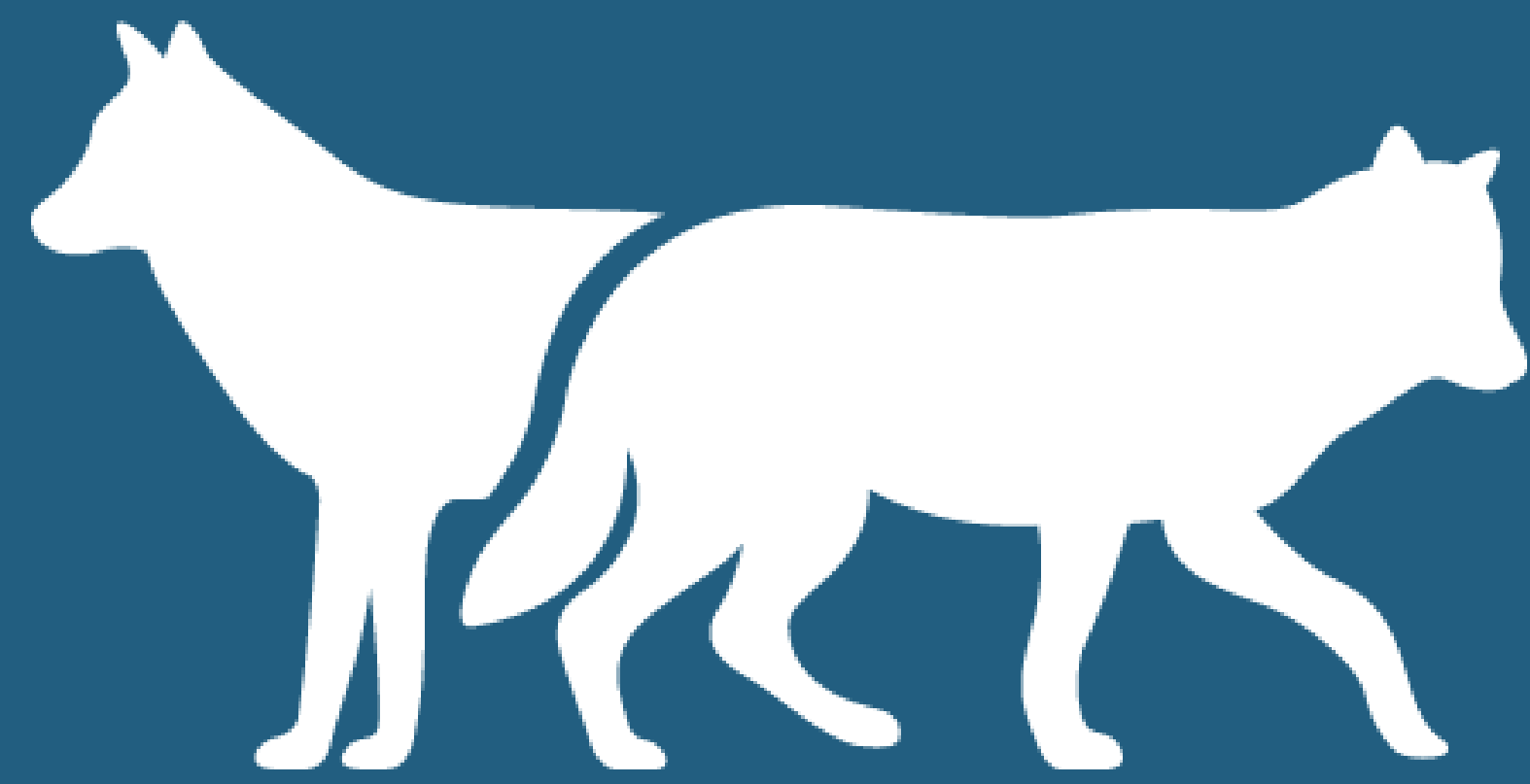


Wolves Across Borders

International Conference on Wolf Ecology & Management



WOLVES ACROSS BORDERS



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How fast do native ungulates respond to the return of the wolf in anthropogenic landscapes?

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As wolves naturally recolonise their historical range throughout Europe, ungulate populations are once again in the presence of this natural predator. Classical predator-prey theory predicts that the arrival of a large carnivore will induce adaptive behavioural changes in prey, which could in turn impact other trophic levels through cascading effects. Shifts in diel activity allocation can be an important, and potentially immediate, response for ungulates to mitigate risk exposure. It remains however unknown whether, how and how fast natural predators can provoke these behavioural modifications in highly anthropogenic landscapes, where the 'human super-predator' is a source of risk for both ungulates and wolves. In this study, we investigated the diel activity responses of three native ungulate species along the wolf recolonisation process, detecting the emergence of predator-prey interactions through behavioural plasticity of prey species. Taking advantage of the unique and timely opportunity of the ongoing natural wolf recolonisation in the Central-Eastern Alps, we designed a study placing camera traps throughout four study areas, creating a gradient in time since wolf establishment with alternating hunting contexts. We hypothesised that ungulates would decrease nocturnal activity as wolf presence increased and stabilised, but that the concurrent presence of (diurnal) human hunters and (nocturnal) wolves would force ungulates back to a marked crepuscular activity pattern. We found diel shifts towards diurnality as an immediate and direct response to the wolf recolonisation process in red deer and Alpine chamois, thereby increasing their activity overlap with humans. In red deer, this 'diel shield effect' disappeared in the additional presence of lethal risk from humans, potentially indicating a higher perceived hunter-related lethality during autumn. On the other hand, roe deer modified their diel activity in response to human hunting but not to the wolf, highlighting the lethality of humans or the presence of other risk-mitigating behaviours for this solitary, forest-dwelling species. Our study shows that the wolf recovery in Europe can induce immediate and lasting diel shifts in large herbivores, depending on the biology of the species, but that these diel shifts can disappear in the presence of human hunters.