

1 Perceptions of environmental justice and the conflict surrounding large carnivore
2 management in Norway – implications for conflict management

3
4 Kim S. Jacobsen ^{a, b, 1} John D. C. Linnell ^c
5

6 a) Corresponding author

7 b) The London School of Economics and Political Science, Houghton Street, London WC2A
8 2AE, UK. E-mail: kim.jacobsen@zoo.ox.ac.uk

9 c) Norwegian Institute for Nature Research, PO Box 5685 Sluppen, NO-7485 Trondheim,
10 Norway. E-mail: john.linnell@nina.no

¹ Wildlife Conservation Research Unit, Department of Zoology, University of Oxford, Abingdon Road, Tubney, OX13 5QL, UK

ABSTRACT

Human-wildlife conflict is increasingly being recognised as containing strong elements of social conflict. The extent to which stakeholders regard a management system as being just and fair is a key social dimension of conflict. This paper investigates the perceptions of justice regarding the carnivore conflict in Norway among sheep farmers, environmentalists and indigenous reindeer herders using Q methodology. Three significant perspectives on environmental justice were identified, which we labelled the Carnivore Advocates (containing most environmentalists), the Carnivore Sceptics (containing most of the sheep farmers and reindeer herders) and the Bureaucratic Carnivore Sceptics (containing the remaining sheep farmers and a reindeer herder). The widest disagreement was over what constitutes environmental harm and environmental goods and how the costs and benefits should be distributed, indicating that fundamental differences in values and perceptions underlie the intractability of this conflict. However, the results of this study suggest that the widespread conceptualisation of justice as strictly a matter of equitable distribution of costs and benefits is incomplete. Recognition justice, in the form of acknowledging group identity, lifestyle, knowledge and viewpoints, and seeking mutual respect for differences constituted a good in itself for all stakeholders. It cannot therefore just be viewed as a means to establish equitable distribution of goods and harms. Issues related to participatory justice were also identified, but were not attributed great importance. These results confirm the common assumption that the carnivore conflict in Norway is highly polarised. Because the two poles differ fundamentally in their value perceptions regarding carnivores and how that relates to their sense of identity, we characterise the human-wildlife conflict in Norway as a “wicked problem” where decisions regarding the management of carnivores is going to entail political prioritisation of one viewpoint over the other.

KEYWORDS: Environmental justice, carnivore conservation, human-wildlife conflict, carnivore management and policy

1. INTRODUCTION

Conflicts between people and wildlife are among the most critical threats to the conservation of many species (Dickman 2010). They are likely to become increasingly important as such conflicts are increasing in both frequency and severity across the globe (Madden 2004). The ramifications of conflicts between people and wildlife may extend to affecting the conservation of entire ecosystems if the species in question has a strong ecological role (Woodroffe et al. 2005), and if the conflict leads to extirpation, severe population reduction, or the setting of minimal conservation goals (Berger et al. 2001). Carnivore populations are commonly involved in such conflicts (Treves and Karanth 2003) and carnivores raise particularly strong public engagement (Macdonald et al. 2016). Their conservation nearly inevitably results in their presence in human-dominated landscapes (Carter and Linnell 2016) where conflicts can range from depredation on livestock, damage to property, fear, and the loss of human life (Woodroffe et al. 2005). Such conflicts are often believed to be prime motivators of legal and illegal persecution. This constitutes “human-wildlife conflict” (HWC),

which Madden (2004) defines as situations where “*the needs and behaviour of wildlife impact negatively on the goals of humans or when the goals of humans negatively impact the needs of wildlife.*” Within the HWC literature, the dominant focus has been on biological and technical approaches to mitigation policy (Breitenmoser et al. 2005, Linnell et al. 2012)

However, HWC scholars are increasingly realising that HWC also results in human-human conflict as groups of people with contrasting views on wildlife conservation struggle to shape policy according to their preferences (Treves and Karanth 2003, Dickman 2010, Redpath et al. 2013). Conflicts that are superficially concerned with antagonisms between wildlife and humans are frequently characterised by underlying human-human social conflict. At its most basic level, this social conflict involves groups of people with different values or goals (Madden 2004). As phrased by Madden (2004), HWC can become “*not only conflict between humans and wildlife, but also between humans about wildlife*”. Though this is a distinct advance over the purely technical approach to conflict management, this is nonetheless an over-simplification. Nie (2003) advanced the debate further by identifying an additional layer of complexity. Not only does wildlife induce conflicts of interest regarding its management, but it can also become a focal point for wider fundamental conflicts between social groups. For example, sociological analyses of the conflict over wolves (*Canis lupus*) in Norway have arrived at similar conclusions, finding that the unified resistance against wolves among rural stakeholder groups arises from a common perceived need to defend the rural way of life against the cultural expansion of the urbanised middle class (Skogen and Krange 2013). Knight (2003) found similar dynamics of symbolism in Japan concerning management of the serow (*Capricornis crispus*), even though Japan is geographically and culturally far removed from Norway. Similarly, Naughton-Treves (1997) analysed the influence of socio-economic factors on the perception of HWC around Kibale National Park in Uganda and reports that farmers perceived wild animals as the “government’s cattle” and this increased resentment over the damages they caused. Dickman (2008) found that around Ruaha National Park, tolerance to wildlife damages in some cases fluctuated more with societal changes rather than levels of actual damage.

In terms of HWC, Norway is a particularly interesting case, as it presents a scenario that combines livestock (sheep and semi-domestic reindeer) husbandry practices that are extremely susceptible to predation from naturally recovering populations of large carnivores in a period of societal change in rural areas. This is happening against the backdrop of a wealthy country with well-established democratic institutions, the lowest human population density in Europe and vast areas of human-modified, but very suitable habitats. The Norwegian model of placing unguarded sheep and semi-domestic reindeer into boreal forest and alpine tundra habitats shared with large predators has been called “a recipe for maximum conflict” (Zimmermann et al. 2010).

The conflict surrounding carnivore policy in Norway lies at the intersection of HWC and environmental justice. On the most obvious level is the issue of distributive justice which centres on who should carry the costs caused by large carnivore depredation on livestock, semi-domestic reindeer and pets. The Norwegian government runs a compensation scheme that aims to give monetary restitution for all livestock lost (Expert Panel Report, Norwegian Environment Agency 2011). These schemes aim to compensate for the externalities caused by society's decisions to conserve problematic species, in other words to redistribute the costs of carnivore presence across the whole of society rather than placing the whole burden on the livestock producer (Bulte and Rondeau 2007, Schwerdtner and Gruber 2007). However, this scheme is seen as inadequate by livestock owners (Mattisson et al. 2011) and there is a highly

polarised and acrimonious debate between the livestock breeders and environmental groups concerning the fate of carnivores in Norway. This also needs to be understood within the context of society's perception of fairness or justice. While the published literature has focused on developing guidelines for how to run efficient compensation schemes and evaluating their impacts, there has been no research on how different stakeholders consider these schemes within a justice framework.

David Schlosberg (2004) argues that a solely distributive approach to justice is insufficient in practice because it does not adequately encompass the range of demands made by the environmental justice movements. He claims that “the recognition of identity and for full participatory democratic rights are integral demands for justice” (Schlosberg 2004) and argues that environmental justice should include the issues of participation and recognition in addition to distribution. In Schlosberg’s framework (outlined in Schlosberg 2003, 2004, 2007), “distribution” refers to equitable division of environmental harm and environmental goods between communities or individuals. “Participation” refers to the extent to which individuals or communities are able to take part in the decision-making process. “Recognition” refers to the recognition of the diversity of the participants and their identities. He draws on Young (1990), who argues that recognition is both the foundation of distributive justice and a good in itself: lack of recognition of social differences prevents the examination of those differences that give rise to inequitable distribution and also leads to a negative image of the self, thus constituting a harm. These justice categories are interlinked, as Young (1990) points out, and in the same way as a lack of recognition can lead to outcomes of distributive injustice, unawareness of distributive injustices can lead to failures of recognition of affected stakeholders. Martin et al. (2016) have also echoed these concerns and placed them directly within a biodiversity conservation context. We will deploy insights from the three categories of environmental justice to deconstruct how justice is viewed by three groups of stakeholders involved in conflicts over large carnivores in Norway. Although, there have been multiple social science studies of the Norwegian large carnivore conflict (e.g. Skogen et al. 2013), this is the first to formally adopt a justice approach. While understanding a complex social conflict such as this will not automatically lead to either its resolution or to better conservation outcomes, it is a necessary first step to begin seeking routes to such goals, and can at least guide a process of channelling the conflict into less time consuming and destructive channels (Carter and Linnell 2016).

2. STUDY SITE

2.1 Policy background and legal frameworks

Norwegian large carnivore policy has been constantly changing during the last centuries (Landa et al. 2000, Linnell et al. 2010, Swenson et al. 1995, Swenson and Andrén 2005, Wabakken et al. 2001). A law on extermination from 1846 initiated over a century of state sponsored persecution which led to the extinction of wolves and drastic reductions in populations of brown bears (*Ursus arctos*), wolverines (*Gulo gulo*) and Eurasian lynx (*Lynx lynx*). Legislation gradually began changing from the 1960's with incremental limitations being placed on hunting methods and seasons, leading ultimately to the removal of bounties and then protection. Their management has been discussed by national parliament through four distinct processes in the 1991-92, 1996-97, 2003-04 and 2015-16 parliamentary sessions, which have led to a range of regulations that govern the details of their management. The current system (www.rovviltportalen.no) has set clear recovery goals (which are both upper and lower limits) and recovery areas. Quota regulated hunter harvest and government operated lethal control is used to enforce these limits and zoning policies. Respective goals are 3 annually breeding wolf packs, 13 annual bear reproductions, 39 annual wolverines reproductions, and 65 annual lynx reproductions. The goals have been reached for wolves, wolverines and lynx, and the bear population has been slowly increasing towards the goal. Management is delegated to 8 regions, where a large carnivore management board is appointed by the Ministry of Climate and Environment, drawing on elected members of the County Parliaments and the Saami Parliament. The policy also requires the state to compensate owners for livestock, semi-domestic reindeer and hunting dogs that are killed by large carnivores.

The early policies were built within the frames of the Game Law from 1981 (law nr. 38 on Hunting and Trapping Game), although much of this was then absorbed into the Biodiversity Law from 2009 (law nr. 100 on the Management of Nature's Diversity). Norway is also a signatory to various international biodiversity conventions including, the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), the Convention on Biological Diversity (Rio Convention), the European Landscape Convention, the Washington Convention (CITES), and the Convention on Migratory Species (Bonn Convention). It is important to note that Norway is not part of the European Union, and is therefore not bound by the Habitat's Directive. At the core of Norwegian policy is an explicit and clearly articulated attempt to balance conflicting policy goals. On one hand their national laws and international obligations oblige them to contribute to large carnivore conservation, although none of the legal texts frame the extent of this obligation in unambiguous operational terms. On the other hand Norway has a very active rural policy that aspires to maintain its rural areas where extensive agriculture (including sheep production) is a key component. A final consideration is a national obligation under both national and international law (ILO Convention 169 – Indigenous and Tribal Peoples Convention) to consider the needs of the indigenous Saami people whose culture is closely tied to herding of semi-domestic reindeer.

This duality of purpose is also enshrined within the Constitution. The revision of the Norwegian constitution in 2014 formalised the relationship between the rights of its citizens and the state of the natural environment. Article 112 states that "*everybody has the right to an environment that secures their health, and to a natural environment where the productivity*

and diversity is conserved. Natural resources shall be used within a long term and holistic consideration that also considers this right for future generations" (Lovdata 2014). This paragraph can be interpreted to support the cause of both the opponents and proponents of carnivores. The right to an environment where the diversity is conserved can be interpreted as an obligation to maintain carnivore species, because they constitute a part of biodiversity. Equally, the right to an environment with productive capacity can be interpreted in favour of the livestock industry because the capacity to produce food and other products from outfield grazing of livestock (a productive use of the natural environment) is seen as threatened by carnivore presence. Furthermore, the biodiversity associated with extensive livestock grazing systems is placed on equal footing with large carnivores. Article 108 of the constitution also commits to Saami rights: "State authorities are obliged to create the conditions such that the Saami can secure and develop their language, culture and society".

As a result of these dual purposes that are enshrined in all legislative levels carnivore management is a complex process of finding compromises between multiple interests. The different points of view among different stakeholders concerning the nature of this compromise is the foundation for the conflicts that exist concerning large carnivores. Of further relevance to our treatment of participatory justice is the second sentence of article 112 "Citizens have the right to knowledge about the state of the environment and about the effects of planned and ongoing human impacts on nature, so that they are able to take care of the rights mentioned in the previous clause" which clearly requires these compromises to be made in open, informed and participatory processes.

2.2 Recovery of large carnivores and conflicts

There have been conflicts ever since the first signs of large carnivore recovery in the mid 1980's. Much of this has focused on carnivore depredation on sheep and semi-domestic reindeer. Norwegian sheep and reindeer production systems depend on the extensive use of outfield (forest and alpine tundra) forage. Sheep and reindeer free-range without fences or guarding, and with minimal herding, in the outfields. Sheep free-graze during the summer (June to September) and reindeer free-graze year round. Losses are high (Mabille et al. 2015, Tveraa et al. 2014), although the proportion lost to carnivores is a key debate because normally less than 10% of all lost animals are found and subject to necropsy. The existing compensation system has paid for all kills that are confirmed as being due to large carnivores plus all undocumented losses above what is viewed as background loss levels. The setting of these levels is the core of the controversy, although there are also many debates concerning compensation rates, with many herders complaining that rates do not cover the lost breeding value of the animals or the time investment and emotional strain of losing animals. In 2012 for example the state paid out 15 million euros for 26.836 sheep and 19.704 reindeer (Mattisson et al. 2014).

In addition to depredation on livestock there are widespread conflicts centred on competition between carnivores and hunters for game, wolves killing hunting dogs, and a wide array of social conflicts that involve fear for human safety and cases where carnivores have become symbols and surrogates for wider urban-rural tensions (Skogen et al. 2013). As in most parts of Europe, the rural areas of Norway are facing many challenges associated with the transformation of a traditional lifestyle based on extensive primary resource use to a modern service economy. The remaining forestry and agricultural activities are becoming more intensive and more mechanised. Widespread rural-urban migration is also representing a

major challenge to rural areas. Reindeer herding faces additional challenges from loss of grazing lands due to disturbance from infrastructure projects associated with recreation, transport, renewable energy production and mining. Accordingly, the conflicts over large carnivores are often perceived by some stakeholders as one additional external threat to the survival of rural lifestyles, while others may perceive them as being symbols of a new era where conservation can get priority in Norwegian nature.

These conflicts have become highly entrenched and institutionalised in Norway (Bredin et al. 2015), resulting in decision making about carnivore policy being made at the level of the nation's highest democratic body, the national parliament. The questions which our study seeks to explore do not centre on the legal legitimacy of these policies, but on the extent to which some key stakeholders regard the compromises that are explicit in these decisions as being fair and just.

3. METHODS

3.1. The Q Methodology

Q methodology provides a tool for systematically investigating the perceptions of stakeholders (Durning 2006). It is a data reduction technique that identifies shared views across a population, producing distinct narratives that each describes a viewpoint (Cross 2005). The subjects are asked to arrange a set of statements along a scale. Each narrative is derived through a statistical process similar to factor analysis and is the product of any subset of the participants who revealed similar views through the distribution of the sorted statements (Eden et al. 2005), providing a statistically convenient grouping of the views of the participants. The Q methodology is suited to studying strongly contentious issues where *“conflict is based on competing interests, competing beliefs, or both”* in which case Q methodology can help with finding mutually acceptable policies (Durning 2006, Mattson et al. 2006).

1.2 Choice of statements

We used the structured statement approach to Q methodology, carried out according to the principles of Fisher's balanced-block design, as described by Watts and Stenner (2012). The 45 statements used in this study were collected from the HWC literature (to make sure that the justice issues most commonly identified by previous studies on the causes of HWC would be represented) and from the Norwegian Environment Agency's news archives, as per the procedure recommended by Watts and Stenner (2012). 15 statements indicative of each of Schlosberg's categories of justice were selected to create three subsets of statements (Table 1). Schlosberg's typology of justice was chosen as the structuring framework because it explicitly incorporates community identities and is grounded in empirical analysis of environmental justice movements (Schlosberg 2013).

The statements within each category were chosen because they recurred frequently in the carnivore discourse, and together span the breadth of views expressed by the three stakeholder groups, ranging from economic arguments to questions of ethics. Statements 1-15 concern the distribution of costs and benefits, as per Schlosberg's category of distributive justice. The statements in this category cover the range from material to non-material costs and benefits perceived as arising from the current carnivore management. Statement 7 pertains to emotional costs that some people experience in association with the current carnivore management, and statements 5 and 14 describe costs in terms of reduced animal welfare. In contrast, statements 8, 10 and 15 concerns non-material

benefits in the form of enjoying carnivore presence, while statements 1, 2, 3, 4, 6, 13 concerns the distribution of the economic costs among livestock owners, taxpayers, the public and each participant's own stakeholder group. Statements 16-30 fall within Schlosberg's category of recognition justice. The statements focus on group identity (statements 25, 26, and 30), how other actors in the carnivore management nexus relate to that identity (statements 16, 17, 18, 19, 24 and 29) and the rights of the stakeholders (21 and 22). Statements 31-45 pertain to participatory justice, covering the range of participatory injustices mentioned in the HWC literature and carnivore discourse in Norway, including access to the decision-making process (statements 31, 33 and 37), political enfranchisement (statements 36, 42, 44) and accountability (statements 32, 34 and 35). In this study, "accountability" is divided into two concepts: (i) accountability in terms of explaining the reasons behind decisions, and (ii) accountability in terms of the opportunities to hold someone responsible for their actions.

1.3. Selection of participants

When selecting participants in Q methodological studies, unlike in quantitative methods, the aim is not to select a representative sample of the population. Instead, the aim is to sample participants that cover the range and diversity of views present among the target stakeholders (Cross 2005). Sampling should be strategic, not random, and should capture individuals who are "data-rich" and are likely to "express a particularly interesting or pivotal view" (Watts and Stenner 2012). The participants in this study were individuals who were practising sheep farmers, reindeer herders or environmentalists. For the purposes of this study, "environmentalist" was defined as any person who actively participates in an environmental organisation. For each of the three stakeholder groups we selected 10 participants from areas with varying degrees of large carnivore impacts and 5 representatives from their interest organisations, giving a total of 45 participants. 40- 60 participants is considered "more than adequate" for Q methodology studies (Brown 1980). We collected even numbers of environmentalists and sheep farmers from localities with high (Hedmark County) and very low (Rogaland County) predator pressure (Figure 1), as the level of carnivore conflict experienced in the participant's local area may affect his/her views (Kleiven et al. 2004). In the case of the reindeer herders, we used the same strategy of capturing the range of predator exposure and seeking representation from both South-Saami areas and North- Saami areas (Figure 1). The local participants were selected by contacting local sheep/reindeer herder collectives and local branches of environmental organisations and following a snowballing approach. We also included board members of the largest organisations that represent the various stakeholder groups' interests, as these are data-rich individuals who play a direct role in the policy process. Representatives of the interest organisations were selected on the basis of their position within the organisation. Leaders, board members and specialists working on carnivore conflict were selected. Overall 94% of people invited to participate did so.

1.4 Sorting of the statements

The participants sorted the statements along a scale running from "most disagree" (-5) to "most agree" (+5). The sorting process was administered online using FlashQ, a computerised Q-sorting tool, and the statements were presented in a randomised order. After each sorting of the statements, the participant was asked to explain the positioning of each statement (a semi-structured interview focused on the placement of each statement, lasting for 20-35 minutes), and this served to develop our understanding of the reasoning behind the rankings.

1.5. Analysis

We employed principal components analysis and varimax rotation for the factor analysis, using the PQ Method software (Schmolck and Atkinson 2014). Factors with eigenvalues >1 and more than one significantly aligning Q-sort are considered significant (Watts and Stenner 2012).

4. RESULTS

The factor analysis resulted in three significant factors: Factor 1 (Eigenvalue: 16.80); Factor 2 (Eigenvalue: 6.45); Factor 3 (Eigenvalue: 2.12). The total explanatory variance was 58% (Factor 1: 29%; Factor 2: 23%; Factor 3: 6%). Explanatory variance exceeding 34-40% is considered satisfactory in Q methodology (Kline 2014). Based on this we recognised three distinct perspectives on the carnivore policy among the participants. In the following text, the degree of agreement (Q-sort value) that a factor assigned to each statement is given in brackets, ranging from -5 to +5. The complete list of statements with associated Q-sort values and z-scores are presented in Table 1.

4.1. Factor 1: The Carnivore Sceptic Perspective

26 participants significantly associated with this factor ($p > 0.05$): 13 reindeer herders (5 North Saami; 5 South Saami; 3 from their interest organisation, 12 sheep farmers (5 from Hedmark; 4 from Rogaland; 3 from their interest organisations) and 1 environmentalist (1 from Hedmark).

The participants aligning with the Carnivore Sceptic perspective strongly emphasise issues of recognition (Table 2). They very strongly feel that their way of life is threatened by carnivores (+5), that their rights are being violated (+4), experience-based and lay knowledge is undervalued (+4), and that there is a lack of gratitude for the societal function they provide (+3). They feel that they have a culture that differs from that of the wider society (+2) but that their unique viewpoint and lifestyle is not recognised or valued by politicians (+2), policymakers (+3) and, to some degree, by society (+1).

The Carnivore Sceptic perspective also strongly emphasises distributive issues. The statement placed at +5 shows strong dissatisfaction with the existing compensation scheme, which is seen as inadequately covering the full value of depredated livestock. The participants belonging to this perspective feel that they pay disproportionate costs of maintaining carnivore populations (+4), not only in material terms, but also emotionally (+2). This perspective expresses concern not only for the distribution of costs between people but also the welfare of livestock (+3). Statements concerning potential benefits of carnivores to the public receive the least agreement, showing that this viewpoint does not see any benefits to the public through maintenance of carnivore populations (-4), and does not perceive the cost of the compensation scheme as a wasteful use of public funds (-4).

Issues of participation are least emphasised. While overall the least significant, there are nonetheless some statements that indicate that there are some participatory injustices perceived by those identifying with the Carnivore Sceptic perspective. They perceive that the mechanisms to hold the public carnivore management body responsible if they make unlawful management decisions are unsatisfactory (-3), and they feel that the scientific focus of management processes excludes them from effectively influencing the carnivore debate (+2) with their experience-based and lay-knowledge.

4.2.Factor 2: The Carnivore Advocate Perspective

14 participants significantly associate with this factor ($p>0.05$), all of them environmentalists (4 from Hedmark, 5 from Rogaland, and 5 from environmental interest organisations).

The participants grouped within the Carnivore Advocate perspective emphasise statements that are indicators of recognition and distributive injustice (Table 2). Statements regarding responsibility to maintain carnivores for the sake of future generations (an intergenerational form of distribution) and the recognition of carnivores place as valued and legitimate parts of the Norwegian fauna (recognition) were ranked highest of all the statements (+5). The rankings form a coherent view that emphasises the obligation to preserve carnivores for the benefit of global society (+4) as well as future generations, and which recognises the rights of carnivores (+3, +4). The Carnivore Advocate group derives distributive benefit from carnivores through increased enjoyment of natural areas (+4) if carnivores are present.

Some participatory injustices are also perceived as problems, but these are ranked lower than nearly all the indicators of distributive and recognition injustices, suggesting that these are perceived to be less significant compared with problems pertaining to distribution and recognition.

4.3.Factor 3: The Bureaucratic Carnivore Sceptic Perspective

3 participants significantly associate with this factor ($p>0.05$): constituting 2 participants from sheep farmer interest organisations and 1 participant from the reindeer herder's interest organisation.

The participants that group within this perspective assign the highest rating to one distributive issue and one recognition issue: the perceived distributive injustice towards livestock in the form of suffering caused to these animals by policies that maintain carnivores that kill and injure livestock (+5) and the violation of the rights of the social group they associate with (+5). This is followed by statements emphasising issues of recognition: the lack of understanding by politicians (+4) and opponents (+4) in the carnivore issue and a sense of their constituting a distinct sub-culture (+3). The costs suffered by their group (+3) and the threats to the livestock industry (+3) (both of which relate to distribution) are also emphasised. However, an even more distinct pattern is formed by the placement of statements that indicate satisfaction with the participatory aspects of the carnivore policy. Adherents of the Bureaucratic Carnivore Sceptic perspective feel very strongly that their group has not been excluded from the policy-making process in the carnivore issue (-5). They do not perceive any inadequacy with the transparency of the carnivore policy process: neither with the accountability (both in terms of decision-makers adequately justifying their decisions (-4) and holding them responsible (-4)), nor the accessibility of the channels for contributing to the decision-making process (-2). They also expressed confidence in using scientific evidence to support their case (+1).

4.4.Distinguishing statements

The distinguishing statements are those that the factor in question has ranked in a significantly different way to all other factors ($p < 0.05$ to $p < 0.01$).

The distinguishing statements for the Carnivore Sceptic perspective show that compared with the other perspectives, it describes more perceived injustice within the participation justice category (accountability, opportunity to provide input in the policy process and the extent to which public officials represent their interests). Because the Carnivore Sceptic and the Bureaucratic Carnivore Sceptic perspectives agree so widely on issues of recognition and distribution, neither of these viewpoints have many distinguishing statements in these areas. It is more instructive to study the distinguishing statements of the Carnivore Advocate perspective to see where it differs from both the Carnivore Sceptic and the Bureaucratic Carnivore Sceptic perspectives. Compared with these two Sceptic perspectives, the Carnivore Advocate perspective shows more concern with the recognition of the intrinsic rights of the carnivores themselves. They emphasise that carnivore presence in nature is part of their way of life. Six of the distinguishing statements indicate distributive issues that the Carnivore Advocate perspective is more concerned with than were the other two perspectives. These issues are in order of descending rank: The obligation to conserve carnivores for the benefit of future generations (+5). The benefits the participants themselves obtain from carnivores (+4). The obligation to conserve carnivores for the benefit of global society's conservation agenda (+4). Benefits the public loses due to carnivore opposition (+3). Wrongly blaming all livestock losses on depredation and thereby shifting the costs of poor husbandry practices to carnivores and their proponents (+3). Current carnivore management constitutes animal abuse of carnivores due to overuse of lethal control and hunting (+3). Livestock owners' intolerance of depredation presenting a threat to the enjoyment and environmental enhancement which the public receives from carnivores (+1).

The narrative of the Carnivore Advocate perspective is also distinguished by ranking of statements which indicate *less* perceived injustice for some issues. Several aspects of distribution are considered less pressing when compared with the other two factors. The Carnivore Advocate perspective does not view carnivores as an economic threat to livestock production (-4) and shows very little agreement with the proposition that emotional stress to the owners caused by carnivores should be compensated (-3) or that the compensation value offered for lost livestock is inadequate (-1). The members of this perspective also perceive a significantly lesser degree of injustice when it comes to recognition of their group identity and rights.

4.5. Consensus statements

These are the statements that do not significantly distinguish between any pair of factors ($p < 0.05$ to $p < 0.01$). There are six consensus statements, two relate to matters of recognition and four relate to participation in the policy-making and management process. None of the three perspectives express the view that public documents used in carnivore management are inaccessible (Factor 1: -2, Factor 2: -2, Factor 3: -2) and for all three perspectives the statement that proposed that civil disobedience could be justified is ranked further towards the "disagree" than the "agree" end of the scale. The Carnivore Sceptic, Carnivore Advocate and Bureaucratic Carnivore Sceptic perspectives are united in the degree to which they feel that politicians listen to their opinions but do not really take them into account: no one ranked these towards the "least agree" side, but none prioritised it for the higher rankings either (Factor 1: +1, Factor 2: +2, Factor 3: 0). All three perspectives also express the perception that other stakeholder groups look down on them, though this is not perceived as the most pressing issue as this statement is placed on +1 or +2 (Factor 1: +1, Factor 2: +1, Factor 3: +2). Ranked somewhat higher is a shared experience of being portrayed in a misleading fashion by the opposing side: Factor 1 ranks this statement at +2, Factor 2 at +2, and Factor 3 at +4.

5. DISCUSSION

The results of this study clearly supported Schlosberg's (2004) and Martin et al.'s (2016) calls to broaden the environmental justice framework to explicitly embrace issues of recognition and participation alongside the more commonly studied distributive component. Elements of all three forms of justice could be identified in the narratives concerning large carnivore conservation in Norway.

5.1. Recognition

The justice issues in the category of recognition are ranked highly in all perspectives but particularly by the Carnivore Sceptic and the Bureaucratic Carnivore Sceptic perspectives (Table 2), which describe similar narratives: they self-identify as a distinct sub-culture within wider society and feel that their way of life is threatened by carnivores. In both cases, the other statements ranked similarly on the scale shed light on the perceived conditions that allow such a threat to remain. Both the Carnivore Sceptic and the Bureaucratic Carnivore Sceptic perspectives describe a perceived lack of recognition of their views, lifestyles and local knowledge by society and policymakers. In contrast, the Carnivore Advocate perspective expresses more satisfaction with the recognition their group receives from society and policymakers. The aspects of recognition injustice that this perspective emphasises most strongly is the importance of recognising the role that carnivores play as components of the Norwegian fauna, which the participants holding this perspective perceive as closely linked with their own sense of identity, indicating that they have a sense of community that includes carnivores. These statements received very little agreement from the Carnivore Sceptic and the Bureaucratic Carnivore Sceptic perspectives. However, recognition is not the dominant category of distinguishing statement for any of the three perspectives, signifying that this is not the area of widest disagreement.

5.2. Distribution

The Carnivore Sceptic and Bureaucratic Carnivore Sceptic viewpoints emphasise similar justice issues within the category of distribution. Both narratives express the view that they pay disproportionate costs of maintaining carnivore populations. They also both disagree with statements proposing that the costs of carnivores should be tolerated for the sake of the benefits received by the public. In terms of its perception of distributive injustices, the Carnivore Advocate perspective constitutes the polar opposite of the other two perspectives. This was revealed by its distinguishing statements, which included as many as 13 statements pertaining to distribution of costs and benefits. The proponents of the Carnivore Advocate perspective are strongly concerned with the obligation to preserve carnivores for the sake of future generations and the conservation agenda of a wider global society, and participants associating with this perspective derive increased enjoyment value from natural areas if carnivores are present. This indicates that stakeholders aligning with the Carnivore Advocate perspective perceive failure to conserve carnivore populations as distributive injustice through reducing the value of nature for global society, future generations and their own enjoyment, while the other two perspectives do not see any such benefits arising from carnivore presence. This reveals a fundamental difference in value perception.

5.3. Participation

The statements within the participation category were ranked low relative to the other two categories, as a source of discontent by all three groups. In contrast to the extensive similarities in the perceptions expressed by the Carnivore Sceptic and Bureaucratic Carnivore Sceptic

perspectives when it comes to recognition and distribution, these two factors diverge in their views on participatory issues. The Bureaucratic Carnivore Sceptic's perspective is characterised by broad satisfaction with the participatory aspect of the Norwegian carnivore policy. The Carnivore Sceptic perspective distinguishes itself from the other two perspectives by expressing a greater degree of discontent with participatory issues relative to the other two (Table 2). The Carnivore Sceptic perspective describes a sense of disenfranchisement in the carnivore issue through dissatisfaction with their representation by elected public figures, opportunities for input into the carnivore policy formation process, and accountability. In this study, “accountability” is divided into two concepts: (i) accountability in terms of explaining the reasons behind decisions, and (ii) accountability in terms of the opportunities to hold someone responsible for their actions. Both the Carnivore Sceptic and the Carnivore Advocates perspectives express more satisfaction with (i) than (ii). The Bureaucratic Carnivore Sceptic perspective expresses satisfaction with both aspects of accountability and distinguishes itself by its strong degree of approval relative to the other two perspectives.

5.4.Consensus

The purpose of identifying consensus statements was to determine opportunities for improving policy without significant opposition. There are very few statements that do not significantly distinguish between at least two perspectives. Only three of the consensus statements indicated perceived injustice. All three perspectives express the view that politicians only superficially listen to their opinions without taking them into account, and perceive condescension from other stakeholder groups. However, neither of these are ranked very highly, thus they are not perceived as very pressing relative to the other issues. There is stronger agreement around the shared perception of being portrayed misleadingly by the opposing side in the carnivore debate. Notably, there are no consensus statements relating to distributive justice, suggesting that the widest disagreement in the Norwegian carnivore conflict is over how environmental costs and benefits should be distributed, as well as about the way of understanding the actual nature of the costs and benefits that carnivores represent.

This lack of consensus supports the common observation that the conflict over the fate of carnivores in Norway is highly polarised (e.g. Expert Panel Report Norwegian Environment Agency 2011, Bredin et al. 2015a). Despite the existence of three distinct perspectives among the stakeholder groups, the conflict appears to be basically bipolar. The Carnivore Sceptic and Bureaucratic Carnivore Sceptic perspectives exhibit extensive similarities in their perception of distribution and recognition, with only slight differences in the strength of agreement with individual statements within each category. In contrast, the Carnivore Advocate perspective is highly dissimilar to both of the other two perspectives. Admittedly, all perspectives strongly emphasise issues related to recognition and distribution, but the participants that grouped within the Carnivore Advocate perspective agreed with different statements *within* these categories. There seem to be two very distinct sides to this conflict, one that opposes carnivore presence and one that embraces it. The polarisation of the stakeholder views in Norway differs markedly from the pattern of stakeholder views identified in some other areas. Bredin et al. (2015b) found no clear groupings of stakeholders against or in favour of jaguar conservation in Brazil, despite jaguars generally having an impact on cattle breeding (Zimmermann et al. 2005, Palmeira et al. 2008) and, on rare occasions, killing people (Neto et al. 2011). In contrast, polarised and antagonistic debates surrounding carnivores are common in North America and Europe (Nie 2003, Bredin et al. 2015a) suggesting that cultural factors may indeed be significant determinants of HWC.

This invites the question of why the Bureaucratic Carnivore Sceptic perspective emerged as a significantly distinct viewpoint? This is because the Carnivore Sceptic and Bureaucratic Carnivore Sceptic perspectives are different enough in the perception of the participatory aspect of the carnivore policy to constitute separate groupings in the factor analysis. The Bureaucratic Carnivore Sceptic perspective describes a narrative that is likely to fit individual members of the livestock sector with greater mastery of the political decision-making process.

5.5.Implications for understanding human-wildlife conflict

Our results resonate with the wider literature trying to describe the nature of HWC in Fennoscandia (Krange and Skogen 2007, Krange and Skogen 2011, Skogen and Krange 2003, Hiedanpää and Bromley 2011). Recognition (of the diversity and identity of participants by other groups, constituting an issue of community survival) has been shown by this study to be important in the minds of stakeholders in the Norwegian carnivore conflict. This supports the general trend towards re-conceiving HWC as human-human conflict (Madden 2004). Specifically, it is consistent with Nie's (2003) conclusion that conflicts about carnivores become a focal point for wider and deeper underlying conflicts. Issues of recognition rank as highly as statements describing direct costs of the current carnivore policy, suggesting more fundamental grievances that colour the debate over carnivores in Norway. This indicates that the framing of HWC as human conflict about carnivores (Madden 2004) is oversimplified, and that in some cases, such as Norway, HWC also embraces conflicts that are not solely about carnivores. The Carnivore Sceptic and Bureaucratic Carnivore Sceptic perspectives reveal a sense of constituting a distinct rural sub-culture with a way of life that is threatened. This is compatible with Skogen and Krange's (2013) claim that carnivore opposition in Norway is at least partly caused by a distinct rural culture that is perceived to be under threat from urban environmentalists and wider issues of social change. Furthermore, Bredin et al. (2015a), using an ecosystem service framework, found that some stakeholders in Norwegian wildlife management perceive traditional farming as performing an important cultural service. This may also contribute to explaining why the perspectives that expressed a critical view on carnivores (the Carnivore Sceptic and Bureaucratic Carnivore Sceptic viewpoints) emphasised injustices pertaining to recognition of the value of the services their occupations provide instead of just distributive injustices.

The results also support the notion that conflict between hegemonic (scientific) and subordinate (lay and experience-based) forms of knowledge can contribute to the social conflict exacerbating HWC, as argued by Skogen and Krange (2003). The participants who formed the Carnivore Advocate and the Bureaucratic Carnivore Sceptic perspectives expressed confidence in their use of scientific knowledge, while those grouped in the Carnivore Sceptic perspective perceived the focus on scientific knowledge as a barrier, and strongly emphasised the lack of value assigned to experience-based or lay knowledge.

The three perspectives derived by the Q-methodological analysis demonstrate that conflict over wildlife management and conservation can cause stakeholders to group together across geographical and cultural divisions. Each perspective falls along the lines of stakeholder identities (with the exception of one environmentalist from Hedmark, the area with the highest predation pressure, who aligned with the Carnivore Sceptic perspective). The Carnivore Sceptic perspective and the Bureaucratic Carnivore Sceptic perspective contain the sheep farmers and reindeer herders, while the Carnivore Advocate perspective only consists of environmentalists. The Bureaucratic Carnivore Sceptic perspective is entirely composed

by representatives from the sheep farming and reindeer herding interest organisations, as would be expected given that this perspective expresses strong satisfaction with the ability to manoeuvre the participatory aspects of the carnivore policy. It is noteworthy that the views of sheep farmers and reindeer herders do not separate into separate perspectives, even though these two groups are known to disagree widely on other issues. This shows that when it comes to perceptions of environmental justice underlying carnivore resistance, these two stakeholder groups hold very similar views despite socio-economic and cultural differences. It is also interesting that even sheep farmers in areas with almost no large carnivores at present group together with their colleagues from areas suffering greater predator impacts. This indicates institutionalisation of views among carnivore sceptics across different livestock industries and cultural backgrounds.

Our results underline the need to recognise the range of components of environmental justice (distribution, recognition and participation) but also reveal the need to recognise the diversity of sub-categories within each. For example, within the category of distribution it is clear that some stakeholders emphasise notions of intergenerational justice, extend the notion of justice to include non-human life-forms (carnivores and domestic animal respectively) and perceive a range of different types of costs and benefits, not just those of an economic nature.

5.6. Implications for human-wildlife conflict alleviation and conservation

Human wildlife conflicts are often regarded as constituting a severe threat to the conservation of a range of species (Dickman 2010, Madden 2004). Although there are some arguments for social conflicts being unavoidable in conservation (McShane et al. 2011) and they may not always even be undesirable for conservation per se as conflict can have some positive influences (Young et al. 2010) and may stimulate change and provide positive outcomes for biodiversity (Redpath et al. 2013). However, it is the consequences of social conflict that determine whether it is constructive or harmful (Lederach 1997). The literature on environmental conflict emphasises that social conflict is usually uncondusive to successful conservation outcomes and stresses the importance of support from stakeholders. Madden and McQuinn (2014) argue that it may be tempting to disregard social conflicts as they are often believed to be outside the purview of conservation, but that “long-term conservation success requires deepening conservationists’ capacity and strategies to include responses that seek to understand and address these more elusive social conflicts”. Unaddressed social conflict can detract from long-term conservation objectives (Messmer 2000, Madden and McQuinn 2014, Redpath et al. 2013, Redpath et al. 2015), and lead to non-compliance and opposition to conservation initiatives (Young et al. 2016, Madden 2004). This is demonstrated by the occurrence of illegal killing of carnivores, which is at least partly due to social conflict in Scandinavia and elsewhere (Pohja-Mykra and Kurki 2014, von Essen and Allen 2015, Muth and Bowe 1998).

Understanding the nature of these social conflicts is a first step on the path to exploring potential ways to mitigate or alleviate these conflicts. Perceptions of justice and fairness can be strong motivators of people's attitudes and behaviours, including of their compliance with regulations (Tyler 1990). Furthermore, it is now considered to be essential for any process of social change, including within the environmental movement, to be conducted in manner that is fair, participatory, and viewed with widespread legitimacy. These are the principles which are enshrined within legislation such as the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, for example (<http://ec.europa.eu/environment/aarhus/>). However, multiple authors have also identified the need to be able to move forward with policy, even in the absence of consensus (Peterson et al. 2005).

Among the three stakeholder groupings that our analysis identified in Norway, the highly polarised and divergent nature of justice perceptions means that common ground is scarce. It is clear that any attempt to alter the distributional impact of carnivores would result in dissatisfaction from either the stakeholders adhering to the Carnivore Advocate perspective or those of the Carnivore Sceptic and Bureaucratic Carnivore Sceptic perspectives, as the view on distributive issues expressed by the Carnivore Advocates is nearly the opposite of that held by the other two perspectives. There were no consensus statements relating to distributive justice, suggesting fundamental disagreement over the value or disvalue attached to carnivores and how these environmental costs and benefits should be distributed. However, all groups identified recognition issues as being important. Even if they disagreed on what should be recognised it indicates that a mutual and respectful recognition of their different points of views, forms of knowledge, underlying values and practices may help reduce at least one dimension of the justice perceptions. Given the huge efforts that have been invested in building institutions to manage large carnivores that involve elected officials, stakeholder forums, and state of the art knowledge about their status and ecology it is reassuring to see that participation issues were not ranked very negatively, although there is clearly room for further improvement. This offers hope that it is possible to construct institutions where stakeholders with widely divergent values can meet to discuss issues in a respectful manner and have access to a broad common knowledge platform. However, the results clearly indicate that such institutions do nothing to change the fact that there is a very dramatic division associated with how the different groups view large carnivores and their management, which reflects deeper divisions and concerns about environmental ethics, values and the very fabric of rural life and identity. This implies that any decisions about large carnivores are going to have to be one of political prioritisation of one view over the other. Developing a widely accepted carnivore policy in Norway thus has all the hallmarks of a “wicked problem” (Camillus 2008, Marchini 2014). In Sweden, increased participation did not reduce the wickedness of carnivore management (Duit and Löf 2015). Still, while participation by itself may not reduce the conflict associated with the outcome of this prioritisation, it is necessary in order to ensure that the political choices are made through means that are regarded as legitimate by the stakeholders (de Marchi and Ravetz 2001, Sidaway 2013) and to avoid increasing perceptions of participatory injustice.

Though it is not possible to assume that the perceptions among stakeholders in Norway will be the same in countries with different cultural or socio-economic circumstances, aspects of this conflict are likely to be present in conflicts across the world, and conclusions about the range of issues encompassed within environmental justice can inform conservationists trying to solve HWC across locations and contexts. The results from this study suggest that a predominant focus on equitable distribution of economic costs to achieve conflict resolution is not justified (e.g. Agarwala et al. 2010). Instead a wider conception of justice is necessary to encompass the range of issues perceived by stakeholders. Although distributive issues were strongly emphasised by participants, issues relating to recognition were also identified as important. Despite their importance to the stakeholders, the perceived injustices pertaining to recognition would have been overlooked if adhering to the distributive-participatory paradigm only. This has significant implications for conservation efforts, where distributive and participatory notions of justice and fairness appear to be prevalent. Recognition is under acknowledged as a good in itself, as opposed to just a requirement to achieve satisfactory distributive and participatory justice (Martin et al. 2016). Our results indicate that there is a need to explicitly recognise that there is a difference between recognition (acknowledging a practice or viewpoint as being legitimate and valuable) and agreement (giving this practice or viewpoint priority). We can respect others even if we do not agree with them.

This indicates the importance of considering a broad conception of injustices and harms when trying to solve conflicts surrounding the conservation of wildlife, not just alleviation of the economic burden. Our results show that addressing the distribution of environmental costs and benefits would only alleviate part of the injustices perceived by stakeholders.

6. Conclusions

Overall our results reveal that it will be impossible to address all perceptions of injustice felt by all stakeholders. This is because it appears that fundamentally different values concerning distributive justice underlie their positions. In such situations where it is impossible to satisfy all stakeholders about the *outcome* of a given policy debate it is important to ensure that the *process* of making decisions is regarded as being fair and just, and that the participants are treated with *respect and due recognition* of their identities and divergent perspectives. Such considerations should be motivated by both a hope that they may produce a better and lasting conservation outcome (Carter and Linnell 2016), and because these behaviours are intrinsic to democratic processes and societal norms.

Acknowledgements

We would like to thank Charles Palmer and Kimberly L. Byrd for their generous contributions, the stakeholder organisations for their assistance, and all the anonymous stakeholders for their participation. We would also like to thank the anonymous reviewers for their highly valuable input. JDCL was funded by the Research Council of Norway (grant number 212919) and the Norwegian Environment Agency.

REFERENCES

- Agarwala M., Kumar S., Treves, A, Naughton-Treves L. (2010) *Paying for wolves in Solapur, India and Wisconsin, USA: comparing compensation rules and practice to understand the goals and politics of wolf conservation*. Biological Conservation, 143: 2945-2955. DOI: 10.1016/j.biocon.2010.05.003
- Berger J., Stacey P. B., Bellis L., Johnson M. P. (2001). *A mammalian predator-prey imbalance: grizzly bear and wolf extinction affect avian neotropical migrants*. Ecological Applications, 11(4), 947-960. DOI: 10.1890/1051-0761(2001)011[0947:AMPPIG]2.0.CO;2
- Bredin Y. K., Lindhjem H., van Dijk J., Linnell J. D. (2015a) *Mapping value plurality towards ecosystem services in the case of Norwegian wildlife management: AQ analysis*. Ecological Economics, 118: 198-206. 10.1016/j.ecolecon.2015.07.005
- Bredin Y. K., Linnell J. D. C., Silveira L., Torres N. M., Jacomo A. A. & Swenson J. E., (2015) *Institutional stakeholders' views on jaguar conservation issues in central Brazil*. Global Ecology & Conservation 3: 814-823.

- 820 Bredin Y.K., Lindhjem H., van Dijk J., Linnell J.D.C. (2015) *Mapping value plurality*
821 *towards ecosystem services in the case of Norwegian wildlife management: A Q analysis.*
822 Ecological Economics 118, 198-206.
- 823 Breitenmoser U., Angst C., Landry J.M., Breitenmoser-Würsten C., Linnell, J.D.C., Weber
824 J.M. (2005) *Non-lethal techniques for reducing depredation.* People and wildlife: conflict or
825 coexistence? Woodroffe R., Thirgood S., Rabinowitz A. (Eds.) Cambridge University Press,
826 Cambridge, pp. 49-71.
- 827 Brown S. R. (1980). *Political subjectivity: Applications of Q methodology in political science.*
828 Yale University Press.
- 829 Bulte, E., Rondeau D. (2007) *Compensation for wildlife damages: habitat conversion,*
830 *species preservation and local welfare.* Journal of Environmental Economics and
831 Management, 54: 311-322. DOI: 10.1016/j.jeem.2007.02.003
- 832 Camillus J. C. (2008) *Strategy as a wicked problem.* Harvard business review, 86.5:98.
- 833 Carter N.H., Linnell J.D.C. (2016) *Co-adaptation is key to coexisting with large carnivores.*
834 Trends in Ecology and Evolution 31, 575-578.
- 835 Cross R. (2005). *Exploring attitudes: the case for Q methodology.* Health education
836 research, 20(2): 206-213.7. DOI: 10.1093/her/cyg121
- 837 De Marchi B., Ravetz J. R. (2001) Participatory approaches to environmental policy.
838 Cambridge Research for the Environment.
- 839 Dickman A. J. (2010) *Complexities of conflict: the importance of considering social factors*
840 *for effectively resolving human-wildlife conflict.* Animal Conservation, 13: 458-466.
841 DOI: 10.1111/j.1469-1795.2010.00368.x
- 842 Dickman A.J. (2008). *Key determinants of conflict between people and wildlife, particularly*
843 *large carnivores, around Ruaha National Park, Tanzania.* London: University College
844 London.
- 845 Duit A., Löf A. (2015) *Dealing With a Wicked Problem? A Dark Tale of Carnivore*
846 *Management in Sweden 2007-2011.* Administration & Society, 1(25). DOI:
847 10.1177/0095399715595668
- 848 Durning D. (2006) *Using Q-methodology to resolve conflicts and find solutions to*
849 *contentious policy issues.* Network of Asia-Pacific Schools and Institutes of Public
850 Administration and Governance (NAPSIPAG): 601.
- 851 Eden S., Donaldson A., Walker G. (2005) *Structuring subjectivities? Using Q methodology in*
852 *human geography.* Area, 37(4): 413-422. DOI: 10.1111/j.1475-4762.2005.00641.x
- 853 Hiedanpää J., Bromley D.W. (2011) *The harmonization game: reasons and rules in*
854 *European biodiversity policy.* Environmental Policy and Governance, 21: 99-111.
855 DOI: 10.1002/eet.561

- 856 Kleiven J., Bjerke T., Kaltenborn B.P (2004). *Factors influencing the social acceptability of*
857 *large carnivore behaviours*. Biodiversity & Conservation, 13(9): 1647-1658. DOI:
858 10.1023/B:BIOC.0000029328.81255.38
- 859 Kline P. (2014). *An easy guide to factor analysis*. Routledge: London.
- 860 Knight, J. (2003) *Waiting for wolves in Japan: an anthropological study of people-wildlife*
861 *relations*. Oxford University Press, USA.
- 862 Krange O., Skogen K. (2011) *When the lads go hunting: the "Hammertown mechanism" and*
863 *the conflict over wolves in Norway*. Ethnography, 12: 466-489.
864 DOI: 10.1177/1466138110397227
- 865 Krange O., Skogen K. (2007) *Reflexive tradition. Young Working-Class Hunters between*
866 *Wolves and Modernity*. Nordic Journal of Youth Research, 15 (3): 215-233. DOI:
867 10.1177/110330880701500301
- 868 Landa A., Linnell J.D.C., Swenson J.E., Røskft E., Moskness I. (2000) *Conservation of*
869 *Scandinavian wolverines in ecological and political landscapes, In Mustelids in a modern*
870 *world: conservation aspects of small carnivore-human interactions*. ed. H.I. Griffiths, pp. 1-
871 20. Backhuys Publishers, Leiden, Netherlands.
- 872 Lederach J.P. (1997) *Building Peace: Sustainable Reconciliation in Divided Societies*. United
873 States Institute for Peace.
- 874 Linnell J.D.C., Odden J., Mertens A. (2012) *Mitigation methods for conflicts associated with*
875 *carnivore depredation on livestock*. In: Boitani L., Powell R.A (Eds.) *Carnivore ecology and*
876 *conservation: a handbook of techniques*. Oxford University Press, Oxford, pp. 314-332.
- 877 Linnell J.D.C., Broseth H., Odden J., Nilsen E.B (2010) *Sustainably Harvesting a Large*
878 *Carnivore? Development of Eurasian Lynx Populations in Norway During 160 Years of*
879 *Shifting Policy*. Environmental Management 45, 1142-1154.
- 880 Lovdata (2014) *Kunngjøring av Stortingets vedtak 13. mai 2014 om endringer i Grunnloven*.
881 URL: <https://lovdata.no/dokument/LTI/forskrift/2014-05-14-628>. Accessed 7th April 2016.
- 882 Mabile G., Stien A., Tveraa T., Myserud A., Broseth, H., Linnell J.D.C. (2015) *Sheep*
883 *farming and large carnivores: What are the factors influencing claimed losses?* Ecosphere 6,
884 Article 82.
- 885 Macdonald D. W., Jacobsen K. S., Burnham D., Johnson P. J., Loveridge A. J. (2016). *Cecil:*
886 *A Moment or a Movement? Analysis of Media Coverage of the Death of a Lion, Panthera*
887 *leo*. Animals, 6(5), 26.
- 888 Madden F. (2004) *Creating coexistence between humans and wildlife: global perspectives on*
889 *local efforts to address human-wildlife conflict*. Human Dimensions of Wildlife, 9(4): 247-
890 257. DOI: 10.1080/10871200490505675
- 891 Madden F., McQuinn B. (2014) *Conservation's blind spot: the case for conflict*
892 *transformation in wildlife conservation*. Biological Conservation 178 (2014): 97-106.

893 Marchini S. (2014) *Who's in Conflict with Whom? Human Dimensions of the Conflicts*
894 *Involving Wildlife*. In: Applied Ecology and Human Dimensions in Biological Conservation.
895 Springer Berlin Heidelberg, pp. 189-209.

896 Martin A., Coolsaet B., Corbera E., Dawson N.M., Fraser J.A., Lehmann I., Rodriguez I.
897 (2016) *Justice and conservation: The need to incorporate recognition*. Biological
898 Conservation 197, 254-261.

899 Mattisson J., Odden J., Linnell J.D.C. (2014) *A catch-22 conflict: access to semi-domestic*
900 *reindeer modulates Eurasian lynx depredation on domestic sheep*. Biological Conservation
901 179, 116-122.

902 Mattisson J., Odden J., Nilsen E. B., Linnell J. D. C., Persson J., Andrén H. (2011) *Factors*
903 *affecting Eurasian lynx kill rates on semi-domesticated reindeer in northern Scandinavia:*
904 *can ecological research contribute to the development of a fair compensation system?*
905 Biological Conservation, 144(12) 3009-3017. DOI: 10.1016/j.biocon.2011.09.004

906 Mattson D. J., Byrd K. L., Rutherford M. B., Brown S. R., Clark, T. W. (2006). *Finding*
907 *common ground in large carnivore conservation: Mapping contending*
908 *perspectives*. Environmental Science & Policy, 9(4): 392-405. DOI:
909 10.1016/j.envsci.2006.01.005

910 McShane T.O., Hirsch P.D., Trung T.C., Songorwa A.N., Kinzig A., Monteferri B.,
911 Mutekanga D., Van Thang H., Dammert J.L., Pulgar-Vidal M., Welch-Devine M., Brosius
912 J.P., Coppolillo P., O'Conner S. (2011) *Hard choices: making trade offs between biodiversity*
913 *conservation and human well-being*. Biological Conservation 144, 966-972.

914 Messmer T.A. (2000) *The emergence of human-wildlife conflict management: turning*
915 *challenges into opportunities*. International Biodeterioration & Biodegradation 45.3: 97-102.

916 Muth R. M., Bowe J. F. Jr. (1998) *Illegal harvest of renewable natural resources in North*
917 *America: Toward a typology of the motivations for poaching*. Society & Natural
918 Resources 11.1: 9-24.

919 Naughton-Treves, L. (1997) *Farming the forest edge: vulnerable places and people around*
920 *Kibale National Park, Uganda*. Geographical Review, 87(1): 27-46. DOI: 10.1111/j.1931-
921 0846.1997.tb00058.x

922 Neto M. F. C., Neto D. G., Haddad V. (2011). *Attacks by jaguars (Panthera onca) on humans*
923 *in Central Brazil: report of three cases, with observation of a death*. Wilderness &
924 environmental medicine 22(2):130-135. DOI: 10.1016/j.wem.2011.01.007

925 Nie M. (2003) *Beyond wolves: the politics of wolf recovery and management*. University of
926 Minnesota Press, Minnesota.

927 Norwegian Environment Agency (2011) *Expert Panel Report On Carnivore Damage*. URL:
928 <http://www.rovviltportalen.no/multimedia/49100/Innstilling-fra-ekspertvalg-om-endringer-i-erstatningsordningen-01072011.pdf&contentdisposition=attachment>. Accessed 14th April
929 2014.
930

- 931 Palmeira F. B., Crawshaw P. G., Haddad C. M., Ferraz K. M. P., Verdade L. M. (2008).
 932 *Cattle depredation by puma (Puma concolor) and jaguar (Panthera onca) in central-western*
 933 *Brazil*. Biological conservation, 141(1):118-125. DOI: 10.1016/j.biocon.2007.09.015
- 934 Peterson M.N., Peterson M.J., Peterson T.R. (2005) *Conservation and the myth of consensus*.
 935 Conservation Biology 19, 762-767.
- 936 Pohja-Mykra M., Sami K. (2014) *Strong community support for illegal killing challenges*
 937 *wolf management*. European Journal of Wildlife Research 60.5: 759-770.
- 938 Redpath S.M., Bhatia S., Young J. (2015) *Tilting at wildlife: reconsidering human–wildlife*
 939 *conflict*. Oryx 49.02: 222-225.
- 940 Redpath S.M., Young J., Evelyn A., Adams W.M., Sutherland W.J., Whitehouse A., Amar A.,
 941 Lambert R.A., Linnell J.D., Watt A., Gutiérrez R.J. (2013). *Understanding and managing*
 942 *conservation conflicts*. Trends in Ecology & Evolution, 28(2), pp.100-109.
- 943 Schlosberg D. (2003) *The justice of environmental justice: reconciling equity, recognition,*
 944 *and participation in a political movement*. In: Light A., De-Shalit A. (Eds.) Moral and
 945 political reasoning in environmental practice. The MIT Press, Cambridge, pp. 77-106.
- 946 Schlosberg D. (2004) *Reconceiving environmental Justice: global movements and political*
 947 *theories*. Environmental Politics, 13(3): 517-540. DOI: 10.1080/0964401042000229025
- 948 Schlosberg D. (2007) *Defining environmental justice: Theories, movements, and nature*.
 949 Oxford University Press, Oxford.
- 950 Schlosberg D. (2013) *Theorising environmental justice: the expanding sphere of a discourse*.
 951 Environmental Politics, 22(1): 37-55. DOI: 10.1080/09644016.2013.755387
- 952 Schmolck, P., & Atkinson, J. (2014). PQMethod (Version 2.35) [Computer software].
 953 Retrieved from <http://schmolck.org/qmethod/>. Accessed: 25th April 2014.
- 954 Schwerdtner K., Gruber B. (2007) *A conceptual framework for damage compensation*
 955 *schemes*. Biological Conservation, 134: 354–360. DOI: 10.1016/j.biocon.2006.08.010
- 956 Sidaway R. (2013) *Resolving environmental disputes: from conflict to consensus*. Earthscan,
 957 London.
- 958 Skogen K., Krangle O. (2003) *Adapting adaptive management to a cultural understanding of*
 959 *land use conflicts*. Society Natural Resources, 16(5): 435-450. DOI:
 960 10.1080/08941920309180
- 961 Skogen K., Krangle O. (2003) *A wolf at the gate: The anti-carnivore alliance and the*
 962 *symbolic construction of community*. Sociologia Ruralis, 43: 309-325. DOI: 10.1111/1467-
 963 9523.00247
- 964 Skogen K., Krangle O., Figari H. (2013). *Ulvekonflikter*. Akademia forlag, Oslo.

965 Swenson J.E., Wabakken P., Sandegren F., Bjärvall A., Franzén R., Söderberg A. (1995) *The*
966 *near extinction and recovery of brown bears in Scandinavia in relation to the bear*
967 *management policies of Norway and Sweden*. Wildlife Biology 1, 11-25.

968 Swenson, J.E., Andrén, H. (2005) A tale of two countries: large carnivore depredation and
969 compensation schemes in Sweden and Norway, In People and wildlife: conflict or
970 coexistence? eds R. Woodroffe, S. Thirgood, A. Rabinowitz, pp. 323-339. Cambridge
971 University Press, Cambridge.

972 Treves A., Karanth J. U. (2003) *Human-carnivore conflict and perspectives on carnivore*
973 *management worldwide*. Conservation Biology, 17(6):1491-1499. DOI: 10.1111/j.1523-
974 1739.2003.00059.x

975 Tveraa T., Stien A., Broseth H., Yoccoz N.G. (2014) *The role of predation and food*
976 *limitation on claims for compensation, reindeer demography and population dynamics*.
977 Journal of Applied Ecology 51, 1264-1272.

978 Tyler T. R. (1990) *Why People Obey the Law*. New Haven, CT: Yale University Press.

979 von Essen E., Allen MP. (2015) *Reconsidering illegal hunting as a crime of dissent:*
980 *Implication for justice and deliberative uptake*. Criminal Law and Philosophy: 1-16.

981 Wabakken P., Sand H., Liberg O., Bjärvall A (2001) *The recovery, distribution, and*
982 *population dynamics of wolves on the Scandinavian peninsula, 1978-1998*. Canadian Journal
983 of Zoology 79, 710-725.

984 Watts S., Stenner P. (2012) *Doing Q Methodological Research: Theory, Method &*
985 *Interpretation*. SAGE Publications Ltd, London.

986 Woodroffe R., Thirgood S., Rabinowitz A. (2005) *People and Wildlife, Conflict or Co-*
987 *existence?* Cambridge University Press, Cambridge.

988 Young I. (1990) *Justice and the Politics of Difference*. Princeton.

989 Young J. C., Searle K., Butler A., Simmons P., Watt A. D., Jordan A. (2016). *The role of*
990 *trust in the resolution of conservation conflicts*. Biological Conservation, 195, 196-202.

991 Young J.C., Marzano M., White R.M., McCracken D.I, Redpath S.M, Carss D.N., Quine C.P.
992 Watt A.D.(2010) *The emergence of biodiversity conflicts from biodiversity impacts:*
993 *characteristics and management strategies*. Biodiversity and Conservation 19, no. 14: 3973-
994 3990.

995 Zimmermann A., Baker N., Inskip C., Linnell J. D., Marchini S., Odden J., Treves A. (2010)
996 *Contemporary views of human–carnivore conflicts on wild rangelands*. In: du Toit T., Kock
997 R., Deutsch (Eds.) Wild rangelands: Conserving wildlife while maintaining livestock in semi-
998 arid ecosystems. Wiley-Blackwell, Chichester, pp. 129-151.

999 Zimmermann A., Walpole J.M., Leader-Williams N. (2005) *Cattle ranchers' attitudes to*
1000 *conflicts with jaguar Panthera onca in the Pantanal of Brazil*. Oryx, 39(04):406-412. DOI:
1001 10.1017/S0030605305000992

Table 1. List of statements and the Q-sort values and z-scores for each factor. The Q-sort values and z-scores indicate the importance a factor assigns to each statement relative to the other statements. Z-scores have standardised mean and standard deviation which allows for comparison of z-scores for the same statement across factors. Statements that were seen as more important by the factors are indicated by more extreme Q-values and z-scores (Bredin et al. 2015).

Justice category	Statement number	Statement	Q-sort values (a) and z-scores (b)					
			Factor 1		Factor 2		Factor 3	
			a	b	a	b	a	b
Distribution	1	Predators present a significant economic threat to the Norwegian livestock industry.	3	1.12	-4	-1.41	3	0.97
	2	Compensation for depredated livestock is a waste of taxpayers' money.	-4	-1.33	-2	-0.50	-1	-0.42
	3	The costs of maintaining carnivore populations in Norway should be paid by the people who wish to keep them, not society as a whole.	0	-0.10	-4	-1.72	-3	-1.09
	4	My group pays disproportionate costs of maintaining carnivore population for public benefit.	4	1.75	-3	-0.96	3	1.17
	5	Current carnivore policy constitutes animal abuse of livestock.	3	1.22	1	0.26	5	2.01
	6	The compensation scheme does not cover the full value of lost livestock.	5	1.89	-1	-0.27	2	0.65
	7	The compensation scheme ought to compensate for emotional trauma, stress and fear caused by carnivores.	2	0.48	-3	-1.00	0	0.01
	8	Carnivores enhance my enjoyment of natural areas.	-3	-1.08	4	1.71	-1	-0.57
	9	The carnivores are blamed for livestock losses caused by poor grazing conditions or inadequate care.	-4	-1.70	3	1.15	-2	-0.66
	10	Because the public value carnivores, opposition to carnivores deprives the public of benefits.	-3	-1.11	3	1.17	-2	-0.70
	11	We owe it to future generations to preserve carnivores.	-1	-0.36	5	2.11	0	-0.18
	12	We owe it to the global society to preserve carnivores.	-2	-0.85	4	1.67	-3	-0.84
	13	Livestock owners use the compensation scheme to gain extra profit.	-5	-2.11	0	0.02	0	0.21
	14	Current carnivore policy constitutes animal abuse of carnivores.	-4	-1.40	3	0.73	-4	-1.74
	15	We ought to tolerate livestock losses because of the enjoyment the public derives from carnivores.	-5	-1.91	1	0.38	-5	-1.90
Recognition	16	Other stakeholder groups look down on us.	1	0.44	1	0.16	2	0.78
	17	Society at large does not care about my group.	0	-0.17	-2	-0.56	1	0.45
	18	The opposition portray us misleadingly.	2	0.82	2	0.67	4	1.27
	19	Society does not recognise the viewpoints of my group on the carnivore policy.	2	0.78	-1	-0.36	0	-0.09
	20	Local knowledge is not valued in current carnivore management.	4	1.37	0	-0.21	-2	-0.78
	21	Protection of carnivores violates the property rights of landowners.	1	0.36	-4	-1.67	1	0.54
	22	The current carnivore policy constitutes a violation of the rights of my group.	4	1.35	0	0.01	5	1.68
	23	The carnivore opponents do not accept that animal species have rights.	-2	-0.74	4	1.38	-1	-0.39
	24	The current carnivore policy does not exhibit understanding of our lifestyle.	3	1.08	0	-0.03	2	0.61
	25	Carnivores are part of my group's way of life.	-1	-0.33	3	1.31	-4	-1.27
	26	Carnivores threaten my group's way of life.	5	1.80	-5	-1.87	3	1.14
	27	Carnivores belong as part of the Norwegian fauna.	0	-0.24	5	2.20	1	0.37
	28	Politicians do not understand our lifestyle.	1	0.36	0	-0.03	4	1.68
	29	We receive little gratitude for the service we provide.	3	0.91	1	0.24	1	0.57
	30	My group constitutes distinct a sub-culture different from society at large.	2	0.71	-2	-0.44	3	0.88
Participation	31	It is difficult to access official documents regarding carnivore management.	-2	-0.53	0	-0.21	-2	-0.71
	32	It is difficult to know who is responsible for the various	0	0.17	0	-0.08	-4	-1.82

	aspect of the public carnivore management.						
33	It is difficult access scientific documents that is used in the decision-making process in carnivore management.	-2	-0.59	1	0.04	-3	-1.12
34	Satisfactory mechanisms exist to hold the public management body responsible if they make decisions that violate laws governing carnivore management.	-3	-0.90	-1	-0.28	2	0.79
35	Public actors adequately justify and explain their decisions regarding carnivore management.	-1	-0.25	2	0.53	4	1.40
36	International conventions that oblige Norway to conserve its carnivore populations do not need to be heeded because we had no say in the formation of these legal structures.	-1	-0.39	-5	-1.87	-1	-0.46
37	My group has been excluded from the policy-making process in the carnivore issue.	0	0.10	-2	-0.66	-5	-1.82
38	The scientific focus in the carnivore issue excludes my group's viewpoints.	2	0.57	-3	-1.10	1	0.43
39	There are clear opportunities to provide input in the carnivore policy-making process.	-2	-0.68	2	0.53	2	0.65
40	The media debate of the carnivore issues does not reflect my personal view.	0	0.00	-1	-0.30	0	0.20
41	Civil disobedience is justified because our viewpoint is not taken into account in the carnivore policy-making process.	-1	-0.43	-3	-0.75	-2	-0.68
42	The democratically elected officials adequately represent my view on the carnivore issue.	-3	-1.18	2	0.46	-1	-0.28
43	My group is heard to a lesser extent than other stakeholder groups in carnivore policy-making.	1	0.46	-1	-0.32	-3	-1.06
44	The politicians listen to our opinions on the carnivore issue, but this has no impact on their policies.	1	0.46	2	0.42	0	0.17
45	Groups that do not have the right to participate in the shaping carnivore management are nonetheless given access to the decision-making process.	0	0.16	-2	-0.53	0	-0.05

1010
1011
1012
1013
1014
1015
1016
1017
1018
1019
1020
1021
1022
1023

Table 2. The distribution of strongly perceived justice issues ($>+2$ or <-2) among the three categories of justice. (Whether it is a negative ranking or positive ranking indicates injustice is dependent on the phrasing of the statement. The statements in this table are those that indicate perceived injustice.) Values higher than +2 or lower than -2 have been classified as “strongly accepted/rejected” adapted from Mattison et al. (2008).

	Ranking	Distribution	Recognition	Participation
Factor 1	± 5	1	1	0
	± 4	1	2	0
	± 3	2	2	2
	± 2	1	3	2
	Total:	5	8	4
Factor 2	± 5	1	1	0
	± 4	2	1	0
	± 3	3	1	0
	± 2	0	1	1
	Total:	6	4	1
Factor 3	± 5	1	1	0
	± 4	0	2	0
	± 3	2	2	0
	± 2	1	2	1
	Total:	4	7	1

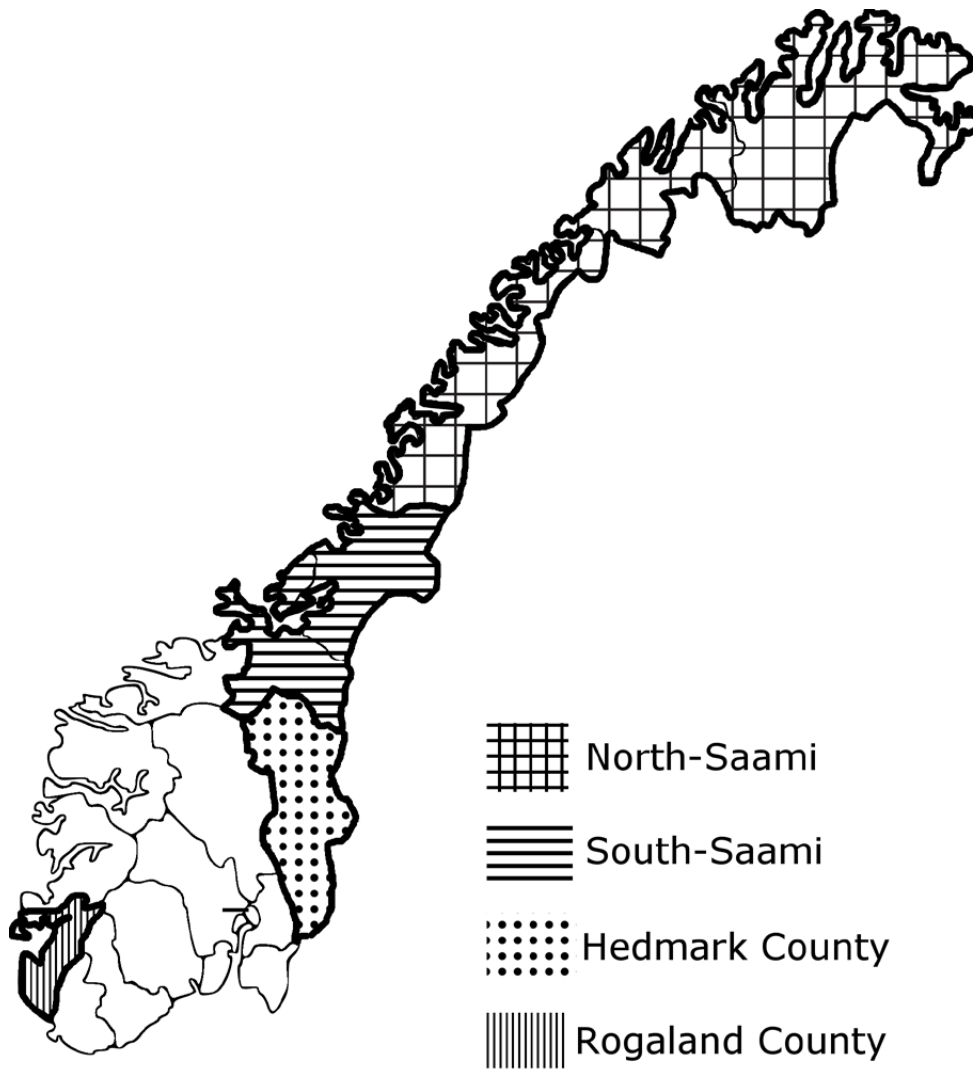


Figure 1. Participant sampling areas. The areas were chosen to capture a wide range of predation pressure and cultural contexts.