

Despite the potentially positive impact of wind power on global warming, improperly located wind turbines may have a negative effect on the local biodiversity of wildlife. How these animals react to wind farms is poorly known. The scientific goal of the project is to find effect of wind farms on the roe deer. It is assumed that the presence of wind farms, which occupy an area significantly exceeding the home range of ungulates, will affect individuals of this species because it is a new anthropogenic factor. Roe deer occupying agricultural landscape is a convenient model for studying large herbivores affected by wind farms. The study will consist in comparing the analyzed parameters in roe deer exposed to wind farms and individuals out of this impact, i.e. on the control areas. The study will implement two main research aims: 1) behavioral response of roe deer to wind farms and 2) the assessment of the impact of wind farms on the body condition of the roe deer. Behavioral response is any kind of altered behavior under the influence of (for example, wind farms), for example: moving to a different location.

It is planned to use drones to collect aerial photos on five wind farms and their associated control areas. After the photos are taken, the presence of the group will be visually identified and the individuals will be given locations. Apart from the number of individuals in the group and the distance between them, and other aspects will be assessed. To verify how roe deer will use the area of wind farm comparing to the control area the use of telemetry collars is planned. A total of 24 collars will be used - 12 in wind farm areas and 12 in adjacent control areas. Telemetry collars will acquire the location of animals every hour using a placed GPS receiver.

The aim 2, i.e. the assessment of the impact of wind farms on the body condition of the roe deer, will be carried out directly by postmortem sampling and indirectly by genetics and stress analyses. The study will base of hunted roe deer on the area of wind farms and control areas. It is planned to gather data on body weight, fatness of the kidneys (indicator of body condition) in all individuals as well as weight antlers (for males) and the number of embryos (for females) as well as the presence and intensity of changes in internal organs. Genetics will provide the assessment of the relationship of individuals and fitness, because it is necessary to determine whether particular features tested in roe deer do not result from belonging to a family group, i.e. having a specific genotype causing increased susceptibility to diseases. It is also plan to extend the analysis with a stress level of animals on given area to verify whether the stress caused by wind farms can be treated as a factor leading to the reduction of the body condition parameters, because long term stress can lead to significant health consequences.

The obtained results allow to determine the possible long-term effects of wind farms on ungulates on the example of roe deer. It will be possible to determine the risk associated with the development of wind energy in the context of poorly known large mammals. In addition, the research will allow for the creation of guidelines to minimize this effect or how to monitor effect of wind farms on wild large mammals.