Rural structures pose greater relative threat to birds than urban ones

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About one billion birds are killed every year when they unwittingly fly into human-made objects such as buildings with reflective windows. Such collisions are the largest unintended human cause of bird deaths worldwide—and they are a serious concern for conservationists.

A new paper published in June in the journal *Biological Conservation* finds that, as one might suspect, smaller buildings cause fewer bird deaths than do bigger buildings. But the research team of about 60—including three co-authors with the University of Washington—also found that larger buildings in rural areas pose a greater threat to birds than if those same-sized buildings were located in an urban area.

Lead author of the paper is Stephen B. Hager, professor of biology at Augustana College in Rock Island, Illinois. Co-author Karen Dyson, an urban design and planning doctoral candidate in the UW College of Built Environments helped collect bird-collision data and assisted in editing the paper, along with UW alumni Anqi Chen and Carolyn Foster.

The research team monitored 300 buildings of varying size and environmental surroundings for bird mortality at 40 college and university campuses in North America in the autumn of 2014. This included six buildings on the UW's Seattle campus. They designed a standardized monitoring protocol so that the field crews documented bird mortality uniformly. In all, they documented 324 bird carcasses of 41 species. At each site, somewhere between zero and 34 birds met their feathery demise.

"Consistent with previous studies, we found that building size had a strong positive effect on bird-window collision mortality," Hager and team wrote in a statement about the continent-wide research. "But the strength of the effect on mortality depended on regional urbanization."

Why is that? The researchers think it might be related to how birds select habitats during migration, and differences in bird behavior between urban and rural populations. For example, they write, forest-adapted birds often select rural habitats with lots of open space and fairly few impervious surfaces over more urban areas.

Lighting patterns may also play a part, they reason. Lights from large, low-rise buildings in rural areas may act to attract migrating birds in what the team dubbed a "large-scale beacon effect," where this effect may be "more diluted among large buildings in urban areas."

Another theory is that urban birds may actually learn from "non-fatal" collisions and gain "new anti-collision behaviors" that help them avoid colliding with windows in urban areas. Previous research, they note, "suggests that the relatively large brain size in birds makes them primed for learning."

The results suggest, the authors write, that measures taken to prevent bird collisions "should be prioritized at large buildings in regions of low urbanization throughout North America."

More information: Stephen B. Hager et al. Continent-wide analysis of how urbanization affects bird-window collision mortality in North America, *Biological Conservation* (2017). DOI: 10.1016/j.biocon.2017.06.014