

Community science birding data does not yet capture global bird trends

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Male Green-crowned Brilliant hummingbird. Credit: Çağan H. Şekercioğlu

Binoculars in hand, birders around the world contribute every day to a

massive database of bird sightings worldwide. But while community science observations of birds can be useful data, it may not be enough to fill the data gaps in developing countries where professional bird surveys are insufficient or absent.

Ornithologists at the University of Utah say that community science bird data shows different trends in bird populations than professional bird surveys do, especially in developing countries. Researchers look for trends to know whether the number of individuals in a species is increasing, stable or decreasing—with the latter as a warning sign that the species is in trouble. Their results are published in *Biological Conservation*. More observations are needed, the researchers say, both by birders and professionals.

"We hope that this study will encourage birdwatchers to be more conscientious in their recording," says Monte Neate-Clegg, doctoral student and lead author of the study, "to think of these data not just as a personal record but as contributing to a wider cause."

Birding is a long tradition, but as paper guidebooks and life lists have given way to digital records and mobile apps, birders have become more connected, compiling their data into near real-time global snapshots of where and when birders are seeing species. For this study, the authors accessed data from [eBird](#).

Developed by the Cornell Lab of Ornithology, eBird is the world's largest biodiversity-related community science project, the lab says, with more than 100 million bird sightings contributed each year. Birders submit sightings and checklists to eBird, which reaches out to birding experts when a sighting seems out of the ordinary.

U ornithologist Çağan Şekercioğlu is a world-class eBirder, currently ranked [fifth in the world](#) for spotting more than 8,000 bird

species—more than 76% of all the species that eBirders have ever reported.

In 2018, former Şekercioğlu lab member JJ Horns found that eBird [trend](#) data matched the U.S. Breeding Bird Survey to within 0.4%. The results of the three-year project were encouraging—maybe eBird, they hoped, could serve to accurately fill in data for countries that didn't have the same level of governmental or professional surveys.

So, to compare eBird trends with worldwide trends, they turned to BirdLife International, an independent global partnership of conservation organizations.



Quechua woman looking for birds through a birdwatching telescope in montane rainforest, San Miguel Polylepis Forest, Cochabamba, Bolivia. Credit: Çağan H. Şekercioğlu

"BirdLife amasses data and expert opinion across the world," Neate-Clegg says. Their methods for assessing bird populations and trends vary, though. "Some estimates are based on complete population counts or interpolated surveys," he says. "Most are indirectly assessed via changes in habitat or other impacts, such as hunting or wildlife trade."

Downloading and analyzing eBird data is not an Excel-scale task. The U's Center for High Performance Computing assisted in processing the data, which includes more than 800 million records. Using observations from the past 20 years, Neate-Clegg further filtered the data to focus on the best-quality observations and to match the list of species with those reported by BirdLife International. Calculating the trends in bird counts over time, Neate-Clegg rated them as increasing, decreasing or stable.

For the final list of 8,121 species, BirdLife listed 624 (7.7%) as increasing, 3,616 (44.5%) as stable and 3,881 (47.8%) as decreasing. The eBird trends differed: 1,974 (24.3%) species were rated as increasing, 4,942 (60.9%) as stable, and 1,205 (14.8%) as decreasing. Only a little more than a third of the species displayed trends that agreed between the two data sources. Unfortunately, that's not much better than would have been expected by chance.

"This isn't particularly reassuring," Neate-Clegg says.

Part of the disagreement is due to the different experience of birdwatching in the tropics as compared to the U.S.

"Birdwatchers in the tropics tend to be more targeted in their approach," Neate-Clegg says, "meaningfully searching for particular species. This may mean that, although a species is declining, eBirders are still finding them reliably and so we do not detect that decline in the eBird data."

"In some cases," Şekercioğlu adds, "the rarer bird species can be seen more often by birders who may overlook the common species nearby that they have already seen before."

Some results of the study were encouraging, though.



Orange-billed Sparrow. Credit: Çağan H. Şekercioğlu

As in the earlier study, Neate-Clegg's study shows that the rate of agreement with BirdLife trends for a species increases as the number of

eBird checklists for that species increases. "This suggests that our accuracy will increase as more people gather data in the tropics," he says. The rate of agreement is also higher for species where population trends are directly estimated rather than indirectly inferred. "This suggests that we still need in situ population trend estimation by experts to validate eBird trends," he adds.

Neate-Clegg says that the results of this study are far from the end of the story. "It is really important that we carry out studies such as these to validate the use of eBird data," he says. "It would be great to get to the point where we can successfully leverage what will soon exceed 1 billion bird records to estimate population trends."

With a need for more quality data, Neate-Clegg encourages eBirders to include as much additional information in their checklists as possible. For example, he says, eBirders have the option of recording all species seen or counts of every species, as well as associated metadata such as the duration of the birdwatching period and the distance traveled.

"All of these data are important for maximizing the number of checklists we can use while controlling for variation in effort," he says.

Birding in many different places, and not just hotspots with high [species](#) numbers, is also important. "You should be birding everywhere you go," Şekercioğlu says, "which also has the personal satisfaction of being a pioneer as you are adding data from places with little or no bird data."

In other words, keep watching the skies. And the trees. And the wetlands. Birders' efforts do not go unnoticed. The researchers express their gratitude to the Cornell Lab of Ornithology, BirdLife International and the millions of birders who contribute to eBird and other community science efforts like [iNaturalist](#). "The centuries-long symbiosis between birdwatchers and ornithologists is the best example of the collaboration

of community scientists, professional scientists and conservationists," Şekercioğlu says.

More information: Montague H.C. Neate-Clegg et al, Monitoring the world's bird populations with community science data, *Biological Conservation* (2020). [DOI: 10.1016/j.biocon.2020.108653](https://doi.org/10.1016/j.biocon.2020.108653)

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