

Opinion

Conflict animals or conflict people— that is the question

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Abstract: Managing conflictual scenarios involving large carnivores is generally addressed from an animal-centric perspective. This is rather contradictory because such conflicts are mostly triggered by human conduct that acts on animal's instinctive behaviors. Shifting conflict mitigation perspectives to human behaviors may thus provide a more consistent management strategy than focusing only on animals. For example, human habituation and anthropogenic food conditioning are 2 main conflict drivers that mostly depend on human behavior. Thus, an approach that addresses the human dimension aspects of these conflicts needs to be reinforced. I offer 6 points to consider in prioritizing management to mitigate human–bear conflicts and, more generally, large carnivore conflicts. One of the most difficult challenges is not only managing habituated large carnivores, but also intensifying the human behavior-related management efforts.

Key words: anthropogenic food conditioning, brown bear, conflictual animals, human habituation, human–large carnivore conflicts

THE HUMAN POPULATION has increased worldwide in the last decades (Gerland et al. 2014). Expanding human activities affect how humans interact with animals and whether these interactions are positive or negative (Messmer 2000, Gaynor et al. 2018, Cimatti et al. 2021). Human–wildlife conflicts (HWCs) may arise when wildlife share the same physical space with humans. Given the range of wildlife species that may be implicated in HWCs, arguably large carnivore predation of domestic livestock has the greatest potential for negative impacts both to pastoralists and carnivores (Ugarte et al. 2019).

Large carnivores are recolonizing parts of their historical ranges because of increased regulatory actions and management, which has decreased poaching and retaliatory hunting (Cimatti et al. 2021, Franchini et al. 2021). As such, large carnivores are increasingly sharing areas with humans (Lowry et al. 2012, Venter et al. 2016, Hovardas et al. 2021). This emerging aspect of human–large carnivore coexistence is altering the nature of HWCs (Hovardas et al. 2021) and contributing to a growing worldwide problem (Messmer 2000, Treves and Karanth 2003, Franchini et al. 2021).

Except in the case of attacks on humans,

where encouraging appropriate human behaviors is recognized as being of paramount importance for reducing fatal encounters (Penteriani et al. 2016), managing conflictual scenarios involving large carnivores is generally addressed from an animal-centric perspective (Franchini et al. 2021). This is rather contradictory because such conflicts are mostly triggered by human conduct that acts on animal's instinctive behaviors (e.g., HWCs result from the exercise of natural behaviors in the context of an anthropogenic footprint). Shifting conflict mitigation perspectives to human behaviors (e.g., improved animal husbandry) may provide a more consistent management strategy than focusing only on animals (Gunther et al. 2018, Smith et al. 2018, Tomeček 2019, Urbigit 2019).

The brown bear (*Ursus arctos*) is a charismatic large carnivore whose populations are expanding over most of its range (Haroldson et al. 2021, Swenson et al. 2021). Brown bears have frequently been the focus of management efforts to mitigate conflicts with humans. However, conflicts are still increasing, mostly because the role of human behaviors contributing to the conflicts has not been fully considered, and despite the growing body of work regarding what humans can do to reduce HWCs, the real issue

that remains is getting people to do it (Lackey et al. 2018, Krofel et al. 2021).

Increased tolerance of brown bears toward humans (i.e., human habituation) and anthropogenic food conditioning are 2 main conflict drivers, and both mostly depend on human behavior (Gunther et al. 2018, Lackey et al. 2018, Franchini et al. 2021, Krofel et al. 2021). Additionally, because human tolerance and food conditioning can also be spread by social learning (e.g., transmission from mother to offspring; Morehouse et al. 2016), interventions at the source of the problem (i.e., frequent bear exposure to people and easy access to human-derived foods) may avoid exacerbating conflicts among socially related bears (Beckmann and Lackey 2018, Gunther et al. 2018, Lackey et al. 2018). Thus, an approach that addresses the human dimension aspects of these conflicts needs to be reinforced. Mitigating undesirable human behaviors and improving the decision-making of people sharing the landscape with bears may represent one of the most effective tools for reducing conflicts (Lackey et al. 2018). In this regard, I offer 6 points to consider in prioritizing management to mitigate human–bear conflicts and, more generally, large carnivore conflicts.

Addressing the source of the problem

Because humans share the responsibility for triggering HWCs by not preventing wildlife access to anthropogenic food and human resources such as apiaries and livestock, it would be more effective to correct human behaviors than those of bears through the use of bear-proof bins, guard dogs, and electric fences to curtail access to anthropogenic attractants (Lackey et al. 2018, Smith et al. 2018, van Eeden et al. 2018, Krofel et al. 2021). If bears are not rewarded when approaching humans and their activities, conflicts are less likely to occur.

Long-term benefits of proactive measures

When initial actions are implemented to reduce feeding on anthropogenic foods, predation on domestic animals, and/or damage due to foraging on cultivated fruits, agricultural products, and apiaries, the pre-emptive measures must be in place over time to be effective. Acting on every single bear means interven-

tions with short-term impact on 1 individual at a time.

Saving cost and personnel time

Focus on human education and modifications of human infrastructures that might trigger conflicts is less costly in terms of money and time spent by personnel. This may include personnel, such as rangers, involved in reducing the impact of habituated bears. For example, the costs of averting human interactions with and preventing damages of only 7 habituated bears over a 3-month period (June to October 2021, in the León portion of the Cantabrian Mountains, northwestern Spain) were: (1) 120 guard days of 8 hours each (i.e., 960 guard hours); (2) €13,440 EUR (\$13,174 USD) in personnel cost (cost per hour = €14 EUR/\$13.7 USD); and (3) €3,300 EUR (\$3,235 USD) in vehicle use (D. Pinto and D. Cubero, Junta de Castilla y León, personal communication).

Improving human effort

Saving time allows personnel to engage in other tasks such as poaching control, fire prevention, and tourist/visitor regulation. These tasks contribute to a more holistic approach.

Transboundary strategies

Because bears, like other large carnivores, can cover large areas (Gunther et al. 2018, Proctor et al. 2019, Haroldson et al. 2021, Swenson et al. 2021), management strategies should incorporate transboundary-level jurisdictional management. Administrations working collaboratively is crucial for addressing conflicts across jurisdictional boundaries (Penteriani et al. 2018, Proctor et al. 2019).

Viewing industry

Improved enforcement of regulations governing the tourism viewing industry decreases animal habituation (Gunther et al. 2018, Lackey et al. 2018). Because recreational activities are increasingly in demand, the lack of proper regulations can trigger more human–bear interactions, which may end in conflict (Penteriani et al. 2017, Gunther et al. 2018).

Conclusions

The habituation of some bears to people, mainly in human-modified landscapes, is in-

evitable and likely to increase because of more areas where people and bears will coexist in the future. This close coexistence represents a growing concern for managers (Gunther et al. 2018). It is thus time for large carnivore managers involved in conflict prevention to increasingly employ strategies that largely include pre-emptive changes in human behavior and the efficient restriction of predator access to human resources. Appropriate human behavior has already been highlighted as a critical element for reducing the risks of human–large carnivore conflicts. One of the most difficult challenges is not only managing habituated large carnivores, but also intensifying the human behavior-related management efforts that have made management of large carnivores successful (Penteriani et al. 2016, Beckmann and Lackey 2018, Gunther et al. 2018, Lackey et al. 2018, Smith et al. 2018).

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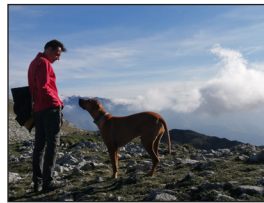
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