Luc Hoffmann Institute

THE STATE OF KNOWLEDGE AND PRACTICE ON

HUMAN–WILDLIFE CONFLICTS

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FOREWORD

Jon Hutton
Director, Luc Hoffmann Institute

In mid-2018, Duan Biggs, a researcher at Griffith University, approached the Luc Hoffmann Institute for support in incubating a new approach to navigating human–wildlife conflict (HWC). Duan was also looking for ways to manoeuvre through conflicting views among stakeholders in the nature conservation sector with divergent values and perspectives.

The novel approach involved eliciting and making explicit the different values and assumptions that underlie stakeholder cognitive frameworks of how actions lead to outcomes (mental frameworks), and exploring any potential conflicts in values and how these can be acceptably navigated.

The past decade has seen a radical shift in the way that wildlife impacts on human livelihoods are conceptualised and addressed. No longer are such conflicts framed as a dynamic that is solely played out between people who suffer from wildlife damage and the animals that inflict it. Instead, a more nuanced view has emerged showing different human stakeholder groups, from conservation professionals to local community members, with conflicting views and values regarding species management. Reframing HWCs in this way creates the possibility to share and apply lessons across seemingly disparate stakeholder groups.

The Luc Hoffmann Institute undertook a quality assessment of the innovator's approach, provided a scoping budget and had the idea evaluated externally by the Luc Hoffmann Institute Advisory Council. Everyone agreed that HWCs can be deeply damaging to both people and wildlife, and that with a bit of refinement and incubation, Duan's novel approach could be a way to anticipate and mitigate such conflicts. Since the issue concerns interactions not only between humans and wildlife, but also humans and other humans, the initiative was born as *Navigating conflict over iconic wildlife*.

Through guidance and support from Luc Hoffmann Institute, and with multi-stakeholder pilot workshops tapping into the Luc Hoffmann Institute's network and expertise, Duan has been able to explore the potential for a global standard for navigating conflict over iconic wildlife. Part of these initial stages was a scoping study, for which we enlisted the help of three external consultants with expertise in environmental conflict management and governance – Dr Isla Hodgson, Prof. Steve Redpath, and Prof. Camilla Sandström – who worked together with Duan to review the existing knowledge and practice on such conflicts. Combined with interviews from key informants, this report outlines initial thoughts on how such a standard could be composed. It draws inspiration from existing standards and examines how such standards have addressed barriers to global and local implementation.

I hope this publication provides a fresh perspective on overcoming the critical conservation challenge of HWC, sparking engagement around an exciting new way of doing things, and spurring further innovation for the well-being of nature and people.

EXECUTIVE SUMMARY

Conflicts in conservation are widespread issues of global concern, seriously threatening worldwide goals of biodiversity preservation and sustainable development. As the human population rises, and wider environmental issues, such as climate change and habitat degradation, continue to escalate, conflicts are predicted to increase in both frequency and intensity. In recognition of the severity of such problems and the multiple threats they present, international organisations, governments, and research institutes alike have expanded their efforts into the understanding and resolution of conflicts. Despite this increasing attention from both academic and empirical perspectives, conflicts persist, fostering environmental, social, economic and political problems on a global scale. Scholars and experts have suggested that, in order to progress, a complete overhaul is required in how we frame, think about, and manage conflicts in conservation. However, such suggestions are yet to be translated into a more practical context.

A consortium of Griffith University in Australia, the Namibian Nature Foundation, and WWF, being incubated by the Luc Hoffmann Institute, is exploring the potential for a novel initiative that will address the shortcomings of present management efforts. This initiative would involve developing and testing a new process in conflict management: the creation of a standard to guide and improve approaches to conflicts globally. This report provides the starting point for this process. From an extensive review of the literature and interviews with leading experts, we present an overview of current conflict management, associated problems. and knowledge gaps, as well as areas in which management might be improved. We then examine the possibility of combining these insights into a standardised approach to guide future management, focusing on the governance and social outcomes of conflict management.

A serval trips a remote camera trap in the Sasol Secunda Petrochemical Plant, South Africa. Despite being home to one of the world's largest petrochemical plants, Secunda holds the world's highest serval density

Key findings relating to the state of knowledge and practice in human–wildlife conflicts

- *The term "conflict" is often misused.* Conflicts are fundamentally social and political problems, yet are often confused with human–wildlife impacts. Many interventions are centred around the goal of mitigating the latter, which risks overlooking the structural causes of conflicts and the socio-political context in which they are embedded. Conflicts need to be reframed to widen perspectives and understanding.

- *Consistent evaluative measures of conflicts are lacking.* There are many recommendations for management interventions, but little empirical evidence to support them – especially regarding approaches that aim to tackle the socio-political aspects of conflict. This is problematic, as it limits the capacity to assess outcomes and improve future strategies. A long-term, adaptive management approach – that fosters social as well as ecological learning – is desperately required. This will allow strategies to be implemented and revised based on sound evidence and vital stakeholder perspectives, ensuring that they are appropriate and relevant to a local context.

- *There are problematic disciplinary and sectoral silos.* Because conflicts are often understood as environmental problems, they are commonly researched and managed by individuals from conservation or natural science backgrounds. However, addressing the social and political dimensions of conflict requires expertise from multiple disciplines and sectors. This issue is compounded by little practical guidance on how to implement multidisciplinary approaches. A framework or set of guidelines assisting managers to decide what works where would be beneficial.

- The literature suggests that the governance of conflict management is often ineffective, poorly understood or overlooked – despite evidence that multiple key issues reside in this area. Furthermore, blanket recommendations of 'idealised' governance often mask important inefficiencies and failures. This may be addressed by combining diagnostic frameworks – that evaluate and identify problems with existing governance structures – with normative principles of effective and robust governance.

From the evidence reviewed in this report, it can be concluded that *a profound change is required in how conflicts are understood, addressed, and managed.* Our research implies that more is required than simply improving attempts to resolve conflicts. Rather, fundamental modifications are needed in the institutions and discourses that govern conflict management, as well as changing how people perceive and react to such situations. A standard may be a positive step in this direction.

Advice on the development of a standard for conflict management

Standards are used globally to eliminate bad practice and strengthen procedures through the institutionalisation of certain principles. Such an approach has been widely applied to complex, social–ecological dilemmas, such as sustainable development and the exploitation of natural resources. In section 5, we provide an overview of existing standards relevant to conservation and review the literature to describe their relative strengths and weaknesses. We draw on these insights to discuss the potential for a new standard for conservation conflict management, advise on a possible structure, and to suggest the following factors that should be considered moving forwards.

- *A standard for the management of conservation conflicts could be a valuable tool in addressing the overarching issues in how such issues are currently managed and governed.* This could form a logical progression from advisory global guidelines – such as those currently being developed by the International Union for the Conservation of Nature (IUCN) – to a more binding framework.

- Although there are wider issues pertaining to conflict management and governance, conflicts themselves cannot be generalised. A standard would therefore *need to balance principles of global relevance with mechanisms that allow flexibility at a regional, local or site-specific scale.* What may work is a similar structure to the site-based designs of the Forest Stewardship Council (FSC) Principles and Criteria or the IUCN Green List, where encompassing criteria that are consistent on a global level are adapted to a local context using a set of more flexible indicators.

- This should also be reflected in *how the standard is implemented.* For instance, the standard and its overarching principles may be governed at the national level, but the local or site-specific criteria (and mechanisms for conflict resolution) managed by local working groups and jurisdictions to ensure appropriateness and relevance.

- An early question to address is: *who will develop, maintain, and monitor the standards?* It is important that the governing institution involves not just conservationists and government actors, but also expertise from other disciplines – including conflict resolution, peacebuilding, international relations, and social studies. Such perspectives will be invaluable in setting a standard for conflict management in conservation.

- Finally, an important factor to consider is an *assurance scheme.* Almost all standards reviewed in this report utilise third-party assurance, which help to ensure credibility, compliance, relevance and impartiality in standard setting and implementation.

In summary, this report concludes that a global standard for conservation conflict management could be a valuable and productive tool; a positive step in the way of better managing such complex problems and therefore worthy of further exploration. However, caution should be exercised. We recommend therefore that the consortium continue to collaborate with experts from other sectors, organisations, and disciplines in the development of this standard, and look to existing mechanisms for conflict resolution as potential frameworks. Further work should also be done in conjunction with other advancements in this direction, such as the IUCN global guidelines. In doing so, this initiative can only be strengthened.

Livestock losses to bears and wolves, alongside declining markets for wool and meat, threaten the future of Transhumant herders in Armenia

1 INTRODUCTION

Interactions between humans and wildlife are inevitable. The rapid expansion of the human population, coupled with extensive habitat loss and fragmentation, has increased the potential for people and animals to come into contact – often with devastating consequences for all involved. Human lives and livelihoods can be significantly impacted by wildlife through the predation of livestock and game (Hemson *et al.*, 2009; Loveridge *et al.*, 2017), damage to crops and property (Storie and Bell, 2017; Torres, Oliveira and Alves, 2018) and direct attacks resulting in human injury or even death (Liu *et al.*, 2011; Amarasinghe *et al.*, 2015). Moreover, individuals may experience psychological trauma including fear, extreme stress, and diminished mental well-being (Barua, Bhagwat and Jadhav, 2013). The consequences for wildlife can also be extensive and severe. Retaliatory killing, hunting, and habitat destruction have contributed to widespread declines in countless species, and have driven others to extinction (Torres, Oliveira and Alves, 2018). Such situations – where humans and wildlife have an adverse impact on one another – are known in mainstream conservation as human–wildlife conflicts (HWCs; Conover, 2001).

Over the last 20 years, increasing attention has been placed on understanding and managing HWC (Distefano, 2005; Redpath *et al.*, 2013; Nyhus, 2016). This stems from a growing recognition that HWC occurs globally and can hinder not just conservation efforts, but also worldwide goals of sustainable development (Young *et al.*, 2010; Redpath *et al.*, 2013; d'Harcourt, Ratnayake and Kim, 2017). A further incentive is that conflicts are predicted to increase in both frequency and intensity in response to wider environmental issues, such as climate change and the continued destruction of habitat to meet the needs of a still-rising human population (Lamarque *et al.*, 2009; Messmer, 2009; Young *et al.*, 2010; Mason *et al.*, 2018). Research efforts, predominantly rooted in the natural sciences, have analysed HWC extensively and developed an array of frameworks, theories, and empirical approaches to assist in the understanding and management of such problems (Redpath *et al.*, 2013; Nyhus, 2016; Pooley *et al.*, 2017). Governments, major non-governmental organisations (NGOs) and non-profit organisations have all placed increased efforts into the mitigation of HWC. Many international organisations now have designated teams of experts who specialise in this area, such as that established by IUCN in 2016 (IUCN SSC Human–Wildlife Conflict Task Force, 2020).

Despite an expanding body of literature and increasingly innovative empirical strategies, the global management of HWC has had limited success. In some areas, the retaliatory killing of wildlife has slowed and populations have been allowed to recover (Dickman and Hazzah, 2016) or initiatives have managed to reduce some of the costs incurred by local communities as a result of living with wildlife (Eklund *et al.*, 2017). However, conflicts continue to foster widespread environmental, social, economic, and political problems across the globe (Redpath, Bhatia and Young, 2015; Young *et al.*, 2016b; Mason *et al.*, 2018; Guerra, 2019). Members of the conservation community have suggested that this warrants further exploration, and that attention should be shifted towards understanding why conventional approaches to management are not working. Conservationists and others wishing to manage HWC effectively perhaps need to take a step back and review current practice from a wider perspective. Are we managing conflicts appropriately? Are we understanding and approaching conflicts from the right angle? If not, how can management practices be improved?

1.1 Aims and outline of the report

Substantial progress has been made in conflict research over the last decade, and there is a growing awareness of the problems associated with the current understanding and management of HWC. A consortium of Griffith University in Australia, the Namibian Nature Foundation, and

WWF, being incubated by the Luc Hoffmann Institute, is exploring the potential for a novel initiative that will address the shortcomings of present management efforts. This initiative would involve developing and testing a new process in conflict management: the creation of a standard to guide and improve approaches to HWC globally. This report contributes to the initial development of a potential standard, drawing on vital insights and perspectives from the field to answer the following overarching questions of what is wrong with how HWC is currently understood and managed, and how management practices might be strengthened.

To do so, we first explore the concept of HWC and how it is defined. We then review conventional management approaches, briefly discuss their individual strengths and weaknesses, and identify wider, overarching issues, including those pertaining to governance (section 2). It has been suggested that HWC management is limited not only by what actions are taken, but also because of who makes the decisions behind these actions, who writes the rules, and who implements them (Hoare, 2015; Baynham-Herd *et al.*, 2018).

Following this, we provide an overview of the alternative approaches to understanding and managing conflicts and advise on how different perspectives and tools from other disciplines – such as the social and political sciences – may be useful (section 3). In section 4, we explore governance in a wider sense, explain what is meant by 'good' governance, and how problems in current governance structures may be diagnosed. Finally, we examine the possibility of combining these insights into a standardised approach to guide the future management of wildlife conflicts, focusing on the governance and social outcomes of conflict management.

Namibia was the first African country to incorporate protection of the environment into its constitution. With WWF's help, the government has reinforced this conservation philosophy by empowering its communities with rights to manage and benefit from the wildlife on their lands through communal conservancies

We present existing research on relevant standards from natural resources management and wider conservation practice and use this information to advise on the potential design for a new standard, as well as the factors that need to be considered moving forwards.

1.2 Defining conflict

The term human–wildlife conflict (HWC) is used widely across mainstream discourses regarding conservation and the environment, featuring in major publications and international campaigns (Redpath, Bhatia and Young, 2015). However, this term has been heavily criticised. *The Concise Oxford English Dictionary* defines conflict as 'a state of opposition or hostilities', 'a fight or a struggle' or a 'clashing of opposed principles' (COED, 2011). This definition alludes to social interaction between two or more antagonists. From this perspective, wildlife can be excluded as a potential party in conflict, as it implies an element of consciousness and awareness around activities that could be considered antagonistic (Peterson *et al.*, 2010). Few, if any, wild animals could be suggested as being aware that their actions are impinging upon human lives and livelihoods, or to be purposefully trying to undermine human goals.

Further, the HWC framing is considered problematic because it places undue emphasis on negative human–wildlife interactions and masks the arguably more important human–human dimensions of conflict (Raik, Wilson and Decker, 2008; Peterson *et al.*, 2010, 2013; Madden and McQuinn, 2014). More recent conceptualisations of conflicts, such as those related to conservation or biodiversity, highlight the social and political nature of such phenomena (Raik, Wilson and Decker, 2008). Such definitions generally converge around the idea that conflicts are fundamentally between people with incompatible goals, who perceive these goals as being threatened by the assertion of another's interests (Young *et al.*, 2010; Peterson *et al.*, 2013; Redpath *et al.*, 2013). This carries the implication that some form of power dynamics is involved (Raik, Wilson and Decker, 2008). Typical examples of conservation conflicts therefore include: clashes between local communities, conservation NGOs, and governments over the designation of protected areas or species (Aiyadurai, 2016); farmers or game managers who rely on predator control for their livelihood and those who advocate for species protection (Hodgson *et al.*, 2018); and resource users with state or conservation bodies over the management of natural resources, such as fisheries (Butler *et al.*, 2015). However, situations are further complicated by the fact that they often extend beyond clashing interests and incompatible views regarding conservation and natural resources. Conflicts frequently have underlying, deeper-rooted social and political components that, at first, seem distantly connected to conservation, but are hugely important in shaping conflict dynamics (Dickman, 2010; Madden and McQuinn, 2014; Young *et al.*, 2016a; Mishra *et al.*, 2017). Latent social tensions, fractured relationships, political histories and diminished trust can all manifest, and have a role to play in how actors in conflict engage with one another, react to management interventions, and position themselves within conflict (Madden and McQuinn, 2014; Mathevet *et al.*, 2015; Young *et al.*, 2016b; Hodgson *et al.*, 2018; 2019).

We explore these issues in more detail later in this report. However, it is important that we highlight the various framings to explain our own definition of conflict. For the purpose of this work, we follow Young *et al.* (2010) in distinguishing between human–wildlife *impacts*, and human–human *conflicts*. Human–wildlife impacts refer to the negative consequences of human–wildlife interactions, such as predation or illegal killing (commonly known as HWC). We understand conflicts as social phenomena that are created and maintained through human interaction (Brox, 2000) and that sometimes manifest as disagreements over wildlife (Madden and McQuinn, 2014; see also Box 1). We therefore use the general term 'conflict' throughout this report to refer to human–human conflicts and distinguish this from human–wildlife impacts (Box 1).

Box 1 – How we define conflict and distinguish it from human–wildlife impacts

What do we mean by 'conflict'?
Throughout this report, we distinguish between 'human–wildlife impacts' and 'conflicts' (see also Young *et al.*, 2010). These are defined as follows.

> **Human–wildlife impact**: The consequence (positive or negative) of an interaction between humans, human activities, and wildlife.
>
> *Examples of human–wildlife impacts include livestock loss incurred through predation, damage to crops and property, direct attacks, disease transmission, destruction of habitat, the killing of wildlife by humans and vice versa.*
>
> **Conflict:** An antagonistic human–human interaction.
>
> *Examples of conflicts are disputes (i.e. disagreements over wildlife or natural resource management), underlying conflicts (historical tensions, past interactions) and identity conflicts (deeply held values, beliefs and socio-political inequities) (see also Madden and McQuinn, 2014).*

Conflicts can be better visualised using the 'levels of conflict' model identified by the Canadian Institute for Conflict Resolution (CICR, 2000). See Figure 1.

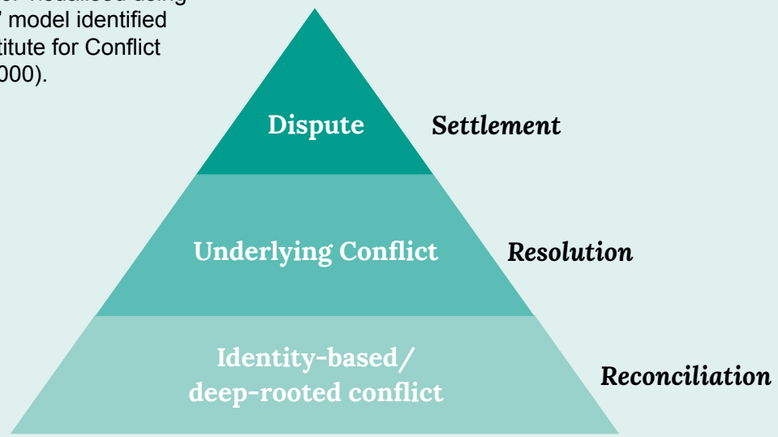


Figure 1 – Model demonstrating the three levels that can exist within a conflict, and the corresponding measures that can be taken to address them, according to the CICR (2000). Adapted from Madden and McQuinn (2014).

2 CONFLICT MANAGEMENT TO DATE: A REVIEW

In this section, we provide an overview of the common approaches currently used to manage conflicts over wildlife (see Table 2), including a brief comparison of the context in which they are typically applied, the relative strengths and weaknesses of each approach and, where possible, a measure of effectiveness (see section 2.2). We define management here as any effort made to reduce the possible negative consequences of a conflict, including attempts to mitigate wildlife impacts or more stakeholder-orientated approaches. Our overview was compiled via an extensive search of the peer-reviewed literature, obtained from two comprehensive databases of scientific publications (Web of Science and Google Scholar) using the search terms 'human–wildlife conflict', 'conservation conflict', 'mitigation', and 'management'. To include approaches employed by NGOs and other non-academic bodies (i.e. governments), we also conducted a review of the grey literature, using the web-based search engine Google and the same search terms outlined above.

2.1 Categorisation

The literature surrounding this subject is vast, and can be contradictory (see also Distefano, 2005; Nyhus, 2016; Eklund *et al.*, 2017; Pooley *et al.*, 2017; Holland, Larson and Powell, 2018 for extensive reviews of conflict management methods). This is further complicated by the fact that the extent to which certain approaches are discussed within the literature depends largely on whether the situation is framed as an HWC or otherwise (Peterson *et al.*, 2010; Baynham-Herd *et al.*, 2018, see also section 1.2 for definitions of conflict). Under the HWC frame, tools that reduce or prevent human–wildlife impacts – usually technical or legislative – are emphasised due to the reasoning that the intensity of a conflict equates to the level of damage caused by wildlife (Redpath, Bhatia and Young, 2015; Pooley *et al.*, 2017). Governments and NGOs also typically use this framing when discussing conflicts (e.g. WWF, 2019b). Other, more stakeholder-orientated approaches are discussed in depth under the 'conservation' or 'human–human' conflict frame, on the basis that conflicts are sustained because of underlying socio-political factors (Redpath, Bhatia and Young, 2015; Baynham-Herd *et al.*, 2018).

To streamline this breadth and complexity for this report, we have divided current approaches into categories (Table 1). Many groupings for distinguishing approaches to conflict management already exist. For example, Hoare (2015) catalogues approaches depending on whether they are applied within or outside the conflict zone, whereas Distefano (2005) distinguishes between 'preventative' and 'mitigative' strategies. However, most categorisation still only focuses on methods used to reduce human–wildlife impacts under the HWC frame. A more comprehensive and encompassing ideology is that presented by Baynham-Herd *et al.* (2018), who theorise that most methods used to address conflicts are, at their core, behavioural interventions aimed at changing the proximate human behaviours that threaten conservation interests. For example, retaliatory killing is often addressed using technical solutions aimed at reducing the negative wildlife impacts that cause this behaviour (Nyhus, 2016), whereas resistant behaviours towards conservation efforts are met with dialogic or trust-building processes to increase the likelihood of acceptance (Young *et al.*, 2016a). We therefore follow Baynham-Herd *et al.* (2018) in using the categories of behavioural interventions identified by Heberlein (2012) to categorise approaches to conflict management (see Table 1 for full definitions of these categories). It is important to note that these categories are not mutually exclusive; rather, it could be argued that all interventions are, in a way, cognitive, as they may alleviate the negative psychological impacts of conflict regardless of whether the tangible impacts are actually reduced (Barua, Bhagwat and Jadhav, 2013). For example, simply the implication that human–wildlife impacts are being reduced may enhance feelings of safety and security within members of local communities. However, for the purpose of this report we divide interventions into the three categories identified in Table 1.

2.2 Evaluating effectiveness

Providing a concrete measure of intervention effectiveness is challenging. A substantial issue in conflict research is that management is often recommended or applied without any real empirical evidence as to its effectiveness in practice (Miller, Jhala and Schmitz, 2016; Treves, Krofel and McManus, 2016; Eklund *et al.*, 2017). When techniques are evaluated, research highlights that the majority are livestock management tools where effectiveness is gauged based on a reduction in livestock losses or in the number of predators killed (Hazzah *et al.*, 2014; Holland, Larson and Powell, 2018). However, as we have explained, conflicts are not just defined by human–wildlife impacts. Consequently, the effective management of a conflict is often not achieved by reducing such impacts alone. The multiplicity of ecological, economic, cultural, social and political factors involved – many of which are interrelated – make identifying an approach as effective difficult, especially those that are focused on improving stakeholder compliance and dialogue (Weise *et al.*, 2019). This is a major barrier to conflict management, as inappropriate or poorly executed interventions can incur further costs, reduce trust in management authorities, and exacerbate existing conflicts (Eklund *et al.*, 2017; Hodgson, 2018).

Where possible, we have presented an indication of effectiveness for each approach and which parameters are commonly used in this assessment. We have also reviewed the main strengths and weaknesses of each, to provide a conceptual evaluation of these methods where empirical measures are not available (Table 2).

2.3 Technical Interventions

2.3.1 Species removal

Perhaps the most traditional approach to conflict management is the direct removal or restriction of a species from the area in which it is causing an impact, thereby directly removing threats to human lives and livelihoods. This can involve lethal or non-lethal control methods. Typically, the effectiveness of species removal is measured by the extent to which negative wildlife impacts have been reduced in the conflict zone – for example, a decrease in incidences of livestock predation, crop raiding, and direct attacks on humans. In some studies, effectiveness is also determined by how levels of human tolerance towards the species have changed over the duration of the management intervention.

Lethal control

Governments employ regulated methods of lethal control as a tool to alleviate unwanted human–wildlife impacts, such as depredation (McManus *et al.*, 2015). In Europe, for example, the lethal control of grey wolves *Canis lupus*, brown bear *Ursus arctos*, Eurasian lynx *Lynx lynx*, and wolverine *Gulo gulo* is permitted under the EU Habitats Directive (1992) in instances where these species are impacting local livelihoods, and alternative mitigative techniques have failed. In marine conflicts, the regulated culling of marine mammals to protect fish stocks is not unusual (Bowen and Lidgard, 2013). Forms of lethal control include harvesting, culling, legalised hunting, and selective or targeted killing of 'problem' individuals. The latter method is often used in instances where animals pose a direct threat to human safety or property, such as African elephants *Loxodonta africana* (Hoare, 2015); leopards *Panthera pardus* (Holland, Larson and Powell, 2018) and several species of shark (McCagh, Sneddon and Blache, 2015).

Lethal control is often considered a cheap and cost-effective method of reducing negative human–wildlife impacts, potentially explaining its popularity with governments (Naughton-Treves, Holland and Brandon, 2005). However, effectiveness – both in terms of impact reduction and tolerance levels – is contested. The relationship between legalised lethal control and the minimisation of negative human–wildlife impacts is a complex one (Redpath *et al.*, 2017). There is evidence to support the belief that impacts such as livestock loss are reduced by the culling or harvesting of predators (e.g. Eklund *et al.*, 2017), but also arguments that the available evidence is insufficient to conclude lethal control effectively limits predation (Avenant and du Plessis, 2008; Treves, Krofel and McManus, 2016). Similarly, while selective removal of aggressive or problem individuals has been shown to prevent human fatalities under certain circumstances (Goodrich, 2010), overall effectiveness of this method seems largely dependent on the characteristics of the species involved (Swan *et al.*, 2017). Selective removal of African elephants *Loxodonta africana* rarely reduces rates of crop-raiding and property damage, as the offenders who are removed are often replaced by new recruits (Chiyo *et al.*, 2005; Fernando *et al.*, 2012; Hoare, 2015). Individual sharks who regularly attack humans are often killed, yet there is limited evidence to actually support the belief that doing so reduces attack rates (Lennox *et al.*, 2018).

There is also a hypothesis that allowing local people the right to hunt or cull problem species will heighten tolerance through a sense of 'ownership' or of regaining control, thereby reducing incidences of illicit or retaliatory killing (Naughton-Treves, Holland and Brandon, 2005; Swanepoel, Somers and Dalerum, 2015). The evidence to support this theory has again been widely debated (Chapron and Treves, 2016; Stien, 2017). A positive relationship between lethal control and tolerance is difficult to ascertain when other factors such as predator abundance, previous experience, demographics and legislature changes can all have additional influence (Eriksson, Sandström and Ericsson., 2015; Olson *et al.*, 2015). Some scholars argue that in examples where wildlife management provides additional benefits to local communities, such as the revenue provided by trophy and sport hunting, lethal control actively raises tolerance (Nelson, Lindsey and Balme, 2013; Trinkel and Angelici, 2016). Yet, while legal hunting increases tolerance in some sectors of society, it is often controversial amongst wider society and has limited social acceptability (Eklund *et al.*, 2017). Furthermore, lethal control may at first seem cost-effective, but often requires long-term commitment and expense – especially regarding large-scale culling and harvesting efforts – which may indirectly reduce tolerance in the long-term (McManus *et al.*, 2015).

Non-lethal control

Due to the controversies, ethical issues, and inadequacies of lethal control methods, attention has recently shifted towards non-lethal techniques (McManus *et al.*, 2015). Translocation has been applied to mitigate conflicts worldwide, including situations involving bears, elephants, felids, wolves, wolverines (Holland, Larson and Powell, 2018), sharks (Hazin and Afonso, 2014), seals

A beekeeper maintains one of the beehives that the park is testing as a deterrent to block elephants that try to leave the boundaries of Kui Buri National Park, Prachuap Khiri Khan Province, Thailand

Table 1 – Definitions for the categories of conflict intervention
Adapted from Heberlein (2012), see also Baynham-Herd *et al.* (2018).

Category of intervention	Definition
Technical	Interventions aimed at the external environment, including physical barriers, land-use changes, changes to species population sizes or behaviour. Often short-term interventions applied at the human–animal interface.
Cognitive	Attempt to change negative human behaviour towards wildlife and conservation through the provision of information and knowledge, for example education schemes or social media campaigns.
Structural	Altering the deeper social, political and economic contexts in which HWC sits. Includes financial instruments to alleviate economic costs incurred by living alongside wildlife; legislative changes to enforce new rules and behaviours; or social transformation through mediation, stakeholder engagement and participatory processes.

Table 2 – Summary of main approaches to conflict management, their strengths and weaknesses, and examples of application.

	Sub-category	Approach(es)	Strengths	Weaknesses	Examples
Technical	Lethal control	Regulated harvest/cull of conflict species. Selective or targeted killing of problem individuals	Considered cheap and cost effective. Linked to reduced human–wildlife impacts (e.g. predation) and increased tolerance. Can bring additional revenue to communities, e.g. trophy hunting	Could be considered unethical; limited social acceptability. Unwanted ecological impacts. Evidence of link to tolerance inconclusive	Hunting of cougars in North America (LaRue *et al.*, 2012) and brown bear in Sweden (Kindberg *et al.*, 2011)
	Non-lethal control	Translocation of problem individuals. Reproductive control	Can reduce predation and attack rates. More ethical and socially acceptable method of control	Resource heavy. Translocation rarely successful; animal dies, is replaced, or returns to site of capture. Effectiveness is species dependent	Translocation of problem elephants in Africa (Hoare, 2015). Brood management of hen harriers in UK (Elston *et al.*, 2014)
	Deterrents	Olfactory (chilli, surfactants), visual (lighting, fladry), biological (bees), auditory (acoustic deterrent devices) animal repellents	Shown to decrease incidences of crop raiding and predation. Often cheap and culturally appropriate method	Some only effective in areas with infrastructure, e.g. sufficient electricity. Seen as a panacea. Animals can become habituated	Elephants and Bees project, Save The Elephants (King *et al.*, 2017)
	Physical barriers	Fencing and reinforced bomas	Sometimes successful at reducing predation, crop raiding or property damage	Fail in long term. Responsibility of maintenance falls to local communities	Implemented in Amboseli region (east Africa) by Born Free Foundation and African Wildlife Society
	Livestock husbandry	Guard animals, alternative practices	Guards effectively deter solitary species. Changes to practice limit human–wildlife interaction and thus reduce impacts. Financially feasible	Financial limitations of training and feeding guards. Changes to practice may not be possible or culturally acceptable	Anatolian guard dog scheme by Cheetah Conservation Fund (CCF) in Namibia (Potgieter, Kerley and Marker, 2016)
Technical	Land use planning	Spatial separation of humans and wildlife. Zonation, corridors, habitat modification	Allows people to co-occur with wildlife at high densities (in theory). Wildlife undisturbed; allows for normal behaviours	Limited empirical evidence. Relies on extensive data of species movements and home ranges. May require political support (planning permission)	Niche partitioning in Kenya (Schuette *et al.*, 2013).
	Predictive measures	Behavioural and spatial analyses of human–wildlife interactions	Techniques used to detect presence or movements of wildlife and prevent negative incidents. Some evidence to show decline in attack rates and predation	Can require expensive technologies and thus technical knowledge. Some methods (e.g. surveillance) rely on human compliance	Shark Spotters programme in False Bay, South Africa (Engelbrecht *et al.*, 2017).
Cognitive	Education schemes	Providing information and training to local communities on animal movements, behaviours and conflict prevention	May improve tolerance and attitudes through enhanced knowledge and capacity to deal with impacts. Provides additional benefits to communities through training	Not well represented by reviews; effectiveness largely unknown. Can encounter problems of legitimacy	Bear Aware programme in Aspen, Cheetah Conservation Fund field research and education centre in Namibia
	Social marketing or awareness campaigns	Encourage collective action and pro-conservation behaviours through communication	Can encourage pro-environmental behaviours. Has been shown to evoke positive emotions towards species	Few evaluations of effectiveness. Only effective in societies with the infrastructure to deliver campaigns (e.g. television and social media).	Heads up for Harriers! campaign, UK (PAW Scotland, 2018)
Structural	Economic or livelihood	Compensation, wildlife utilisation	Helps to reduce costs incurred by wildlife. Provides incentive to engage in conservation. Additional benefits to communities	Subject to issues associated with poor governance structures, e.g. corruption, insufficient rates, unequal distribution of benefits	Predator conservation fund, Amboseli (Maclennan *et al.*, 2009).
	Legal mechanisms	Binding (international, national, regional law). Non-binding (guidelines, codes of conduct)	Multiple and varied. Can be necessary when species are endangered	Effectiveness difficult to ascertain; attitude change influenced by many other factors. Often multiple laws in place that contradict one another	Code of Conduct among fishermen in Purse Seine (Hamer, Ward and McGarvey, 2008). EU Habitats Directive (1992) and Natura 2000.
	Socio-political dimensions	Participatory processes, community-based conservation	Can build dialogue and trust. Improve tolerance towards wildlife, while providing benefits for local communities	Subject to politics of participation. Problems of corruption and poor governance	Partnership Against Wildlife crime Scotland (Hodgson, 2018). Wildlife Management Areas in Tanzania (Bluwstein, Moyo and Kicheleri, 2016

and salt-water crocodiles (Guerra, 2019). Relative success – often measured with this method as reduction in attacks or predation events – is limited, and very much dependent on the species in question. For example, translocation has been shown to reduce shark attacks (Hazin and Afonso, 2014), but has been ineffective with other species due to animals returning to the original site of capture or continuing negative behaviours at the new site (Linnell, Odden and Mertens, 2012). Similarly, translocation can induce new unwanted behaviours in individual animals, which are transferred to the new site. For instance, Athreya *et al.* (2013) demonstrated increased aggression, possibly due to stress, in translocated leopards. A further problem with this method is cost – translocations are highly expensive – which makes them undesirable especially as success rates are typically low (Linnell, Odden and Mertens, 2012).

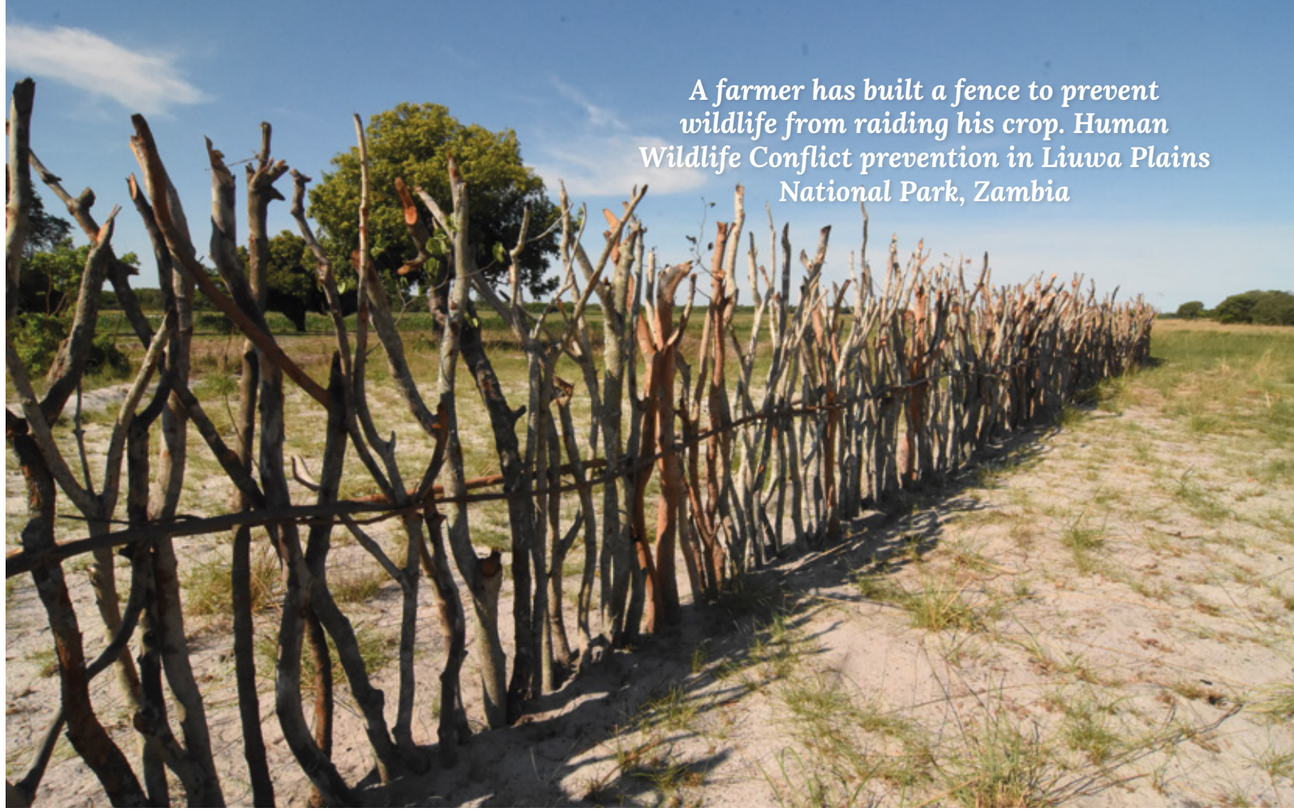
Other non-lethal methods involve techniques that reduce reproductive rates. One example is the brood management of hen harriers *Circus cyaneus*, a scheme recently introduced to the UK by the government agency, Natural England. This scheme is intended as a management tool, aiming to reduce predation of grouse chicks – the apparent cause of an intense conflict between conservation and landowners who manage their estates for the sport of driven grouse shooting (Thirgood and Redpath, 2008; Elston *et al.*, 2014). However, this scheme has proved highly controversial and is not accepted by some stakeholders (Redpath *et al.*, 2010). In addition to translocation, reproductive or fertility control methods require substantial resources. However, some suggest that by reducing population sizes, the potential for conflict is therefore reduced, while others praise such efforts as they allow animals to stay in their own territory, thereby reducing the social perturbation effects caused by translocation or lethal control (McManus *et al.*, 2015).

2.3.2 Deterrents

Deterrents provide another non-lethal conflict management tool, commonly used to dissuade species from entering human settlements and accessing resources. Types of deterrent are many and varied, ranging from *olfactory* repellents – such as the use of chilli to deter elephants (Hoare, 2015) or chemicals to repel sharks from popular swimming areas (Guerra, 2019) – to *visual*, including light-emitting diode (LED) systems designed to discourage big cats [as used in Amboseli National Park to combat human–lion conflict: see Okemwa et al. (2018)] or brightly coloured material (known as fladry) used to deter wolves in some Scandinavian countries (Musiani *et al.*, 2003). *Acoustic* devices are largely used in the marine environment, the most obvious examples being acoustic harassment devices (AHDs) that are employed to discourage marine mammals from approaching fishing fleets (Guerra, 2019). Finally, *biological* deterrents – such as beehive fences – are increasingly being applied as a way to combine conflict management with additional revenue for local communities. An example includes the Elephants and Bees project, implemented and supported by the charity Save the Elephants (see Table 2).

The effectiveness of deterrents is often evaluated by changes in the rate of predation or crop-raiding events before and after application. In the case of African elephants, several studies claim that olfactory and biological deterrents have decreased incidences of crop raiding (e.g. King *et al.*, 2009; Hoare, 2015) – some by as much as 86% [see Malugu (2010) for studies from Tanzania and the western Serengeti]. Anecdotal evidence from villages bordering the Indian Sundarbans suggest that solar-powered lighting systems deterred tigers from entering their grounds (Inskip *et al.*, 2013) and similar LED lighting systems were successful in the short term at reducing predation by lions in Amboseli, reducing livestock losses by over four times (Okemwa *et al.*, 2018).

However, as stated by Hoare (2015), deterrents are often touted as the 'new single solution' and are therefore much hyped by NGOs and the media, despite insufficient empirical evidence. Several scholars agree that, while the use of deterrents like chilli and bee-hive fences are effective to a point, alone they are not sufficient as a conflict management tool and are therefore most successful when used in conjunction with other measures, such as guarding (see section 2.3.4; Parker *et al.*, 2007; King *et al.*, 2009; Okemwa *et al.*, 2018). In addition, specific deterrents are only viable in certain contexts, for example where there is historical exposure to beekeeping (Hoare, 2015) or sufficient electricity to support a powerful lighting system (Inskip *et al.*, 2013). The cost of maintenance is often difficult for some communities to absorb, which can reduce



A farmer has built a fence to prevent wildlife from raiding his crop. Human Wildlife Conflict prevention in Liuwa Plains National Park, Zambia

compliance and therefore overall effectiveness (Bauer, de Iongh and Sogbohossou, 2010; Hoare, 2015; Holland, Larson and Powell, 2018; Guerra, 2019). Wildlife may become habituated, and, especially in the case of AHDs, deterrents may affect non-target species (Dawson *et al.*, 2013; Shaffer *et al.*, 2019).

2.3.3 Physical barriers

Various types of fencing and other physical barriers have been applied in multiple contexts to deter animals from entering human-dominated areas and seem to be particularly favoured by NGOs. For example, the African Wildlife Foundation (AWF) and Born Free Foundation have both established fences as HWC management strategies in rural Africa.

The lessening of human–wildlife impacts is often used as a benchmark of effectiveness (Okello, Kiringe and Warinwa, 2014) yet evidence suggests this 'success' is often short-lived (Hoare, 2015; Osipova *et al.*, 2018). It has been suggested that long-term failures are due to issues of governance, rather than technical limitations of the fence itself. While the initial set-up and associated costs are taken on by NGOs, the responsibility of maintenance often falls to local communities (Okello, Kiringe and Warinwa , 2014). This may prove achievable for the private sector, yet in communal lands fences are subject to issues caused by a lack of labour, resources, capacity and willingness for upkeep (Hoare, 2015; Osipova *et al.*, 2018). Thus, long-term effectiveness is questionable and context dependent. Some suggest that more natural fencing options – such as woody plant barriers – are more sustainable, yet these deteriorate with time and risk additional environmental impact (Okello, Kiringe and Warinwa, 2014). As with deterrents, more experiential research is needed, alongside acknowledgement that fencing is a stronger management strategy when used in combination with other measures (Okello, Kiringe and Warinwa, 2014; Hoare, 2015).

Improved infrastructure, including reinforced enclosures (or bomas in Eastern and Southern Africa), is another method that has been suggested to reduce depredation incidents, while also being touted as culturally acceptable (Bauer, de Iongh and Sogbohossou, 2010; Pettigrew *et al.*, 2012). However, effectiveness is limited if livestock is predated by multiple species,

as some may still be permitted entrance by enclosure design (Woodroofe *et al.*, 2007) As with fencing, problems are also encountered when it comes to maintenance and the additional resources needed to keep livestock inside (such as the supply of fodder) – thus effectiveness is enhanced if such additional needs are accounted for (Bauer. de Iongh and Sogbohossou , 2010).

2.3.4 Livestock husbandry techniques

Perhaps one of the most explored sub-category is that of tools to mitigate predator-livestock conflicts, possibly due to the high costs imposed on local agriculturalists through livestock loss (Pooley *et al.*, 2017; Holland, Larson and Powell, 2018). Because of this emphasis, many reviews focus on large carnivores (e.g. Bauer, de Iongh and Sogbohossou, 2010; Eklund *et al.*, 2017) and effectiveness is measured either as a reduction in livestock losses or retaliatory killing incidents (e.g. Dickman and Hazzah, 2016).

A popular method is the provision of *guard animals.* These are most often shepherd dogs – as have been deployed in Namibia by the Cheetah Conservation Fund (CCF) but can be other species, including llama. Guard animals can be effective at reducing predation rates in species with solitary lifestyles, such as cheetah (Potgieter, Kerley and Marker, 2016), coyote and cougars in North America (Gehring *et al.*, 2010), bears in Europe (Rigg *et al.*, 2011) and dingoes in Australia (Bommel and Johnson, 2012). This method is also popular on the basis that it is non-lethal, seen as environmentally friendly and relatively close to natural behaviours (Gehring *et al.*, 2010; Bommel and Johnson, 2012; McManus *et al.*, 2015; Rigg *et al.*, 2011). On the other hand, social species such as lions and wolves are not so susceptible to guard animals (Potgieter, Kerley and Marker, 2016). Additionally, guard dogs have been shown to display unwanted behavioural traits, including the killing of both target and non-target species and inattentiveness (Rust *et al.*, 2016). Dogs can also be killed themselves, which in turn evokes resentment and possible acts of retaliation from owners (Home, Bhatnagar and Vanak, 2018). There are also additional financial limitations incurred through ownership, such as training and feeding costs, that can reduce the likelihood guards will be accepted (Holland, Larson and Powell, 2018).

Alterations made to husbandry practices can also be used as a preventative technique, and

Sheep from this herd are provided to farmers as compensation for loss of livestock due to leopard predation. This initiative has reduced illegal killing of leopards and contributed to a significant increase of the leopard in the Kopet Dag mountain range in Turkmenistan

there is some evidence to support the fact that changes made to practice – such as grazing livestock in different areas or moving livestock inside at night – can be successful at limiting predation rates (Hemson *et al.*, 2009). Out of all livestock husbandry tools, this may be the most financially feasible (Eklund *et al.*, 2017) yet this is highly context dependent, as in some local areas amendments to husbandry may be unachievable (Bauer, de Iongh and Sogbohossou , 2010).

2.3.5 Land use planning

Methods that rely on land-use or land management changes are developed on the assumption that most negative human–wildlife impacts occur where the two geographically overlap (Sitati *et al.*, 2003; Margulies and Karanth, 2018). These include *zonation*, where land is designated for specific uses (e.g. protected area or heavy resource use) or seasonal closures according to species ecology, *wildlife corridors*, or *habitat modification* where features considered to be attractive to wildlife are removed, such as watering holes or vegetation (Elfström *et al.*, 2014; Lewis *et al.*, 2015). Evaluations of such approaches are hard to come by, as many exist as theoretical models (Schuette *et al.*, 2013). Effectiveness is sometimes linked to the gains or losses afforded to local people from protected areas. Evidence suggests communities will be more supportive and tolerant if additional economic benefits are received, yet if severe losses are incurred, then implementation becomes politically difficult (Holland, Larson and Powell, 2018). These methods also require substantial datasets relating to species movements and home ranges (Gilman *et al.*, 2008).

2.3.6 Predictive measures

Research into animal movements, behaviours and ecologies can be used as tools to prevent negative human–wildlife impacts and have been utilised in Zimbabwe to better manage conflict over lions (Kuiper *et al.*, 2015) and other predators (Loveridge *et al.*, 2017). Some studies have aided conflict management through better understanding of human–wildlife interactions, enabling more appropriate techniques to be employed (Loveridge *et al.*, 2017). Similarly, technological *detection methods,* such as radio collars, drones and acoustic analysis, have enabled predators to be mapped, and early warning systems to be put in place [e.g. sharks (Hsu *et al.*, 2007); Indochinese tigers (Azlan and Sharma, 2006); African lions (Weise *et al.*, 2019)]. Such systems can also be placed on livestock to detect fatalities and cause of death quickly, possibly debunking myths around predation and reducing pressure on local communities (Linnell, Odden and Mertens, 2012). However, most of these methods rely on advanced technology that can be mistrusted or misunderstood by non-scientists and introduce feelings of resentment or disempowerment. Challenges may be presented when attempting to implement research, and such approaches are subject to scientific bias and disciplinary silos (Loveridge *et al.*, 2017).

A possible way to overcome this challenge is to use citizen science as a means of *surveillance*, such as the Shark Spotters programme in False Bay, South Africa, which has been highly effective at reducing shark attacks on beachgoers (Engelbrecht *et al.*, 2017). Weise *et al.* (2019) also support the use of social science to check in with local communities when implementing early warning or alert systems that require compliance and adapt technology and training according to local needs.

2.4 Cognitive interventions

Rather than focusing on methods to alleviate wildlife impacts – which, as we have discussed, can have limited, short-term effectiveness – cognitive approaches have been increasingly applied under the more recent view that antagonistic views of certain species can exist irrespective of the amount of damage they inflict on local communities (Bagchi and Mishra, 2006; Hazzah, Borgerhoff Mulder and Frank, 2009). Cognitive interventions instead target the psychological, social and cultural factors that are believed to drive adverse behaviours towards wildlife (Heberlein, 2012). These can include fear and perceived risk, which can be disproportionately high in relation to actual predation or attack rates (Barua, Bhagwat and Jadhav, 2013; Bond and Mkutu, 2018), strongly held cultural beliefs (Bauer, de Iongh and Sogbohossou, 2010; Dickman, 2010), feelings of detachment (Dickman and Hazzah, 2016) and a lack of ecological knowledge (Baruch-Mordo *et al.*, 2011; Lewis *et al.*, 2015).

Cognitive approaches involve *education schemes* that aim to improve knowledge regarding the habits, movements of species, and ways in which impacts may be prevented or reduced. Examples

Dr Ludwig Siefert measures out a reversal for an immobilised lion in Queen Elizabeth National Park. This is one of the park's oldest lions, estimated to be over 14 years of age. She regularly killed cattle in Hamkungu and Kasenyi villages in 2018 and was satellite collared to monitor her movements

include: the Bear Aware programme applied in Aspen, Colorado, USA, to educate residents living alongside black bears *Ursus americanus* of common bear attractants and repellents (Baruch-Mordo *et al.*, 2011); the informal and formal sessions run by the Cheetah Conservation Fund (CCF) at their Field Research and Education Centre in central Namibia, which include training courses for local farmers, livestock and game-rearing interests. *Social marketing* or *awareness campaigns* aim to encourage collective action and manipulate negative perceptions towards species, such as the Stand with Wildlife campaign created by Oakland Zoo to manage conflicts over cougars *Puma concolor* in California, USA Or the UK's Heads Up For Harriers project implemented by the Partnership Against Wildlife crime (PAW Scotland, 2018) as part of a wider action plan to increase awareness and acceptance of protected raptors threatened by illegal killing on game shooting estates (Hodgson, 2018).

Very few studies systematically evaluate cognitive methods as conflict management strategies (Baruch-Mordo *et al.*, 2011; Holland, Larson and Powell, 2018). There is evidence to suggest that tolerance, communication, and social interaction are improved, increasing the likelihood of pro-conservation behaviours (Inskip *et al.*, 2014; Holland, Larson and Powell, 2018). In 2001, selection of the Malaysian sun bear *Helarctos malayanus* as an official mascot for the Balikpapan district was said to incite feelings of ownership and pride among residents, where previously bears were killed for raiding commercial fruit plantations (Fredriksson, 2005). Behavioural intentions towards another bear species, the spectacled bear *Tremarctos ornatus*, are thought to have changed in parts of Ecuador after a five-year education programme (Espinosa and Jacobson, 2012) and perceived livestock losses decreased among Namibian farmers following the CCF training scheme (Rust and Marker, 2014). However, the relationship between attitudinal changes, improved tolerance and actual behavioural change is not always linear, although this is regularly assumed to be the case (Baruch-Mordo *et al.*, 2011).

Education schemes and campaigns encounter problems of legitimacy and authority, so that the intervention is hindered not by its subject matter, but rather by those overseeing its implementation (Hodgson *et al.*, 2019). Further, firmly held cultural or spiritual beliefs can often override technical or scientific information, even after educational strategies (Dickman, 2010). Fitzherbert *et al.* (2014) suggest that the most effective cognitive approach is one which utilises existing, community-level mechanisms of leveraging collective action. The in-community campaign led by the Sukuma people of Tanzania used local cultural institutions and sanctions for rule-breaking to eliminate bad practice in the

hunting of lions (Fitzherbert *et al.*, 2014). Similarly, in the review by Bauer, de Iongh and Sogbohossou. (2010) of human–lion conflict management in West and Central Africa, the authors state that the single most effective instrument for the improvement of tolerance was the promotion of magical or religious protection, for example, nature-friendly incantations played on Guinea community radio.

2.5 Structural interventions

Structural interventions are focused on changing the wider contextual factors thought to have influence on human behaviours (Heberlein, 2012; Baynham-Herd *et al.*, 2018). Here, we identify three main areas in which structural interventions have been applied to HWC: *economics and livelihoods; legal mechanisms;* and *socio-political interventions.*

2.5.1 Economics and livelihoods

Compensating for wildlife damage

The most visible consequences of human–wildlife interactions concern the economic costs incurred through depredation of livestock, and damage to crops and property (Dickman and Hazzah, 2016). Livelihoods can be substantially impacted and costs severe, especially in less developed countries, where high percentages of the population are in poverty and often live in close proximity to wildlife (Loveridge *et al.*, 2017). In Zimbabwe for example, livestock loss due to predation reduced the annual income of agricultural communities by up to 20% (Butler, 2000), and those living in the Bhadra Tiger Reserve, India, were found to lose 11% of total crops to elephant damage and 12% of livestock to big cats per annum – a yearly income reduction of 11% (Madhusadan, 2003). Industries, such as fisheries, commercial farms, and sporting interests, can also be significantly affected by predation and other wildlife damage (Redpath *et al.*, 2010; Söffker *et al.*, 2015). A highly common strategy to manage conflicts is therefore to lessen this economic burden by compensating for incurred losses, and effectiveness is generally measured as apparent improvement of tolerance.

Monetary compensation is perhaps the most widely applied and frequently employed conflict management strategy of this review, implemented across Europe (Boitani and Linnell, 2015), Africa (Dickman, 2010; Hazzah *et al.*, 2014; Hoare, 2015), Asia (Karanth, Gupta and Vanamamalai, 2018), North and South America (Ravenelle and Nyhus, 2017). Compensation schemes are largely politically popular, serving as a relatively simple method of improving attitudes towards conservation initiatives by directly addressing the more tangible costs of conflict (Naughton-Treves, Holland and Brandon, 2005; Hemson *et al.*, 2009). However, despite its widespread implementation, the actual efficacy of compensation in mitigating conflict is debated (Ravenelle and Nyhus, 2017). Some schemes have proved successful at reducing retaliatory killing, particularly of lions. For example, two schemes applied in Amboseli – the Predator Conservation Fund and Mbirikani Predator Conservation Fund – resulted in significant declines in the numbers of lions killed by Maasai pastoralists (Hemson *et al.*, 2009; Hazzah *et al.*, 2014). However, compensation schemes rarely eliminate conflict, and in many instances hostile behaviours towards species, and conservation efforts, continue (Meghna *et al.*, 2010; Marino *et al.*, 2016).

It has been widely suggested that this is because compensation only addresses the symptoms of conflict, as opposed to the less visible root causes (e.g. Hoare, 2015; Redpath *et al.*, 2013; Redpath, Bhatia and Young, 2015). The illegal killing of wildlife can also be an act of resistance against governments or state authorities, who are perceived to be placing the objectives of conservation above their own needs (von Essen *et al.*, 2014; Dickman and Hazzah, 2016). Compensation is highly vulnerable to social, political and governance issues, such as corruption, insufficient funding, processing delays, unfair rates, social opportunity costs, and limited adaptive capacity (Ogra and Badola, 2008; Bulte and Rondeau, 2005; Ravenelle and Nyhus, 2017). Such issues can foster further resentment among those negatively affected, increasing the potential for opposition to conservation (e.g. Dickman *et al.*, 2014). Additional issues may arise in relation to how claims are verified. Claimants may find it difficult to prove an incident of predation or attempt to cheat the system (Bulte and Rondeau, 2005). Unless schemes are transparent, constantly monitored, substantially funded and trusted by those involved – which most often is not the case – then they are destined to fail as a long-term measure (Ravenelle and Nyhus, 2017).

More recent but less well-studied economic approaches include *insurance schemes*, *alternative relief* and *consolation payments*. Insurance schemes have been trialled in Namibia to alleviate

conflicts involving elephants (Hoare, 2015), and mitigate damage caused by marine mammals to fish stocks and gear (Guerra, 2019). Effectiveness in the marine environment is unknown, but some terrestrial case studies demonstrate an increase in tolerance towards species post-implementation (Nyhus, 2016). Some authors suggest insurance is a more realistic and just strategy, as fair payments can be ensured by better incorporating risk into the price of premiums (Chen *et al.*, 2013). Such premiums can be unaffordable – although this can be negated by additional support from either the state or non-government sources, such as community financing or eco-tourism (Mishra *et al.*, 2003; Chen *et al.*, 2013; Nyhus, 2016). Consolation payments – a fixed amount paid by the state to assist communities financially affected by wildlife – have been trialled by organisations like Big Life Foundation and Amboseli For Elephants to alleviate financial hardship caused by large carnivores and ungulates (Okello, Kiringe and Warinwa , 2014). Early research implies such schemes are not effective on their own and need to be used in conjunction with other measures such as fencing and lighting to improve local tolerance towards wildlife (Okello, Kiringe and Warinwa, 2014). Alternative relief, involving the provision of non-financial aid such as food or water, has been recommended as a conflict management tool but is yet to be evaluated (Hoare, 2015).

Rather than pay for wildlife damage, *performance payments* award for the preservation of species. In Finland, commercial fisheries are provided with a financial reward for seal tolerance (Varjopuro, 2011). Similarly, Samí reindeer herders in Sweden are paid depending on the amount of wolverine reproductions on their land, which is said to have increased wolverine survival rates by up to 120% within a decade (Persson, Rauset and Chapron, 2015). Although there is some evidence of success in terms of improving tolerance for species, performance payments are not without their challenges. Such schemes suffer from end-of-contract issues, where benefits are lost when the contract ends (Hanley, 2015). In addition, individuals may attempt to 'cheat the game' and corrupt the system, skewing benefits (Hanley, 2015).

Wildlife Utilisation

Some conflict management strategies use wildlife to generate alternative sources of income, negating the need for external compensation for damage (Berkes, 2004; Spiteri and Nepal, 2008; Waylen *et al.*, 2015). *Marketing of sustainable goods*, such as local crafts or predator friendly meat, as has been used in Nepal to curtail snow leopard killing in Nepal (Mishra *et al.*, 2003) and negative human–cheetah interactions in Namibia (Rust *et al.*, 2016). Few studies evaluate such methods. *Eco-tourism* is perhaps the most popular management strategy within this category, utilised in parts of Asia and Africa (Trinkel and Angelici, 2016; Vannelli *et al.*, 2019). It is touted as an effective form of conflict management that brings benefits for both humans and wildlife, as the additional revenue gained from tourist enterprises increases incentive to conserve the species that attract them (Snow Leopard Conservancy, 2019). In some regions – particularly South Africa – tourism ventures have resulted in significant recoveries of wildlife populations (Nelson, Lindsey and Balme, 2013) and reintroductions of others (Trinkel and Angelici, 2016). Further, there is evidence to suggest that residents involved in tourism schemes feel greater responsibility or ownership for wildlife (e.g. Vannelli *et al.*, 2019) and that tourism can be used to fund other forms of conflict management, such as compensation or additional conservation initiatives (Cisneros-Montemayor *et al.*, 2013). Yet tourism as a comprehensive conflict management tool is still under question, mainly due to issues of poor governance. In some instances, restrictions are unfairly forced, benefits are not shared equally, and revenue is not adequately devolved to local communities (Trinkel and Angelici, 2016). *Community-based tourism,* such as community conservancies or homestays, are said to give local communities a greater degree of control or ownership of tourism practices and the income generated from it (Vannelli *et al.*, 2019). Many of these schemes are claimed to be more sustainable, culturally appropriate, and provide a greater incentive for conservation (Caro and Riggio, 2013). However, more recent literature denotes similar issues of corruption, exclusion and coercion exist within community-based tourism (Bluwstein, Moyo and Kicheleri, 2016). These problems are further exacerbated by the fact that areas with higher concentrations of wildlife – such as villages that border nature reserves – will receive higher benefits than those who do not, potentially creating new tensions or further aggravating existing resentment towards conservation efforts (Hanley, 2015). Demand for additional revenue may also promote unethical practices, such as canned hunting (Nelson, Lindsey and Balme, 2013).

Michael Kaelo, Chief Community Officer for the Mara Lion Project, works with local communities and schools to enhance coexistence between communities, their livestock and wildlife

Another form of wildlife utilisation is *conservation-related employment*, where local people are directly employed by conservation initiatives to carry out site maintenance, monitoring and surveillance. Perhaps the best example of this is the Lion Guardians initiative, where Maasai warriors in Kenya are employed to track and research lions and act as guardians to the local community by chasing away lions who enter the village, and by assisting locals to install preventative measures (Hazzah *et al.*, 2014). This initiative emphasised the Maasai culture and belief system, utilising an already strong spiritual tie to lions and reinforcing it while allowing guardians to retain the status otherwise obtained through lion killing by providing a source of income. Hazzah *et al.* (2014) describe a near total cessation of lion killing in every area in which the Lion Guardians initiative has been applied, which differs from other, more traditional monetary compensation schemes in the same area (e.g. Hemson *et al.*, 2009). Elsewhere, employment of local scouts has improved participation in conservation within local communities, while decreasing hazards and strengthening local leadership (Holland, Larson and Powell, 2018). However, not all cultures value wild animals in the same way, and benefits may be slower outside of a local context (Hazzah *et al.*, 2014).

2.5.2 Legal mechanisms

Multiple binding and non-binding legal instruments exist to prevent negative human–wildlife impacts, usually involving the protection of species and prevention of negative human behaviours towards them. These include *policy* instruments, such as declarations, statements of interest, standards, guidelines, recommendations, memorandums of understanding and codes of conduct or practice; and law, whether that be international, national or regional (Trouwborst, 2015). Effectiveness is difficult to ascertain. With respect to species abundance – sometimes used as an indicator of how well legal mechanisms are reducing conflict – effects are entangled with geographical and ecological changes, such as recovering prey populations (Redpath *et al.*, 2017). Another measure of success is attitude change, although again, attitudes are influenced by a number of other factors (such as governance structures), are heavily case dependent, and often unpredictable. For example in Croatia, attitudes towards brown bears became increasingly negative due to a shift from local management,

protectionist policy (Majicá *et al.*, 2011). A policy that allowed culling of wolves was enacted to increase tolerance towards wolves, but research implies tolerance actually decreased (Treves, Naughton-Treves and Shelley, 2013). This may be explained by the fact that much environmental law seemingly contradicts human rights law, and can be perceived by many as an imposition, or unfair bias by the state towards conservation objectives (Trouwborst, 2015; Bluwstein, Moyo and Kicheleri, 2016). However, there is evidence to support the view that enforcement of protective legislature can reduce killing of large predators (Liu *et al.*, 2011) and are necessary in areas where species are severely endangered (Redpath *et al.*, 2017). Additionally, non-binding agreements, such as codes of conduct or community bylaws, can have more success if groups are allowed to self-regulate. For example, fishermen using the purse seine developed a code of practice wherein it was mutually agreed to avoid areas of high marine mammal activity, thereby avoiding unintended human–wildlife impacts, such as predation and by-catch (Hamer, Ward and McGarvey, 2008).

2.5.3 Social and political dimensions

More recently, there has been a shift in emphasis from technical interventions towards processes that attempt to tackle the various underlying social and political dimensions of conflict, such as *participatory processes* to improve the inclusivity of conservation and include a variety of perspectives and bodies of knowledge, or *community-based conservation* initiatives that attempt to improve governance by devolving user rights to local communities (Trinkel and Angelici, 2016). We will discuss these methods in more detail in section 3, but in terms of specifically managing conflicts over wildlife, evaluative investigations are relatively rare. Many studies recommend more participatory, multi-stakeholder processes that concentrate on building dialogue and trust, and hand over more decision-making power to local agents (e.g. Hoare, 2015; Young *et al.*, 2016a; Holland, Larson and Powell , 2018) yet empirical evidence of how such efforts work in practice is limited in relation to HWC. Some scholars suggest that *participatory* or *knowledge co-production* processes – such as forums, workshops and collaborative decision-making – encourage the proactive resolution of conflicts through the sharing of values, bodies of knowledge, and perspectives, as well as mutual identification of shared goals (Nyhus, 2016). *Community-based conservation* initiatives, such as community conservancies and community-based natural resource management (CBNRM), are often praised as panaceas for conflict, tackling numerous issues in one (Pooley *et al.*, 2017; Holland, Larson and Powell, 2018). Studies do support the view that such interventions can increase tolerance towards some species, while providing multiple benefits to local communities (Berkes, 2010; Dickman, 2010; Bobo and Weladji, 2011) and numerous NGOs appear to be establishing more community-focused approaches to conflict. For example, WWF state that they combine technical solutions with social and economic development through the establishment of conservancies in east and central Africa (WWF, 2019b), as do the AWF, who work in conjunction with the Kenya Wildlife Service to 'empower communities' through conservancies rather than make them 'feel like victims' (AWF, Internet).

However, collaborative management and participation as conflict management strategies are inherently challenging (see Butler *et al.*, 2015). More often than not, entrenched social and political conflicts limit the potential for cooperation, and participatory processes become arenas for strategy and power play rather than genuine collaboration and consensus (López-Bao, Chapron and Treves, 2017). There are difficulties associated with uniting different knowledge types, including challenges of legitimacy and credibility (Dickman, 2010; Young *et al.*, 2016b; Hodgson *et al.*, 2019). In addition, research is increasingly demonstrating that forms of community-based conservation – especially in developing countries – are often ineffective in practice, limited by poor relationships and trust, corruption, hierarchal or ineffective structures of governance, asymmetries in power, and unequal or unfair distribution of benefits (Igoe and Croucher, 2009; Benjaminsen *et al.*, 2013). We explore these issues in more detail later in this report, but in summary while such processes have potential to effectively manage conflicts in theory, in practice conflicts may in fact be exacerbated.

2.6 Wider issues

Many issues explored in this section are situational and relate only to specific approaches. However, it became apparent during our review that there were some overarching problems with current conflict management, which are summarised in Table 3. One palpable issue was the distinct lack of evaluation for management interventions (Eklund *et al.*, 2017; Holland, Larson and Powell, 2018). Studies that did evaluate strategies focused mainly on livestock husbandry techniques, with very little or no attention on cognitive or structural interventions (see also Holland, Larson and Powell, 2018). Even then, measures of effectiveness and success were context dependent and bias towards tangible human–wildlife impacts (Bauer, de Iongh and Sogbohossou, 2010; Eklund *et al.*, 2017). This implies that recommendations are made and strategies implemented without the robust, empirical evidence needed to justify them (Treves, Krofel and McManus, 2016; Eklund *et al.*, 2017; Baynham-Herd *et al.*, 2018). It is clear a more evidence-based approach is needed, alongside a more constant evaluative strategy with what constitutes effectiveness clearly outlined. Conflict management in conservation generally lacks a cohesive framework to assess, monitor and evaluate strategies. This is despite an adaptive management approach – which promotes a cycle of constant evaluation, adaption, and learning – being repeatedly advocated (Bunnefeld, Hoshino and Milner-Gulland, 2011).

Damage to vegetable crops by Bonnet Macaques is one of the drivers of large scale shifts to tea cultivation in the Western Ghatts with associated broad-scale socioeconomic impacts

Table 3 – Summary of wider issues in the current conflict management.

Issue	How to overcome?
Lots of recommendations but very little empirical evidence to support them	Movement towards more evidence-based practice
Very few evaluations of management strategies	Encourage long-term adaptive management approach
Focus on technical or legislative solutions. Desire for rapid, 'win–win' outcomes	Need inter-disciplinary research and multi-sector collaborations. Promote a more holistic view of conflicts and their management
Little understanding of underlying social, political and economic drivers of conflict	Incorporate social and political elements into impact assessments, modelling, and research
Interventions recommended and implemented by conservation researchers and practitioners	Bring in expertise from other sectors; encourage transdisciplinary collaboration
Too much emphasis on single solutions and panaceas	Management strategies should utilise a combination or package of measures

Another problem area pertains to how conflict management is governed (Nelson, Lindsey and Balme, 2013) – in other words, who steers management interventions and how they do so (see section 4.1 for detailed definitions of governance). It is a global problem that local or rural communities and their needs are inhibited or marginalised in decision-making and management (Sterling *et al.*, 2017). It has been suggested that conflict management is predominantly led by conservationists and natural scientists, who steer towards successful conservation outcomes and can lack empathy or knowledge in regard to local practices and concerns (Bauer, de Iongh and Sogbohossou, 2010; Dickman and Hazzah, 2016). Further, hegemonic, scientific narratives of conservation and biodiversity loss can have considerable power with state or government agencies, which can marginalise alternative values and meanings (Schuetze, 2015; Aiyadurai, 2016). Suppressed stakeholders may then attempt to regain power through acts of resistance, which can include the production of counter narratives, lobbying, the formation of local coalitions and institutions, and sometimes illegal or retaliatory killing of the species that conservation initiatives are attempting to protect (Ostrom, 2015; von Essen *et al.*, 2014, 2015; Veríssimo and Campbell, 2015).

In addition, managing conflicts from a predominantly westernised, biodiversity-centric viewpoint risks sidelining important traditional, cultural or local practices and norms. Many cultures and societies will have mechanisms already in place to deal with conflicts, such as community bylaws, sanctions and rules (Oduma-Aboh, Tella and Ochoga, 2018). If well understood and integrated, such mechanisms can be utilised to assimilate conservation objectives into local practice (Fitzherbert *et al.*, 2014; Dickman and Hazzah, 2016). There is strong evidence to suggest that where cultural mechanisms are used to meet conservation objectives, and local people are provided with the capacity and support to govern management initiatives, outcomes for both people and wildlife are positive (Hazzah *et al.*, 2014; Fitzherbert *et al.*, 2014; Dickman and Hazzah, 2016; Young *et al.*, 2016a).

In addition, conflict management efforts can be limited by weak institutional arrangements and diffuse linkages between different societal levels (Hoare, 2015). There is often a major lack of contact, feedback and accountability between the local level – where local actors are dealing with human–wildlife impacts – and the national level, where policies and overarching decisions are made about the conflict from an outside perspective (Hoare, 2015; Hodgson, 2018). This can result in management strategies that are inappropriate to a local and cultural context (Bauer, de Iongh and Sogbohossou, 2010; Oduma-Aboh, Tella and Ochoga, 2018). For example, while the initial cost of fencing or infrastructure may be borne by NGOs or governments, long-term maintenance often falls to the local community who lack adequate capacity and resources (Hoare, 2015; Nyhus, 2016). Community-based approaches are also limited by corruption in some countries. Governments, tour and hunting operators may fail to devolve the benefits gained through tourism adequately, and in conservation-related employment schemes, there are often problems associated with contracts, wages and work schedules (Bluwstein, Moyo and Kicheleri, 2016; Trinkel and Angelici, 2016).

2.6.1 Overview of the main institutions managing HWC globally

It has been suggested that the management of conflicts is dominated by conservation-based NGOs, non-profit organisations and environmental sectors of government (e.g. Pooley *et al.*, 2017). This has proved difficult to ascertain based on a web-based search, as many international groups work in large-scale collaborations with regional and local governments or non-state organisations (see Appendix A). Responses from a short survey, distributed to experts in the field, demonstrated that conflict management involved a range of international organisations (including conservation NGOs and those more rooted in humanitarian causes, such as the UN), state authorities, and non-profit organisations (see Table 4). Respondents were also able to give additional information, in which it was repeatedly suggested that listing all global institutions is "impossible" due to their high number and geographic variety. It was also noted that the IUCN, alongside the World Bank, are currently building an HWC network that will provide a platform for connecting these organisations with one another.

Table 4 – The main organisations identified as having key involvement in the management of HWC globally.
Data from a short survey distributed to experts in the field (*n* = 17) in February 2019.

Organisation/Institution	Link
IUCN Task Force on human–wildlife conflict	http://www.hwctf.org/about/what-we-do, https://www.iucn.org/ssc-groups/mammals/african-elephant-specialist-group/human-elephant-conflict/tools-study-and-management-hec
Forest Departments of all states in India	(N/A)
UN Environment Programme (UNEP)	https://www.unenvironment.org/explore-topics/environmental-rights-and-governance
Food and Agriculture Organisation of the United Nations (UN FAO)	http://www.fao.org/3/i1048e/i1048e00.htm, http://www.fao.org/forestry/wildlife/67288/en/
Scottish Natural Heritage	https://www.nature.scot
Royal Society for the Protection of Birds (RSPB)	https://www.rspb.org.uk
Australian State Wildlife Agencies details via Australian Government Environment Department	http://www.environment.gov.au/land/nrs/getting-involved/agencies
World Wildlife Fund (WWF)	https://wwf.panda.org/our_work/wildlife/human_wildlife_conflict/
USAID	https://rmportal.net/library/content/human-wildlife-conflict-study
Wildlife Conservation Society (WCS)	https://www.wcs.org/our-work/solutions/wildlife-management
World Bank	http://www.worldbank.org/en/events/2017/03/23/reducing-human-wildlife-conflict-and-enhancing-coexistence
Peace Parks Foundation (PPF)	https://www.peaceparks.org/

3 THE APPLICATION OF OTHER DISCIPLINES TO CONFLICT

3.1 Why do we need more tools in the toolbox?

Despite increasingly innovative management attempts, conflicts continue to persist and, in some cases, worsen – often at great cost to conservation and sustainable development (Redpath *et al.*, 2013; d'Harcourt, Ratnayake and Kim, 2017; Defries and Nagendra, 2017; Mason *et al.*, 2018). Conflicts are therefore being referred to in the academic literature as "wicked" problems: intractable arguments of undeniable complexity with no obvious solution (DeFries and Nagendra, 2017). Research demonstrates that even achieving consensus among stakeholders regarding what should be done to overcome the situation can be a difficult and apparently unfeasible endeavour (Young *et al.*, 2016b; Lute *et al.*, 2018). However, a constant challenge is that those wishing to manage conflicts – including governments, conservation practitioners and other involved stakeholders – typically desire quick, easy solutions with immediate "win–win" outcomes. Resources are limited, and little evidence of rapid progress can cause decision-makers to withdraw funds and disengage with conflict management (Stenseke, 2009). Furthermore, the perception of conflicts as disputes that can be easily settled through technical, legislative or dialogic means raises expectations among stakeholders (Millar, 2013). The failure of such efforts to achieve resolution can thus lead to frustration, and the exacerbation of existing tensions (Gerique, López and Pohle, 2017). The real issue is therefore how conflicts are understood and managed in the real world (Madden and McQuinn, 2014).

Improving the management of conflicts globally first requires a transformation in how these issues are framed (Peterson *et al.*, 2010; 2013; Madden and McQuinn, 2014; Redpath, Bhatia and Young, 2015; Young *et al.*, 2016b). Perpetuated by the framing of HWC, negative consequences of human–wildlife interactions – namely wildlife damage or retaliatory killing – are presented as the central problem. Consequently, current approaches are rooted around human–wildlife impacts (as outlined in section 1). Even stakeholder-orientated interventions, such as forums and workshops, are built around reducing human–wildlife impacts. Whilst such efforts are necessary, they do not tackle the underlying causes of conflicts. Conflicts are increasingly understood as being fundamentally social and political, although they sometimes manifest as disagreements over wildlife (Dickman, 2010; Redpath *et al.*, 2013; Madden and McQuinn, 2014; Hodgson *et al.*, 2018). It has been recommended therefore that the focus of HWC research shift from human–wildlife interactions towards the underlying human–human dimensions, in order to paint a more complete picture of HWC (Redpath, Bhatia and Young, 2015 Pooley *et al.*, 2017). This includes identification and assessment of the social, historical and political drivers (Constant, Bell and Hill, 2015; Bennett *et al.*, 2017; Cretois *et al.*, 2019), and a better understanding of how human relationships and interactions shape conflict dynamics (Redpath *et al.*, 2013; Baynham-Herd *et al.*, 2018; Hodgson 2018; Hodgson *et al.*, 2019). A multitude of relevant disciplines exist that can be used to examine conflicts through a different lens (see Appendix B). For example, political ecology and peace studies both have conflict as their primary focus and are concerned with identifying the underlying structural causes – particularly power dynamics and social inequalities – and how these factors shape conflicts (Rogers, 2015; LeBillon and Duffy, 2018). Environmental history reveals political tipping points, important events, and socio-economic shifts that have occurred through time, providing valuable historical context to contemporary situations (Lambert, 2015; Mathevet *et al.*, 2015). In contrast, anthropology, psychology and other social sciences offer insight into human attitudes, perceptions, behaviours, and actions, as well as the variables that influence them (Bennett *et al.*, 2017). Conflict research is gradually becoming more interdisciplinary, drawing on different perspectives and insights from these fields (Pooley *et al.*, 2017).

Reframing conflict is not only relevant to theoretical understanding, but also to how conflicts are managed. Practical management of HWC also requires a movement away from the current focus on short-term solutions with narrow focus,

Grey wolves (Canis lupus) *hunting wild boar* (Sus scrofa) *in Seredskay, Vologda Oblast, Russia, February 2009*

to strategies that are long-term, transdisciplinary, and multi-levelled (Butler *et al.*, 2015; Hoare, 2015; Redpath, Bhatia and Young, 2015; Young *et al.*, 2016b; Pooley *et al.*, 2017; Hodgson, 2018). This is yet to be achieved, especially on a global scale. Progress is hindered by: a) a disciplinary bias in research and management, in that both are typically led by natural scientists or conservation practitioners; b) the difficulty of detecting and analysing predominantly latent social, political and cultural dimensions; and c) a lack of guidance on what works best and where (Ban *et al.*, 2013; Redpath, Bhatia and Young, 2015; Young *et al.*, 2016b). In section 3.2, we explore these issues in more detail and make suggestions as to how they may be rectified.

3.2 The disciplinary bias of current human–wildlife conflict research and management

It has been argued that HWC research and management suffers from a disciplinary bias, in that both are dominated by those with a background and training in the natural sciences, ecology, and conservation (Sandbrook *et al.*, 2013; Redpath, Bhatia and Young, 2015; Bennett *et al.*, 2017). This can lead to what is known as a disciplinary silo, in that there is a narrow perception of what issues require the most attention (Thirgood and Redpath, 2008), which can significantly limit the understanding and management of conflicts. For example, these disciplines have a largely technical focus, tend to be static and descriptive, and traditionally use quantitative assessments and methodologies. Acquiring a deeper understanding of the socio-political and more latent aspects of conflict, however, requires qualitative methodologies and open-ended research questions, as opposed to rigid hypotheses (White *et al.*, 2009).

Management interventions are also frequently led – or seem to be so – by conservation practitioners, conservation-based NGOs or governmental sectors and statutory bodies focused on environmental protection (see Table 4). Decisions regarding which management strategy to employ are therefore often biased towards the objectives of conservation, aimed at changing negative human behaviours in favour of species protection (Baynham-Herd *et al.*, 2018). Management actions reflect the disciplinary

A jaguar head and skin are sold alongside cigarettes in an illegal wildlife market in Iquitos, Peru

training of conservation practitioners (Sandbrook *et al.*, 2013). Additionally, conservationists frequently do not see themselves as part of the problem (Redpath, Bhatia and Young, 2015; Hodgson, 2018; Hodgson *et al.*, 2018). However, if HWC is to be reframed as a predominantly social conflict, then conservationists must be acknowledged as important actors, with their own agendas, world views, norms and values that influence their actions with others (Glasl and Ballreich, 2004; Peterson *et al.*, 2013; Lüchtrath and Schraml, 2015; Redpath, Bhatia and Young, 2015; Hodgson *et al.*, 2018). Research often focuses on the entrenched views of stakeholders who oppose conservation and investigate how best these attitudes may be reversed. However, the entrenched positions of those in favour of conservation is also a major issue that stands in the way of effective management (Thirgood and Redpath, 2008; Hodgson *et al.*, 2019). As Pooley *et al.* (2017) argue, conservation is just one of many voices.

Tackling conflicts in the real world requires the incorporation of complex social, economic, and political factors into management strategies, and not only effective, but also genuine participation and collaboration among all stakeholders involved (Bauer, de Iongh and Sogbohossou, 2010; Dickman *et al.*, 2011; Butler *et al.*, 2015; Young *et al.*, 2016a; b; Redpath *et al.*, 2017). Such challenges are often beyond the capacity of conservation practitioners or natural scientists alone, who may lack adequate training or resources to effectively carry out strategies based within other disciplines (Madden and McQuinn, 2014; Dickman and Hazzah, 2016). Conservationists, biologists and ecologists have a reasonably full toolkit for dealing with human–wildlife impacts, yet the arsenal for tackling the underlying social, cultural and political conflicts is sufficiently lacking (Madden and McQuinn, 2014; Redpath, Bhatia and Young, 2015).

Improving the management of conflicts in practice therefore requires expertise from other disciplinary backgrounds, including social and political scientists, economists, anthropologists, economists, and lawyers specialising in environmental ethics and social justice. In addition, external actors, trained in facilitation, mediation and peacebuilding are required to effectively engage stakeholders with diverse perspectives and knowledge – and among them foster constructive dialogue, encourage active participation and guide collaborative decision-making. Research suggests that there is often little consideration of who is conducting management, despite evidence that levels of trust, perceptions and governance structures play key roles in how stakeholders respond to management interventions (Yasmi *et al.*, 2012; Sandström, Eckerberg and Raitio, 2013; Zachrisson and Beland Lindahl, 2013). The question of who can legitimately and appropriately carry out transdisciplinary approaches is one that requires more attention.

3.3 The difficulty of detecting and analysing predominantly latent social, political and cultural dimensions

Another important question to address is: what information do we need to obtain? And how do we obtain it? The re-framing of conflict as fundamentally between humans has called for approaches that pay attention to their underlying social and political dimensions. Since the 1990s, research into these dimensions has been steadily increasing (Pooley *et al.*, 2017). Specifically, social science methodologies have been applied in both theoretical and empirical contexts, including the use of quantitative and qualitative techniques. Some argue the application of such methods to HWC has been, until now, relatively superficial, concentrating on negative human–wildlife interactions and the elements that cause them (Blekesaune and Rønningen, 2010; Hayman *et al.*, 2014). Within academia, more recent application of social science perspectives has extended to explore different values and meanings in conflict (St John *et al.*, 2019) and stakeholder participation and engagement (Weise *et al.*, 2019). An increasing number of studies are using the theoretical underpinnings from other disciplines, such as criminology (see Appendix B). For example, von Essen *et al.* (2014) applied criminological theory to the illegal killing of grey wolves *Canis lupus* in Scandinavia, classifying this as a crime of dissent and act of resistance towards the state, as the result of hegemonic protectionist discourses.

However, the understanding of such dimensions requires largely qualitative data from intangible sources (White *et al.*, 2009; Barua, Bhagwat and Jadhav, 2013). Qualitative data do not fit well into models (Heinonen and Travis, 2015). Nor does the fluid, dynamic and unpredictable nature of social phenomena – such as differing values and trade-offs – appeal to those more used to casual or linear relationships between response and explanatory variables (White *et al.*, 2009; Ban *et al.*, 2013). As a result, the application of these disciplines to HWC is still said to be "scattered at the fringes" and viewed as a relatively new concept within the field (Madden and McQuinn, 2014; Pooley *et al.*, 2017). Clearly, better integration of HWC research with other disciplines is needed.

Some attempts have been made at integrated socio-ecological assessments and models (e.g. Sitati, Walpole and Leader-Williams, 2005), yet the social aspects are obtained from tangible sources that are relatively easy to measure, such as the use of environmental services (White *et al.*, 2009). It is clear that more effort needs to be made to establish a common language between natural and social or political scientists, and to build clear frameworks that can help assist this integration (Ostrom, 2009; Igoe, 2011; Redpath *et al.*, 2013). More recent conceptual frameworks have been developed, advising on how to bridge multiple disciplines – for example, the integrated conceptual framework presented by White *et al.* (2009). Whilst these efforts are valuable in improving theoretical understanding, and the development of integrated models, they do not offer advice in how to manage conflicts more comprehensively. The challenge therein lies in how to apply this knowledge in a practical context.

3.4 Lack of practical guidance

A further problem is that there is very little practical advice offered to practitioners, managers, governments and statutory bodies on how to effectively manage conflict. This is despite the fact that these stakeholders are under increasing pressure to act and find solutions (Young *et al.*, 2016b). Most of the knowledge, recommendations, and theoretical frameworks remain within academic circles, and have yet to be translated into widely applicable guidelines for decision-makers and managers[1]. This is in part due to the wealth of information

[1] The IUCN is in the process of developing its own comprehensive guidelines, due for release in April 2020.

available. As noted in section 3.2, there are a large number of disciplines that explore conflict through different lenses (see also Appendix B), each extensive and encompassing a multitude of tools and approaches that could be applied to HWC. It is therefore difficult to know which questions to ask, how this information should be obtained, which techniques work best and where (Ban *et al.*, 2013; Sandbrook *et al.*, 2013).

A useful starting point is the systematic 'conflict management tool' developed by Young *et al.* (2016b). This step-wise approach – building on the theoretical framework proposed by Redpath *et al.*, 2013) – was a response to the recognition that conventional conflict management approaches tended to be ad hoc and is specifically targeted at decision-makers (Young *et al.*, 2016b). Although it does not identify specific transdisciplinary techniques and where they should be applied, the tool provides guidance as to key stages in effective conflict management, and the questions that must be asked at these stages. The first two stages involve identifying and understanding the conflict, including its wider societal and political dimensions, and possible gaps in this understanding. The third pertains to developing appropriate management interventions – for example, in situations where entrenched conflicts are preventing collaboration or constructive dialogue (Dresse *et al.*, 2019), this stage would be used to identify other options. Only when a multi-stakeholder process is viable, can managers move on to steps four and five, which encompass building a shared understanding and consensus regarding what the collective goal is, and how it is to be achieved. Key questions at this stage, for example, would refer to what constitutes a managed conflict, which problems need to be addressed, and whether there is consensus surrounding these questions. Finally, stage six describes long-term monitoring of the actions implemented, and adaptation where appropriate (Young *et al.*, 2016b).

What may be a useful next step is to now answer the questions of which techniques can be applied, and where. In sections 3.5 to 3.7, we use the core stages of conflict management outlined by Young *et al.* (2016b) to frame a literature review of transdisciplinary tools, techniques and strategies that can be applied to assist in these stages.

Lark bunting, an obligate grassland songbird, on sage brush in Malta, Montana, USA

3.5 What works where? Adding tools to the toolbox

3.5.1 Mapping and assessing conflict (identification and understanding of context)

Prior to the application of any management strategy, investigations should be carried out to gain a thorough understanding of the conflict and its context (Bauer, de Iongh and Sogbohossou, 2010; Dickman, 2010; Redpath *et al.*, 2013; Eklund *et al.*, 2017; Baynham-Herd *et al.*, 2018). Human–wildlife impacts are often mistaken for conflicts, and vice versa (Young *et al.*, 2010). However, these situations require quite different approaches to management (Madden and McQuinn, 2014). Thus clarifying what the problems are – and, more importantly, agreeing this with involved stakeholders – could ensure subsequent interventions and strategies are relevant, effective, and make the best use of resources (Young *et al.*, 2016b; Eklund *et al.*, 2017; Baynham-Herd *et al.*, 2018). As discussed previously, human–wildlife impacts may be adequately mitigated through technical solutions, whereas conflicts are often embedded in wider economic, social and political contexts that are commonly overlooked (White *et al.*, 2009; Ban *et al.*, 2013; Madden and McQuinn, 2014; Redpath, Bhatia and Young, 2015; Pooley *et al.*, 2017). Analysing these components is essential to prevent conflict escalation. Further, all relevant stakeholders must be identified and their roles within the conflict well understood (Marshall, White and Fischer, 2007; Redpath *et al.*, 2013; Young *et al.*, 2016b). Conflicts can involve many different actors of various backgrounds and capacities, at varying societal levels (Raik, Wilson and Decker, 2008; Gerique, López and Pohle, 2017). In short, the "who, what, when and why" of conflicts must be assessed, understood and agreed before the design and implementation of any strategy (Schwartz *et al.*, 2018).

There are a multitude of techniques and methodologies to assist in conflict mapping and assessment. Integrated impact assessments, which describe social, cultural, economic and political situations, are gaining traction in conservation (White *et al.*, 2009; Ives *et al.*, 2015). These can involve situation and stakeholder analyses, which are conducted through a range of methods from interviewing to focus groups (Ban *et al.*, 2013). Integrating qualitative social aspects with quantitative environmental assessments can be difficult, but various different frameworks exist that assist in the diagnostic and descriptive enquiry of conflicts (Ostrom, 2015).

Identifying the relevant stakeholder groups – defined here as all groups or individuals affected by and influencing the dynamics of a conflict (Young *et al.*, 2016b) – and their respective roles within the conflict can be relatively straightforward or distinctly challenging, depending on the extent, scale and history of the situation (Vogler, Macey and Sigouin, 2017). Analysis can involve stakeholder grids or analysis tables, for which organisations like UNICEF (Internet) provide guidelines. However, some stakeholders may be "hidden", in the sense that they have an influential role in the conflict but are not usually considered in decision-making and other participatory processes; for example marginalised groups within local communities, such as women and elders (Sterling *et al.*, 2017; Vogler, Macey and Sigouin, 2017). This is especially true when examining "sensitive" subjects, where the capacity of an individual to participate is restricted by cultural or societal boundaries. For example, poachers or illegal hunters may not wish to identify themselves (von Essen *et al.*, 2014; Hodgson, 2018) or in some societies it is culturally inappropriate for women or elders to have an active role in decision-making (Webber, Hill and Reynolds, 2007). In such instances, ethnographic approaches may be useful (see Appendix B, also Barua, Bhagwat and Jadhav, 2013 and Hodgson, 2018). However, such methods are often resource heavy and may be limited in practice by time constraints. Discourse analysis of relevant texts, such as grey literature (news articles, web pages, social media) and existing reports can also provide an idea of key stakeholders and their positions (Hodgson *et al.*, 2018). Additionally, techniques from the fields of environmental history and political ecology lend insight into the main players and historical or current relationship and power dynamics (Lambert, 2015; LeBillon and Duffy, 2018). Social network analysis is a useful tool from the social sciences, with which to analyse who key stakeholders are, and how they interact. This technique has been applied to understand stakeholder relations within a conflict in Malta, that resides over the hunting

of protected migratory birds (Veríssimo and Campbell, 2015).

However, once the key stakeholders have been established, it is then possible to outline the "where" and "why" of conflict. Typically, questionnaires have been used for this purpose, but a whole suite of more in-depth, qualitative techniques exist, including semi- to unstructured interviews, focus groups and forums (Bennett *et al.*, 2017; Young *et al.*, 2018). Mental models are a hugely applicable tool from the cognitive sciences, that can be used to understand complex systems that feature multiple stakeholders (Biggs *et al.*, 2011; Jones *et al.*, 2014; Mosimane *et al.*, 2014; Moon *et al.*, 2019; see also Box 2). Using a set of varied methodologies, mental models create graphical or diagrammatic representations of how an individual structures reality, based on their knowledge, experience, values and beliefs, and can thus be used to explain the factors that influence people's perceptions of, reactions and behaviours in a conflict setting (Mosimane *et al.*, 2014). Theoretical games (see Box 3) and models are also valuable tools in understanding conflict (Redpath *et al.*, 2018). Mathematical games and individual-based models (IBMs), provide simplified replications of highly complex systems, allowing for the main drivers to be identified (Tilman, Watson and Levin, 2017).

A herd of cows in the Hamkungu village, Queen Elizabeth Park, Uganda. This is one of the most conflict prone areas in the park, where lions often kill cows

Box 2 – Overview of mental models and their application to conflicts

Mental models are graphical representations of how people know, perceive and make decisions about a particular situation and the ways in which they interpret information to make this reasoning (Moon *et al.*, 2019). Essentially, mental models describe how the world is constructed in an individual's mind. With foundations in the cognitive sciences – psychology, philosophy, anthropology – mental models are constructed based on individual knowledge, experiences, value and belief systems.

The use of mental models in conservation is currently very limited, but they could be hugely applicable to conflicts. Mental models utilise a suite of methodologies from in-depth interviews, to drawings (Jones *et al.*, 2014), role-playing and group mapping and model building (Mosimane *et al.*, 2014). Models can be individual or shared, and have multiple and varied uses, including the following.

- Understanding of group experience and collective behaviour in response to the same phenomenon (Jones *et al.*, 2014) and individual behaviours and their influences (Game *et al.*, 2014).
- The understanding and mapping of conflicts, through exploration of enablers, barriers and solutions with stakeholders (e.g. Mosimane *et al.*, 2014)
- Identify areas of consensus, and areas of divergence and thus potential for conflict (Biggs *et al.*, 2008).
- The possible suitability of future management interventions (Biggs *et al.*, 2011).
- Contribution to the reconciliation of conflicts through shared mental models, which can be used to build a shared vision for management or utilised to build trust and mutual understanding of one another's world views, experiences and misconceptions (Halbrendt *et al.*, 2014).

Mental models can be quite resource intensive, requiring time, expertise, financial support and greater stakeholder participation (Moon *et al.*, 2019). But they have potential to be a great tool in the understanding and management of conflicts.

Example: application of mental models to understand conflicts in Namibia

Mosimane *et al.* (2014) explored mental models with stakeholders regarding a conflict in Namibia, and was able to identify assumptions and perceptions of the system that limited compliance with conservation initiatives. Researchers were then able to suggest strategies to reduce conflict, such as land-use planning and livelihood enhancement; and enabled managers to engage stakeholders based on shared components rather than disagreements.

3.5.2 Planning and development

Once the conflict has been understood and mapped – and these elements understood and agreed by all stakeholders – the process can then move on to identifying which management action(s) should be taken. Ideally this stage should be enacted with all key stakeholders or representatives of stakeholder groups around the table, to allow for decisions to be made that are consensual, inclusive, relevant to a local context and culturally appropriate, and within the boundaries of available resources. It should be recognised that this stage may be a long-term process, and that getting all to participate and reach consensus is often not possible. The conflict may already be too acute, or power imbalances too pronounced, for stakeholders to be willing to engage constructively (Dresse *et al.*, 2019). In such cases, multi-stakeholder processes may be ineffective. Alternatives may be top-down – for example decisions made by government actors to overcome contentious issues (Butler *et al.*, 2015; Redpath *et al.*, 2017) – or bottom-up, such as engaging with stakeholders separately (Young *et al.*, 2016b). A long-term management solution may be engaging stakeholders in conflict resolution or peacebuilding processes, which are discussed in more detail in section 3.5.3.

Box 3 – Games as tools to address conflicts

Behavioural games offer an interesting and innovative set of tools for the examination and management of conflicts and have already been utilised in conflicts over natural resource management (Redpath *et al.*, 2018). They provide a model to help understand human decision-making in conflicts. A 'game', as defined by game theorists, is in fact a type of strategic model, simulating a scenario where 'players' (or 'agents') make decisions and act based on the decisions and actions of others. They can be theoretical, experimental or constructivist (Redpath et al 2018).

Theoretical games can be used to understand human behaviour in conflict scenarios on a simplistic level, e.g. what conditions cause individuals to cooperate? (Tilman, Watson and Levin, 2017). In experiential games, behavioural responses to certain interventions are investigated in a controlled setting, which can be used to predict how stakeholders might react to management actions *before* application. This is especially useful when conflicts are severe, and interventions may be controversial or politically difficult (Redpath *et al.*, 2018). For example, Travers *et al.* (2011) used experiential games to predict the outcomes of incentive-based interventions on illegal resource use in Cambodia, finding that options that allowed local communities to self-govern were the most accepted. This led to the establishment of local institutions to enable self-organisation.

Games can also be used in iterative processes to foster dialogue and aid decision-making. Constructivist games, such as those used by the Companion Modelling Community (ComMod) to facilitate discussion around a water resource management problem in Thailand (Barnaud *et al.*, 2010), involve role-playing, cards and even board games to build trust and encourage active participation. Individuals are allowed the freedom to explore different outcomes, reframe the situation, and build inventive solutions in a slightly more informal environment than traditional deliberative processes (Barnaud *et al.*, 2010; Redpath *et al.*, 2018).

University of Arizona researchers hold up the paws of a brown bear in the Huachuca Mountain range in Arizona, USA. This bear was trophy hunted in mid-2017 and likely illegally

Techniques that may be used at this stage include experiential games (Travers *et al.*, 2011) and multi-criteria modelling. The latter was used to "weigh" various management options to reduce conflicts over hen harrier and game sports in the UK, under different scenarios with local stakeholders (Redpath *et al.*, 2004). As discussed in Box 2, shared mental models can also be used as a tool to explore the suitability of various management options, and allow stakeholders to realise shared visions and goals (Biggs *et al.*, 2008; Halbrendt *et al.*, 2014). Assessment techniques from the field of economics can help to identify the most cost-effective and feasible strategies. Cost–benefit analysis (CBA) systematically analyses interventions in terms of who gains and who loses, and by how much (Hanley, 2015). By mapping out the distribution of benefits and costs, managers may be able to predict whether an intervention is likely to be rejected, and by whom. Mburu, Birner and Zeller (2003) analysed the transaction costs imposed on landowners by a collaborative management scheme in Kenya and were therefore able to recommend changes that could increase compliance. Similarly, choice experiments or contingent evaluations can reveal which interventions actors are willing to pay for, or where they will accept compensation (Hanley *et al.*, 2010).

There is also a multitude of techniques to assist decision-making processes and enable stakeholders to prioritise or rank their preferences for different interventions. These include structured decision-making (McGowan *et al.*, 2011), the nominal group technique (Hugé and Mukherjee, 2018) and threat prioritisation (CMP, Internet-a).

3.5.3 Management techniques (conflict resolution and transformation)

Management interventions will depend on the outcomes of stages 1–4 of the conflict management process identified by Young et al. (2016b). For example, technical, economic or legislative solutions – such as those outlined in section 2 – may be sufficient if the situation at hand involves human–wildlife impacts. However, for entrenched conflicts, processes focused on conflict resolution and peacebuilding may be required.

Peace studies is an extensive discipline, focused on gaining a deeper understanding of the structural or root causes of a conflict and ways to resolve or transform them (Rogers, 2015; LeBillon and Duffy, 2018). Approaches to

resolution range from basic arbitration to more diverse forms of mediation and facilitation, but the general idea is to bring in an external third party to shift fractured or antagonistic relationships to reconciliation through a broad set of actions (Dresse *et al.*, 2019). These may include dialogue, trust-building exercises, negotiation and peace agreements (Maas, Carius and Wittich, 2013; Aggestam, 2015; Ide, 2016). The line between the role of a facilitator and that of a mediator are often blurred, but in essence facilitators guide groups towards consensus, whereas mediators tease out underlying issues and work on repairing fractured relationships (Miller and King, 2005). Both have a place in conservation conflicts and could be used simultaneously. Although facilitation generally requires conflicts to be mild enough for joint decisions to be possible, different groups of actors within the same conflict may be more or less able, or willing, to engage (Aggestam, 2015; Dresse *et al.*, 2019). Conversely, mediation practices, which are typically used for more severe conflicts, may help bring stakeholders to a point where they can participate in facilitation or collaborative decision-making. These can involve some of the techniques already discussed, such as shared mental models and constructivist games, which may be used to communicate diverse perspectives and overcome trust barriers (Redpath *et al.*, 2018; Moon *et al.*, 2019).

Box 4 – Brief introduction to environmental peacebuilding

Environmental peacebuilding is a relatively new field that views environmental issues as opportunities for resolution and focuses on using natural resources as a conflict management tool. Peacebuilding considers multiple actors at various levels and is interested in the dynamics of conflict and cooperation at different scales (Ide, 2016). Thus, it provides a useful perspective.

According to Dresse *et al.* (2019), environmental peacebuilding has three 'categories':

1. Prevention
2. Promotion of dialogue and trust
3. Sustainable Development

Each category is applicable to different contexts. For example, where conflicts are severe and constructive dialogue is not possible, the development of a technical preventative solution to address an environmental problem could act as a conflict management tool (Maas *et al.*, 2013; Ide, 2016). Actors can engage minimally about a subject that is "below politics" (Aggestam, 2015). In this category, resolution is not the goal – but it can set the scene for broader peacebuilding (Dresse *et al.*, 2019).

However, if parties are willing and able, restorative approaches may be more applicable. These include the development of a shared arena or forum, where actors can recognise past injustices and current differences in perspectives and values (Ide, 2016). Often with the help of a facilitator or mediator, such divergences can be acknowledged and potentially resolved. One example is the Good Water Neighbours initiative implemented by Ecopeace, which aimed to promote dialogue in trans-boundary conflicts between Israeli, Jordanian and Palestinian borders. The final trajectory is sustainable peacebuilding. The goal of this type of peacebuilding is to address the root causes of conflict, such as asymmetrical power relations (Dresse *et al.*, 2018). It should be noted that these trajectories are not linear: different types of peacebuilding can be exercised simultaneously, and progress made in technical or restorative approaches can be reversed by external social or political events.

There are various different approaches to peacebuilding and conflict resolution, some of which are summarised in Box 4. A recent extension is the theory of conflict transformation, which goes beyond the goal of reaching jointly agreed outcomes to conflict, involving profound change in how such situations are conceptualised and approached (Madden and McQuinn, 2014). Instead of seeing conflicts as inherently negative situations that must be overcome, conflict transformation views such situations as catalysts for social change (Rodríguez and Inturias, 2018). Further, transformation moves away from treating conflicts as episodic events to continuously evolving, dynamic phenomena, which involves understanding the underlying structural causes (Lederach, 1995). This requires a transformation of how people perceive conflicts and the institutions and discourses that determine how they are managed, as well as addressing the relationships between the parties themselves (Ramsbotham, Miall and Woodhouse, 2016). Although this concept is still developing and lacks empirical guidelines, it can be summarised as addressing three dimensions of conflict: individual (individual awareness and responses to conflict); relational (relationships within and between stakeholder groups); and institutional (formal and informal rules that control how society deals with conflict) (Madden and McQuinn, 2014; see also Figure 2). This could be a useful framework with which to enact change in how conflicts are understood and managed in future and warrants further exploration.

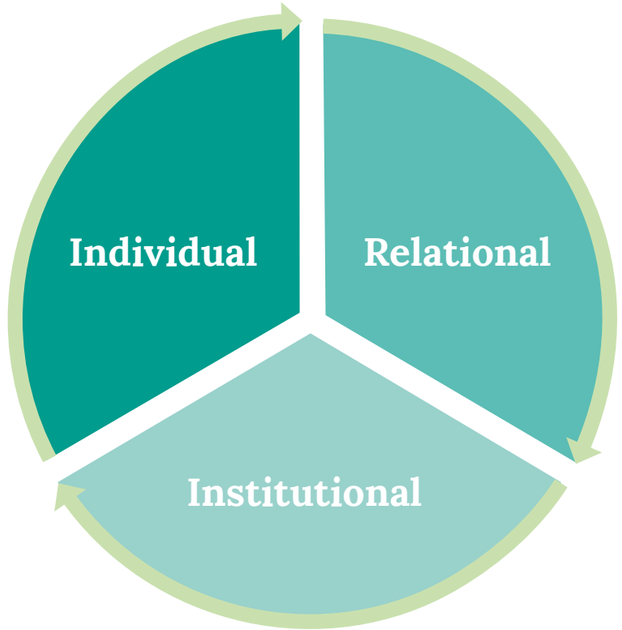


Figure 2 – Visual representation of the three dimensions that must be theoretically and empirically understood and addressed for the process of conflict transformation. "Individual" relates to conceptualisations and reactions to conflict at an individual level. "Relational" refers to the interactions and dynamics between stakeholder groups. "Institutional" encompasses the rules and norms that govern how conflict is approached, and the capacity of institutions to adapt to such crises (Lederach, 2003; Madden and McQuinn, 2014; Rodríguez and Inturias, 2018).

4 UNDERSTANDING AND IMPROVING GOVERNANCE IN THE CONTEXT OF HUMAN–WILDLIFE CONFLICT

4.1 Understanding governance and its role in human–wildlife conflict

In a broad sense, governance can be understood as the regulatory processes and mechanisms that influence how society coordinates to realise collective goals (Ostrom, 2015; Dietz, Ostrom and Stern, 2003; Lemos and Agrawal, 2006). This includes the role of institutions, defined here as the established societal norms and rules (formal and informal) that shape how decisions are made, which actions are taken, how power or authority is exercised and by which actors (Kooiman, 1993; Dietz, Ostrom and Stern, 2003; Campese *et al.*, 2016). Governance is distinguished in this way from management. Management refers to operational decisions, whereas governance reviews the broader processes and structures through which decisions are made. In short, the study of governance asks questions about how society is organised, and by whom.

In recent years, governance has become more of a concern to the field of conservation – particularly in relation to the management of protected areas, and local rights and access to natural resources. This is in part due to the growing recognition that governance plays an important role in conservation and sustainable development (United Nations, 2009; Armitage, de Loë and Plummer, 2012; Borrini-Feyerabend *et al.*, 2004; Lange *et al.*, 2013). Issues that are large scale and complex – like many environmental problems – cannot be addressed adequately by individual action, and so the management of these problems relies on effective mechanisms to steer collective responses (Ostrom, 2015). However, natural resources and conservation actions are often governed inappropriately (Salafsky *et al.*, 2002; Cleaver, 2012). This realisation has sparked much interest and discussion around the subjects of resource and environmental governance (Ostrom, 2009; Armitage, de Loë and Plummer, 2012; Borrini-Feyerabend *et al.*, 2004). Many international organisations now recognise effective governance as a core element of successful environmental protection and sustainability (United Nations, 2009; Campese *et al.*, 2016; WWF, 2019a).

Governance in HWC has received little attention in comparison. Some scholars have identified 'poor' governance as a serious barrier to the effective management of HWC, that requires more consideration (e.g. Bauer, de Iongh and Sogbohossou, 2010; Hoare, 2015). We have explored issues specifically pertaining to governance throughout this report. However, despite scholarly recommendations, at present there is little integration of the governance literature within wildlife studies, and thus a lack of understanding of specific governance issues within wildlife conflicts and how they may be overcome (Smith *et al.*, 2019). In sections 4.2 and 4.3, we review the wider governance literature regarding sustainability, conservation and natural resources management in order to apply key concepts to the context of conflicts. In general, there are two main approaches to governance: the normative approach to assess the quality of governance, and the diagnostic approach, which has a more empirical focus in trying to understand why governance sometimes fails (Peters, 2011). We explore these approaches and use them to frame our overview of understanding and improving governance, which include "good" governance principles, issues pertaining to specific governance structures, and how the governance of conflict management may be approached in future.

4.2 The normative approach to governance

Good governance has become something of a buzzword in conservation, increasingly used in the discourses of international organisations and public bodies (see Table 5). However, it is important to remember that the idea of what constitutes good governance is a normative concept, derived from social norms and standards (Peters, 2011). There is therefore no definitive answer to the questions of what good governance is and how it is achieved. Furthermore, there are many different conceptualisations of this notion, backed by various ideologies and principles (Armitage, de Loë and Plummer, 2012; Lange *et al.*, 2013). The ambiguity of the term allows for certain actors to adopt a form of "good" governance that fits with their own perspectives and system (Peters, 2011). Nonetheless, the normative approach to governance does provide a mechanism for the quality of both government and governance to be evaluated, and a basis for re-shaping ineffective governance structures (Borrini-Feyerabend *et al.*, 2004).

This is reflected in the different conceptualisations of good governance offered by various international organisations. For example, WWF and the World Bank both focus on evaluating government – through the identification and mitigation of state corruption – and helping governments and businesses to work together in order to reach sustainability goals (Table 5). Other perspectives of good governance, however, look specifically at decision-making processes, such as IUCN and FAO, which advocate that state decision-makers should act in ways that are equitable, transparent, accountable, effective, responsive, inclusive, and work towards building consensus – while also remaining within the law. These eight good governance principles originate from the UN (United Nations,2009) and have been utilised in various academic and non-academic publications.

Table 5 – 'Good' governance, as defined by five international organisations (UN, IUCN, FAO, WWF and the World Bank)

Organisation	What defines "good governance"?
United Nations (UN)	The process by which decisions are implemented. Good governance should be equitable, inclusive, participatory, consensus-orientated, accountable, transparent, responsive, effective, efficient and should follow the law (United Nations, 2009)
International Union for the Conservation of Nature (IUCN)	"The interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken and how citizens and other stakeholders have their say." Decision-makers should act in an open, fair and transparent way, and be held accountable. Decisions should be inclusive, effective, efficient, consensus-orientated, and follow the rule of the law (IUCN and , World Commission on Protected Areas, Internet)
Food and Agriculture Organisation of the UN (FAO)	The principles of good governance can be made operational through equity, efficiency, transparency and accountability, sustainability, subsidiarity, civic engagement and security (FAO, 2007)
World Wildlife Fund (WWF)	Locally managed resources, certification schemes, and balancing conservation with producer/worker's rights. Tackling corruption. Helping governments and businesses to meet sustainable targets (WWF, 2019a)
World Bank	Capable, efficient, open, inclusive and accountable institutions. Tackling corruption (World Bank, 2020)

Another widely recognised set of guidance principles are those of Ostrom (2015; see Box 5), whose work is rooted in the common pool resource (CPR) literature, referring to resources that are jointly used by a community of individuals where use of the resource by an individual reduces the quality or quantity of that resource for others (Ostrom, 2015; Smith *et al.*, 2019). For example, fisheries, pasture lands and community-owned forests are all considered CPRs. The design principles consider the governance characteristics that stimulate collective action within the user community to manage CPRs sustainably and prevent their deterioration (also referred to as principles for "robust" governance) (Ostrom, 2015). Local level collective action, institution crafting, and the distribution of user rights are key themes (Dietz *et al.*, 2003), as is self-governance, or self-organisation, of local communities (Lopez and Moran, 2016; Biggs *et al.*, 2019). The design principles have proved a useful lens with which to evaluate CPR governance, and research suggests that the absence of some or all of the principles threatens the likelihood of collective action and therefore the long-term sustainability of CPRs (Baggio *et al.*, 2016). It has been advocated that Ostrom's work should be applied more to conservation, based on the criticism of conventional, exclusionary approaches to wildlife and natural resources management, and a shift in perspective towards conservation problems as complex, social–ecological dilemmas (Ban *et al.*, 2013; Cumming and Allen, 2017). Smith *et al.* (2019) argue that the focus on local level collective action could be useful in understanding how institutional arrangements govern human–wildlife interactions, viewing hunting as a CPR. However, some scholars – including Ostrom herself – warn against viewing the design principles as a panacea (Ostrom, 2007; Baggio *et al.*, 2016). Each problem or situation has its own unique elements and so cannot be generalised. Nevertheless, Ostrom's principles provide a good basis for tackling complex social–ecological dilemmas (Balliet and Van Lange, 2013). The most relevant features to wildlife conflicts are easily accessible mechanisms for conflict resolution, and effective internal communication and trust-building (Ostrom, 2015).

Box 5 – Ostrom's eight design principles for robust governance

1. Clearly defined boundaries (clear definition of the contents of the system and effective exclusion of external un-entitled parties).

2. Rules regarding the appropriation and provision of common resources that are adapted to local conditions.

3. Collective-choice arrangements that allow most resource appropriators to participate in the decision-making process.

4. Effective monitoring by representatives of the appropriators.

5. A scale of graduated sanctions for resource appropriators who violate community rules.

6. Mechanisms of conflict resolution that are cheap and easy to access.

7. Self-determination of the community recognised by higher-level authorities.

8. In larger social–ecological systems (SESs), organisation in the form of multiple layers of nested enterprises, polycentric governance, with small local SESs at the base level.

Two police officials hold up a jaguar skin collected from an illegal wildlife market in Iquiots, Peru

4.2.1 From centralisation to decentralisation

Also normative is the idea that including all resource users and stakeholders – rather than excluding them – will lead to more sustainable outcomes for both people and planet (e.g. Agenda 2030). Until recently, the conventional approach to governance in conservation was "command-and-control", where decisions and rules are made, authorised and regulated by one central body – which are typically formal institutions of the state (Armitage, de Loë and Plummer, 2012; Driessen *et al.*, 2012). This approach can be useful at achieving some conservation outcomes and is valuable under certain circumstances. For example, where species are severely endangered by human activities and stronger enforcement is needed (Redpath *et al.*, 2017) or where severe conflict limits collaboration (Hodgson, 2018). Government institutions have constitutions, rules and procedures that enable them to make decisions in the face of entrenched conflicts, and state actors can adopt important leadership roles in these situations (Young *et al.*, 2012; Butler *et al.*, 2015).

However, the centralised approach to governance has often proved ineffective at achieving sustainable outcomes. Most conservation problems are complex, large-scale, and involve not only ecological, but also social political and economic issues (Armitage, de Loë and Plummer, 2012; Smith *et al.*, 2019). Further complications arise because: a) many of these issues are interdependent; and b) characterised by multiple actors with different governance roles, interests, values, beliefs, norms, and capacities to enact change on the system (Bergsten *et al.*, 2019). Furthermore such factors are dynamic, and thus there is an inherent complexity and uncertainty which many traditional approaches to governance have failed to manage (Booher and Innes, 2019). Top-down processes lack direct interaction between stakeholders and so tend to produce win–lose outcomes that are often unjust in relation to local needs and concerns. For example, local communities may be marginalised or even excluded from conservation planning and implementation (Sterling *et al.*, 2017). Traditional or cultural forms of conflict resolution, wildlife management, and resource use may be ignored or inhibited without prior consultation (Oduma-Aboh, Tella and Ochoga, 2018). On the other hand, conservation actions may be forgone in favour of economic development and globalisation or reversed in response to socio-political changes (Salafsky *et al.*, 2002). Decisions are therefore perceived to be unjust, which can incite opposition, non-compliance, and conflict (Armitage, de Loë and Plummer, 2012; Aiyadurai, 2016). There is now a wide acknowledgement that conservation problems cannot sufficiently be dealt

with by single governance actors or organisational hierarchies, and that state actors cannot be the lone driving force behind environmental decision-making (Bergsten *et al.*, 2019).

This then raises the question of who should be involved in tackling such "wicked" problems (Lange *et al.*, 2013; Mason *et al.*, 2018). The answer is seen as shifting responsibilities and power from centralised state authority to other local or private bodies (Ostrom, 2009; Hoare, 2015; Bluwstein, Moyo and Kicheleri, 2016; Hossu *et al.*, 2018). This process of re-organisation is known as decentralisation (Ribot, 1999). Powers may be devolved to local state institutions, communities, NGOs, cooperatives, associations and the private sector (Ouedraogo, 2003), who work in a variety of partnerships and utilise different mechanisms and incentives to engage societal sectors in conservation. For example, in public–private and private–social partnerships, certification schemes and ecosystem services payments are used as incentives to encourage sustainable production of public goods (Lemos and Agrawal, 2006). There are also many examples of co-management or collaborative governance. Such efforts aim to bring together stakeholders with diverse backgrounds, experiences and perspectives, and integrate different knowledges as a means of collaborative problem solving (Hossu *et al.*, 2018). Collaborative processes work towards reconciliation of conflicts regarding competing interests and ideas about how natural resources should or should not be used (Johnston *et al.*, 2011; López-Bao, Chapron and Treves, 2017). Processes of social learning, interaction and participatory decision-making are emphasised (Butler *et al.*, 2015). The collaborative approach to governance therefore recognises the need for the devolution of authority to a more local context, and aims to improve the representativeness and inclusivity of environmental decision-making through the integration of local knowledge and sharing of responsibility (Margerum, 2007).

However, decentralised or more collaborative forms of governance are often hailed as a mutually beneficial antidote to "poor" governance – a concept widely assumed to constitute state-centric interventions (Bluwstein, Moyo and Kicheleri, 2016). Collaborative governance has been suggested to bring direct and indirect social benefits, including an increased sense of community, improved levels of trust and relationships among stakeholders, and enhanced social, political and intellectual capital (Innes and Booher, 2000; Butler *et al.*, 2015; Ulibarri, 2015; Booher and Innes, 2019). In some cases, this has led to improved conservation planning and implementation, more sustainable resource use, wildlife management or protection (Berkes, 2010; Butler *et al.*, 2015; Nel *et al.*, 2016). As a result, collaborative governance has become a buzzword in conservation of late, praised as a win–win solution that benefits all (Bluwstein, Moyo and Kicheleri, 2016). Scholars and conservation practitioners alike advocate for collaborative forms of governance, despite the ongoing question of what constitutes "success" and a lack of empirical evidence to suggest that genuine decentralisation is occurring on the ground (Blaikie, 2006; Hysing, 2009). In practice, collaborative governance has many pitfalls and limitations, which we discuss in more detail in section 4.3.1.

In summary, the normative approach to governance is useful in that it widens perspectives, placing focus on the process of managing conservation projects, rather than the outcome, and encourages consideration of not only ecological, but also social and political elements. It additionally provides a mechanism for evaluating government and governance, and guidance as to how problems within governance may be overcome. However, social–ecological systems are complex, and cannot be generalised. The normative approach can oversimplify complex systems in order to derive 'ideal' modes of governance – such as collaborative or integrative modes – and result in blanket recommendations that divert attention away from addressing the actual problems (Ostrom and Cox, 2010; Bergsten *et al.*, 2019). Also needed therefore are general diagnostic frameworks that can be used to analyse problems with existing systems (Ostrom and Cox, 2010; Peters, 2011; Armitage, de Loë and Plummer, 2012; Smith *et al.*, 2019). It is vital to not only to evaluate the effectiveness of governance, but also to understand why governance fails.

4.3 Diagnostic approach to governance

The term 'governing' is customarily associated with government or state institutions (Peters, 2011). The concept of governance, however, was developed within the political sciences in response to the understanding that other, more varied institutional

Warning posters produced by a local NGO highlight the dangers of living alongside the gaur in southern India

arrangements exist and have an equally important role in steering society (Bevir, 2011). Alongside government and state actors, a variety of other governance agents exist including civil society, the private sector, market stakeholders, and land managers (Kooiman, 1993; Driessen *et al.*, 2012). Such agents can operate independently or together, in a variety of different ways, forming various governance arrangements. A diversity of governance structures (or modes) therefore emerge across different sectors and levels of society, operating under their own regulatory mechanisms and processes. Yet, there are no universal definitions of the many and varied modes of governance (Lange *et al.*, 2013). Multiple different labels and conceptualisations of these modes exist, and some are more recognised than others.

There is general agreement, however, that different modes have key features that distinguish them from others, although there is ongoing discussion as to what constitutes these features exactly. Some studies have focused solely on which policy instruments are used (Jordan, Wurzel and Zito, 2005), whereas others have conducted more complex, multi-criteria analyses (Weber, Driessen and Runhaar, 2011). The analytical framework proposed by Lange *et al.* (2013) is perhaps the most comprehensive, identifying three key dimensions for categorising governance: politics refers to the process of governance, including the actors involved and how they exercise power and interact; polity encompasses the structural components, such as institutional structures and rules; and policy depicts the content of governance – the policy instruments and strategies used to reach specific goals, how they are developed and how they are implemented.

Lange *et al.* (2013) hypothesise that the dimensions identified are interdependent, and that shifts take place within them. A useful perspective is to visualise governance modes on a continuum between two extremes, which relate to the level of state intervention (Hysing, 2009; Driessen *et al.*, 2012). On the one side is the more traditional "command-and-control" governance structure, where society is steered by top-down, formal institutions of the state. On the other is complete social autonomy, in which society self-governs (Figure 3). Between these two extremes lie multiple variations, including collaborative or network governance, polycentric governance, public–private partnerships, and interactive governance (Driessen *et al.*, 2012).

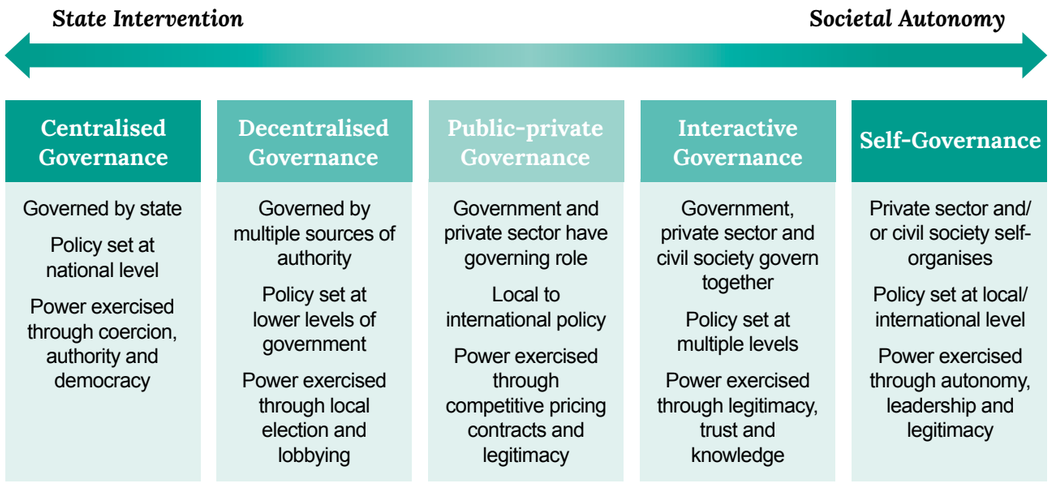


Figure 3 – Diagram of the simplified governance modes, and their key features. Modes are on a continuum from complete state intervention to total social autonomy. Adapted from similar figures by Hysing et al. (2009) and Dreissen et al., (2012).

The three dimensions identified by Lange *et al.* (2013) are key, as they encompass the central dimensions of governance and therefore can be used to diagnose failures within different governance modes. This is especially relevant when examining the idealised types of governance often recommended in conservation – there is no "silver bullet" or "one-size-fits-all" mode of governance (Ostrom and Cox, 2010). However, using diagnostic approaches, core problems can be diagnosed and addressed. In section 4.3.1, we use the framework by Lange *et al.* (2013) to evaluate common issues associated with collaborative governance in conservation and conflict management.

4.3.1 Diagnosing failures in collaborative governance

The collaborative approach to governance has flourished following the broad realisation that no single actor can effectively govern approaches to complex social–ecological challenges (Berkes, 2010; Hossu *et al.*, 2018). Collaborative governance comes in many guises, including co-management (Butler *et al.*, 2015) and various types of community-based initiatives; including CBNRM or community wildlife management (Balint, 2007; Webber, Hill and Reynolds, 2007). Such efforts aim to bring actors from multiple sectors together to engage in participatory decision-making and management and are thus theorised to improve transparency (Ernoull and Wardell-Johnson, 2013; Sandström, Crona and Bodin, 2014), integrate diverse perspectives and knowledges (Armitage *et al.*, 2009; Newig, Günther and Pahl-Wostl, 2010) and support and inspire collective action (Booher and Innes, 2019). In general, collaborative approaches are thought to enhance the capacity of societies to deal with complex social–ecological problems (Bergsten *et al.*, 2019).

However, simply bringing diverse actors together does not equate to effective governance (Armitage, de Loë and Plummer, 2012). Research on CBNRM (e.g. Benjaminsen *et al.*, 2013; Bluwstein, Moyo and Kicheleri, 2016), integrated management plans (Ernoull and Wardell-Johnson, 2013) and adaptive co-management (Folke *et al.*, 2005; Butler *et al.*, 2015) demonstrates that, in practice, there are many barriers and limitations to the effectiveness of collaborative arrangements. While it can be good to decentralise authority, collaborative governance can also spark problems. We will now use the core dimensions outlined by Lange *et al.* (2013) to illustrate common failures within collaborative governance structures.

Politics

Collaborative governance is often undermined by what Bluwstein, Moyo and Kicheleri (2016) refer to as the politics of participation. Actors may be around the same table, or working on the same issue, but sustainable solutions are only fostered if such actors genuinely collaborate (Bergsten *et al.*, 2019). However, the opportunity or willingness to collaborate is often limited, because environmental and sustainability issues extend beyond typical organisational boundaries, and involve actors with different beliefs, interests, values and capacities (Imamura, Lebel and Garden, 2005; Kininmonth, Bergsten and Bodin, 2015). Which actors choose to collaborate, and with whom, is heavily influenced by a number of other external factors, such as political histories, social tensions, relationship and power dynamics (Susskind and Rumore, 2015; Hossu *et al.*, 2018). As such, many attempts at collaborative governance instead become arenas for strategic positioning and power play. Rather than collaborate, actors compete and work independently within the same issue, which can lead to conflict, miscommunication and limited progress (Ostrom, 2015; Ruysschaert and Salles, 2014; Hossu *et al.*, 2018; Bergsten *et al.*, 2019). The absence of a central body can also lead to questions of legitimacy and authority and raise the potential for the entrenchment of power elsewhere (Armitage, de Loë and Plummer, 2012). For example, local communities are often represented by local elites or champions who have high social standing, may be corrupt, and still ignore the needs of marginalised community groups such as women and children (Webber, Hill and Reynolds, 2007).

Further, while many initiatives appear decentralised, they may not be so in reality. Governments may struggle to devolve adequate power and control to other actors (Bene *et al.*, 2009; Mapedza, 2009). In such instances, local organisations and bodies may be appointed to represent and respond downwardly to their constituencies, but instead remain upwardly accountable to higher state authorities (Sandström, 2009; Hansson-Forman *et al.*, 2018). Locals cannot hold their representatives to account and are still coerced into cooperating with initiatives that disempower them (Bluwstein, Moyo and Kicheleri, 2016). In this way, governments may still exercise control in rural areas – a process known as recentralisation (Ribot, 1999). Recentralisation is common in less developed countries and has been well documented in critiques of community-based initiatives, such as Wildlife Management Areas (WMAs) in Tanzania (Benjaminsen *et al.*, 2013; Bluwstein, Moyo and Kicheleri, 2016). It is therefore important to understand the political motivations behind the decentralisation of governance, which may reflect a desire to offload responsibility as opposed to genuinely facilitate collaborative deliberation (Ulibarri, 2015).

Polity

Linking actors across multiple levels has great benefits, such as an enhanced capacity for monitoring, feedback and understanding (Armitage, de Loë and Plummer, 2012). However, it is not easy to achieve in practice. Spatial and temporal scales between institutions often do not match up – for example, a community conservation scheme in Kalimantan, Indonesia, was cut short due to a deadline from funders (Wunder *et al.*, 2008). Similarly, decision-makers are often slow to respond to crises at the local level (Hoare, 2015). Collaborative governance needs strong horizontal and vertical linkages to engage stakeholders at all levels, including state and non-state actors, and ensure appropriate accountability and adaptive capacity (Armitage, de Loë and Plummer, 2012; Ernoull and Wardell-Johnson, 2013). This requires sufficient infrastructure – in a physical, communicative, and institutional sense. However, it is a challenge to find governance arrangements that are suitable. Effective institutions are limited by lack of resources, trained personnel, and an unresponsive bureaucratic culture (Sandström, Eckerberg and Raitio, 2013; Emerson, Nabatchi and Balogh, 2012). By way of illustration, the effectiveness of two collaborative governance arrangements in coastal zone management was influenced by the distribution of funding (Ernoull and Wardell-Johnson, 2013). In one area, NGOs were supported by public and private funding, which allowed local interests to be represented at national level, and thus increased the general social acceptance of resulting management decisions. In the other, limited funding and support for NGO presence limited cross-scale collaboration, and local voices were lost (Ernoull and Wardell-Johnson, 2013). For collaborative governance to be effective, vertical and horizontal linkages should be emphasised to improve communication, information exchange, and social learning (Lebel, Grothmann and Siebenhüner, 2010).

To summarise, a blanket recommendation of one idealised mode of governance is not progressive and may in fact divert attention away from important governance gaps. Generalisability must be balanced with local context (Smith *et al.*, 2019). Rather, approaches to governance should first work to identify existing governance modes, and diagnose potential failures. This can then be combined with generalised principles to prescribe solutions for effectiveness. Developments in this integrated approach will require better engagement between different disciplines, which we have advocated throughout this report.

5 THE USE OF STANDARDS IN CONSERVATION AND SUSTAINABILITY: AN OVERVIEW

5.1 What do we mean by a standard?

The word 'standard' is an umbrella term, with many different meanings – even experts have difficulty in definition (Alcántara, 2002). Historically, the term refers to an authorised unit of measurement (*Oxford English Dictionary*, 2020), which provides the basis for a much broader definition of an authorised or recognised principle for assessing the quality of certain subjects, goods and procedures. There are many different nuances within this definition, some more strict than others. For example, a standard can mean an informal set of criteria or an idealised model – or, it can mean official documentation, enforced rules, or nationally and internationally agreed principles (Alcántara, 2002). Fundamentally, however, standards provide a baseline for conformity, on which the accuracy or quality of a subject can be judged. The International Organization for Standardization (ISO) provides a more comprehensive definition: "…documents that provide requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose" (ISO, Internet).

Standards can therefore be used to minimise and discourage bad practice and strengthen procedures through the institutionalisation of certain principles. For example, relatively mature fields such as education and medicine have well established standards for a variety of purposes, including ethics and quality of evidence (Rosnow *et al.*, 1993). Similarly, a standardised approach can be used to navigate complex social–ecological dilemmas, such as sustainable development and the exploitation of natural resources. Industries that can be environmentally and socially disruptive – for example mining and tourism – use standards to improve the governance and management of their practices and overcome conflicts with local or indigenous peoples (Miranda, Chambers and Coumans, 2005; Boutilier, 2017). Certification processes, such as those developed by the FSC and Marine Stewardship Council (MSC), require certified forest and fishery owners to identify and uphold certain criteria relating to environmental protection, effective management and indigenous peoples' rights of ownership and access to these resources. Such certification schemes are seen as part of a necessary shift from ineffective hierarchal or state-led governance to more market-based or private modes of governance (Boström and Hallström, 2013; Gale and Haward, 2014). This is explained in more detail in section 5.4.

5.2 Why a standard for conflicts in conservation?

Conflicts in conservation are hugely complex social–ecological problems (Mason *et al.*, 2018). As this report has collectively demonstrated, there are currently widescale issues in how such dilemmas are understood, managed, and governed that seriously need to be addressed. However, there is a lack of consistent principles and strategic guidance pertaining to how these issues may be overcome (Decker *et al.*, 2016; Salafsky *et al.*, 2019). A standard may therefore provide one mechanism with which to improve the governance and management of conservation conflicts.

However, conservation conflicts are inherently complex and there is little empirical evidence of intervention effectiveness, let alone evaluations of overarching guidelines, criteria or principles for management (Salafsky *et al.*, 2019). In this section, we review the existing literature regarding the use of standards in other sectors, to provide insight into how a standard for conflict management may be implemented, potential areas of strength and weakness, and other relevant insights.

5.3 International trade agreements to tackle conflict: The Kimberley Process

In the late 1990s, several international NGOs called attention to the trade of "blood" diamonds, which funded wars and caused refugee crises across west and central Africa (Bieri, 2010). The Kimberley Process was established in 2000 to reduce said conflicts by ending the illicit diamond trade. It is an example of multi-stakeholder governance, consisting of representatives from international governments, civil society and the diamond industry (Haufler, 2009). Through a series of meetings and consultations at the international level, actors negotiated a regulatory framework aimed at tackling the trade in blood diamonds. This framework involves imposing sanctions, verification and trade procedures on the diamond industry – known collectively as the Kimberley Process Certification Scheme (KPCS) (Grant and Taylor, 2004; Grant, 2012; Bieri, 2010). Joining this scheme is voluntary; however, countries that choose to participate must commit to and maintain certain actions, including trade bans on illegal diamonds from other, non-participating countries, and attendance at annual progress meetings (Wright, 2004; Bieri, 2010; see Figure 4).

Figure 4 – Peer review procedure held at Kimberley Process (KP) annual meetings. Adapted from Davidson, 2016.

The process is considered a positive movement towards the resolution of conflicts and nearly all diamond-producing countries are members, including South Africa, Japan, China, and the United States (Grant, 2012). It has been suggested that the scheme has supported peacebuilding by making it substantially more difficult for blood diamonds to make their way into the market and act as a funding source (Haufler, 2009). However, there are some critics of the process.

The implementation of the KPCS is facilitated by a collaboration between state and non-state actors, including diamond firms, industry associations and NGOs who collectively encourage voluntary participation in the scheme. The participation of industry relies on the World Diamond Council, whereas nations are encouraged to cooperate by pressure from NGOs, such as the UN (Bieri, 2010). Enforcement and punishment for violations is left to the discretion of each participating nation (Grant, 2012; Howard, 2016). For example, the Foreign and Commonwealth Office, in conjunction with Her Majesty's Customs, implements the scheme in the United Kingdom (Wright, 2004). The lack of an independent monitoring scheme and strong,

centralised leadership poses problems. It is easy for countries to opt out of their own trade laws or cheat the system and, although the KPCS was developed and implemented through multi-stakeholder governance, it is still heavily criticised as overly bureaucratic, which can engender non-compliance within its participating nations (Howard, 2016).

5.4 Non-state, multi-stakeholder initiatives

As already discussed in this report, state-centric governance modes often cannot adequately address complex environmental problems (Berkes, 2010). Local rights and access to resources can be neglected by national legislation, engendering conflicts; rules are difficult to enforce in the remote regions where resource use and extraction occurs (Ruysschaert and Salles, 2014; Jonas, Makagon and Roe, 2016). Corruption, non-compliance and weak environmental policies also contribute to poor social and environmental outcomes, and thus limit progress in sustainable development (Bernstein and Cashore, 2007).

Over the last two decades, non-state multi-stakeholder alternatives – such as voluntary certification schemes (VCSs) – have boomed, setting standards for socially and environmentally responsible practices in multiple sectors (Boström and Hallström, 2013; Gale and Haward, 2014; Brandi *et al.*, 2015; Milder *et al.*, 2015). Such initiatives are considered examples of private or non-state, market driven governance, in that they are established without the direct involvement of government agencies (Auld *et al.*, 2009; Glasbergen, 2011). Through the creation of new market institutions, VCSs aim to provide capacity and incentives for sustainable resource use within the global economy. The incentive is that once producers or managers meet certain criteria, their goods become certified as environmentally and socially responsible – an accreditation that is becoming increasingly attractive to consumers (Conroy and Beatley, 2007; Gale and Haward, 2014). VCSs have therefore been widely advocated as effective ways to fill the gaps that governments are not able, or willing, to address (Glasbergen, 2011).

Examples include the FSC certification schemes; the Marine Stewardship Council (MSC) certification for sustainable fisheries; the Roundtable on Sustainable Palm Oil (RSPO) and Roundtable on Responsible Soy (RTRS). Additional certification schemes are in place for coffee, cocoa and tea (e.g. the Rainforest Alliance), cotton (the Better Cotton Initiative), sugarcane (the Better Sugarcane Initiative) and sustainable fuels (the Roundtable on Sustainable Biomaterials).

5.4.1 Basic structure and requirements

VCSs are typically established and governed by large, international NGOs, corporations or non-profit organisations (e.g. WWF and Unilever established the MSC); further developed and refined through multi-stakeholder processes, and then later adopted voluntarily by producers or resource managers (Cashore, Auld and Newsom, 2004). Although the exact structure of the standard-setting body differs largely, the general idea is that a multi-stakeholder organisation brings together actors from diverse backgrounds and interests into the decision-making process, thus allowing for different perspectives and concerns to be voiced, competing interests to be negotiated, and solutions to conflicts found (Boström and Hallström, 2013).

According to Milder *et al.* (2015), VCSs typically have the following four components.

1. *The standard itself.* This identifies the minimum criteria and requirements that must be met to receive certification.

2. *An assurance system.* Usually conducted by a third party [for example, Accreditation Services International (ASI)], this process inspects the standard and its implementation, and evaluates compliance.

3. *Certification or label.* The documentation that producers or managers can use to market and advertise their product, and that external parties (for example, consumers, potential funders) can use to assess products or processes.

4. *Training or technical assistance* to aid producers who are aiming to achieve compliance with the standard.

There are additional requirements that must be met before a standard can be identified as a VCS, including that the standard be established on a voluntary basis, encourage self-organisation among participants, and target a specific commodity (Brouwer, Georgiou and Turner, 2003). Certain international organisations also have requirements that must be satisfied in order for them to provide endorsement, such as a focus on minimising negative social and environmental impacts, meaningful stakeholder participation, accessibility and transparency, and independent, third-party accreditation (WWF, 2012).

5.4.2 Case study: The Forest Stewardship Council

The FSC is perhaps the earliest and most established non-state multi-stakeholder arrangement in natural resources management. Set up in 1993 in Toronto, Canada, the FSC has since developed the *FSC Accreditation Standard*, which identifies the minimum requirements needed to ensure forestry programmes are "managed in a competent, consistent, impartial, transparent, rigorous, reliable and credible manner" (FSC, 2019). Also known as the FSC "Principles and Criteria", the standard consists of 10 general principles (FSC, Internet; Box 6).

Box 6 – The 10 FSC Principles and Criteria for environmentally and socially responsible forest management (FSC, Internet)

1. Compliance with laws and FSC Principles

2. Long-term tenure and use rights to the land and forest resources shall be clearly defined documented and legally established

3. Indigenous peoples' rights shall be recognised and respected

4. Community relations and workers' rights shall be maintained and enhanced

5. Efficient management of forest products to ensure economic viability and a range of environmental and social benefits

6. Management should maintain, conserve and/or restore ecosystem services and environmental values, and avoid, repair or mitigate environmental impacts

7. A management plan should be written, implemented and kept up to date

8. Monitoring and evaluation should take place in order to implement adaptive management

9. High conservation values should be maintained and enhanced through applying the precautionary approach

10. Management activities shall be planned and managed in accordance with the Principles and Criteria collectively.

The FSC principles are broad statements that are too generalised to be applicable at ground level, and so are coupled with a set of criteria. The FSC does not carry out certification. Third party certification bodies – accredited by ASI – carry out the process, identifying their own indicators with which to measure the criteria (Boström and Hallström, 2013). This then allows the general principles and criteria to be adjusted to a local or regional context (see Figure 5).

Structure

The FSC is governed by a General Assembly, which is divided into three chambers with representatives from various societal sectors: environmental (NGOs); economic (business interests); and social (local communities and indigenous groups) (FSC, 2019). Each chamber is allocated one third of the voting power. Government bodies are not permitted as members, but are involved in various other ways. There is also a secretariat (located in Bonn, Germany) that handles day-to-day operations (Boström and Hallström, 2013).

Figure 5 – Typical structure and process of FSC certification

5.4.3 General strengths

Within the mainstream literature and global sustainability discourse, VCSs are recognised as a positive movement towards improving both the conservation of biodiversity and the sustainable development of rural livelihoods (Tayleur *et al.*, 2017). The certification provides an incentive for producers to act responsibly through market demand for more sustainable products, and offers a mechanism to improve accountability and the overall governance of global supply chains (Blackman and Rivera, 2011; Potts *et al.*, 2014; Bennett *et al.*, 2015). This latter argument could be especially relevant for low to middle income countries, where governments lack the capacity and resources to regulate resource use effectively, levels of corruption are high, and the negative social impacts of intensified commodity production are more severe (Barrett and Scott, 2001; Gibbs *et al.*, 2010). The social benefits of engaging multiple civil society actors in supply chain governance are frequently promoted (Blackman and Rivera, 2011).

Several studies have also examined the benefits of certification schemes to the environment, and

The government of Ghana works with WWF and other international organisations to implement electronic monitoring of the country's tuna fisheries. This pilot project began in 2015 with the aim to track fishery activities and provide accurate data on fishing

have reported some positive impacts (Lambin *et al.*, 2014; Bennett *et al.*, 2015). For example, in Costa Rica and Colombia, organic coffee certification schemes have reduced the usage of chemical pesticides and herbicides, increased tree cover, and improved soil and water conservation practices (Blackman and Naranjo, 2012; Rueda and Lambin, 2013; Ibanez and Blackman, 2016). VCSs have also been linked to a decrease in deforestation in some areas (Takahashi and Todo, 2014).

5.4.4 General weaknesses

Insufficient evidence of impacts

Although some studies report positive influences of VCSs, overall there are too few reliable sources of evidence to support this claim (Visseren-Hamakers and Pattberg, 2013; Milder *et al.*, 2015). A literature review of sustainability certification in certain sectors found that although 26 reports evaluated sustainability standards, only eight focused on environmental impact (Blackman and Rivera, 2011). Further, the authors judged these eight studies as poorly designed and overly based on quantitative measures, thus lacking credibility as comprehensive evaluations (Blackman and Rivera, 2011). Without robust evidence, it is difficult to ascertain whether commitments are being fulfilled, which is important information needed to attract or sustain business and political interest (Milder *et al.*, 2015). Lack of robust evidence also limits the potential to improve and adapt existing standards (Tayleur *et al.*, 2017). Efforts to generate this knowledge base could learn from developments in evidence-based conservation measures, including adaptive management and other forms of systematic monitoring (Pullin and Knight, 2009).

Available evidence implies that conservation and social impacts may not be as great as promised. A review of two marine eco-labels – the MSC ecolabel and generic "dolphin-safe" ecolabel – found that both were unlikely to make significant contributions to protection of marine life, due to ineffective and inconsistent procedures, unclear criteria, and lack of robust linkages (Ward, 2008). In Southeast Asia – particularly Indonesia – social conflicts continue despite the introduction of the RSPO and the steady increase in numbers of participants (Ruysschaert and Salles, 2014). Political ecologists conclude the system is therefore limited, and requires deep improvement (Edwards and Laurance, 2012; McCarthy, 2012). In summary, better understanding of

the benefits and shortcomings of VCSs could substantially improve their performance, rather than claims based on weak evidence. However, sustainable development is a long-term process. Sustainability standards are a positive step in the right direction – but adaptive management would benefit their progress.

Challenges of managing multi-stakeholder processes and conflicts

Agencies developing standards must navigate the challenges of managing multiple groups of actors across different sectors, interests and scales (Boström and Hallström, 2013; von Geibler, 2013). As with any cross-sector collaboration, the effectiveness of this non-state governance depends on how well actors engage with and reinforce another (von Geibler, 2013; Lambin *et al.*, 2014; Tayleur *et al.*, 2017). A collaborative strategy is widely promoted by VCSs, but often actors – typically conservation NGOs and growers or producers – have conflicting interests and agendas, which results in stakeholders taking strategic action rather than genuinely collaborating (Ruysschaert and Salles, 2014). For example, joint meetings within the RSPO make limited progress due to the irreconcilable views and power dynamics between involved stakeholders (Ruysschaert and Salles, 2016). As a result, contentious issues are not dealt with adequately.

Issues of legitimacy and authority

The concept of legitimacy relates to how well a shared rule or regime of an authority system of is accepted within society (Bernstein and Cashore, 2007). For something to be considered legitimate, it must be generally acknowledged as appropriate and justified, and this is realised through processes of social interaction (Bernstein and Cashore, 2007; Schouten and Glasbergen, 2011). Without adequate legitimacy, standards are less likely to be accepted and result in non-compliance. However, non-state and private forms of governance often struggle to obtain legitimacy – especially democratic legitimacy (Schouten and Glasbergen, 2011). In the absence of a state authority, democratic legitimacy is typically hindered as there is no central body or mechanism to ensure democracy (Ruysschaert and Salles, 2014). In the case of VCSs, legitimacy must be gained through other means, including principles for participation, transparency and inclusivity (Schouten and Glasbergen, 2011). Involved stakeholders must therefore recognise a VCS as a shared process in which problems must be raised and addressed (Bernstein and Cashore, 2007). There is the additional challenge that stakeholders must ensure compliance within their own groups (Ruysschaert and Salles, 2014). From the perspective of legitimacy, some studies have found voluntary schemes such as the RSPO to be largely democratic (Schouten, Leroy and Glasbergen, 2012), whereas others have found participation of stakeholders is limited (Schouten and Glasbergen, 2011) and compliance – or lack of it – is largely based on self-interest (Ruysschaert and Salles, 2014). In addition, multi-stakeholder processes can encounter problems because there are multiple potential sources of authority, which can cause issues if stakeholders are not willing to share or lend power (Boström and Hallström, 2013).

Trade-offs

Voluntary agreements face the challenge of balancing the need for reaching conservation goals with the objective of including as many actors – with different interests and goals – as possible (Busca, 2010). In the initial establishment phase of the VCS, the first priority is to ensure participation of multi-sector stakeholders (Ruysschaert and Salles, 2014). Therefore environmental criteria cannot be too strict and are often left open to interpretation, despite repeated calls from conservation NGOs and non-profit organisations for increased protection (Busca, 2010). This can lead to certain actors "cheating the game". A grower or producer may be able to take advantage of the fact that documents can be interpreted loosely. For example, with respect to the RSPO, legal protection in Sumatra applied to the orangutan as a species, but did not specifically define its habitat, meaning that vital habitat could still be technically deforested to provide land for plantation (Meijaard *et al.*, 2012).

5.5 Existing standards for management and governance of conservation practice

It is not just the sectors of industry and natural resources management that require standards to ensure procedures are socially responsible. The practice of conservation itself can also benefit from having clear standards to outline core principles for effective management and governance. For example, if a protected area or conservation initiative is established without recognition of indigenous peoples and their cultures, knowledges or customary use of resources, conflicts can be evoked (Malmer *et al.*, 2018). Or, the effectiveness of a conservation intervention may be reduced by a lack of consistent guidelines for monitoring and evaluation (Salafsky *et al.*, 2019). It has increasingly been suggested that a standardised approach should be applied to conservation to ensure best practice, and provide practitioners and managers with an incentive to think carefully about often overlooked factors, such as equity, governance, and social impact (Hoare, 2015; Pooley *et al.*, 2017). In more recent years, a few standards have emerged to suit this purpose.

Baka subsistence hunters and gatherers in the forest. La trinationale de la Sangha (TNS; The Sangha Trinational) is a unique collaboration between the countries of Cameroon, the Central African Republic and the Republic of Congo in promoting the conservation of natural ecosystems as a strategy for sustaining the long-term development of these countries

5.5.1 Open Standards for conservation

Open Standards (OSs), were developed by the Conservation Measures Partnership (CMP) as a means of improving the design, management and evaluation of conservation initiatives (CMP, Internet-b). The CMP is a consortium of practitioners from mainly conservation-based organisations (Redford *et al.*, 2015) who designed the OSs based on extensive analysis of existing decision support tools for conservation planning (Schwartz *et al.*, 2018). The OSs have five components that together provide a comprehensive decision-making tool, which include situation and viability analyses, action prioritisation, and the development of a conceptual model (Schwartz *et al.*, 2018; CMP, Internet-b). The OSs not only provide a structure for the principles of adaptive management, but also focus on tracking and accountability (Schwartz et al., 2018). The OSs have been applied to assist in the planning stages of conservation initiatives in specific regions (Vareltzidou, 2009) and for species across wide geographic scales (Wilson *et al.*, 2014).

There is little evaluation of the CMP OSs. However, Schwartz *et al.* (2018) do identify important considerations that are yet to be addressed. These include stakeholder identification and engagement – in particular: how to decide who is relevant and how to ensure their participation; and how to integrate multiple and varied threats into assessments. It is also apparent that best practice guidelines are still lacking in the more qualitative social and political aspects, such as stakeholder values, governance and social inequities (Wells *et al.*, 2016). We have also identified these gaps in section 3. In the last few years, progress has been

Aerial view of chopped-down Boreal forest near a tar sands mine north of Fort McMurray, Alberta, Canada

made towards conservation standards that aim to improve the social and political dimensions of management, particularly in relation to protected areas and indigenous peoples' rights. Although such standards are still in the relatively early stages of development, they do lend useful insight and raise important questions to be considered.

5.5.2 IIED-proposed conservation standards

In 2016, conservation standards were proposed by the International Institute for Environment and Development (IIED) in collaboration with Natural Justice, a non-profit organisation of environmental lawyers working at the local level to support indigenous peoples and local communities (Natural Justice, Internet). While the OSs were developed to improve the decision-making in conservation planning, IIED's conservation standards were conceptualised in recognition of a notable absence of human rights-based practical advice available to conservation practitioners and managers (Jonas, Makagon and Roe, 2016). The discussion paper by Jonas, Makagon and Roe (2016), identifies relevant rights law and advises how this can be further distilled into standards aimed at improving environmental justice in the management of protected areas and conservation projects. Such standards would provide the minimum human rights conditions that conservation interventions should be expected to meet, eventually forming a site-based tool that donors, organisations, and managers could use to assess and monitor the projects they endorse (Jonas, Makagon and Roe, 2016). Although these standards have not yet been institutionalised, their potential and future direction was discussed in detail at the 2017 Global Dialogue on Human Rights and Biodiversity Conservation in Kenya (Malmer *et al.*, 2018), which lends insight and interesting questions to the potential development of a standard for guiding the management of HWC. Such questions include where such a standard would be housed, which actors would form a roundtable similar to that of the RSPO and how they would be engaged (Malmer *et al.*, 2018). Participants in the dialogue acknowledged the difficulty of bringing multiple actors to the table. However, an interesting aspect of the IIED proposal is the incorporation of internationally recognised redress mechanisms – such as the Whakatane Mechanism (see Box 7) – which are dedicated to the resolution of conservation and resource use conflicts, and can be used to facilitate dialogue and trust-building among national level actors (Jonas, Makagon and Roe, 2016; Malmer *et al.*, 2018). Participants also recognised the length of time needed to effectively create and establish such a process, highlighting that such standards, while important, require care and long-term, stepwise development (Malmer *et al.*, 2018).

Box 7 – Outline of the Whakatane Mechanism, a conflict resolution framework developed by the International Union for the Conservation of Nature

The Whakatane Mechanism

Developed at the fourth IUCN World Conservation Congress in 2008, the Whakatane Mechanism is a set of mediation methods specifically for solving conflicts related to indigenous territories and conservation interests. It aims to address and redress current and historic injustices against indigenous peoples, and their access to land rights, tenure, and resources in protected areas.

The mechanism is housed and implemented by IUCN, but can only be initiated by request from local communities. The request is then reviewed by a steering commission, which includes the IUCN secretariat and its members. Following acceptance, a six-stage process then follows.

1. *Initial contacts:* Relevant actors are contacted by the IUCN Task-Force who present the situation and request their engagement.

2. *First roundtable:* Stakeholders are engaged in a discussion regarding the process of the Whakatane Mechanism, and must all agree on the process.

3. *Assessment:* This involves a 4–5 day field trip to the area under question with local actors.

4. *Validation:* The findings of step 3 are reviewed with local communities or indigenous peoples.

5. *Second roundtable:* Stakeholders are gathered at the national and local level to discuss a final report, draw conclusions and make recommendations, and decide on the next steps.

6. *Implementation, follow-up and monitoring:* The mutually agreed actions decided in stage 5 are then implemented, monitored and evaluated.

The IUCN states that the mechanism is not a "one-off assessment", but a long-term process to provide the context and capacity for trust-building. Thus, stages 1–5 are seen as essential preparation for a much longer process of initiation, adaptation, and follow-up. The question of whether the Whakatane Mechanism could be transferred to a more general, global context, as a large-scale redress mechanism for conflict resolution, was discussed at the World Congress in 2014.

Reference: Forest People's Programme, 2016; Malmer et al., 2018.

5.5.3 The IUCN Green List standard

In their proposal, Jonas, Makagon and Roe (2016) identify the IUCN Green List as a similar framework for improving the social performance of conservation interventions. The Green List, first developed in 2012, is a form of voluntary certification that aims to reward effective management and equitable governance of protected or conserved areas (IUCN and World Commission on Protected Areas, Internet). Managers and practitioners must satisfy a set of minimum requirements that pertain to good governance, sound intervention design and planning, effective management and positive conservation outcomes – the four components that IUCN identify as central to the successful conservation of nature. See Figure 6.

There are elements of the Green List that could potentially be relevant to the design of a global standard in conservation conflict management. One relates to how the Green List deals with the challenge of scale. As has been outlined within this report, some factors in conflict are context dependent, influenced by local and cultural mechanisms, and there is thus no silver bullet to deal with them. However, there are wider, overarching issues that appear to affect conflict management on a global scale (see section 2.6). The Green List identifies encompassing criteria that are consistent on a global level, and which must be met for certification to be awarded (IUCN, 2017). However, within these criteria, they also specify a set of indicators that can then be used to adapt the standard to a local context, which provides flexibility and allows regional or local factors to be considered. This is also reflected in the operational structure of the Green List (Figure 6). The standard is governed at the global level by a designated committee of experts working within the IUCN – assigned by the IUCN's director general – who manages the overall standard-setting, assurance and operational procedures, as well as making the final decisions (IUCN, 2017). However, the process at the local level is overseen by Expert Assessment Groups (EAGLs) who work alongside local jurisdictions to adapt the global standard to local needs, assist in documentation and implementation, and engage local stakeholders within the process. The latter task has no specific methodology in respect of various local or cultural mechanisms for engagement that already exist within local jurisdictions (IUCN, 2017). Therefore, the EAGL does not prescribe an idealised process, but works with and evaluates existing regulatory mechanisms (Wells *et al.*, 2016). This could be a hugely important factor in the designation of a standard for best practice in HWC management. As discussed in section 1.7, local communities may already have culturally appropriate methods of conflict resolution in place that, when ignored, can limit the effectiveness of governance and exacerbate existing tensions (Oduma-Aboh, Tella and Ochoga, 2018). So, while a standard needs to be consistent in some areas, there also needs to be opportunity for adaptation and flexibility.

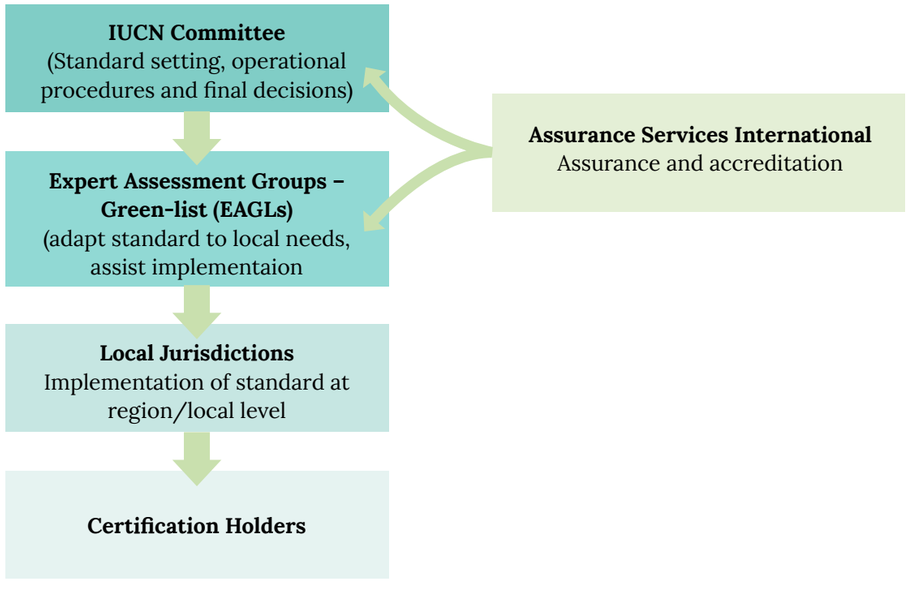


Figure 6 – Simplified representation of the implementation process for the IUCN Green List standard

Another core element of the Green List is the assurance system. Like the FSC and MSC, IUCN works in partnership with ASI, which acts as an independent oversight body to ensure credibility, consistency, and impartiality throughout the development and application of the standard (IUCN, 2017). ASI audits decision-making processes at the global level and sends trained reviewers to monitor the EAGLs at regional and local levels, providing an "out-of-country" perspective and verifying that the process is compliant with ASI procedures (Wells *et al.*, 2016). In addition, the IUCN claims to be working towards the "Global Codes of Good Practice for Sustainability Standards" set by ISEAL (Box 8) and aims to have complied with all requirements by 2019[2]. The principles set by ISEAL aim to ensure credibility and inclusivity within standard setting and implementation (ISEAL, 2014).

As with the sustainability standards, participation in the Green List is entirely voluntary (IUCN, 2017). The process therefore relies on non-financial incentives to ensure stakeholder participation and compliance, including the international recognition that comes with an IUCN endorsement, a sense of local and national pride, and the marketing potential of a green-listed site (Wells *et al.*, 2016). There is also the incentive that potential funders and decision-makers may provide more political and financial support to an initiative that has high conservation impact and adheres to the minimum requirements for ethical and equitable management (Akçakaya *et al.*, 2018). Although aspirational goals and the reporting of success is important in engaging society within conservation (Young *et al.*, 2014), the risk of such an incentive scheme is that it may introduce bias towards protected or conserved areas that are already well resourced. Of the limited number of studies that evaluate the Green List, Wells *et al.*, (2016) found that while 25 sites have already been designated as 'green-listed', others lack the capacity, understanding, experience or resources to attain the standard. For example, some site personnel did not have adequate understanding or knowledge of the assessment criteria, or the capacity to work towards them; others believed the standard was a direct evaluation of their own performance and so provided false information to gain Green List status (Wells *et al.*, 2016). The IUCN has since added a candidacy phase to the process, designed to allow more areas to participate and build capacity (IUCN, 2017). If the standard is to be more widely adopted, further efforts need to be made to provide clear guidance, overcome language barriers and misconceptions, and develop a clear and consistent communication strategy (Wells *et al.*, 2016).

Box 8 – Outline of the three global codes of practice for the effective development, implementation, and evaluation of sustainability standards defined by the International Social and Environmental Accreditation and Labelling Alliance

The International Social and Environmental Accreditation and Labelling Alliance (ISEAL) identifies the following three codes of practice.

1. **Standard setting**
   Refers to the development, structure and revision of the standard. States that the standard must be developed through multi-stakeholder consultation and decision-making processes.

2. **Assurance**
   A framework for assessing compliance with the standards. Ensures rigour, accessibility, accuracy and transparency of the standard.

3. **Impacts**
   A 'roadmap' of monitoring and evaluation to measure progress against the Sustainable Development Goals.

[2] At time of writing, the IUCN has not provided an update as to whether the ISEAL principles have been fulfilled.

6 CONCLUSIONS, ADVICE AND RECOMMENDATIONS FOR THE DEVELOPMENT OF A STANDARD TO GUIDE CONFLICT MANAGEMENT

6.1 Overall conclusions

This report contributes to an initial dialogue regarding the potential of a standard to strengthen the management of HWCs globally. From an extensive review of the literature, we have provided an overview of the wider issues regarding how conflicts are currently understood, managed and governed. We have also made suggestions as to how these problems may be overcome. These insights are summarised as follows.

- The term "conflict" is often misused. Conflicts are fundamentally social and political problems, yet are often confused with human–wildlife impacts. Many interventions are centred around the goal of mitigating the latter, which risks overlooking the underlying structural causes of conflicts and the socio-political context in which they are embedded. Conflicts should therefore be reframed to widen perspectives and understanding.

- Consistent evaluative measures of management strategies are lacking. There are many recommendations, but little empirical evidence to support them, as strategies are rarely evaluated. Due to their complex nature, it is also inherently difficult to provide a standardised measurement of what constitutes an effective strategy or a managed conflict. However, this is problematic as it limits the capacity to assess outcomes and improve future strategies. Conflict management requires long-term monitoring and an adaptive approach that fosters social learning, allowing strategies to be implemented and revised based on sound evidence.

- Conflicts are often studied and managed through disciplinary and sectoral silos. Because conflicts are currently widely understood as environmental problems, they are often researched and managed by individuals from conservation or natural science backgrounds. However, addressing the social and political dimensions of conflict requires expertise from multiple disciplines and sectors.

- There is little practical guidance in how to implement multidisciplinary approaches. A framework or set of guidelines assisting managers to decide what works and where would be beneficial.

- Governance is often ineffective, poorly understood or overlooked. Little attention is given to who governs management interventions, despite evidence that key issues reside in this area. Further, blanket recommendations of idealised governance modes often mask important inefficiencies and failures. This may be addressed by combining diagnostic frameworks with normative principles of effective and robust governance.

We conclude that a profound change is required in how conflicts are understood, addressed, and managed. This implies that more is required than simply improving attempts to resolve conflicts. Rather, fundamental modifications are needed in the institutions and discourses that govern conflict management, as well as change in how people perceive and react to such situations. A standard may be a positive step in this direction.

6.2 Potential development of a standard for conflict management

A standardised approach could be beneficial in addressing the aforementioned issues in the management and governance of conflicts. However, it should be noted that the IUCN SSC Task-Force on Human–Wildlife Conflict is currently developing guidelines for a similar purpose. Such guidelines will be designed for governments and managers, to advise on the effective management of conflicts on a global scale[3]. A standard could form a logical next step to these guidelines, moving from an advisory to a more binding framework. The consortium should be aware that this process will take longer[4] to build and refine, given the number and variety of factors that need to be considered (section 6.3). Further, this will require a good working relationship with IUCN. There should be open communication throughout this process to ensure synergies.

Although a standard could be a positive step in the transformation of conflicts, it should be exercised with caution. Some aspects of conflict are context-dependent, and thus conflicts cannot be generalised. This should be reflected in the design and structure of the standard and its governing bodies. Further, standards are not a silver bullet. Their application alone will not ensure positive outcomes in conflict management. As noted in section 5, standards can be a force for good, but do have their flaws. We address these issues in section 6.3, raising some important factors to consider moving forward in the development of a standard for conflict management.

Cattle preyed upon by wolves in Armenia

6.3 Key factors to consider and recommendations

An early question to address is who will develop, maintain and monitor the standards. Some certification schemes, like the Kimberley Process, are developed at national level with the involvement of state actors, whereas others – including the FSC, MSC and many of the sustainability standards – are examples of non-state multi-stakeholder governance, where new governing bodies are formed from the representatives of multiple sectors and without the involvement of state actors. The multi-sectoral aspect is logical for large-scale industries and natural resources management, where a diversity of interests are involved. However, collaborative processes experience problems, such as conflict and multiple sources of authority (see section 5.4.4). Additionally, governments can have an important role in providing a strong supportive framework to complement the standard. Therefore while state involvement can introduce issues of bureaucracy, state support is beneficial.

[3] From personal communication with Alex Zimmerman, chair of the IUCN task force.
[4] The task-force is currently in the initial development phase of the guidelines, and is aiming for early to mid 2020 as a loose deadline for the first set of guidelines to be made public.

The IUCN Green List is housed within the IUCN, but was developed in collaboration with national governments (including Korea, Colombia, France, Australia, Kenya, Italy, and China) and a variety of conservation NGOs. A similar process may work for the development of a standard for conflict management. However, it is important that the governing institution involves not just conservationists and government actors, but also expertise and NGOs from other disciplines – including conflict resolution, peacebuilding, international relations, and social studies. Such perspectives will be invaluable in setting a standard for conflict management in conservation.

Another factor to consider is the structure of the standard itself. As previously stated, some aspects of conflict cannot be generalised. However, what may work is a similar site-based design to the FSC Principles and Criteria and the Green List. A set of overarching, general principles may be outlined that pertain to the issues described in this report. For example, the management team should consist of expertise relevant to the conflict and its wider contexts, or existing governance structures should be identified and assessed prior to any governance reforms. Each principle could then be assigned more nuanced criteria. Finally, flexible indicators to measure these criteria at ground level could then be used to adapt the standard to a more local or site-specific context. Expert teams could work with local jurisdictions at ground level to ensure local and cultural mechanisms of conflict resolution are respected and utilised.

Then there is the rather large question of *how the standard will be implemented.* There are myriad ways in which this can be achieved. The IUCN, for example, has voluntary working groups of experts at regional and site level, who work with local jurisdictions to assist in the implementation of the standard. The FSC and RSPO rely on external certification bodies, accredited by third party organisations like the ASI, whereas the Kimberley Process devolves responsibility to the governments of its participating nations. Which will work best depends on: a) the structure of the standard; and b) the resources available. Regardless, a standard for the global management of conflicts in conservation will be resource heavy in terms of personnel and financing. The IUCN has perhaps combatted this slightly through the establishment of voluntary expert groups; however, such groups will likely be time constrained.

Another important factor to consider is an *assurance scheme,* which is essential to the effective monitoring and evaluation of standards. Almost all the standards reviewed in this report appointed third-party assurance. This may seem an unnecessary complication, but organisations such as the ISEAL help to ensure credibility, compliance, relevance, and impartiality in standard setting and implementation. We recommend that an assurance system be incorporated into the design of a standard for conflict management.

Finally, the concept of *legitimacy* was emphasised in our research on standards in terms of how well the standard will be accepted, and what motivates stakeholders to participate. With conflicts, it may be that incentives are “intended”, as they are for the Green List. The motivation to maintain and meet the requirements came from the pride and recognition gained from a certification awarded by an internationally recognised organisation. However, conflict management efforts cannot be marketed to tourists or consumers. An alternative would be to target donors and organisations who fund such projects to uphold the standard and use it as a tool to verify the initiatives they are asked to support.

6.4 Future directions

We recommend that the consortium continue to collaborate with experts from other sectors, organisations and disciplines in the development of this standard, and look to existing mechanisms for conflict resolution – such as the Whakatane mechanism – as potential frameworks. There are already movements in the same direction, such as the development of a global redress mechanism for conflicts and guidelines specifically pertaining to the management of HWC, both within IUCN, and in the formation of a HWC network with the World Bank. This initiative can only be strengthened through working jointly with such advancements, to provide a united front and combine resources.

David Leto, WWF-Kenya Elephant Officer, takes part in tracking and elephant collaring activity in the Masai Mara reserve, Kenya

APPENDIX A

Summary table of institutions managing HWC management efforts in Africa

Institution	Type	Approach(es)	Location(s)	Project Partners	Funding
Elephants for Africa	Charity	Mainly research e.g. tolerance and success of mitigation schemes through interviews or questionnaires with local farmers. Improvement of livestock health.	Work in Botswana (mainly Makgadikgadi Pans National Park) but based in England and Wales.	Studies carried out by students from University of Bristol. Affiliated with Republic of Botswana Ministry of Environment, Wildlife and Tourism; Bostwana Department of Wildlife and National Parks; Kalahari Conservation Society and Khumaga Primary School.	"Human–wildlife coexistence project" funded by GoodPlanet Foundation (Omega). Also reliant on donations. External funding from Chicago Zoological Society, Colombus Zoo, Memphis Zoo, Maryland Zoo, and Chicago Board of Trade.
Space For Giants	NGO	Coexistence strategies – build fences to stop elephants breaking into cropland. "Elephants are no longer the enemies of the people who can protect them best". Also research into elephant movements and behaviour.	Angola, Botswana, Gabon, Kenya, Namibia, Uganda, Zambia, Zimbabwe. Head office in Kenya, but other offices in London and New York.	Northern Rangelands Trust, San Diego Zoo, Botswana Race for Rhinos, African Wildlife Foundation, International Conservation Caucus Foundation (ICCF), National Geographic, UNEP, TIhokomela Endangered Wildlife Trust, Leopardess Foundation, Loisaba Conservancy, United Nations Development Programme (UNDP), Nature Conservancy, United States Agency for International Development (USAID), US Fish and Wildlife Service, Brooklyn Bowl (New York), US Department of the Interior, Uganda Wildlife Authority, Uganda Tourism Board, Save the Elephants, Uganda Conservation Foundation, Silent Heroes Foundation, Lewa Wildlife Conservancy, Kenya Wildlife Service, Botswana Department of Wildlife and National Parks, Department for Environment, Food.	

Institution	Type	Approach(es)	Location(s)	Project Partners	Funding
WWF	Independent Foundation	"We're preventing clashes between humans and animals" – various approaches. Technical solution, but also community interventions (identified separately), e.g. conservancies. Balance environmental protection with socio-economic development.	East and central Africa. Sites: Mau-Mara Serengeti (lion and elephant collaring); Coastal Kenya (land-use planning to prevent elephant and buffalo incidents).	Various	Funded by government and development agencies, trusts and foundations, and corporate partners. Most HWC work is funded by USAID.
African Wildlife Foundation	Charity	Specialised training and equipment (LED torches, "thunder flashes"); empowering communities with such tools, and establishing community conservancies where members employed as scouts to protect against poaching.	Tsavo East National Park	In conjunction with Kenya Wildlife Service	Public donations
Kenya Wildlife Service	Government organisation	Problem Animal Management Unit (PAMU) – rapid response team. Wildlife Compensation Process (led by District Wildlife Compensation Committee – includes MP of the area and head of local council). Fencing and local community interventions.	Kenya	Managing wildlife outside parks and reserves means that the unit has to physically interact with: members of parliament, councillors, opinion leaders, rural communities, provincial administration, NGOs, Civil society, private ranchers and other relevant ministries at the grass-root level.	Government funded
ALERT	Charity	Work with communities, policy makers, NGOs, researchers and businesses to implement locally conceived and relevant solutions to create sustainable motivation to conserve lions – e.g. lighting system and lion monitoring.	Zambia and Zimbabwe	Zambia National Parks and Wildlife Department, Copperbelt University, Coventry University, West Kentucky University, Zambian Forestry Department, "local communities".	Public donations.

APPENDIX B

Summary table of disciplines that explore conflict through different lenses

Field	Core concepts	Key methodologies	Application to HWC	Key references/individuals
Environmental history	How interactions between nature, humans and the natural world have changed over time	Archival and documentary research techniques	Places contemporary conflicts in their historical context, and reveals "tipping points", shifts and events that led to conflict escalation or de-escalation	Lambert, 2002 (history of grey seal conservation in Britain); Lambert, 2015 (environmental history and conservation conflicts)
Human–animal geography	Geography of animals and how this relates to human use of space.	Geographic tools (tracking, genetics, spatial analyses)	Helpful in predicting where conflicts may occur, or where there may be high incidences of human–animal interactions.	Lorimer and Srinivasan, 2013 (overview of human–animal geographies); Marguiles and Karanth, 2018 (a political-animal geography of encounter)
Ethics	Concerns the nature and justification of moral values and how they influence decision-making	Non-specific	Helping to understand values and norms, and their role in decision-making and conflicts. Also ethical considerations for management practices.	Dower, 2015 (ethics in conservation conflicts); Brittain *et al.*, 2020 (ethical considerations in conservation research)
Ethnography	Documenting human behaviours, sociabilities, cultures and emotional states	Behavioural analyses. Participant observation, cultural immersion, in-depth interviews, conversational analysis	Useful for in-depth analysis of human perspectives, social issues, and cultures that may influence HWC. Can be used to uncover hidden impacts e.g. mental health stressors. Valuable in sensitive situations that require a longer-term, less intrusive approach.	Barua, Bhagwat and Jadhav, 2013 (hidden impacts of HWC); Radford *et al.*, 2018 (ethnographic approach to analysing human relationship with Barbary macaques)
Psychology	Recognising, understanding and predicting human behavioural or cognitive patterns, attitudes and motivations	Case studies, naturalistic and lab-based observation	Aids in comprehending and predicting behaviour of stakeholders towards wildlife or other stakeholders in a conflict situation, and reactions to management interventions	Wieczorek-Hudenko, 2012 (emotions and decision-making in HWC)
Anthropology	Study of human behaviour	Behavioural analyses, ethnography, interviewing, questionnaires, historical analyses	Can explain why and how people behave towards wildlife or conservation interventions. Lends insight into different cultures, values and norms	Hill *et al.* (2017)
Sociology	Scientific study of human and societal relationships	Social network analysis, focus groups	Understand interactions at all levels: individual; institutional; and community	Bennett *et al.*, 2017 (social sciences in conservation)
Economics	Understanding economic agents (e.g. firms, consumers, institutions, trade unions) and the consequences of their interactions	Cost–benefit analysis (CBA), contingent evaluations	Measure costs and benefits to different parties, and how we can mitigate conflicts using this knowledge. Also how incentives can be used as management strategies	Hanley *et al.*, 2010; Hanley, 2015 (contingent valuations in hen harrier conflicts, UK and economics in conservation conflicts)

Field	Core concepts	Key methodologies	Application to HWC	Key references/individuals
Criminology	Study of crime, explanations for crime and social reactions to crime	Profile individuals to understand the motivation for the criminal behaviour. Interviews, participant observation	Can help to understand why people engage in illegal acts (poaching, hunting of protected species, wildlife trade), the underlying socio-political causes (e.g. act of resistance), and how such crimes can be classified	von Essen *et al.* 2014; von Essen and Allen, 2017 (illegal hunting of wolves); Carlson, 2018 (poaching)
Social–ecological systems	Considers trade-offs between the social and ecological components of a system	Suite of tools and methods borrowed from the social sciences	Can help to integrate social considerations into conservation, and emphasises the dynamic and unpredictable nature of such systems	Ban *et al.* 2013 (application of SES to conservation)
Political ecology	Attention to inequalities and structures that influence conflict dynamics. Focus on power dynamics and social justice	Ethnographics, oral histories, archival data, discourse analysis	Conflict central to the field – identifies how social and political inequalities have shaped relations (e.g. cooperation, conflict) and what should be changed to transform these situations.	LeBillon and Duffy, 2018 (conflict ecologies), Evans and Adams 2016 (fencing elephants in Kenya)
International relations	Study of politics, economics and law, and how they relate, on a global level	Policy analysis, quantitative and qualitative methods	Understanding of trans-boundary conflicts, global political dynamics and theories of peacebuilding on an international scale.	Gearoid Millar (personal communication)
Peace studies	Analysis of roots and structural causes of conflict, for its prevention and resolution	Methodologies from politics, international relations, sociology, economics, and anthropology. Multi-level analyses	Seeks to understand and address complex, underlying structural factors that produce conflict, e.g. poverty and injustice. Looks for general and global patterns	Rogers, 2015 (overview of peace studies); Madden and McQuinn, 2014 (conservation conflict transformation)

Field	Core concepts	Key methodologies	Application to HWC	Key references/individuals
Power theory (part of social and political sciences)	Theory and understanding of power structures and how they are developed or institutionalised. Changes in power distribution over time	Non-specific	Need to engage with power theory to overcome structural causes of conflicts, e.g. hegemonic power and counter-narratives of resistance (or invisible or hidden power). Understand how power dynamics have developed over time, and predict how they may change again. Highly relevant to governance	Raik, Wilson and Decker, 2008
Geopolitics	Study of the influence of factors such as geography, economics, demography on politics, or combination of political and geographic factors relating to a phenomenon, e.g. climate change	Non-specific	Important now that conflicts are seen through this lens, i.e. climate or environmental change can cause of conflicts (Lederach, 2017)	Gaynor *et al.*, 2016; (armed conflict and conservation)
Human dimensions research	Refers to how and why humans value natural resources, how humans want resources managed, and how humans affect or are affected by natural resources management decisions	Statistics, historical accounts, interviewing, life histories, surveys (attitudinal)	Focuses on human attitudes towards wildlife, and how to improve tolerance. Numerous scholars developing innovative methods to research such topics, e.g. Common Ground Matrix	Big field in North America: Alistair Bath (University of Newfoundland), Michael Manfredo (Colarado State), Daniel Decker (Cornell University)
	What conduct is or is not permitted in society. Study of laws, policies, norms and safeguards, rights and responsibilities	Non-specific	Can help to identify legal frameworks, laws and policies at all levels of a conflict (individual, national and international). Help to understand laws that exacerbate conflicts, or enable adverse biodiversity/social impacts	Harry Jonas, previously of Natural Justice

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