upland deer management
14. I think that the Finding the Common Ground process has changed my mind about some deer management issues

**2. What do you think the Finding the Common Ground process has achieved, if anything?**

**3. What do you think the limitations of the Finding the Common Ground process have been, if anything?**

**4. What would you like to see follow on from the Finding the Common Ground process, if anything?**

**5. Do you have any other comments or reflections you would like to make about the Finding the Common Ground process?**

**6. What is your age?**

- 18 – 24
- 25 – 34
- 35 – 44
- 45 – 54
- 55 – 64
- 65 – 74
- 75 +
- Prefer not to say

**7. What is your gender? (You can skip this question if you prefer)**

**8. Which of the following best describes your main employer?**

- Private estate
- Public/governmental body
- Non-Governmental Organisation
- Consultancy

- Community body
- Prefer not to say
- Other (please describe in the box below)

**9. Which of the following describes your work?** (Please tick as many or as you few as you wish)

- Stalking
- Conservation
- Forestry
- Policy
- Consultancy
- Community development
- Prefer not to say
- Other (please describe in the box below)

**10. How many years have you been involved in work with some relevance to deer management?**

- 0 – 5 years
- 6 – 10 years

- 11 – 15 years
- 16 – 20 years
- 21 – 25 years
- 26 – 30 years
- 31 – 35 years
- 36 – 40 years
- 40 years +
- Prefer not to say

**11. Are you a member of a Deer Management Group?**

- Yes
- No
- Prefer not to say

**12. Is your work mainly nationally-focused (for instance on national policy) or area-based?**

If you choose area-based, please tick the Local Authority area(s) in which you work in Q10 below.  
If you choose nationally-focused, please ignore Q10 and skip to the end of the survey.

- Nationally-focused
- Area-based (**please tick the Local Authority area(s) in Q10 below**)
- Prefer not to say

**13. Please tick the Local Authority area(s) which you work in (continued overleaf)**

- Aberdeen City Council
- Aberdeenshire Council
- Angus Council
- Argyll and Bute Council
- City of Edinburgh Council
- Clackmannanshire Council
- Comhairle nan Eilean Siar
- Dumfries and Galloway Council
- Dundee City Council
- East Ayrshire Council
- East Dunbartonshire Council
- East Lothian Council
- East Renfrewshire Council
- Falkirk Council
- Fife Council
- Glasgow City Council
- Inverclyde Council
- Midlothian Council
- North Ayrshire Council
- North Lanarkshire Council
- Orkney Islands Council
- Perth and Kinross Council
- Renfrewshire Council
- Scottish Borders Council
- Shetland Islands Council
- South Ayrshire Council
- South Lanarkshire Council
- Stirling Council
- The Highland Council
- The Moray Council
- West Dunbartonshire Council
- West Lothian Council

Other (if you work in areas outside of Scotland please detail them below)

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**END OF SURVEY**

**Thank you very much for completing this survey. If you have any questions or comments please email \_\_\_\_\_.**

B.7 CGF reflection survey

## **Finding the Common Ground process and Common Ground Forum - Reflection Survey**

### **About the survey**

It is over a year since the Finding the Common Ground process concluded and nearly a year since the Common Ground Forum was established. The aim of this short survey is to gauge longer-term perspectives on the Finding the Common Ground process as well as the work that the Common Ground Forum has begun. The survey includes four open-ended questions allowing you to reflect on what you think the process and forum have achieved so far and where you think work still needs to be done. The final question asks what profession you work in to help contextualise responses. Responses to this survey will help inform an updated evaluation report which will be produced towards the end of this year and will be made available for you to read. All responses are gratefully appreciated.

If you have any questions, please email me at \_\_\_\_\_.

### **Privacy notice**

Your completion of this survey is voluntary, your responses are anonymous and all data will be stored securely. Please email \_\_\_\_\_ if you have any questions.

1. What do you think the Finding the Common Ground process and/or Common Ground Forum have achieved so far, if anything?
2. What do you think the shortcomings of the Finding the Common Ground process and/or Common Ground Forum have been, if anything?
3. From your perspective, what work still needs to be done, if anything, by the Common Ground Forum to improve collaboration and produce positive outcomes in the upland deer management sector?
4. Are there any other comments you would like to make about the Finding the Common Ground process and/or Common Ground Forum?
5. What is your profession/employment industry?

## Appendix C. Ethics – additional information and material

### C.1 Research Ethics and Integrity Assessment Form



THE UNIVERSITY of EDINBURGH  
School of GeoSciences

## PART 1 - First Pass Assessment

### General Data Protection Regulation (GDPR)

Data protection legislation changed on 25 May 2018 when the [General Data Protection Regulation \(GDPR\)](#) came into force replacing the existing Data Protection Act 1998. **Whenever we use personal data** we must have a [legal basis](#) for doing so. In the case of historic and scientific research the legal basis is '[processing in the public interest](#)' and this is legal basis upon which the Ethics Committee assume your research is based (if relevant). Note however, that for those **people collecting 'Special Categories' of personal data**, you must have a different legal basis – here the legislation has created a special legal basis for us – '[Research in the public interest](#)'. The GDPR calls for a '[Privacy notice](#)' to be used for all research involving personal data – we refer to that as a 'Participant Information Sheet', templates for which are in the guidance '[Research under the General Data Protection Regulation](#)'. We also require consent to participate in the research from people, a consent template is also on the '[Research under the General Data Protection Regulation](#)' website. A [compliance checklist](#) in relation GDPR is available, but **all necessary compliance steps have been integrated into this form e.g. the DPIA – Data Protection Impact Assessment**. **Box 2 below on the 'Rights of human subjects' will ask you questions about this, if relevant for your research.**

1. Are you an undergraduate, MSc or PhD student?

YES Complete Part 2 of the Research Ethics and Integrity Assessment Form (as 'Self' or 'Full').

NO **Go to Question 2**

2. Has your research been reviewed by an external body (e.g. NHS, BAS)?

YES Complete a Confirmation of External Review Form (available at [Our Forms and Resources](#))

NO **Go to Question 3**

3. Does your research involve human subjects (e.g. interviewing, participant observation, PAR, survey, audio/film recording)?

YES Complete Part 2 of Research Ethics and Integrity Assessment Form (as 'Self' or 'Full').

NO [Go to Question 4](#)

4. Does your research involve environmental fieldwork (e.g. sampling, directly monitoring a site, environmental disturbance, trans-boundary movement of specimens /samples)?

YES Complete Part 2 of the Research Ethics and Integrity Assessment Form (as 'Self' or 'Full').

NO [Go to Question 5](#)

5. Does your research involve the use of data/material provided by an external source (e.g. other researcher, agency, data repository) or archival work?

YES Complete Part 2 Research Ethics and Integrity Assessment Form (as 'Self' or 'Full').

NO [Go to Question 6](#)

6. Are you confident that you understand the requirements of the General Data Protection Requirements (GDPR) (2018) and that you have appropriate documented agreements and procedures in place to cover your collaborative working relationships with academic or non-academic partners (including local field assistants), extending to how intellectual property, publication and authorship will be shared?

YES [Go to Question 7](#)

NO Complete Part 2 Research Ethics and Integrity Assessment Form (as 'Self' or 'Full').

7. Are you confident that your work meets the standards of integrity required by the UoE and that you have a sound and justifiable plan regarding dissemination of the results of the research (e.g. to potential beneficiaries such as funders, study participants, land occupiers or owners, local communities, etc.)?

YES Please email the Research Ethics and Integrity Secretary ( [ethics.geos@ed.ac.uk](mailto:ethics.geos@ed.ac.uk) ) with your project title and a copy of this First Pass Assessment. The Research Ethics and Integrity Committee reserve the right to obtain a written record of your reasoning.

NO Complete Part 2 of the Research Ethics and Integrity Assessment Form (as 'Self' or 'Full').



THE UNIVERSITY of EDINBURGH  
School of GeoSciences

## PART 2 - Research Ethics and Integrity Assessment Form

Tick either Self or Full Assessment		
<b>SELF ASSESSMENT</b>	x	READ Research Ethics & Integrity <u>Self-Assessment Guidance Notes</u>
<b>FULL ASSESSMENT</b>		READ Self-Assessment Guidance Notes in conjunction with <u>Full Guidance Notes</u>
Has a member of the Committee been consulted prior to submission?		If ticked please provide the name of Committee Member <b>Name:</b>

Title of Research Project: 'Finding the Common Ground on Sustainable Upland Deer Management' Evaluation

Worktribe reference number: N/A

Duration & timing of Research Project: August 2022 to May 2024 (with absolute end date of December 2024 only if needed)

Name of Principal Investigator: Callum Leavey-Wilson

Signature of Principal Investigator:

Callum Leavey-Wilson

Date: 06/07/2022

(Electronic signatures / typed names are accepted)

Research Institute (staff and PhD only):

Global Change

Earth & Planetary Science

Geography & The Lived

Environment

Email of Principal Investigator:

Co-Investigator(s) email(s) (if applicable):

<b>Student supervisor information</b> (if applicable)
Name of Supervisors: Janet Fisher, Sam Staddon
Signature of Supervisor*:
Janet Fisher
-----
Sam Staddon
Date: 15/06/22
(* Electronic signatures accepted or typed name and date if supplied with the email from your supervisor which verifies approval )

Type of student (if applicable)	Tick	Student Number	Name of your programme secretary
Undergraduate Honours			
Taught MSc			

MSc by Research			
PhD	x	S1524849	<a href="mailto:pgrsupport.geos@ed.ac.uk">pgrsupport.geos@ed.ac.uk</a>

<b>Check List before submission</b>	
I have read the appropriate Guidance Notes	x
I have completed all relevant check boxes	x
I have included a Research Summary	x
I have completed the Additional Statement box (where appropriate)	x
I have appended all other relevant documents (where appropriate)  (NB: If you are an <b>Undergraduate, MSc or PhD student submitting a Full Assessment</b> please attach your Plain Language Statement(s), Consent Form(s), and copies of formal agreements, email correspondence, etc. as appropriate)	x

\*\*\*\*\*

<b>After this form is completed!</b>
<b>STAFF and PhD students + all FULL assessments by UG/MASTERS STUDENTS:</b> Email the completed form (along with any additional supporting documents) to the Committee Secretary by emailing <a href="mailto:ethics.geos@ed.ac.uk">ethics.geos@ed.ac.uk</a> . The form will be logged and reviewed by the Committee and a Determination returned to you within 3 weeks.
<b>UG and MASTERS STUDENTS:</b> Attach a copy of this form to your project proposals and share with your Programme Director/Course Organiser, as directed in your dissertation handbooks. (If you have completed this form as a Full assessment, see instructions just above).

\*\*\*\*\*

## Research Project Assessment

### Research Summary

Please provide a research summary (around 500 words), to include (if applicable):

- A **brief overview** of the research
- A summary of the proposed research **methods and techniques**
- An indication of type, number, selection criteria, and recruitment of **participants and/or sites**
- An indication of **information to be collected and/or analysed**
- Any **previous experience you have** of the research sites, methods etc.

### Title

Evaluating the 'Finding the Common Ground on Sustainable Upland Deer Management' Project

### Summary

This research focuses on a collaborative project led by Scottish Environment LINK and the Association of Deer Management Groups with the aim of building better relationships amongst stakeholders involved in upland deer management through civic mediation. This project is being undertaken in the context of the Scottish Government's implementation of the recommendations of the Deer Working Group's Report: 'The Management of Wild Deer in Scotland'. This is a multi-party process involving stakeholders from stalking, conservation and forestry that is primarily funded by NatureScot with additional funding coming from other organisations on the project steering group. Centre for Good Relations have been contracted by the steering group to facilitate the civic mediation process. It will last one year beginning from August 2022. My role is to evaluate the process and assess the extent to which contention around deer management has been addressed via improved stakeholder relationships through civic mediation.

### Aim

The overall aim of the project is to evaluate the extent to which conflict between parties involved in the 'deer sector' (stalking, conservation and forestry) over 'sustainable upland deer management' has been ameliorated through improved relationships brought about by civic mediation.

**The research project will therefore help in answering the following research questions pertaining to a chapter or chapters in my PhD:**

- Why is there conflict around sustainable upland deer management? What are the key factors involved?
- What are the challenges and barriers to ameliorating conflict around sustainable upland deer management?
- To what extent has conflict around sustainable upland deer management been ameliorated?
- To what extent is civic mediation an effective method of conflict amelioration in this case?
- What lessons can be drawn from this process that can be applied to other attempts to ameliorate land use conflicts in upland areas?

These will then inform my broader research questions:

1. What factors drive land use conflicts in upland areas?
2. What are the challenges and barriers to upland land use conflict amelioration?
3. Which methods are most effective at ameliorating land use conflicts in upland areas?
4. How can these methods be included in land use planning and policy going forward?

#### **Involved parties**

- 'Finding the Common Ground' steering group which is comprised of representatives from Scottish Environment LINK via Plantlife; Association of Deer Management Groups; Trees for Life; Woodland Trust; Cairngorms National Park Authority; Scottish Land & Estates; and NatureScot. *Role is to lead the process.*

- Centre for Good Relations. *Role is to conduct the mediation.*

- Callum Leavey-Wilson. *Role is to evaluate the mediation process.*

- Janet Fisher and Sam Staddon (Academic Supervisory Team). *Role is to provide supervision to Callum.*

#### **Project outline**

- Initial discussions with the steering group were held in March 2022 to scope the potential for my involvement.

- Discussions with Centre for Good Relations and members of the steering group were held in spring and summer 2022 to develop my methodology for the project evaluation

- Formal sign-off of my methodology will occur in July/early August 2022 well in advance of the first workshop.

- The first workshop will be held from 29<sup>th</sup> August to 31<sup>st</sup> August 2022. I will be present at this workshop collecting data through participant observation.

- Further data collection will occur through pre- and post-workshop surveys.

- Participants will also be invited to interview in a semi-structured format after the workshop.

- The dates of the following 4 1-day workshops are yet to be confirmed though I will attend all of these where possible and data will be collected through participant observation. The final workshop will be in May 2023.

- Other surveys and interviews with project participants and potentially facilitators as well will be conducted at intervals during the process.

- A further one year of evaluation time will be allowed in order to evaluate change and participant viewpoints over a longer period of time. It is envisaged this process will therefore last until May 2024. The absolute maximum end date of this will be 1<sup>st</sup> December 2024. This period of evaluation will likely include further interviews with willing participants as well as surveys.

#### **Memorandum of Understanding (MoU)**

A MoU has been agreed between the four parties involved in the process (the steering group, Centre for Good Relations, Janet Fisher and myself). This MoU sets out roles and responsibilities of the parties as well as a data management agreement and data ownership. The MoU states that:

- Data should be shared between Centre for Good Relations, the steering group and Callum and Janet so as to help facilitate the evaluation process. This is all data that relates to the evaluation process as part of this MoU collected by any of the parties in this agreement.

- Data will be shared on a confidential basis only amongst the parties mentioned above.

- Data arising from the project will be jointly owned by Centre for Good Relations, the steering group and Callum and Janet with consent granted to Callum to include data arising from the process in his PhD.

(The MoU is appended to this document).

Further details on these points are provided in the additional statements box.

### **Methods**

During the workshops themselves, I will take a participant observation approach. This is to avoid interfering with the mediation process itself and it is also the expressed desire of the project steering group that I avoid an overly intrusive approach. Practically, there will also not be enough time during the workshops to conduct more hands-on methods because of the plans of Centre for Good Relations. I also believe an observational approach would avoid diluting or influencing the mediation process and allow me to capture 'purer' and more accurate data. Observations will be recorded in a notebook and subsequently digitised on my university laptop at the end of each workshop day. It is not anticipated that photos will be taken or used. In total there will be 5 workshops (the first 2.5-day workshop and the 4 1-day workshops) where this approach will be employed.

Semi-structured interviews will be conducted with participants at intervals (to be determined) between the workshops. The precise timings of these interviews will depend on the approach taken by Centre for Good Relations. It is likely that these interviews will occur after the first workshop – probably in September or October 2022 – and at some point in the middle of process (probably February/March 2023) and at the end of the process after the final workshop (in May/June 2023). Further interviews will be conducted over the following year up until an end date of May 2024. The point of these interviews after the mediation process itself has finished is to understand participants' reflections on the processes and gauge the extent to which change has been achieved. All participants (n = 42 as of May 2022) will be invited to interview. I will aim to achieve a cross-sector balance (stalking, conservation and forestry) in conducting these interviews. Participants will receive a Participant Information Sheet and Consent Form prior to their participation (attached to this application).

Surveys will be sent to all participants involved in the process at regular intervals during the process to gauge their thoughts about the process and the extent to which the process has improved relationships and shifted stakeholder positions on deer management issues. Surveys will likely be sent at the following points:

1. Early/mid-August 2022 (before the first 2.5-day workshop)
2. Early-mid September 2022 (after the first 2.5-day workshop)
3. January/February 2023 (mid-point during the process – between the 2<sup>nd</sup> and 3<sup>rd</sup> workshop)
4. May/June 2023 (after the final workshop)

Further surveys will be sent over the following 1-year period until May 2024. This is to gauge longer term participant viewpoints. The timings of these surveys are not yet set but it is anticipated to be in late summer/autumn 2023, winter/spring 2024 and summer 2024.

Surveys will be brief to avoid respondent fatigue and will ask a mixture of closed and open questions. Surveys will be sent in online form though if requested by participants I will send these in physical form as well. Analysis of survey results will be conducted in NVivo. The surveys will be produced with consent and comment from Centre for Good Relations and the steering group. I will use Online Surveys to create and send the surveys, as the GDPR-approved GeoSciences platform.

### Participants

Participants have been identified and recruited by the steering group in line with their aim of bringing together the three main stakeholder groups involved in deer management (stalking, conservation and forestry). I have not been involved in the selection of participants. As of May 2022, 42 participants have agreed to attend the process. Participants include those who have accepted an invite to attend the process (34) and the project steering group members themselves (8). It is likely that the number of participants attending the workshop will vary – with people leaving and joining over the course of the year. The steering group will endeavour to ensure that around 40 people (including themselves) remain involved and that these numbers include an accurate representation as possible of stakeholders involved in the ‘deer sector’.

Participants will be provided with a Participant Information Sheet in advance of the commencement of the process in August. Participants who have agreed to interview will be sent an Interview Consent Form to read and sign. Both of these documents will inform participants of the data to be collected and the ethical obligations under which the research will be conducted.

### Information to be collected and analysed

Observational, interview and survey information will be collected through the methods detailed above. This information will include participant views on the mediation process, on substantive issues relating to deer management and other thoughts relating to themselves as stakeholders involved in deer management. Some of this data may be readily quantifiable – such as survey questions asking participants to rate their response on a scale – though the majority will be qualitative information, such as participant responses to open questions or observations made on participant interaction during the workshops.

Data will be stored on my university laptop and backed up to the School of GeoSciences DataStore system. Data will be analysed in NVivo 12.

### Sites

Data will be collected at the first 2.5-day workshop at the University of Stirling. The following four 1-day workshop venues have not yet been confirmed – this may depend on the outcomes from the first workshop, as the civic mediation process is very much an iterative process which is partly participant-led. All workshops will be held in Scotland.

If interviews are conducted these may be in-person but they may also be conducted online or by phone.

<b>1</b>	<b>Legal, moral responsibilities, codes of conduct</b>	<i>yes</i>	<i>no</i>	<i>N/A</i>
A	Are there any conflicts of interest between the researchers, funding bodies, the institution, and/or research subjects/environments?		x	
B	Is the research compliant with the General Data Protection Requirements (GDPR) (2018) and University of Edinburgh Data Protection procedures?	x		
C	Have you completed the legally-required data protection training?	x		

	(‘Data Protection’ and ‘Data Protection in Research’ self-enrol modules on Learn <a href="https://www.ed.ac.uk/records-management/training/data-protection">https://www.ed.ac.uk/records-management/training/data-protection</a> )			
D	Will your data be used, accessed or stored away from University premises?	x		
E	Separate from any legal obligations, is there a moral responsibility to provide feedback or results to research participants/landowners?	x		
F	Will you take all necessary measures to maintain the integrity of the research? (Key elements of research integrity include: Honesty; Rigour; Transparency; The care and respect of all participants. Research ‘misconduct’ relates to: plagiarism, falsification, fabrication, as well as poor quality day-to-day research practices)	x		
G	Are you aware of codes of conduct from professional associations that should guide your research?	x		
H	If the research is to take place outside the UK, will the research be, or has the research been, reviewed in the host country?			x
I	Does your research concern groups which may be construed as terrorist or extremist?		x	

**GUIDANCE** relating to legal and moral responsibilities and a sample list of Codes of Conduct can be found in the Self-Assessment Guidance Notes. ***If applicable, use the Additional Statement box at the end of the form for the following:***

***If you answer YES to 1A*** please state how conflicts of interest will be dealt with.

***If you answer YES to 1B*** please describe the physical and security arrangements you will put in place for the data

***If you answer YES to 1D*** please describe the arrangements you have put in place to safeguard the data from accidental or deliberate access, amendment or deletion when it is not on University premises, including when it is in transit, and (where applicable) it is transferred outside the EEA.

***If you answer NO to 1H*** please state why the research will not be ethically reviewed in the host country.

***If you answer YES to 1I*** please complete and submit a Prevent Duty Form (available via the ethics webpages) alongside your completed Ethics Assessment Form.

<b>2</b>	<b>Rights of human subjects</b> Complete this box <b>ONLY IF</b> the project involves living human subjects, or if your work requires extensive interaction with land users or other people in the course of your research	yes	no	N/A
A	Is confidentiality adequately handled by normal tenets of ethical academic research?	x		
B	Are the research subjects capable of understanding their rights and of providing informed consent?	x		

C	Are the research subjects 18 years of age or over?	x		
D	Will research subjects be informed of your responsibilities to report any evidence of abuse or criminal activity?	x		
E	Will research participants be informed about your obligations under the General Data Protection Requirements (GDPR) (2018)?	x		
F	Will the research involve collection of what the GDPR 2018 refers to as 'special categories' of personal data i.e. health data, data relating to race or ethnicity, to political opinions or religious beliefs, trade union membership, criminal convictions, sexual orientations, genetic data, or biometric data?		x	
G	Will information containing personal, identifiable data be transferred to, shared with, supported by, or otherwise available to third parties outside the University?		x	
H	Are you appending any of the following: form/statement you will be using to obtain informed consent; Plain Language Statement; Participant Information Sheet?	x		

***If NO to A,B,C,D,E or YES to F,G, FULL Ethics Assessment required***

**GUIDANCE** relating to subjects' rights, confidentiality, and the General Data Protection Requirements (GDPR) (2018) can be found in the Self-Assessment Guidance Notes (those completing a 'Full' assessment should also read the Full Ethics Assessment Guidance Notes). ***If applicable, use the Additional Statement box at the end of the form for the following:***

***If you answer YES to 2F you must ensure you adhere to the following:*** Compliance with the minimisation principle (i.e. use only the absolute minimum of personal data required for your purpose); Store data securely; Anonymise personal data if you can, and if you cannot anonymise, wherever possible, pseudonymise all personal data.

***If you answer YES to 2G please explain why this necessary and how the transfer of the information will be made secure. If the third party is based outside the European Economic Area please obtain guidance from the Data Protection Officer ([dpo@ed.ac.uk](mailto:dpo@ed.ac.uk) or phone 0131 651 4114).***

***If you answer YES to 2H please append these documents when submitting this form.***

<b>3</b>	<b>Potential harm, discomfort or stress for living human subjects or non-humans and environments</b>  This box must be completed for <b>ALL</b> research projects	yes	no	N/A
A	Is there significant foreseeable potential for psychological harm or stress for those involved in your research or its dissemination (including the research team)?		x	
B	Is there significant foreseeable potential for physical harm or discomfort for those involved in your research or its dissemination (including the research team)?		x	

C	Is there significant foreseeable potential for violation of cultural or social norms/practices?		x	
D	Is there significant foreseeable potential for conflict or discomfort for any humans or non-humans your research will impact upon? (including issues of safeguarding)		x	
E	Have you considered the implications of your research with respect to the climate emergency and sought to minimise potential harm posed by conducting the research?	x		
<b><i>If YES to A,B,C,D FULL Assessment is required</i></b>				
<p><b>GUIDANCE</b> relating to the minimisation of harm, discomfort, or stress can be found in the Self-Assessment Guidance Notes (those completing a ‘Full’ assessment should also read the Full Ethics Assessment Guidance Notes). <b><i>If applicable, use the Additional Statement box at the end of the form</i></b> to include a statement on procedures to minimise harm, discomfort and/or your stance in relation to the violation of cultural norms and practices.</p> <p><b><i>Use the Additional Statement box at the end of the form</i></b> to detail your response to <b><u>3E</u></b> on the climate emergency</p>				

<b>4</b>	<b>Effect on environment</b>			
	Complete this box <b>ONLY IF</b> your project includes environmental fieldwork that involves <b>sampling or directly monitoring</b> a site, or if your research will involve movement in or through <b>sensitive environments</b>	<i>yes</i>	<i>no</i>	<i>N/A</i>
A	Will the fieldwork be conducted in an environmentally sensitive area or area of Special Scientific Interest, OR require <i>crossing</i> a sensitive area?			
B	Have appropriate steps been taken to gain permission to access the field site(s) (including privately held land)?			
C	Will the landowner/responsible agency be informed of your responsibilities to report any evidence of abuse or criminal activity?			
D	Will samples be collected and removed in sufficient quantities to have a negative physical/environmental impact on the site and/or its eco-system?			
E	Will the conduct of the fieldwork significantly disrupt the site and/or its environment?			
F	Does the fieldwork involve sampling rare/endangered or harmful taxa/species?			
G	Will the research involve transporting samples/specimens between countries or across other significant boundaries?			
<b><i>If YES to A, D, E, F or G, FULL Ethics Assessment required</i></b>				

**GUIDANCE** relating to environmental fieldwork can be found in the Self-Assessment Guidance Notes (those completing a 'Full' assessment should also read the Full Ethics Assessment Guidance Notes). ***If applicable, use the Additional Statement box at the end of the form*** to include a statement on how you will attempt to gain permission, and if applicable, append any written agreement with the land owner to the end of the form.

<b>5</b>	<b>Institutional/agency consent</b>	<i>yes</i>	<i>no</i>	<i>N/A</i>
	This box must be completed for <b>ALL</b> research projects			
A	Have permissions for access to archives and data repositories been arranged?	x		
B	Where data has or will be obtained from another researcher, agency, archive, or other source, is it clear that the intended usage adheres to the terms of supply?	x		
C	Will issues of data handling and consent be dealt with adequately and following procedures agreed with agencies, archives, and/or land managers?	x		

**GUIDANCE** relating to data protection and consent can be found in the Self-Assessment Guidance Notes (those completing a 'Full' assessment should also read the Full Ethics Assessment Guidance Notes)

<b>6</b>	<b>Collaborative working</b>	<i>yes</i>	<i>no</i>	<i>N/A</i>
	Complete this box <b>ONLY IF</b> the research will involve <b>working collaboratively</b> with other academic/non-academic partners and/or <b>employing local field assistants</b> (including guides/translators).			
A	Is there a formal agreement in place regarding the collaborative relationship with the academic partner(s)?			x
B	Is there a formal agreement in place regarding the collaborative relationship with the non-academic partner(s)?	x		
C	Is there a formal agreement in place regarding the employment of local field assistants (including guides and translators)?			x
D	Will care be taken to ensure that all individuals involved in implementing the research adhere to the ethical and research integrity standards set by the UoE?	x		
E	Have you reached agreements relating to intellectual property, publication and authorship? (please see the <a href="#">School's Authorship Policy &amp; Guidance</a> )	x		

**GUIDANCE** relating to collaborative working, the employment of local field assistants, and intellectual property rights can be found in the Self-Assessment Guidance Notes. ***If applicable, use the Additional Statement box at the end of the form***: If you answer **YES to A, B, C or D** please outline the format of this (e.g. written contract, email

correspondence, witnessed verbal agreement) in the Additional Statement box at the end of the form. If you answer **NO to any** of the above please include a statement on your plans for agreeing the nature of any collaborative/working relationship(s) in the Additional Statement box at the end of the form. If applicable, append any written agreements to the end of the form.

<b>7</b>	<b>Dissemination and benefit sharing</b>	yes	no	N/A
	This box must be completed for <b>ALL</b> research projects			
A	Will the research reports, associated publications and other outputs accurately reflect the data collected?	x		
B	If the research will be undertaken outside the UK, will the research findings, associated publications and, where feasible, data be made available in the country where the research took place?			x
C	Will you disseminate the findings to the study participants or land owners?	x		
D	Is the research expected to benefit the academic partners (directly or indirectly)?			x
E	Is the research expected to benefit the non-academic partners, research participants and/or local communities (directly or indirectly)?	x		
<p><b><u>GUIDANCE</u></b> relating to dissemination and benefit sharing can be found in the Self-Assessment Guidance Notes. <b><u>If applicable, use the Additional Statement box at the end of the form:</u></b> If you answer <b>NO to A, B or C</b> please include a statement justifying your decision in the Additional Statement box at the end of the form.</p>				

<b>8</b>	<b>Other Approval</b>	yes	no	N/A
A	Does the sponsor require formal prior ethical review?			x
If Yes, by what date is a response required?				
B	Does the project require the approval of any other institution and/or ethics committee?		x	
If Yes, by what date is a response required?				
C	Will you collect or use NHS data?		x	

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If you answer **Yes to 8C** you may require sponsorship and/or Caldicott Approval.

Please refer to the ACCORD (Academic and Clinical Central Office for Research and Development) website for more information <https://www.accord.scot/>

### **Additional Statement**

Please use this space to explain how you will address the ethical and integrity issues raised by the questions above ('Self' assessments around 500 words; 'Full' assessments around 1,000 words). Please refer to the question numbers above in your response.

#### **1B - Please describe the physical and security arrangements you will put in place for the data**

Data will be stored on a University of Edinburgh laptop. This is backed up to the DataStore system provided through the School of GeoSciences hard drive via the 500GB allowance provided. DataStore is backed up to three different locations with offsite disaster recovery platform and offsite backup and retention. The School's IT team have assured me that any data backed up to this system is protected and easily recoverable if accidentally deleted. The laptop on which the data is stored is secured by a strong password. When I am not on-site and connected by default to the university's network, I always connect my laptop the university's VPN to ensure off-site back up and data protection.

#### **1D - Please describe the arrangements you have put in place to safeguard the data from accidental or deliberate access, amendment or deletion when it is not on University premises, including when it is in transit, and (where applicable) it is transferred outside the EEA**

Data will be stored on a university laptop and be backed up to DataStore via the School of GeoSciences. When I am working on site at the university the data is automatically connected the university's network which provides data protection and back up. When I am working off site – which will mostly be at my home in Edinburgh – my laptop will connected to the university's network via university VPN ensuring data protection and back up. My laptop is secured by a strong password. As explained above, DataStore provides data recovery in the event of damage, loss or deletion. Transit with the data will be relatively minimal (likely limited to the first 2.5-day workshop and the subsequent 1-day workshops) during the course of the project. All data transit will be occurring in the UK.

#### **3E - Have you considered the implications of your research with respect to the climate emergency and sought to minimise potential harm posed by conducting the research?**

All fieldwork and data collection will be conducted in Scotland and I am an Edinburgh based student. The first 2.5-day workshop will be held at the University of Stirling which is accessible by train and bus. It is anticipated that I will use this form of transport to attend the workshop. Further venues of the follow-up 1-day workshops have not yet been confirmed but it is possible they will occur in more remote locations that are not readily provided for by public transport. Where public transport is an option, I will try to use it. I am also planning to purchase a car which will facilitate my travel if needed. Beyond that, any further engagement required will likely be facilitated through a mixture of online, telephone and in-person contact. This will depend on the preferences of the participants themselves. Again, if travel is required to facilitate this engagement, I will endeavour to use public transport where possible as a first option.

#### **5B - Where data has or will be obtained from another researcher, agency, archive, or other source, is it clear that the intended usage adheres to the terms of supply? And 5C - Will issues of data handling and consent be dealt with adequately and following procedures agreed with agencies, archives, and/or land managers?**

The 'Finding the Common Ground...' evaluation project is a four-party process involving the steering group,

Centre for Good Relations, my supervisor and myself. There is therefore involvement from two external non-academic parties. All data will be collected, stored and shared in Scotland. A mixture of quantitative and qualitative data will be collected including survey and questionnaire results, observational data and interviews.

The project requires cross-party data sharing in order to facilitate the evaluation process and produce outputs pertaining to the project. The roles, responsibilities, data sharing and management arrangements are set out in the Memorandum of Understanding appended to this document. Any and all data collected through this process will be shared only with the four parties to this agreement. Though the data collected will be anonymised, it may be possible to identify individuals from their comments as the sector under examination ('the deer sector') is a relatively small world with stakeholders typically aware of one another. Every effort will be made by all parties to ensure confidentiality throughout, as central to the project itself is the fostering of trust. Centre for Good Relations are a very experienced mediation organisation with a history of working with highly sensitive topics. They therefore have the strictest possible data management arrangements in place. The steering group is comprised of senior representatives from well-established public, private and third sector organisations each of which have a history of collaboration, including with government, and therefore secure data management procedures. The terms of the MoU appended to this document specify that data will be shared in a confidential and anonymised manner only amongst the parties involved in the project for the purposes of evaluation alone and that data will be jointly owned by these parties with consent granted to me to include the data in my PhD thesis.

Data will be shared via the University of Edinburgh's secure DataSync service which allows files to be shared externally. These files will only be accessible to Janet, Centre for Good Relations and the steering group. Files in DataSync are stored at the University of Edinburgh, backed up to the University's DataStore system and maintained by Information Services.

**6B - Is there a formal agreement in place regarding the collaborative relationship with the non-academic partner(s)?**

A Memorandum of Understanding (MoU) has been finalised, agreed and signed by the four parties involved in this project (the steering group, Centre for Good Relations, Janet Fisher and myself). This MoU sets out the roles and responsibilities of these parties. It also details the data sharing arrangements and data ownership arrangements – please see the appended MoU for more detail. This will be a mutually beneficial partnership. I am conducting the evaluation of the project for the steering group and Centre for Good Relations and in turn I have been granted consent to use data collected during the project in my PhD fieldwork and thesis.

**6D - Will care be taken to ensure that all individuals involved in implementing the research adhere to the ethical and research integrity standards set by the UoE?**

In effect only I will be implementing the research though the other parties (the steering group and Centre for Good Relations) will be involved through data sharing. The steering group and Centre for Good Relations will be informed of the ethical and research integrity standards in July 2022 well in advance of the first workshop at the end of August. Participants involved will be also be provided with details about the ethical and research integrity standards in advance of the workshop likely in July or early-mid August at the latest. All participants will be sent a Participant Information Sheet and participants who agree to interview will also be sent an Interview Consent Form. The steering group and Centre for Good Relations will adhere to the terms of the MoU which they have signed.

## Appendices

**Memorandum of Understanding (MoU) 'Finding the Common Ground on Sustainable Upland Deer Management' Evaluation Project**

**Between:**

- Callum Leavey-Wilson (PhD student at University of Edinburgh)
- Janet Fisher (Senior Lecturer at University of Edinburgh and primary supervisor of Callum's PhD)

*AND*

- Julie Stoneman (Saving Scotland's Rainforest Project Manager at Plantlife Scotland and chair of 'Finding the Common Ground...' Steering Group)
- Esther Brooker (Associate, Centre for Good Relations)

**Purpose of MoU:**

To define the roles and responsibilities of the parties involved in this project.

**Project background:**

A joint project between the Association of Deer Management Groups and Scottish Environment LINK to use civic mediation methods to develop better relations across the upland deer sector to support the implementation of the Scottish Government's action in the light of their response to the DWG recommendations. ([Please see the project brief for further information](#)).

This MoU covers the evaluation element of this project, which is required to inform both follow on work for this project and similar projects within the environmental sector, to provide an assessment about what this type of process can achieve and the areas of success and failure.

**Project timeline:**

- To begin April/May 2022 and conclude June 2024 with flexibility to extend to December 2024 if required (the very latest point Callum could collect new data within the period of his PhD).

**Role and responsibility of Callum Leavey-Wilson**

- To lead and deliver the evaluation process.
- To develop methods and methodology for evaluation informed by other relevant processes and share plans for this in advance of the first 3-day workshop and at other relevant times as the project progresses, in order to incorporate comments on these from the Finding the Common Ground (FtCG) Steering Group.

- To produce an interim evaluation report at the end of the active project phase and a final report after the last assessment and if deemed necessary by the involved parties, to produce other such reports/reviews at specified intervals.
- To assist with communication of outputs.
- To attend and participate in relevant meetings/workshops etc. where possible. To liaise with relevant parties throughout process.

#### **Role and responsibility of Janet Fisher**

To provide supervision to Callum and to attend the meetings of the process where possible/as relevant.

#### **Role and responsibility of Julie Stoneman**

To provide a conduit between Callum and the FtCG Steering Group, to ensure that the evaluation work fits the expectations of the group, and that Callum receives the relevant support from the group in order to be able collect the information needed to carry out the evaluation, as well as communication of the results.

#### **Role and responsibility of Esther Brooker**

To provide a conduit between Callum and Centre for Good Relations, especially regarding data sharing as described below.

To provide support to Callum for data collection where required/appropriate.

#### **Partnership with Centre for Good Relations and data management**

Centre for Good Relations has been contracted by Plantlife, on behalf of the FtCG Steering Group to conduct the mediation process. Data should be shared between Centre for Good Relations, the FtCG Steering Group and Callum and Janet so as to help facilitate the evaluation process. This is all data that relates to the evaluation process as part of this MOU collected by any of the parties in this agreement. Data will be shared on a confidential basis only amongst the parties mentioned above. Data arising from the project will be jointly owned by Centre for Good Relations, the FtCG Steering Group and Callum and Janet with consent granted to Callum to include data arising from the process in his PhD.

#### **Funding**

Reimbursement of expenses and other costs incurred are expected to be provided from Callum's RTSG, ARC or CASE research expenses.

#### **Signed and dated by parties:**



Julie Stoneman  
02 June 2022

Esther Brooker  
02 June 2022

Callum Leavey-Wilson  
09 June 2022

Janet Fisher  
28 June 2022

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School of Geosciences

## Participant Information Sheet

**Project title:**

'Finding the Common Ground on Sustainable Upland Deer Management' Evaluation

**Investigator:**

Callum Leavey-Wilson

**Address:**

Room 1.02, Old Infirmary Building,

Institute of Geography, School of GeoSciences,  
University of Edinburgh, EH8 9XP

**Contact information:**

Email:

**About the Project**

The principal aim of the project is to evaluate the extent to which the civic mediation process as facilitated by Centre for Good Relations has improved relationships between stakeholders involved in upland deer management. This research is being conducted in partial fulfilment of my PhD which is exploring reasons for contention around land use change in upland areas of Scotland and if and how contention can be ameliorated. The 'Finding Common Ground' evaluation project will form a case study that will be included in my PhD thesis.

The project has two phases:

1. The 'Finding Common Ground' mediation project – August 2022 to May 2023.
2. Post-mediation evaluation – May 2023 to May 2024.

**Who is responsible for the data collected in this study?**

I will be responsible for data collected during the study. I will be supervised by my PhD supervisors Dr. Janet Fisher and Dr. Sam Staddon, both lecturers within the School of GeoSciences at the University of Edinburgh. Further assistance will be provided by Centre for Good Relations and the 'Finding Common Ground' steering group.

Observational, interview and survey data will be collected. Observational data will be collected via notes taken during the workshops held over the course of the mediation process. Interview data will be collected in conjunction with interviews held by Centre for Good Relations as well as interviews conducted by me during the post-mediation evaluation phase. The first phase of interviews will be held at intervals to be determined by Centre for Good Relations. Further interviews will be held after the formal mediation process ends in May 2023. All participants will be invited to interview but participation in these interviews is entirely voluntary and is *not in any way* a requirement of taking part in the 'Finding Common Ground' mediation project itself. Survey data will be collected via short surveys sent before the first workshop, after the first workshop and at subsequent points to be agreed with Centre for Good Relations and the 'Finding Common Ground' steering group (likely in January/February 2023 and May/June 2023). Further short surveys will be conducted at intervals during the post-mediation project – likely in September 2023, January 2024 and May 2024.

Data collected will focus on participants' beliefs, values and attitudes in relation to upland deer management. It will also focus on participants' reflections on the civic mediation process and the extent to which you have found it to be useful. This data will be primarily qualitative – generated from open-ended questions – with smaller quantitative elements – for example, scores that you will be asked to assign to statements in a survey.

All data collected will be stored on a secure University of Edinburgh computer which is backed up to the University's DataStore system via a robust VPN connection. In line with my funding body (Natural Environment Research Council) data will be stored for a minimum of 10 years after the completion of my PhD project. After this period I will request that the data is removed from the University's DataStore system.

Data will *not* be shared with any other parties beyond those involved in the project (Dr. Janet Fisher, Centre for Good Relations and the 'Finding Common ground' steering group). All data will be anonymised in any written work arising from this project. However, if you agree to participate, it may still be possible for you to be identified by those who know the context well, from your quotes and any descriptors which you have consented to as listed in the consent form. Please consider this before giving your consent to be involved in this research.

In signing the accompanying consent form you are agreeing to both participate in this research project and to have any data (anonymised quotes, comments etc.) arising from your participation to be used in publications and associated outputs.

This research project has been reviewed and passed by the University of Edinburgh's School of GeoSciences Ethics Committee on 28<sup>th</sup> July 2022.

If you would like further information or to ask any questions please contact me at

## **What is involved in the study?**

### Participant observation

The first 2.5-day workshop will be held on Monday 29<sup>th</sup> August to Wednesday 31<sup>st</sup> August. Dates for the following four 1-day workshops are still to be confirmed by Centre for Good Relations and the 'Finding Common Ground' steering group. It is likely that the last of these workshops will be held in May 2023.

During the workshops nothing will be required from you by me. I will be taking an observational approach and simply taking notes. Things that I will be taking notes on will include the activities conducted by Centre for Good Relations, the topics of discussion, comments from participants (*which will be anonymised*) and other elements important to the process. This may include reflections from participants on particular topics, whether there is a need for mediation during certain activities and the interactions between facilitators and participants.

### Surveys

Before the first 2.5-day workshop in August you will receive a brief survey which you will be invited to complete. This survey will be completed anonymously, though it will include some descriptive questions which you do not have to answer (e.g. about the sector you work in). The survey should take no longer than 10 minutes to complete. This survey will include a mixture of open and closed questions. The purpose of the survey is to establish a broad baseline of participant viewpoints.

In September, after the 2.5-day workshop, you will then be sent a short follow-up survey to complete which will ask you for your thoughts on the workshop. Results from this survey will be compared with the pre-workshop survey.

It is anticipated that a further two short surveys will be sent to you over the rest of the mediation project. The first of these will be an interval survey sent in January/February 2023 to gauge participant thoughts on the project at the halfway point. The final survey will be sent after the final workshop in May 2023.

After the first phase of the project – the formal ‘Finding Common Ground’ mediation project – has completed in May 2023, the second phase (post-mediation evaluation) will begin. This phase will last one year until May 2024. During this period you will be sent further short surveys at staggered intervals to complete to gauge longer-term change. Details of these surveys and the timings will be communicated to you closer to the time. It is anticipated these will be sent in September 2023, January 2024 and May 2024.

### Interviews

All participants will be invited to interview. During the mediation project, interviews will be led by Centre for Good Relations and I will be present at these. The timing and content of these interviews will largely be determined by Centre for Good Relations and the outcomes of the workshops. It is envisaged that interviews will be conducted in the autumn following the 2.5-day workshop. Further interviews may be conducted half-way through the process (likely in January/February 2023) with further interviews conducted in May 2023 at the end of the mediation project.

After the formal mediation project terminates in May 2023, participants will be invited to further interviews over the course of May 2023 to May 2024. This is in order to allow participants to reflect on the process with some time having elapsed in between. The timings of these interviews will be confirmed closer to the time as they will again be influenced by the progress and outcomes of the civic mediation process itself. They are likely to occur in the late summer/early autumn of 2023, winter 2024 and late spring/early summer of 2024. All interviews will be recorded and a transcription produced of each one. Again, your participation in these interviews is voluntary and you have a right of withdrawal.

### **What are your rights as a participant?**

Taking part in the study is entirely voluntary. You may choose not to take part or subsequently cease participation at any time. Please note ceasing to participate in this study does *not* mean you will cease involvement in the Finding Common Ground mediation project itself.

### **What are the risks involved in this study?**

Your contribution will be kept confidential and all quotes and comments will be anonymised. However, it is important to bear in mind that should quotes or comments collected appear in published work it may still be possible for you to be identified if these comments are easily attributable to yourself, particularly by someone who has knowledge of the sector. You have the right to withdraw from this research at any point prior to publication of the work, and if at any stage before, during or until my

thesis and any associated work has been published you wish to remove yourself and any data collected from you, please inform me and I will ensure this happens. Draft papers will be shared with you prior to any publication so you can object to the inclusion of your comments or quotes. My contact details are at the end of this document.

### **What are the benefits for taking part in this study?**

By participating in this evaluative process you will benefit from the opportunity to reflect on some key issues in upland deer management. You will be given space to discuss your perspective on these issues. You will also be helping to build and improve relationships across upland deer management. Ultimately this may help to lead to positive lasting change in a number of areas (environmental, economic, social etc.) pertaining to deer management, and indeed land management in general.

### **Will I receive any payment or monetary benefits?**

We will not be providing payment or monetary remuneration for your participation.

### **For more information**

This research has been reviewed and approved by the School of GeoSciences, University of Edinburgh Research Ethics and Integrity Committee. If you would like further information or have any further questions about this study in the first instance please contact:

- Callum Leavey-Wilson
- Email:
- Address: Room 1.02, Old Infirmary Building, Drummond Street, University of Edinburgh, Edinburgh EH8 9XP

You can also contact my primary supervisor:

- Dr. Janet Fisher
- Email:

And/or my second supervisor:

- Dr. Sam Staddon
- Email:

### **What if I have concerns about this research?**

If you have further worries about this research, or if you are concerned about how it is being conducted, you can contact the Chair of the GeoSciences Research Ethics and Integrity Committee at [ethics.geos@ed.ac.uk](mailto:ethics.geos@ed.ac.uk).



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## Consent Form

Project title:

‘Finding the Common Ground on Sustainable Upland Deer Management’ Evaluation

Investigator:

Callum Leavey-Wilson

Participant’s name *(please add your name here – either typed or written)*:

-----  
***Please read the accompanying participant information sheet for full details before proceeding with this document.***

Ethical procedures for academic research undertaken from UK institutions require that participants understand how information gathered from them will be used and explicitly agree to take part in research. This consent form is necessary for us to ensure that you understand the purpose of your involvement and that you agree to the conditions of your participation. Please read and then sign this form to certify that you understand and approve the following:

- There are three elements to the project evaluation: participant observation, surveys and interviews.

- By signing this consent form, I agree to participate in the project evaluation through being observed in the mediation workshops, being invited to complete short surveys and being invited to interview.
- I have the right to withdraw from this research at any point prior to publication of the work. If at any stage before the thesis and any associated work has been published I wish to remove myself and any data collected from me, I can inform Callum Leavey-Wilson to ensure this happens. Withdrawing from the evaluation research element of the project does *not* mean withdrawing from the 'Finding Common Ground' mediation project itself.
- During the workshops, observational data will be recorded in handwritten note form. Once the workshop has concluded, notes will be digitised.
- Interviews may be conducted through a mixture of online, in-person and telephone formats – whichever is most suitable for participants. All interviews will be recorded and transcribed.
- The transcript of the interview will be analysed by Callum Leavey-Wilson as the research investigator.
- Access to the observational, survey and interview data will be limited to Callum Leavey-Wilson, Dr. Janet Fisher, Centre for Good Relations and the 'Finding Common Ground' steering group.
- All data collected – observational, survey and interview – will be stored on a secure University of Edinburgh laptop via the University's DataStore system which is connected via a robust VPN connection. In line with Natural Environmental Research Council funding rules, data will be stored for 10 years, after which it will be deleted.
- Any data that are made available through publication or academic outlets will be anonymised so that you cannot be identified, and care will be taken to ensure that other information in the interview that could identify you is not revealed.

Any variation of the conditions above will only occur with your further explicit approval.

### Quotes

Though all quotes will be anonymised, are you happy for the following descriptors to be assigned to them? (Please tick as appropriate). *(Please note leaving a box blank will mean your quotes will not be assigned that descriptor).*

<b>The sector you work or have worked in (e.g. stalking, forestry, conservation etc.)</b>	
<b>The number of years you have worked in issues related to deer management</b>	
<b>Your age range (e.g. 25 to 39, 40 to 59, 60 + etc.)</b>	
<b>Your gender</b>	
<b>The broad geographic area in which you work (e.g. Cairngorms)</b>	

I consent to the use of anonymised quotes with the understanding (as explained in the accompanying information sheet) that it may still be possible for me to be identified by those who have prior familiarity with the sector from my words and the descriptors (if applicable). (Please tick the box below

– Please leave the box blank if you do not wish your quotes to be assigned descriptors; all quotes will still remain anonymous).



By signing this form I understand and agree that:

1. I am voluntarily taking part in this project. I understand that I don't have to take part, and I can cease participation at any time;
2. Data may be used as described above and in the participant information sheet;
3. I have read the participant information sheet;
4. I do not expect to receive any payment for my participation;
5. I can request a copy of the transcript of my interview and may make edits I feel necessary to ensure the effectiveness of any agreement made about confidentiality;
6. I have been able to ask any questions I might have and I understand that I am free to contact the researcher with any questions I may have in the future. (Please see below for contact information).

---

**Printed Participant's Name**

---

**Participant's Signature**

---

**Date**

---

**Researcher's Signature**

---

**Date**

This research has been reviewed and approved by the School of GeoSciences, University of Edinburgh Research Ethics and Integrity Committee. If you have any further questions or concerns about this study, in the first instance please contact:

- Callum Leavey-Wilson
- E-mail:
- Address: Room 1.02, Old Infirmary Building, Drummond Street, University of Edinburgh, Edinburgh, EH8 9XP

You can also contact my primary supervisor:

- Dr. Janet Fisher
- Email:

And/or secondary supervisor:

- Dr. Sam Staddon
- Email:

**What if I have concerns about this research?**

If you are worried about this research, or if you are concerned about how it is being conducted, you can contact the Chair of the GeoSciences Ethics Committee at [ethics.geos@ed.ac.uk](mailto:ethics.geos@ed.ac.uk).



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C.2 Research Ethics and Integrity Determination Form



THE UNIVERSITY of EDINBURGH  
School of GeoSciences

Ref: 2022-649

**Name:** Callum Leavey-Wilson

**Student number (if applicable):** S1524849

**Title of Research Project:** 'Finding the Common Ground on Sustainable Upland Deer Management' Evaluation

The Committee and/or its Delegates have viewed that form and determined the following:

It complies with Research Ethics and Integrity Guidelines, and research can proceed without amendment;

It complies with Research Ethics and Integrity Guidelines, but minor adjustment is needed in line with specifications below. In some cases this may mean re-submission of your Assessment Form.

Re-submission required:

Email clarification required:

It does not comply with Research Ethics and Integrity Guidelines, and research should not proceed in current form, as justified below. This determination means that the protocols need to be re-designed and re-submitted to the Research Ethics and Integrity Committee.

A higher level of review is required. Please complete a Full Assessment.

### Further Specification/Justification

### Chair Approval

Name of Research Ethics and Integrity Chair: Dr Samantha Staddon

Signature:

Date: 28<sup>th</sup> July 2022

The completed form and any supporting documents must be sent to the Research Ethics and Integrity Committee Secretary by emailing [ethics.geos@ed.ac.uk](mailto:ethics.geos@ed.ac.uk).

END OF FORM TO SUBMIT

## Appendix D. Published supplementary material for Chapter 5

### D.1 Table of participants involved by sector classification

<b>Sector</b>	<b>Number of participants</b>	<b>Of which were interviewed</b>
Agriculture	1	0
Community forestry	3	2
Conservation	10	4
Deer and land management representation	5	2
Deer stalking	35	16
Ecology and research	5	3
Forestry regulation	3	1
Game (meat) processing	2	1
Government	2	1
Land management consultancy	6	5
National Parks	2	0
Private forestry	4	2
Private land management	6	3
Private landowner	8	4
Public forestry	3	0
Venison promotion	1	0
Wildlife management and regulation	7	3
<b>Total</b>	<b>103</b>	<b>47</b>

### D.2 Interview guideline

#### **Broad discussion-starter topics**

1. What, for you, are the outstanding issues in the debate about upland deer management?
2. Are you optimistic or pessimistic about the future for upland deer management?
3. What things do you think could be done to address worries about the future of upland deer management?
4. What do you think are the main factors driving change in upland deer management?
5. What do you think of the state of relationships in upland deer management?

### **Mediation process**

1. Why did you get involved in the process?
2. What do/did you think of the process?
3. What do you think its successes are/were?
4. What do you think its shortcomings are/were?
5. Is/was the aim and focus of it clear?
6. Do/did you think the process is/was representative of different views?

### **General**

- Are there any other things you would like to say that we have not discussed?

### D.3 List of codes

1. Deer management
2. Stalking
3. Mediation
4. Change
5. Organisations
6. Good quotes
7. Economics
8. Landownership
9. Understanding
10. Policy
11. Sectors
12. Collaboration
13. Environmental
14. Communication
15. Representation
16. Science
17. Places
18. Trust
19. Conflict
20. Power
21. Culture
22. Practicalities
23. Vision
24. Knowledge
25. Resourcing
26. Emotions
27. Individual

## Appendix E. Published supplementary material for Chapter 6

*Note that this appendix has been edited from the published supplementary material to avoid duplication with information contained elsewhere in the thesis.*

### E.1 Table of evaluation criteria from ECR literature

	Outcomes	Process	Relationships
<b>Susskind (1981)</b>	A sufficient number of possible solutions or options must be developed	All the parties that have a stake in the outcome of a dispute must be identified	
	The boundaries and time horizon for analysing impacts must be agreed upon	The relevant interest groups must be appropriately represented	
	Fair compensation and mitigatory actions must be negotiated	Fundamentally different values and assumptions must be confronted	
	The legality and financial feasibility of bargains that are made must be ensured	The weighting, scaling, and amalgamation of judgments about costs and benefits must be undertaken jointly	
	All parties must be held to their commitments		
<b>Bingham (1986)</b>	An agreement is reached	Participants gained valuable insights into others' viewpoints	Open lines of dialogue are created between participants
	The agreement is stable and implemented		
<b>Buckle and Thomas-Buckle (1986)</b>		The mediator brought the parties to a sound knowledge of the facts surrounding the decision to be made, a clear understanding of the relevant legal and regulatory precedents (both formal and informal) that apply, and an accurate knowledge of their own and all the other parties' interests and strategic options, and persuaded the parties to act according to these clear perceptions	Mediator(s) enables the parties to increase their affective and cognitive awareness about their relationship and the matter at dispute

<b>Moore (1996)</b>	Getting a plan	Representation of all interests	
	Protecting the area	Ownership of the plan	
	Action on the ground	Agency and community	
	All issues covered	Between community factions	
	General acceptance of the process and plan		
	People protected their interests		
<b>Neuman (1996)</b>	Resolving the dispute with a satisfactory and fair process and outcome	Resolving the dispute in a fairly expedient manner, without excessive delays or costs	Creating, preserving, or even improving a working relationship among the parties
	A reasoned decision or resolution of the dispute that comports with existing law and public values	Creating commitment to a decision by giving the parties control over the process and the outcome	
	"Precedent" to guide non-parties in governing future conduct in similar situations		
	"Justice," or the public interest, by which we seem to mean doing the right thing regardless of how well it resolves the particular dispute, taking into consideration the interests of non-parties		
	Credibility and legitimacy of the system		
	Building future dispute resolution skills by "practicing" solving a problem together		
	Providing an opportunity for creative and flexible solutions that meet the parties' real interests		
<b>Holzinger (2001)</b>	Participants in the mediation procedure were able to extend their knowledge of the issue	All the relevant actors participated fully in the procedure	Social relations between the participants have improved as a result of the procedure
	The participants' increased awareness of the issues has meant a change in their perspectives on the problem	Individual participants or groups did not abandon the procedure prior to its conclusion	
	A decision was reached with which most or all of the participants could agree	The procedural rules were adhered to or changed by consensus	

	The agreement dealt with most or all of the relevant aspects of the problem	Those participating in the mediation procedure approve of the way in which it was conducted	
	The results of the mediation were endorsed by the organizations represented	Participants in the procedure approve of the mediator	
	The procedure shortened the time required to resolve the problem compared with conventional procedures, including litigation	Debate was conducted openly and even-handedly	
	The monetary costs of planning were lower as a result of the mediation compared with conventional procedures	Those participating in the procedure retained credibility with their respective organisations and constituencies	
		Consensus was reached on ending the procedure	
<b>Todd (2001)</b>	Purpose	Fairness	Changes in relationships
	Consensus	Efficiency	
	Written agreement	Comparison to alternative processes	
	Interests		
	Wisdom of the agreement		
	Stability of the agreement		
	Has the level of controversy diminished? Is there broad public support?		
	Have the key issues been settled?		
	Are provisions included for renegotiation?		
<b>Rowe (2003)</b>	Has the agreement been implemented? Have the parties complied?		
	Overall effectiveness		
	Agency, program mediator, and parties' capacity is improved through experience with this case	Other processes are used where they are the best approach (based on screening and assessment and on other sources)	

	Government decision-making is improved through use of the process	An appropriate mediator leads the process	
	All parties involved in the process are satisfied that the process was fair and open	The design of the process is appropriate for the dispute and needs of the parties	
	The process is more effective (better benefits for the resources expended) than the other options for this dispute		
	Narrows disagreements (e.g., reduces the number of issues, focuses on priority issues, identifies underlying problems, identifies issues best dealt with another way)		
D'Estrée et al (2004)	Unanimity or consensus	Procedurally just	Reduction in conflict and hostility
	Verifiable terms	Procedurally accessible and inclusive	Improved relations/trust
	Public acknowledgement of outcome	Reasonable process costs	Cognitive/affective shift
	Ratification		Ability to resolve subsequent disputes
	Cost-effective implementation		Transformation
	Perceived economic efficiency		
	Financial sustainability/feasibility		
	Cultural sustainability/community self-determination		
	Environmental sustainability		
	Clarity of outcome		
	Feasibility/realism (legal, political, scientific/technical)		
	Public acceptability		
	Efficient problem-solving		
	Outcome satisfaction/fairness as assessed by parties		
Compliance with outcome over time			
Flexibility			

	Stability/durability		
	Enhanced citizen capacity to draw on collective potential resources		
	Increased community capacity for environmental policy/decision-making		
	Social system transformation		
Foley (2007)		The process was alert to provide transformative opportunities for participants	The parties find increased self-worth and move beyond their own or their constituency's self-interest
		The process provided a voice for the environment via effective measures to assess environmental outcomes	
Orr et al (2008)	Participants' understanding of issues improves (for example, technical issues)	Collaborative problem solving/dispute resolution is determined to be appropriate	Participants communicate and collaborate
	Agreement is achieved	Appropriate participants are involved in the process	Participants understand each other's views and perspectives
	Agreement is of high quality and is expected to last	Appropriate mediator/facilitator engaged to guide the process	
	Agreement is implemented and is durable	Participants have the capacity to engage in the process	
	Participants' collective capacity to manage and resolve this conflict is improved	The mediator/facilitator skills and practices add value	
	Beneficial environmental, economic, community/social, and institutional impacts occur	Relevant information is effectively incorporated into the process	
	Satisfaction and participants endorse collaborative processes	Participants narrow and clarify the issues in dispute	
	Benefits outweigh the costs	Effectiveness and efficiency compared to the most likely alternative	
	Public benefits		
Emerson et al (2009)	Reaching agreement	ECR is deemed appropriate	Improved working relationships
	Quality of agreements	Appropriate participants are engaged	
		Contribution of facilitators and mediators	
		Use of information	
	Effective engagement		

*Table containing the full range of ECR evaluation criteria, categorised according to 1) outcomes, 2) process and 3) relationships, from (Bingham, 1986; Buckle & Thomas-Buckle, 1986; D'Estrée et al., 2004; Emerson et al., 2009; Foley, 2007; Holzinger, 2001; Moore, 1996; Neuman, 1996; Orr et al., 2008; Rowe, 2003; Susskind, 1981; Todd, 2001)*

## E.2 Rationale for evaluation criteria

### *E.2.1 Evaluating outcomes*

Our evaluation looks at five outcomes: 1a) the nature of the agreement; 1b) the degree of conflict; 1c) party knowledge; 1d) issue coverage; and 1e) additional impacts. The ability of parties to reach an agreement that is perceived to be fair, implementable and durable has been considered the hallmark of a successful EM process since the practice's inception (Bingham, 1986; Emerson *et al.*, 2009). Similarly, a reduction in conflict between parties is a sign that a process can be considered to have been effective (Todd, 2001; Rowe, 2003). That parties improve their knowledge of the issue(s) at hand may at first glance be considered a beneficial by-product, however it is also recognised that increased participant knowledge is often a precondition to agreements being struck (Holzinger, 2001; Orr, Emerson and Keyes, 2008). Relatedly, the extent to which the issue(s) at stake are accounted for by a process is important for the degree to which knowledge of these issues can be accrued and, in turn, addressed (Susskind, 1981; Moore, 1996). Finally, it is important that evaluations consider the resulting impacts of the process once it has formally concluded, in order to capture any outcomes that may arise from or go beyond any agreement(s) reached, such as those generated by improved party collaboration (D'Estrée, Colby and Beck, 2004).

### *E.2.2 Evaluating process*

Our evaluation is also comprised of five procedural components: 2a) parties and participation; 2b) role of the mediators; 2c) perceived fairness and transparency; 2d) the use of information; and 2e) ownership and accountability. The identification, representation, engagement and ongoing recruitment of all parties that have an interest in the dispute is generally regarded as a central ingredient in effective mediation processes as well as to ensure the process is seen

as legitimate in the eyes of participants (Moore, 1996; Susskind, 1981; Emerson *et al.*, 2009). Equally important is the selection of appropriately skilled mediators who have the approval of parties and who are able to manage and adapt to change in the pursuit of beneficial outcomes (Buckle and Thomas-Buckle, 1986; Rowe, 2003; Orr, Emerson and Keyes, 2008). The degree to which processes can be considered fair and transparent is also an important qualitative measure such as, for example, providing space for honest debate and ensuring participants are made aware of new developments (Todd, 2001; D'Estrée, Colby and Beck, 2004). Similarly, how information is used and integrated, like scientific data or local knowledge, by parties and mediators is also considered a sign of good practice (Orr, Emerson and Keyes, 2008; Emerson *et al.*, 2009). Lastly, processes are often deemed to be effective when the parties involved gain and retain a sense of ownership over the problems at hand and possible solutions to them and that, in turn, parties are accountable for devising those solutions and subsequently delivering on them (Moore, 1996; Neuman, 1996).

### *E.2.3 Evaluating relationships*

Our evaluation criteria is completed by five relationship-focused themes: 3a) communication; 3b) understanding and empathy; 3c) collaboration; 3d) trust; and 3e) resilience and capacity. It has long been recognised within conflict resolution that ongoing face-to-face dialogue is a simple but important foundation for improving communication between hostile parties as well as a prerequisite for further relational advancements (Bingham, 1986; Orr, Emerson and Keyes, 2008). One such advancement may pertain to enhanced '*affective and cognitive awareness*' of party values and viewpoints (Susskind, 1981; Buckle and Thomas-Buckle, 1986, p. 69) and the building of empathic understanding between parties (D'Estrée, Colby and Beck, 2004). Another, more tangible, manifestation is whether parties can work together better, either during the process itself or once it has concluded (Neuman, 1996; Rowe, 2003; Emerson *et al.*, 2009). The extent to which this is practicable is, however, dependent on the level of trust that parties have in one another (D'Estrée, Colby and Beck, 2004) and whether a process provides '*transformative opportunities*' to improve on collaborative working (Foley, 2007, p. 500). Finally, in attempting to look ahead once processes have concluded, it is useful to examine the degree to which relationships can be viewed as resilient, in terms of the

strengthened capacity, brought about by the process, that parties have to withstand and autonomously resolve any potential future disputes (Holzinger, 2001; D'Estrée, Colby and Beck, 2004).