



What form of human-wildlife coexistence is mandated by legislation? A comparative analysis of international and national instruments

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Abstract

There are currently many controversies over the process of wildlife conservation, mainly focused on determining which forms of human-wildlife relationship should be endorsed by society. These differences often lead to legal discussions between lawmakers and stakeholders as result of misinterpretation of law. In this study, we examine the dominant conservation ideologies underpinning institutionalized wildlife conservation by exploring the moral basis underlying a broad range of national and international legislation. We used a teleological interpretative approach to explore the implicit and explicit intentions of legislative instruments. We found that a shift from a human-nature dualism to an integration paradigm occurred in the legal frameworks during the last 20–30 years. A desire to improve the status of threatened species or ecosystems was clearly expressed in all legislation. However, the widespread mention of consumptive values seems to indicate no principled opposition between the notions of conservation and of sustainable use. We identified three different groups of legislation: (1) a small group containing largely protectionist instruments, (2) a group based on the main European nature conservation texts and, (3) a cluster incorporating almost all the post-Convention on Biological Diversity (CBD) legislation from around the world. The CBD was found to have had a major impact on the shaping of the modern legal instruments, reconciling the eco- and anthropocentric values at the heart of modern legal thinking. Overall, the dominant legal ideology seems to aim for a compromise between the interests of society and wildlife, allowing its sustainable use and steering for shared space.

Keywords Biodiversity · Coexistence · Conservation · Convention on biological diversity (CBD) · Values · Wildlife

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Introduction

The high extinction rate of biodiversity is one of the main consequences of global change, with both growing human population and increasing per capita consumption being the major factors of this trend (Pimm et al. 2014). While the extent to which human activities will affect the future of species is uncertain, the literature addressing the adverse effects of land use change and climate disruption on biodiversity is now broad and our understanding of their mechanisms greatly enhanced (Jantz et al. 2015; Newbold et al. 2015; Suggit et al. 2018; Urban 2015). Even though biodiversity conservation is of worldwide concern, efforts to conserve wildlife in the Anthropocene increasingly lead to a diversity of conflicts between humans and wildlife, and especially between different groups of people over the way wildlife should be conserved (Redpath et al. 2013). These latter social conflicts are not so much about if species should be conserved, but rather centre on issues such as where they should be conserved, how much conservation is enough, how decisions should be made, what the most effective approaches to conservation are, and what is the most appropriate kind of human-wildlife relationship (Batavia and Nelson 2017; Lute et al. 2018). Typically, social conflicts over wildlife lead to attempts to implement administrative measures and boundaries aimed at human needs, but which are often at odds, and largely incompatible with the needs of wildlife. At least for the charismatic megafauna these social conflicts often concern the extent to which animals should be killed, by whom, with which methods, and for what reasons. Recent years have revealed a range of examples of this type of controversy, including debates over whaling (Morishita 2006), elephant hunting and culling (Dickson and Adams 2009), and the use of lethal control and hunting for large carnivores like wolves and lions (Macdonald et al. 2016a; Vucetich et al. 2017). Although a part of these controversies centres on discussions about the best strategy to achieve conservation goals and what levels of offtake are sustainable (Mace 2014), a major component centres on different moral positions based on values, emotions and attitudes about various conservation goals and approaches (Batavia and Nelson 2017; Macdonald et al. 2016b). Because conflicts over values and morals are often not amenable to compromise solutions, there is a tendency for such conflicts to end up being fought in referenda (Minnis 1998; Veríssimo and Campbell 2015) or in various national and international courts (Trouwborst et al. 2015). Such legal battles may resolve policy uncertainty and may deliver wildlife conservation outcomes, but they do nothing to resolve underlying conflicts; in fact, they may actually increase conflicts (Hiedanpää and Bromley 2011; Olson et al. 2015; Trouwborst et al. 2015; Redpath et al. 2017). The main reason referendums and legal battles are often unsuited to resolve such conflicts is due to the fact the social conflicts reflect disagreements over values, and there is no consensus on the core of the conflict. Hence, some stakeholders will have no reason to accept undesirable outcomes. A large part of this may also be because of the confounding of normative and scientific dimensions in such debates and deliberations (Nelson et al. 2016; Singleton 2016) Whereas depending on the circumstances law can be crucial to achieve conservation outcomes that could not otherwise be attained (Chapron et al. 2017; Trouwborst et al. 2017a, b), we would argue that courts are not always the appropriate place to settle conflicts that are essentially about morals.

In this article, we aim to identify the implicit and explicit moral basis of a range of national and international legal instruments. Based on their moral similarities, we then infer clusters of legal texts. As such, this reflects a combination of comparative and teleological analyses of legislation which aims to analyse “the spirit, the general scheme and the wording” of the laws (Fennelly 1996). The teleological interpretive principle is widely

accepted in cases where there is uncertainty about how legal instruments should be interpreted (Lenaerts and Gutiérrez-Fons 2013) and is a central tenet of the general rules of treaty interpretation codified in the Vienna Convention on the Law of Treaties of 1969. This approach has been particularly influential in past European court cases concerning the Habitat Directive (Trouwborst et al. 2017a, b). Adopting a comparative approach also allows us to examine the extent to which the moral basis of national legislation has become globalised (Ellis 2011), and the role that international treaties have played in this process.

Materials and methods

This study consists of both an internal and external enquiry of legally binding instruments (see Trouwborst et al. 2015) where we start with external concepts from the theory and practice of wildlife conservation, explore to what extent we can find support for them internally within the wording of these legal instruments, and then discuss what this means for the application of the instruments. Our focus was on wildlife species that tend to be high in the public awareness, such as terrestrial mammals and birds. The basis for our analysis was a set of 18 key multilateral environmental agreements and other international legislation and 20 national legal instruments dedicated to wildlife specifically and/or biodiversity conservation in general when relevant, developed between 1968 and 2017 (Table 1). The international instruments were chosen to represent a selection of global and regional treaties and other legal instruments which are most instrumental in shaping the discourses on terrestrial wildlife conservation (see also Bowman et al. 2010; Trouwborst et al. 2017a, b). Whereas national legislation and international legal instruments both tend to be fleshed out in subsequently adopted documents (by-laws, technical guidance, decisions by Conferences of the Parties, etc.) and in court decisions, we focussed our analysis on the legislative texts that are highest in the legal hierarchy, i.e., the acts, treaties and EU legislation themselves. In some cases we had to explore some supporting texts and documents to better understand the positions in the higher level text, or to determine the specific consequences for wildlife. To represent the diversity of potential moral paradigms, the choice of the national level case studies was based on four criteria. Firstly, we used the three major legal traditions (e.g. the Civil law, Common law and Islamic legal traditions; Mitchell et al. 2013) to classify countries' legal systems. Because culture is an important factor in shaping moral thinking we further grouped the countries into four categories representing the four main religions (Christianity, Islam, Buddhism and Hinduism). We then ensured that we included legislation from all continents. Lastly, to cover the wide range of governance forms we ranked countries using the Worldwide Governance Indicators, an index which captures the six key dimensions of governance (Kaufmann et al. 2011). Making sure that most of the combinations were met, we sampled countries with an accessible translation in English or French (the native language of the first two authors).

We initially developed a list of 13 different, but not mutually exclusive, conservation paradigms or approaches that consist of different strategies, discourses, or professional/disciplinary orientations (Table 2) [based on an expanded version of Mace's (2014) categories] and explored the various strategic and moral characteristics of these. These characteristics focused on conceptual issues such as *space* (protected area vs whole-landscape conservation), *interaction* (appropriateness of human exploitation of wildlife), *ontology* (human-nature duality vs integration) and *motivation* (in terms of their eco-centric or anthropocentric nature). We then examined the text of the 38 legal instruments searching

Table 1 List of national and international legal instruments analysed in this study

Global	
Global agreements	Convention on Wetlands of International Importance especially as Waterfowl Habitat. 1971 Convention Concerning the Protection of the World Cultural and Natural Heritage. 1972 Convention on International Trade in Endangered Species of Wild Fauna and Flora. 1975 Convention on the Conservation of Migratory Species of Wild Animals. 1979 Convention on Biological Diversity. 1992
Regional	
African Union	African Convention on the Conservation of Nature and Natural Resources. 1968 African Convention on the Conservation of Nature and Natural Resources. 2003 (not yet in force)
Council of Europe	Convention on the Conservation of European Wildlife and Natural Habitats. 1979 European Landscape Convention. 2000
European Union	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the Conservation of Wild Birds. 2009 (originally 1979) Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora. 1992
European mountain chain instruments	Convention Alpine. 1991 Protocole d'Application de la Convention Alpine de 1991 dans le Domaine de l'Aménagement du Territoire et du Développement Durable. 1994 Protocole d'Application de la Convention Alpine de 1991 dans le Domaine de la Protection de la Nature et de l'Entretien des Paysages. 1994 Protocole d'application de la Convention Alpine de 1991 dans le Domaine des Forêts de Montagne. 1996 Framework Convention on the Protection and Sustainable Development of the Carpathians. 2003 Protocol on Conservation and Sustainable Use of Biological and Landscape Diversity to the Framework Convention on the Protection and Sustainable Development of the Carpathians. 2003 Protocol on Sustainable Forest Management to the Framework Convention on the Protection and Sustainable Development of the Carpathians. 2011
National	
Bolivia	Ley de Vida Silvestre, Parques Nacionales, Caza y Pesca, Decreto Ley 12301. 1975 Ley Marco de la Madre Tierra y Desarrollo Integral para Vivir Bien, Ley No 300. 2012
Brazil	Federal Constitution, Chapter VI Environment, Article 255. 1988 Brazilian Environmental Crimes Law. 1999
Bulgaria	Biological Diversity Act. 2002
Canada	Canada Wildlife Act. 1985 Species at Risk Act (SARA). 2002
China	Environmental Protection Law of the People's Republic of China. 2014 Wildlife Protection Law of the People's Republic of China. 2016
Congo	Loi n° 14/003 du 11 février 2014 relative à la conservation de la nature. 2014
Costa Rica	Biodiversity Law. 1998
Estonia	Nature Conservation Act. 2004
France	Code de l'Environnement, version consolidée au 16 mai 2017. 2017
India	The Indian Wildlife (Protection) Act. 1972
Kazakhstan	The Law of Republic Kazakhstan from July 9, 2004 N 593-II about Protection, Reproduction and Use of Fauna. 2004
Kenya	Wildlife Conservation and Management Act. 1976 The Wildlife Conservation and Management Act. 2013

Table 1 (continued)

Mongolia	Environmental Protection Law. 1995 Mongolian Law on Hunting. 2000
Norway	Nature Diversity Act. 2009
Oman	Royal Decree No. 114/2001 issuing the Law on Conservation of Environment and Prevention of Pollution. 2001 Royal Decree No. 6 of 2003 issuing the Law on Nature Reserves and Wildlife Conservation. 2003
Slovenia	Nature Conservation Act. 1999
South Africa	No. 10 of 2004: National Environmental Management: Biodiversity Act, 2004 with additional reference to the Draft Norms and Standards for the regulation of the Hunting Industry in South Africa. 2004
Tanzania	The Wildlife Conservation Act. 2009
United States	Wilderness Act. 1964 Endangered Species Act. 1973

for words and phrases that either explicitly or implicitly served as indicators reflecting association with the different approaches. This was done in an iterative fashion, with texts being re-examined as the list of indicators grew. The result was a table where each instrument was coded for the presence or absence of a given indicator. In order to visualise the relationship between the different instruments we adopted a document clustering method adapted from Willett (1988). A Jaccard coefficient was used to calculate the similarity in the binary matrix developed from the instruments, which was then clustered using the method of Ward (1963). All analyses were conducted in R 3.4.0.

Results and discussion

The legal instruments contained indicators that reflected partial adherence to 11 of the 13 conservation approaches (Table 2). Rewilding which a recent variation of restoration ecology that emphasizes the restoration of ecological processes and the removal of human agency (Seddon et al. 2014) is a relatively new framework so that there has not been sufficient time for it to explicitly enter legislation. However, the older concept of ecological restoration was widely mentioned in 63% of the instruments indicating widespread support for the idea of improving the status of species and habitats, but without the explicit precepts of rewilding. Although animal rights approaches were not directly represented, there was widespread reference to indicators that reflected an awareness of animal welfare considerations. Notably, this was not in the form of a general principled prohibition against the taking of animal life but was rather in the form of a prohibition on certain killing methods. However, it was rarely explicit if these prohibitions were motivated by a desire to avoid inhumane methods, or those that were either too effective, or non-selective for the target species. It should, however, be noted that we did not explore dedicated animal welfare legislation which often exists in parallel to conservation legislation.

The shaping of legislation and associated indicators reflect the development of conservation paradigms during the last 50–60 years. The evolution of paradigms shows multiple and competing approaches, and is not completely linear, but the timeline shows a clear shift in focus from species to ecosystems. Furthermore, in broad terms, the metrics have

Table 2 Overview of 13 different approaches or discourses surrounding wildlife conservation, with the indicators identified in a selection of international and national legal instruments

Conservation approach/discourse	Indicators	Occurrence
Animal rights	No indicators found	0
Animal welfare	Intent to show respect towards animals	0.18
	Ensure fair chase in hunting	0.03
Wilderness	Prohibit non-selective, very efficient or inhumane hunting methods	0.45
	Allow development of animal populations without human intervention	0.05
	Intent to reduce human interference with wildlife	0.45
	Ambition to preserve an environment independent from human interaction	0.03
	The word “natural” used as a dichotomy: human society on one side, nature on the other	0.76
Rewilding	Nature as something which can continue independent of human activity	0.18
	The state has a right to limit citizen activities to meet conservation purposes	0.24
	Nature has intrinsic value independent of humans	0.13
	No indicators found	0.00
	Assist the recovery of an ecosystem that has been degraded by human intervention	0.63
	Reintroduction of native flora and fauna	0.21
	Aims to conserve an ecosystem through human intervention	0.76
	Purpose to maintain a population on a long-term basis as a viable component of its natural habitat	0.37
	Explicit recognition that humans are involved in the loss of biodiversity	0.26
	Ambition to maintain indigenous flora and fauna without aliens	0.66
Wildlife management	Management of nature aiming to protect biodiversity from excessive rates of extinction	0.63
	Intent to conserve wildlife with human beings involved in the process	0.13
	Wish to maintain a state of equilibrium within a community of organisms	0.26
	Regulate animal trade and harvest from the environment	0.82
	State the possibility for citizens to get involved in active conservation	0.42
	Permit the taking of protected species under specific conditions	0.39

Table 2 (continued)

Conservation approach/discourse	Indicators	Occurrence
Sustainable use	Aim to use the environment while supporting long-term ecological balance	0.71
	Explicit statement that society can exploit its environment	0.68
	Aim to legitimize human-wildlife interaction through hunting activities	0.45
	Fair and equitable distribution of the benefits arising from the utilization of biodiversity	0.37
	Moral responsibility towards the sustenance and well-being of future generations	0.68
Ecosystem services	Legitimizing a human use of nature to meet their needs	0.71
	Emphasize that nature is a commodity	0.29
	Recognize the potential economic value of nature	0.76
	Recognize the potential anthropocentric non-consumptive value of nature (aesthetic, recreational, cultural)	0.84
	Support the view that nature is a renewable good	0.39
New conservation science	Support the vision that nature is ownable	0.42
	Acknowledge landscape, even anthropic as a distinctive part of our natural and cultural heritage	0.18
Cultural landscape Conservation	Legitimizing an ecosystem identified by its origins rooted in human agency	0.05
	Legitimizing of conservation friendly cultural traditions related to wildlife	0.53
Biocultural conservation	Acknowledge the link between biological diversity, ecosystems and human culture	0.24

changed from species and protected areas to those that link nature to human well-being and benefits to people (Mace 2014).

The frequency with which multiple indicators were found reflecting all the other conservation approaches indicates that a plurality of conservation approaches, and thereby different strategic and moral positions, were being simultaneously endorsed. For example, there were widespread mentions of indicators that reflected a wilderness or eco-centric approach. These included references that eluded to a nature-human dualism, intrinsic value, or a desire to reduce human impacts on wildlife. At the same time, there was even more widespread mention of issues related to sustainable use of wildlife, the exploitation of ecosystem services and the deliberate conservation of human-modified landscapes and human-nature biocultural interactions reflecting a high degree of anthropocentrism. This integration of eco- and anthropocentrism into the same instruments is most clearly seen in the CBD (Convention on Biological Diversity) that integrates intrinsic value, existence values and utilitarian use values into its preamble and substantive provisions. The implication is that lawmakers did not see any fundamental incompatibility between recognising that biodiversity has intrinsic value and opening for its exploitation (Bowman et al. 2010). The caveats are placed on the manner of use, which are associated with sustainability.

The extent of similarity in the way that different instruments combine the diverse indicators is best seen in the dendrogram derived from our coding of instrument text (Fig. 1). For the ease of discussion, we group these into three broad groups of clusters. With the exception of the European Landscape Convention (from 2000) all instruments in group A are older instruments from a period stretching from 1964 to 1988. This is clearly shown in

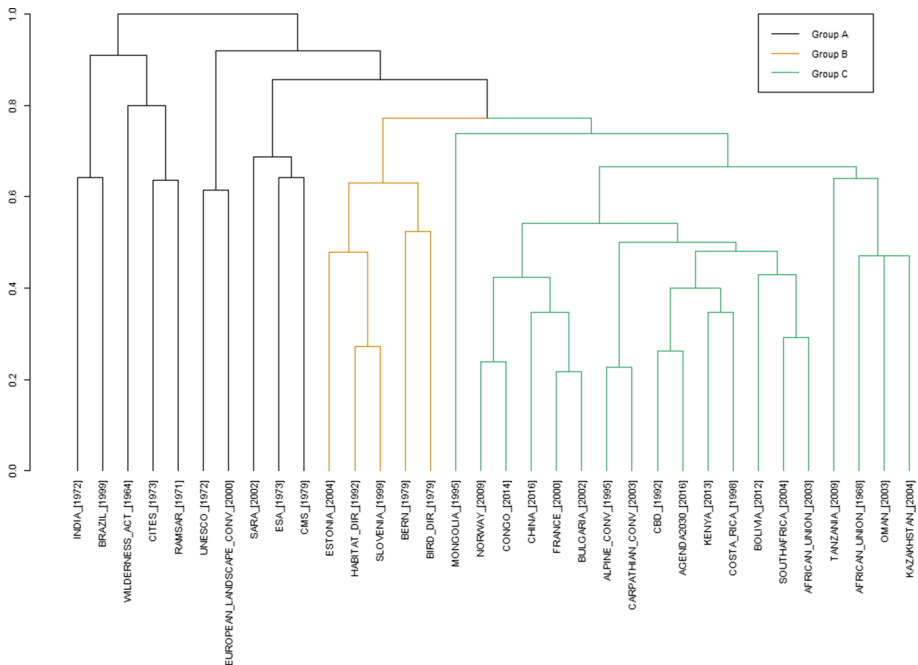


Fig. 1 Cluster diagram of a set of international and national legal instruments (with date that it came into force) coded for indicators of conservation strategies

their narrow focuses that almost exclusively concern wildlife, and which ignore many of the linkages to human societal interests. Accordingly, they fit into Mace's (2014) "Nature for itself" and "Nature despite people" categories. India and Brazil cluster together, apparently because they contain a rather protectionist view of wildlife (severe limitations on killing wildlife), which contrasts with all other countries examined. The next cluster of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), the Wilderness Act and the Ramsar Wetlands Convention reflects instruments that focus on rather narrow themes, of wildlife trade, wilderness preservation and wetlands, respectively. The UNESCO World Heritage Convention and the European Landscape Convention focus on sites, rather than species (as does the Ramsar Convention), and both draw heavily on the idea of heritage, interlinking the ideas of natural and cultural heritage. Canada's SARA (Species at Risk Act), the United States' ESA (Endangered Species Act) and the Convention on Migratory Species also focus narrowly on endangered or otherwise vulnerable (e.g. migratory) species of wildlife.

Group B consists of the core of European nature conservation instruments, namely the European Union's Habitats and Birds Directives, and the Council of Europe's Bern Convention, which share a common history. Two of the newest EU members, Estonia and Slovenia, cluster closely with these because they have drafted their national legislation by drawing directly from the European instruments with few hang-overs from the past.

Group C is a very broad group that almost entirely consists of legal instruments from the twenty first century. In content, they are all very much inspired by the CBD (from 1992) and accordingly are heavily influenced by ideas such as sustainable use, ecosystem services, and the interlinkages between biodiversity conservation and human well-being. Accordingly, they fit neatly into Mace's (2014) "Nature for people" categories. Wildlife concerns are also generally integrated into wider biodiversity conservation agendas, and legislation typically covers a far wider range of issues within the same legal instrument. This group of CBD inspired legislation reflects the fact that most countries' legislation is placed within a hierarchy of regional and global agreements that are going a long way to globally harmonise environmental legislation. The extent to which instruments mention specific sub-issues or not seems to have influenced the structuring within this group. For example Mongolia, Tanzania, Kazakhstan and Oman lie outside the main group. This may well be explained by the way that legislation is organised, with absent issues potentially also covered in other legal instruments that we have not examined.

Although much of the modern legislation seems to be CBD inspired, certain key elements of the CBD were not always very visible. There were frequent mentions of non-economic and existence values, but very few explicit mentions of intrinsic value in the formal sense (Batavia and Nelson 2017). Furthermore, the concept of benefit sharing was rarely formalised into legislation, despite it being a key element of the CBD. It should be noted that the CBD's Nagoya Protocol on Access and Benefit-Sharing has only just come into force (in 2016). Therefore, most countries do not yet have structures in place for implementation of the Protocol's goals and procedures, which may well be integrated as administrative regulations rather than law. Other authors have also pointed out the variation in implementation of CBD into national legislation for issues like benefit-sharing and with respect to other components such as the development of National Biodiversity Strategies and Action Plans (Chandra and Idrisova 2011; Gagnon-Légaré and Prestre 2014). However, these issues are mainly details compared to the dramatic overall impact which the CBD appears to have had on conservation legislation across the globe. From the point of view of our study, the key issue is that it is the moral basis of the CBD which is the single most important framing of modern national legislation governing the human-wildlife

relationship. Despite its mentioning of intrinsic value in the preamble, the entire framing of the CBD is anthropocentric (Mathews 2016) and even discussions of the ethical basis of the CBD almost entirely focus on anthropogenic issues of justice and equality (Schroeder and Pisupati 2010); even to the extent that the conservation goal of the CBD is motivated as an exercise in intergenerational justice, rather than intrinsic value. As a consequence, there is an increasing distance between the text of the major international wildlife conservation conventions (most of which are pre-CBD) and the post-CBD national legislative texts. Although cross-compliance between different instruments is required in theory, there may well be tensions between instruments in practice. These changes fall very much in line with evolving ideas of both the strategic and moral bases of biodiversity conservation in general (Mace 2014; Chan et al. 2016), which are increasingly at odds with some of the social movements among western and urban publics that embrace dualistic ideas of wilderness, rewilding and protectionist discourses.

Overall, our analysis renders several conclusions about the underlying moral basis of national and international legislation that are relevant for controversies over how wildlife should be conserved.

Location of conservation

Apart from the few instruments that are only focused on specific sites, the reviewed legislation mandates wildlife conservation throughout the landscape, although within a geographically differentiated manner. Protected areas are included in all countries' legislation, and it can be expected that wildlife will be subject to a different conservation management regime inside, as opposed to outside, these areas. However, no legal instrument a priori confines wildlife to these areas, and almost all legislation implies that wildlife needs to be integrated into multi-use landscapes where there is bound to be a need to reach compromises with human land uses. This indicates widespread legal support for the land-sharing strategy (in contrast to land-sparing). Such a strategy endorses the idea of trying to extract the maximum amount of conservation value from the whole landscape, which can increase connectivity between protected areas and bring the benefits of wildlife conservation to more people, but also opens for more human-wildlife conflicts.

Motivation for conservation

The reviewed legal instruments all clearly require that wildlife and wider biodiversity be conserved, but are not always explicit about the motivations and intentions. Consumptive and non-consumptive anthropocentric arguments dominate, but there is also some limited mention of intrinsic value. However, because virtually all countries are parties to the CBD it is implicit that they accept its preamble's endorsement of intrinsic value (Bowman et al. 2010), even if this is not explicitly articulated in their national legislation. It is interesting to note that the drafters of the CBD apparently did not see any contradictions between recognising intrinsic value and permitting exploitation of biodiversity. It should be noted that most discussion of the motivations for conservation is included in the preambles of the various legal instruments. While the formally non-binding preambles have lower legal status than the binding substantive provisions of the legal instruments, it is from the former that the greatest insights accrue from a teleological perspective.

Practice of conservation

With very few exceptions (e.g. India, Brazil) the reviewed legislation opens for (or at least does not principally oppose) the exploitation (both consumptive and non-consumptive) of wildlife and other biodiversity for a wide range of human benefits, as long as this can be done sustainably. Generally, the better the conservation status of the species or population involved, the more room for exploitation the legal frameworks tend to allow, and vice versa. There is therefore no obvious support for extremely protectionist policies that go beyond the needs of conserving threatened species.

Combined, the above findings appear to provide support for a general default view of wildlife conservation where there is a broad spatial interface between humans and wildlife, and where humans are able to exploit wildlife as long as this is sustainable. In essence, this indicates that the underlying value basis of modern global wildlife legislation predominantly accords with a non-dualistic form of conservation that is based on coexistence (shared spaces, rather than separation; Carter and Linnell 2016; Linnell et al. 2015), and interactive relationships, including the potential for sustainable exploitation of wildlife for a diversity of reasons (e.g. Chan et al. 2016).

Restrictions on coexistence and exploitation, for example within designated protected and wilderness areas, or because of a species having poor conservation status, appear to be best understood as context-dependent exceptions from, or even refined applications of, the general underlying moral principles of sustainable use. Furthermore, in situations where various publics request that species should be totally protected from human exploitation for reasons other than sustainability, arguments explicitly based on the desires of local cultural, social, or moral positions are likely to make a better fit, generally speaking, than those based on national or international legal requirements. In conclusion, our broad teleological survey of legislation underlines that in many cases, and in particular in situations where species or populations are faring well, the current legal system is unlikely to be the most productive recourse for those who advocate wilderness or protectionist “hands-off” conservation as a matter of principle.

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References

- Batavia C, Nelson MP (2017) For goodness sake! What is intrinsic value and why should we care? *Biol Conserv* 209:366–376
- Bowman M, Davies P, Redgwell C (2010) *Lyster's international wildlife law*. Cambridge University Press, Cambridge
- Carter NH, Linnell JDC (2016) Co-adaptation is key to coexisting with large carnivores. *Trends Ecol Evol* 31:575–578
- Chan KM et al (2016) Opinion: why protect nature? Rethinking values and the environment. *Proc Natl Acad Sci USA* 113:1462–1465
- Chandra A, Idrisova A (2011) Convention on biological diversity: a review of national challenges and opportunities for implementation. *Biodiv Conserv* 20:3295–3316
- Chapron G, Epstein Y, Trouwborst A, López-Bao JV (2017) Bolster legal boundaries to stay within planetary boundaries. *Nat Ecol Evol* 1(3):86

- Dickson P, Adams WM (2009) Science and uncertainty in South Africa's elephant culling debate. *Environ Plan C* 27:110–123
- Ellis J (2011) General principles and comparative law. *Eur J Int Law* 22:949–971
- Fennelly N (1996) Legal interpretation at the European Court of Justice. *Fordham Int Law J* 20:656
- Gagnon-Légaré A, Prestre PL (2014) Explaining variations in the subnational implementation of global agreements: the case of Ecuador and the convention on biological diversity. *J Environ Develop* 23:220–246
- Hiedanpää J, Bromley DW (2011) The harmonization game: reasons and rules in European biodiversity policy. *Environ Policy Gov* 21:99–111
- Jantz SM et al (2015) Future habitat loss and extinctions driven by land-use change in biodiversity hotspots under four scenarios of climate-change mitigation. *Conserv Biol* 29:1122–1131
- Kaufmann D, Kraay A, Mastruzzi M (2011) The worldwide governance indicators: methodology and analytical issues. *Hague J Rule Law* 3:220–246
- Lenaerts L, Gutiérrez-Fons JA (2013) To say what the law of the EU is: methods of interpretation and the European Court of Justice *Colum J Eur L* 20:3
- Linnell JDC et al (2015) Framing the relationship between people and nature in the context of European conservation. *Conserv Biol* 29:978–985
- Lute ML et al (2018) Conservation professionals agree on challenges to coexisting with large carnivores but not on solution. *Biol Conserv* 218:223–232
- Macdonald DW, Jacobsen KS, Burnham D, Johnson PJ, Loveridge AJ (2016a) Cecil: a moment or a movement? Analysis of media coverage of the death of a lion, *Panthera leo*. *Animals* 6:26
- Macdonald DW, Johnson PJ, Loveridge AJ, Burnham D, Dickman AJ (2016b) Conservation or the moral high ground: siding with Bentham or Kant. *Conserv Lett* 9:307–308
- Mace GM (2014) Whose conservation? *Science* 345:1558–1560
- Mathews F (2016) From biodiversity-based conservation to an ethic of bio-proportionality. *Biol Conserv* 200:140–148
- Minnis DL (1998) Wildlife policy-making by the electorate: an overview of citizen-sponsored ballot measures on hunting and trapping. *Wildl Soc Bull* 1973–2006(26):75–83
- Mitchell SM, Ring JJ, Spellan MK (2013) Domestic legal traditions and states' human rights practices. *J Peace Res.* 50:189–202
- Morishita J (2006) Multiple analysis of the whaling issue: understanding the dispute by a matrix. *Marine Policy* 30:802–808
- Nelson MP, Vucetich JA, Chapron G (2016) Emotions and the ethics of consequence in conservation decisions: lessons from Cecil the Lion. *Conserv Lett* 9:302–306
- Newbold T et al (2015) Global effects of land use on local terrestrial biodiversity. *Nature* 520:45
- Olson ER et al (2015) Pendulum swings in wolf management led to conflict, illegal kills, and a legislated wolf hunt. *Conserv Lett* 8:351–360
- Pimm SL et al (2014) The biodiversity of species and their rates of extinction, distribution, and protection. *Science* 344:1246752
- Redpath SM et al (2013) Understanding and managing conservation conflicts. *Trends Ecol Evol* 28:100–109
- Redpath SM et al (2017) Don't forget to look down—collaborative approaches to predator conservation. *Biol Rev* 92:2157–2163
- Schroeder D, Pisupati B (2010) Ethics, justice and the convention on biological diversity. University of Central Lancashire, Preston
- Seddon PJ, Griffiths CJ, Soorae PS, Armstrong DP (2014) Reversing defaunation: restoring species in a changing world. *Science* 345:406–412
- Singleton BE (2016) Clumsiness and elegance in environmental management: applying cultural theory to the history of whaling. *Environ Politics* 25:414–433
- Suggit AJ et al (2018) Extinction risk from climate change is reduced by microclimatic buffering. *Nat Clim Change* 8(8):713
- Trouwborst A, Redpath S, Gutiérrez R, Wood K, Young J (2015) Law and conservation conflicts in conservation: navigating towards solutions. Cambridge University Press, Cambridge, pp 108–118
- Trouwborst A et al (2017a) International wildlife law: understanding and enhancing its role in conservation. *Bioscience* 67:784–790
- Trouwborst A, Boitani L, Linnell JD (2017b) Interpreting 'favourable conservation status' for large carnivores in Europe: how many are needed and how many are wanted? *Biodiv and Conserv* 26:37–61
- Urban MC (2015) Accelerating extinction risk from climate change. *Science* 348:571–573
- Veríssimo D, Campbell B (2015) Understanding stakeholder conflict between conservation and hunting in Malta. *Biol Conserv* 191:812–818

- Vucetich JA, Bruskotter JT, Nelson MP, Peterson RO, Bump JK (2017) Evaluating the principles of wild-life conservation: a case study of wolf (*Canis lupus*) hunting in Michigan, United States. *J Mammal* 98:53–64
- Willett P (1988) Recent trends in hierarchic document clustering: a critical review. *Inf Process Manag* 24:577–597

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