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Barotrauma is a significant cause of bat fatalities at wind turbines

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Summary

Bird fatalities at some wind energy facilities around the world have been documented for decades, but the issue of bat fatalities at such facilities — primarily involving migratory species during autumn migration — has been raised relatively recently [1] and [2]. Given that echolocating bats detect moving objects better than stationary ones [3], their relatively high fatality rate is perplexing, and numerous explanations have been proposed [1]. The decompression hypothesis proposes that bats are killed by barotrauma caused by rapid air-pressure reduction near moving turbine blades [1], [4] and [5]. Barotrauma involves tissue damage to air-containing structures caused by rapid or excessive pressure change; pulmonary barotrauma is lung damage due to expansion of air in the lungs that is not accommodated by exhalation. We report here the first evidence that barotrauma is the cause of death in a high proportion of bats found at wind energy facilities. We found that 90% of bat fatalities involved internal haemorrhaging consistent with barotrauma, and that direct contact with turbine blades only accounted for about half of the fatalities. Air pressure change at turbine

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blades is an undetectable hazard and helps explain high bat fatality rates. We suggest that one reason why there are fewer bird than bat fatalities is that the unique respiratory anatomy of birds is less susceptible to barotrauma than that of mammals.

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