Kikuchi, R. 2008. Adverse impacts of wind power generation on collision behaviour of birds and anti-predator behaviour of squirrels. Journal for Nature Conservation 16: 44-55

Summary: Wind power is a fast-growing energy source for electricity production, and some environmental impacts (e.g. noise and bird collision) are pointed out. Despite extensive land use (2600–6000 m^2/MW), it is said that most of these impacts have been resolved by technological development and proper site selection. The results in this paper suggest that: (i) wind farms kill millions of birds yearly around the world, and the high mortality of rare raptors is of particular concern; (ii) wind farms on migration routes are particularly dangerous, and it is difficult to find a wind power site away from migration routes because there is no guarantee that migration routes will not vary; (iii) according to the presented model of collision probability, the rotor speed does not make a significant difference in collision probability; the hub is the most dangerous part, and large birds (e.g. raptors) are at great risk; and, (iv) based on the field observation of squirrels' vocalisation (i.e. anti-predator behaviour), there are behavioural differences between squirrels at the wind turbine site and those at the control site. Noise from wind turbines (when active) may interfere with the lives of animals beneath the wind turbines. US Government guidelines and the Bern Convention's report have described adverse impacts of wind energy facilities on wildlife and have put forward recommendations. In addition to these documents, the following points derived from the discussion in this paper should be noted for the purpose of harmonising wind power generation with wildlife conservation: (i) engineers need to develop a turbine form to reduce the collision risk at the hub; (ii) institute long-term monitoring, including a comparison between bird mortality before and after construction; and (iii) further evaluate impacts of turbine noise on anti-predator wildlife vocalisations.