

Frontiers in E3 9th cE3c Annual Meeting

# Back to the future:

bridging history into upcoming scenarios

## BOOK OF ABSTRACTS

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Flash Talk 12

## The effects of wild ungulates on smaller mammals: a systematic review and meta-analysis

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Wild ungulates are increasing in several parts of the globe, often recolonizing the empty niche left by previous livestock and agricultural systems. Due to their important role as ecosystem engineers, they can modify and change vegetation structure, as well as modulate soil ecological processes, affecting the remaining components of communities and posing new management challenges. Several studies have evaluated the effects of wild ungulates on other guilds, but the results are very specific (e.g., spatially), missing a more general applicability of knowledge. Thus, our goal is to synthesize the overall effects of wild ungulates on smaller terrestrial mammals on a broad scale.

Due to the complexity of assessing these impacts throughout the ecological network, we focused on mammals since they occupy different trophic levels and are key taxa in food webs. In a second phase, we conducted a review of the documented effects of wild ungulates on smaller mammalian guilds' abundance (<10 kg). Using a hierarchical meta-analytic approach on the reviewed studies that quantified the effects of ungulates, we assessed whether the presence of wild ungulates affects smaller mammalian guilds and whether these effects were associated with biome, wild ungulates' weight and foraging strategy, and smaller mammals' weight.

Our meta-analysis revealed that small mammals' abundance (Rodentia/Soricomorpha/Macroscelidea < 1kg) tended to decrease as wild ungulates abundance increased. Our results suggest that grasslands and coniferous forests exacerbate the negative influence of wild ungulates on small mammals. Our systematic review also reveals a gap in the literature regarding how higher trophic levels respond to wild ungulate disturbances.

The detected impacts of wild ungulates might result in changes in the abundance of small mammals through direct and indirect pathways. Our results must motivate a more holistic evaluation of rewilding projects and the correct assessment of the effects concerning wild ungulates reintroductions.

**Keywords:** Herbivores; Small mammals; Systematic review; Conservation; Wildlife management.