# Conflicts between humans and game species in non-hunting areas: a case study from Slovenia

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#### INTRODUCTION

The consequences of intensive urbanization are reflected in increase of urban and semi-urban landscapes, and thus also in the reduction and fragmentation of several habitats of wildlife. Nowadays, the contact zone between urban areas and natural habitats of wildlife has been increasing due to the simultaneous spread of the agricultural landscape. As a result, many animal species are more and more likely to live in settlements and other human modified habitats, which often results in various conflict situations. Such conflicts can affect the society, activities and interests of people, and are most often reflected as damage on property or domesticated animals, as an increased risk in road traffic due to game-vehicle collisions, higher risk for disease transmission from wildlife to humans and domesticated animals, and/or direct attacks of game species on humans and pets.

All these influences can provoke a negative attitude towards wildlife and even violent interventions against it. Therefore, it is very important to find integrated solutions for game management in non-hunting areas. However, the implementation of the population control measures is currently very difficult in such an environment either due to legal constraints or due to the expected negative responses of the public.

#### AIM AND METHODS

In order to better understand the problematic and to facilitate the active management of game species in the urban environment in Slovenia, we started the project "Game species in settlements, on roads and in other non-hunting areas: problems, challenges and solutions" in 2018. In the initial phase, we analysed all registered data on damage cases from the comprehensive, national wide database of the Ministry of Agriculture, Forestry and Food for the period between 2008 and 2018. We analysed all cases of reported damages in non-hunting areas, i.e. for all game species and several different types of damages.

#### **RESULTS**

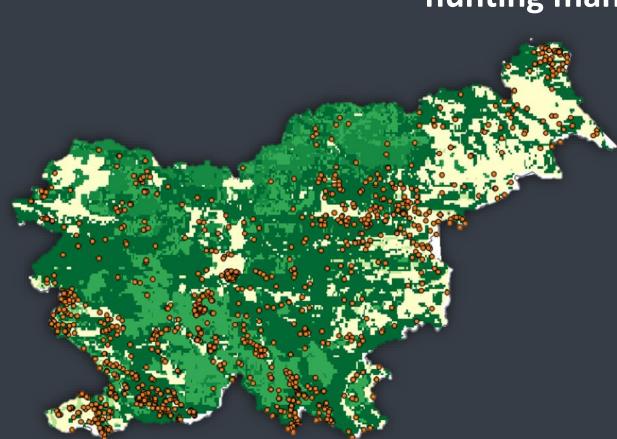
In the study period (2008-2018) and throughout Slovenia, there was a total of 1,570 reported conflict events caused by the following game species: red deer (N=410, 26%), wild boar (N=297, 19%), red fox (N=209, 13%), roe deer (N=193, 12%), stone marten (N=179, 12%), and Eurasian jay (N=130, 8%), respectively; moreover, several conflicts were caused also by hooded crow, brown hare and European badger. Sporadic damage cases were related to edible dormouse, fallow deer, pheasant and mouflon. On average, about 140 claims were reported and resolved annually, with the minimum (n=86) in 2014 and maximum (n=238) in 2010. Regardless the species, most of the damage was made on crops (n=846, 54%), followed by livestock and pets (n=285, 18%), objects and materials connected to agriculture (n=177, 11%), real estate (n=148, 9%), plants (n=79, 5%), vehicles (n=26, 2%), and miscellaneous (n=6, 1%), respectively. Red deer, roe deer, wild boar and jay caused the highest damage on crops (jay causing all damage solely on crops), stone marten and red fox on livestock and pets, and the stone marten also on real estate.

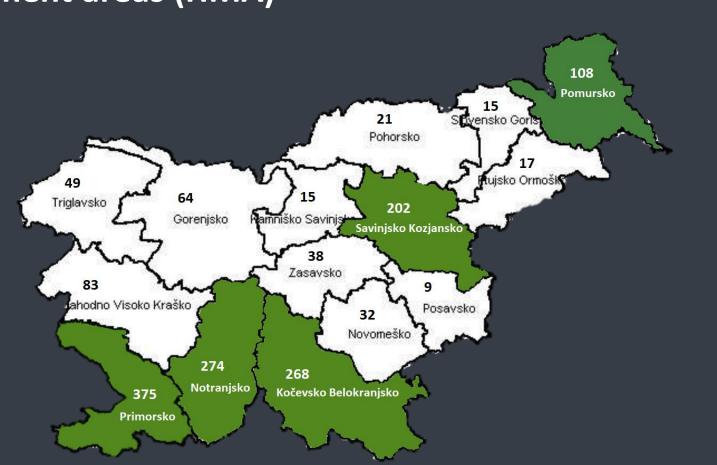
#### CONCLUSION

A high interannual variability in the number of conflicting events can be a result of their stochastic occurrence and the promptness/interest of the injured parties in reporting damage. The number of conflicts is certainly affected also by the availability of food in wildlife's natural habitats and weather, i.e. duration of dry periods and snow cover. Human disturbances in surrounding habitats also have an important impact since they force animals to retreat to other places, such as semi-urban areas, where they can cause damage. The time and place of occurrence of a conflict event and the type of damage depend largely on game species causing it

Roe deer in non-hunting area in Ljubljana, Slovenia. Photo: Ajša Alagić, 2019

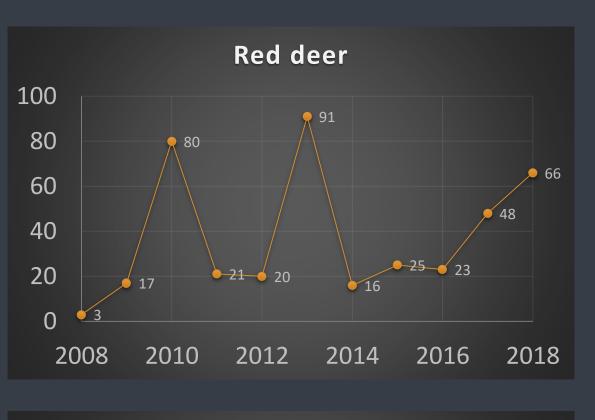
Spatial distribution of all registered conflict events caused by game species in non-hunting areas in Slovenia between years 2008 and 2018 presented by country and by hunting management areas (HMA)

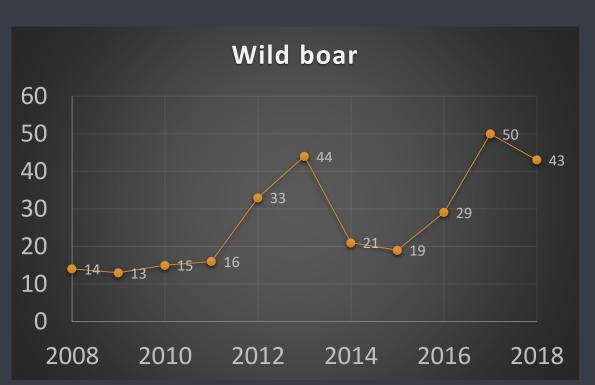


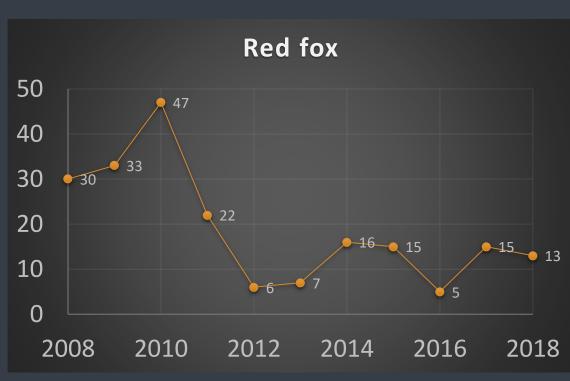


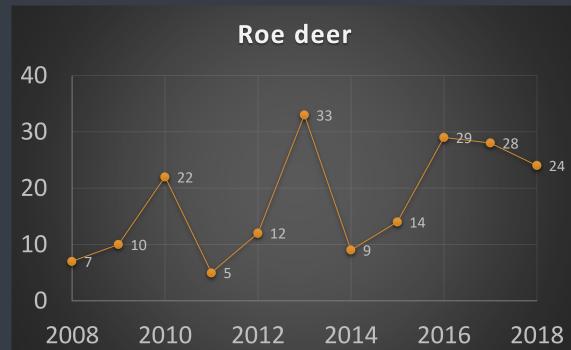
The highest number of reported conflict events is recorded in Primorsko HMA (24%), followed by Notranjsko HMA (17%), both located in the southwest of Slovenia. Majority of conflict events there were caused by wild boar, in Notranjsko HMA also by red deer, which was also the main cause of conflicts in Kočevsko-Belokranjsko and Pomursko HMA. The high number of conflicts in Primorsko HMA is also due to jays destroying apple orchards. The reason behind high number of conflicts in Savinjsko-Kozjansko HMA (central-east of Slovenia) was the stone marten, which in many cases causes high financial damages, i.e. when destroying electrical installations and roofs of buildings.

## Interannual variability in the number of conflicting events caused by red deer, wild boar, red fox and roe deer









### Game species which caused the highest number of conflict events per the type of damage

