

Science for Environment Policy

Wind turbines have minor impact on small-bird populations

Only about two or three small birds are killed by wind turbines each year for every 225-300 houses supplied with renewable energy, new research suggests. The study collated data from 116 US and Canadian studies on 156 species of passerines (small birds). The study suggests some species are affected more than others, but that wind turbines generally have only a minor impact on these small-bird populations.

Wind turbines currently supply around 8% of Europe's electricity, providing over 117 gigawatts of installed capacity¹ of wind [energy](#). However, wildlife groups are concerned about wind turbines killing large numbers of birds. More than half of all bird species are passerines and they are the most frequently killed. Until now, there have been no comprehensive studies collating research on small-bird collisions at wind farms.

The researchers wanted to provide regulators, the wind industry and conservation bodies with a better understanding of collision rates in these populations. They analysed data from 116 studies, the majority (70%) of which provided data specifically on small-bird fatalities. For the remaining 35 studies, they estimated small-bird fatalities based on data on all birds killed.

The results suggest that, on average, 2.10-3.35 small birds are killed each year per megawatt (MW) of installed capacity of wind turbines. A 1 MW turbine on land can power about 225-300 [houses](#). In total, the researchers estimate that between 134 000 and 230 000 small birds are killed annually by turbines across all of the US and Canada.

By contrast, over six million small birds are thought to be killed by communication towers in these two countries. Meanwhile, [cats are estimated to kill at least 55 million birds each year](#) in the UK alone, although some of these are thought to be weaker birds that would die anyway.

Small birds accounted for nearly 63% of all birds killed at wind facilities. But of 24 families of birds, just six accounted for almost half of all those killed. These were larks (*Alaudidae*), wood-warblers (*Parulidae*), vireos (*Vireonidae*), blackbirds or orioles (*Icteridae*), sparrows (*Emberizidae*) and kinglets (*Regulidae*). However, these losses equated to less than 0.1% of North American populations each year – even for the worst affected bird species.

At the species level, the most commonly killed small birds were the shore or horned lark (*Eromophila alpestris*), red-eyed vireo (*Vireo olivaceus*) and western meadowlark (*Sturnella neglecta*). Overall, 22% of all small birds that collided with wind turbines were shore larks. The global shore lark population is large and widespread, so the birds are not considered under threat, though their numbers have declined in [recent decades](#).

It is difficult to produce completely accurate data on bird collisions for a number of reasons. For example, fatalities can only be counted if carcasses are discovered by 'searchers' and some carcasses are scavenged by predators before discovery. Equally, some birds that were not killed by wind turbines may be incorrectly counted. However, equations called 'estimators' have been developed to adjust for these biases. The researchers used four different estimators to gain a more accurate picture of bird collisions than in previous studies.

The researchers also explored evidence for factors thought to contribute to bird collisions. They found no evidence that taller turbines killed more birds, but some evidence that older facilities did, although they did not discuss exactly why this might be.



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1. The maximum number of watts of electricity that can be produced in one hour. For wind turbines, this assumes optimal wind conditions.