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COMMENTARY

Shifting public values and what they mean for increasing democracy in wildlife management decisions

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Abstract Over the last century, changing public attitudes about the value of wildlife have triggered substantial changes in species management that have both benefited and hindered conservation efforts. Understanding and integrating contemporary public values is therefore critical for effective conservation outcomes. Using historic and contemporary examples, we highlight how public attitudes—expressed through the media and campaigns—are shaping the management of introduced and native species, as values shift towards animal welfare and mutualism. We focus on the issue of deliberate human-caused killing of wildlife, because protests against such management have disrupted traditional political and management structures that favoured eradication of wildlife across many jurisdictions and ecological contexts. In doing so, we show that it is essential to work with multiple stakeholder interest groups to ensure that wildlife management is informed by science, while also supported by public values. Achieving this hinges on appropriate science communication to build a better-informed public because management decisions are becoming increasingly democratised.

Keywords Public perception · Animal welfare · Conservation and wildlife management · Lethal pest control · Science communication

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To realise and sustain effective conservation objectives, scientists and wildlife managers cannot afford to ignore contemporary public values. With increasing modernization, globalization, and urbanization, Western attitudes towards the value of the environment are shifting from human dominance over nature to a form of 'mutualism' that sees other animals as equals (Manfredo et al. 2009); these changes have important implications for how we perceive and manage wildlife. Some discuss the inability of governments and institutions to adequately adapt to represent contemporary societal values and meet environmental management needs because of the over-representation of certain and politically powerful interest groups (e.g. hunting and agriculture) in decision-making (Jacobsen et al. 2010). However, historic and contemporary examples suggest that public values, particularly animal protectionist values, are increasingly influencing wildlife management decisions nonetheless.

A key component of this influence may be the increased access that people have to information and platforms for activism provided by mass media and the internet—dynamic mediums that not only adapt readily to changing social values but give voice to a broader public and can define global politics (Bennett 2003). An early example of how the media and activism shaped environmental management is that of poison baiting in the United States (US); after decades of debate among scientists and policy makers (Dunlap 1983), public pressure in the 1970s was instrumental in banning use of poison in wildlife management. This pressure included a "media storm" exposing widespread wildlife eradication campaigns (Flores 2016, p. 164): an essay in *The New Yorker* condemning lethal control of prairie dogs (*Cynomys* spp.) and black-footed ferrets (*Mustela nigripes*) (McNulty 1970), an article in the UK-based *The Spectator* condemning US mass wildlife slaughter (Wagner 1970), and a 3-week long coverage of "the poisoning of the west" in 1971 in *Sports Illustrated* (not typically an environmental medium). Protests also formed outside major environmental organizations (Dunlap 1988, p. 135). In response, US President Richard Nixon banned use of poison in wildlife management in 1972, a move that appealed to young environmentalist voters (Flores 2016, p. 164). Meanwhile, a 1972 documentary titled "Death of a legend" was instrumental in building support to eliminate the grey wolf (*Canis lupus*) bounty across much of Canada (Kellert et al. 1996). DDT (dichloro-diphenyl-trichloroethane) was banned in the same year (Dunlap 1981).

Such events are becoming increasingly common. Indeed, human-induced wildlife mortality by hunting receives mixed support (Decker et al. 2015), but the influence of changing public values on hunting for sport and management is evident (Fig. 1a). For example, the killing of a charismatic lion (*Panthera leo*), 'Cecil', in Zimbabwe in 2015 prompted overwhelming backlash globally against trophy hunting (Fig. 1b). As such, a call to support lion research by the Jimmy Kimmel Live show caused 4.4 million people to access (and crash) the lion-friendly WildCRU website (Macdonald et al. 2016). The Cecil event led to changes in US endangered species protection and commercial airline policies, making it more difficult for US citizens to import lion trophies (Macdonald et al. 2016). Meanwhile, trophy hunting of bears (*Ursus arctos*), lynx (*Lynx lynx*), grey wolves and wild cats (*Felis silvestris*) was banned in Romania in October 2016, following the collection of over 11,000 signatures on an online petition (Agent Green 2016). Proposals to allow hunters to kill grey wolves in Norway have also met heavy opposition from the public and conservation groups, with an online petition obtaining over 160,000 signatures (Siri 2016). The cull target in Norway was then reduced by 68% later that year (Sutterend and Ulven 2016).

Fig. 1 **a** Changing attitudes towards wildlife management have led to public protests against lethal wolf control in the United States, **b** The killing of charismatic lion, Cecil, prompted international backlash against trophy hunting, **c** Public criticism of the use of 1080 poison in pest management in New Zealand is increasing, **d** 1080 poison is used to kill dingoes, branded as "wild dog" control in Australia. Photo credits: Defenders of Wildlife, Wikipedia Commons, Rural News Group New Zealand, Jo Bloomfield

But while public attitudes have influenced management of some wildlife species, lethal control remains a common and widespread management tool. Australia and New Zealand are the biggest distributors of the poison bait sodium fluoroacetate (1080), which is used to control native and introduced mammals. However, in New Zealand, substantial and increasing public disapproval is evident (Fig. 1c), with 40% of the public opposed to using 1080 to control introduced pests (Russell 2014). In Australia, in addition to managing invasive species, the agriculture industry uses 1080 in broad-scale control to protect livestock from native predators including dingoes (*Canis dingo*) (National Project Steering Committee 2014, Fig. 1d). However, in July 2016, in an attempt to eradicate feral goats (*Capra hircus*) researchers released dingoes implanted with a 1080-filled capsule onto Pelorus island in the Great Barrier Reef. The capsule was intended to kill the dingoes within two years so that they did not stay alive on the island for a prolonged period, with the researchers stating "If for whatever reason we can't… shoot those dingoes, those little time-bombs will go off" (Schwartz 2016). It is easy to see how such a statement could lead some members of the public to think scientists have limited regard for animal welfare in wildlife management and pest control projects. As such, this project was ordered to be discontinued and dingoes removed from the island, because it drew strong public backlash including a petition with 5000 signatures (Sargeant 2016).

Such events suggest growing public discontent with certain kinds of lethal control in New Zealand and Australia, and although political structures have historically maintained

the status quo (Letnic et al. 2012), this may change. For example, as is observed internationally, wildlife management decisions in Australia are heavily influenced by a small group of special interest groups, typically consumptive wildlife users and the agricultural industry. However, in 2016, a recently formed political party, the Animal Justice Party, obtained a seat in the NSW State Government and has already questioned the way dingoes are managed by calling for a parliamentary discussion about dingo reintroductions (into areas they've been eradicated from by humans). This is the first time in history that such a discussion has taken place (Legislative Council 2016).

Animal rights activism does not, however, always align with conservation objectives (Doherty and Ritchie 2016), and we must consider the ethics of our management actions. For example, a ban on poison baiting in the US allowed persecuted native species to begin recovery, but if such a ban were to occur in Australia and New Zealand, there may be consequences for native biodiversity via restricted management of invasive species. Furthermore, in the United Kingdom (UK), activists protesting the fur trade released thousands of American mink (*Neovision vision*), a species largely responsible for the endangered status of native water voles (*Arvicola amphibius*) (BBC News 1998). Thus, in certain contexts activism can negatively impact conservation and management outcomes, reinforcing the need to better integrate environmental research with social science in order to accommodate differing values and perspectives. Killing wildlife may be sustainable or serve a management purpose, but it may not be considered ethically defensible, and we must recognize that it is ultimately ethical standards and values that shape our decisions (Pacelle 1998).

Acknowledging that public attitudes around wildlife are fickle (Mech 1996) and that the public don't condemn all lethal wildlife control (Way and Bruskotter 2012), it remains unclear how public sentiment will shape wildlife management in future, but we need to minimize conflict so that decisions continue to be informed by science. Ballot initiatives have been used in the US for decades to allow the public a role in wildlife management decision-making, and typically result in outcomes aligned with animal protectionist views (Pacelle 1998). Ballot initiatives receive criticism because rather than basing decisions on scientific principles, decisions are made by a largely uninformed and unaffected public (Manfredo et al. 1997). Because such initiatives question the professionalism of wildlife managers and scientists, they may build distrust towards them (Minnis 1998). Alternatively, if diverse stakeholders are involved in a collaborative, consensus-based decision-making process, there may be less negative backlash from the public when management is implemented (Keough and Blahna 2006). This highlights the need for appropriate science communication which recognizes public values and allows a better-informed public to contribute to decisions. If we fail to manage and incorporate contemporary public values in decision-making, we may witness a decreased role for science in shaping wildlife management, with serious consequences for conservation.

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