

DESCRIPTION FOR THE GENERAL PUBLIC

Something repeatedly observed in nature is that the number of seeds and fruits produced by plants varies considerably from one year to another. These fluctuations shape the life style of wild animals that depend on natural food resources to survive. In nature, times of feast and famine are not rare, and wild animals are adapted to these changes in food availability in order to survive. One strategy is to compensate the lack of natural food by feeding on human-derived products, such as crops or livestock.

The use of farm foods by wild animals usually leads to economic costs that affect human livelihoods. In response to that damage, some farmers retaliate against wildlife, and kill the animals assumed to be guilty. This response can threaten the persistence of wild animal species that are protected by law and, therefore, can undermine the efforts to conserve biodiversity. Conflict situations associated to wildlife damage occur wherever humans and wildlife share the space in which they live. Classical and well known examples are wolves killing sheep, elephants raiding banana plantations or bears breaking beehives in the search for honey and larvae.

Despite considerable efforts made by wildlife managers to prevent the occurrence of these conflicts, damage caused by wildlife is predicted to increase in many countries around the world. For that reason, scientists and managers have focussed the study of conflicts on the type and frequency of damage, the human perceptions about damage and wildlife, and husbandry practices. Although it is acknowledged that the occurrence of conflict is associated to these human-related factors, the natural drivers of wildlife damage are still poorly understood.

Similar to the natural production of seeds and fruits, the occurrence of damage is not constant in time, but fluctuates from one year to another. Why these variations happen is an unresolved question. The main objective of this study is to investigate whether the year-to-year fluctuations in damage occurrence are associated to temporal variations in the availability of natural food resources. In other words, we want to assess if in years when the natural food is scarce the occurrence of wildlife damage is higher than in years when the natural food is abundant.

To answer this question we plan to use available data on damage caused by brown bears (*Ursus arctos*) from different countries. Specifically, we plan to address our study question in two complementary approaches and will take advantage of a collaboration network already established during previous research project. In the first part, we will focus on bear diet and damage and how both change in time. To do so, we will review all the available scientific literature looking for studies of brown bear diet and damage from all bear populations occurring in temperate forest ecosystems of Asia, Europe and North America. In the second part, we will use data from satellite data as a measure of food availability for bears and check if they are related the number of brown bear damage. We will also use data on the number of beechnut produced in the forests of the Spanish Cantabrian Mountains and the Polish Eastern Carpathians. We will use this information to predict the occurrence of damage in both areas as well as in other European bear populations

This project will help us to have a better understanding of how fluctuations of natural food production can influence human-wildlife interactions. Moreover, it will contribute with a novel application of the freely available data collected from satellites to predict the incidence of bear damage. This can be relevant for conservationist as it can help to make wildlife management less costly and more effective. The project will have important implications for the conservation and management of brown bears across the many countries in the world where bears and humans still coexist.