**Bird and bat species’ global vulnerability to collision mortality at wind farms revealed through a trait-based assessment Appendix 2. doi.org/10.1098/rspb.2017.0829**

Supplementary methods detailing classification of study quality for studies included in the meta analysis.

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The detection of carcasses depends on several factors which were accounted for to varying degrees per study. Additionally, these factors were also related to sampling design, such as spacing of visits to detect and recover carcasses and search radius covered, and in some cases, corrected numbers of collisions were presented [1]. We categorised studies by overall quality of information based on the above sources of bias, into a four-level category for birds, and three-level category for bats, the latter combining low and medium categories.

Firstly, where studies had simply estimated collisions per turbine based on number of carcasses found, this almost certainly resulted in an underestimate of collisions by not accounting for sampling design, scavenger removal or efficiency of searching. This was categorised as (1) “very low” confidence for final estimates, and included studies where only information of number of collision victims and number of turbines searched was presented.

Secondly, corrections for sampling design, scavenger removal and observer skill and efficiency of sampling (e.g. between habitats and ecosystems) were frequently applied, but then studies did not fully consider the further aspect of size bias of birds, thus presenting a single “all-bird” estimate rather than individual species estimates. The number of carcasses recovered per species was available for most studies. Therefore, we scaled the all-bird estimate by this proportion to derive likely species-specific estimates [2]. However, this did not fully account for size biases of individual birds and assumes perfect translation of carcass species proportions to corrected species collision rates, hence these were treated as (2) ‘low’ confidence.

Thirdly, studies often presented estimates for small and large birds separately, thus corrected for size/plumage detection to a certain degree, and some studies separated estimates further based on trials of carcass removal of certain groupings, such as ‘raptor species’. These resulted in refined estimates warranting a higher level of certainty in quality of estimates and were classed as (3) ‘medium’. Estimates of mortality of small passerines for North American wind farms, have been derived for ‘small birds’ from ‘all birds’ [2], we use which we used to increase quality from ‘low’ to ‘medium’. The final (4) ‘high’ confidence category was reserved for studies that directly reported estimates for species accounting for the main sources of bias described above. Further, for bat studies, corrections for scavenger removal were often based on proxy bird species, which might bias the correction. Our corrections for study quality there will inevitably be some variation not captured by our classification, for example, correction for unsearchable portions of the survey area were not always reported, and we therefore treat this as a potential source of bias.

**Supplementary References**

1. Huso MMP, Dalthorp D. 2014 Accounting for unsearched areas in estimating wind turbine-caused fatality. *J Wildl. Manage.* **78**, 347–358.
2. Erickson WP, Wolfe MM, Bay KJ, Johnson DH, Gehring JL. 2014 A Comprehensive Analysis of Small-Passerine Fatalities from Collision with Turbines at Wind Energy Facilities. *PLoS ONE* **9**, e107491. (doi:10.1371/journal.pone.0107491)