DESCRIPTION FOR THE GENERAL PUBLIC

As most wildlife, brown bears are affected by the loss of living space or the changes in the remaining patches of habitat. That has led to the extinction of bears in most of Western Europe. Poland, Croatia and Sweden still have bears in parts of the countries. They belong to the Carpathian, Dinaric-Pindos or Scandinavian populations, respectively. However, bears have still to cope with an environment that is continuously changing due to human activities. Some examples are the development of buildings and transport infrastructures into bear habitat, a growing number of tourists in natural areas, the increased supply of human foods that are accessible to bears, such as garbage, corn fields or food provided intentionally to feed wildlife, hunting of bears or higher levels of pollution. All these activities have an effect on bears and their health. In this study, we want to check how the "humanization" of the environment affects brown bear health. For that, we will measure several parameters indicative of health condition in the hairs, scats, bones and tissues of brown bears form Poland, Croatia and Sweden. These samples will be obtained from data banks and scientific collections in the research institutions of the three countries collaborating in this project. They will be complemented with samples collected in the field in a non-invasive way.

We will obtain several indicators to assess how "healthy" brown bears are in each population. First, we will be measure the stress levels by analysing the concentration of cortisol in scats and hairs. We will estimate the composition and nutritional value of the foods ingested by bears by measuring the stable isotope composition of bear bones and hairs, fatty acids composition of bear tissues, and by spectroscopy of bear scats. How the immune system of the bears reacts to human disturbances will be determined by the levels of immunoglobulins and antibodies in bear scats and blood samples. Finally, we will identify parasites, bacteria and viruses present in bear scats and estimate their amount. All these measures will be combined to obtain a health index for each bear population. The conservation status of wildlife populations is usually assessed based on the number of animals, the area occupied or reproduction rates. Here, we will provide a new tool to assess the conservation status of populations from a health perspective, which could be applied to other species and areas.

This study paves the way for additional standards in brown bear and other wildlife research. When tracking stress, food assimilation and flow of pathogens become a routine procedure, risky changes in the habitat could be detected early enough to apply proper conservation measures. Managers will have a powerful and standardized tool to monitor the health of ecosystems. The society already made a decision that the loss of biodiversity has to be stopped. The results of this research will represent a contribution in that direction and may reveal brown bears as sentinels of detrimental changes in the environment.