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## Editorial

# The management of large carnivores in Sweden – challenges and opportunities

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The articles comprising this special issue of Wildlife Biology present different theoretical and methodological approaches to the study of human individual and collective responses to large carnivores and their management in Sweden. In addition to utilizing the special issue to report on different social science perspectives, departure points and empirical data, we do also launch an integrated overarching meta-perspective to identify recurrent concepts that has to be understood and consciously applied to large carnivore governance and management to better handle individual and collective responses to the associated complex problems.

The papers selected for the issue were initially presented at a workshop in 2013, funded by the Wildlife Management Fund. The workshop gathered social scientists involved in research on different dimensions of large carnivore conservation and management in Sweden. The research presented at this workshop is reported in six scientific articles in this volume. As the breadth and quality of the empirical and theoretical content of the articles included in this special issue demonstrate, large carnivore management is loaded with emotive human responses, issues of social and political trust, conflicting values and norms, clashing knowledge spheres and politicized arenas of interaction (Clark and Rutherford 2014, Sjölander-Lindqvist et al. 2015). It is therefore increasingly important to understand these complex problems, involving uncertainty regarding future prospects for human-wildlife coexistence, conflicting goals and values, and disputes over the burdens and benefits over conservation initiatives. We argue, based on a synthesis of the research presented here, that understanding this complexity requires a societal perspective encompassing social science approaches in parallel to the traditional doctrine of scientific management which has dominated large carnivore conservation for a long time.

By including articles on individual responses to large carnivore governance and management (Frank et al. 2015,

Eriksson et al. 2015, Sjölander-Lindqvist 2015) and articles addressing collective responses and how these can be analyzed (Cinque 2015, Lundmark and Matti 2015, Hallgren and Westberg 2015), we contribute to a renewed and broadened understanding of the contemporary nature of the cultural, political, social and psychological dimensions on “efforts to steer or guide the actions of human groups – from small, local associations to international society – towards achievements of desired ends and away from outcomes regarded as undesirable” (Young 2013:3). By addressing human individual factors such as perceptions, norms and emotions pertaining to large carnivores and understanding these dimensions within a wider context, we extract and connect overarching themes of current findings in Swedish social science research. Through the results of the theories and methodologies of environmental communication, environmental psychology, human ecology, political science, public administration and social anthropology, we can provide insights into how we can understand human–societal responses to large carnivores and related management efforts.

The contributions deal with such questions as:

- What management actions for addressing human fear of brown bears/wolves have the lowest potential to fuel social conflict in brown bears and wolf areas respectively?
- How does direct and indirect experience of large carnivores affect attitudes towards large carnivore policy?
- What are the stated reasons for applying for controlled hunting of wolves and what are the authorities’ rationales for rejecting or approving these applications?
- What are the possibilities to apply deliberative practices to reduce conflict and enhance legitimacy in the management of large carnivores?
- How does collaborative governance transform the role and the behavior of public managers, when moving

from a centralized and performance-oriented style of management to an inclusive and facilitative style of management?

- To what extent does communication in large carnivore governance and management support the ideas of adaptive management?

As regards individual responses, Frank et al. (2015) show through an analysis of a survey distributed to residents in large carnivore areas that fear of attacks on livestock and pets was stronger than fear of attacks on humans in both brown bear and wolf areas. Based on the potential conflict index (PCI) approach the authors conclude that the management actions that had the highest potential for conflict among high-fear respondents in both brown bear and wolf areas were those involving permission to carry guns and pepper spray, while management actions aimed at spreading information on carnivore and human behavior had the lowest potential for conflict index.

By comparing levels of direct experience of bears and wolves with public attitudes towards these animals, Eriksson et al. (2015) examines the social effects of the increase in the Swedish populations of bear and wolf between 2004 and 2009. The results show an increase in direct experience of bears and wolves, lower levels of acceptance of the existence of these animals, and a lower degree of support for the policy goals of both species in 2009 compared to 2004. The changes are more prominent in areas with carnivore populations than in other areas of Sweden.

Sjölander-Lindqvist (2015) examines the applications for the targeted removal of problematic wolves in Sweden through lethal control, and authorities' decisions regarding controlled hunting in three counties in Middle Sweden, between 2002 and 2010. The content analysis of the stated reasons for applying for controlled hunting and the authorities' rationales for rejecting or approving these applications show that the controlled hunting may contribute to settle disputes concerning the material and social impacts of wolves by recognizing the interests of farmers, hunters, and local residents and safeguarding local values and traditions.

With a focus on the recent institutional change to strengthened regional influence Lundmark and Matti (2015) explore the possibilities to apply deliberative practices to reduce conflict and enhance legitimacy in the management of large carnivores. The authors conclude that although the current structure of the collaborative measure (the wildlife or game management delegations WMD/GMD) is designed to meet vital deliberative criteria, there are substantial differences between statutory and effective representation that, as it coincides with diverging beliefs, can affect decision making.

Furthermore the prospects for deliberation in these fora to reduce conflict levels among opposing interests seem to depend on the capacity for ensuring exchange of reasonable and informed arguments.

Hallgren and Westberg (2015) continue on the same theme and examine how different formats for communication affect adaptivity in the GMD. By applying the concepts of discursive opening and closure to communication episodes during meetings and data obtained in interviews and focus group meetings, the authors conclude that the communication practices observed in the GMD meetings prevent management from being adaptive.

Cinque (2015) examines the discretionary role of public managers within the context of collaborative management during the implementation of the wolf hunt in Sweden 2011. The article demonstrates that public managers function as facilitators, interpreters and mediators in pursuing collaborative efforts. Cinque concludes that in order to understand how collaborative management of natural resources works, greater attention has to be directed to the way public managers organize their activities and deal with their mandate.

This collection of articles provides a diversity of perspectives on both individual and collective responses to the governance and management of large carnivores. The findings are synthesized by Sjölander-Lindqvist et al. (2015) proposing how social science approaches can enhance understanding of the different layers and contexts of contested natural resource management. By stressing the individual, socio-cultural, political, and institutional dimensions studied in the articles in this special issue, the authors identify five recurrent concepts that must be understood and consciously applied to large carnivore governance and management: 1) establishment of trust between people and groups interacting on the subject; 2) fair representation of stakeholder interests; 3) acknowledgement of the different knowledge-spheres, including those based on personal experiences, culture and tradition, and science; 4) communication, based on dialogue about pluralistic perspectives, to collectively formulate and agree on set goals; and 5) leadership emphasizing empowerment.

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