

World's biodiversity maps contain many gaps, study finds

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As the world's nations prepare to set new goals for protecting biodiversity, Yale researchers have identified where data gaps continue to limit effective conservation decisions.

In a new study, a team of researchers created maps and assessed regional trends in how well existing [species](#) data are able to represent the distribution of 31,000 terrestrial vertebrates worldwide and therefore help inform policies and actions for sustaining [biodiversity](#) and its benefits.

"These maps highlight the most rewarding opportunities for [citizen scientists](#), and government agencies, and scientists to support biodiversity monitoring and help close critical knowledge gaps," said Walter Jetz, professor of ecology and evolutionary biology and of the environment, director of the Yale Center for Biodiversity and Global Change (BGC), and senior author of the paper.

The study was published Aug. 10 in the journal *PLOS Biology*.

The need for such information is critical as environmental and policy leaders continue to create strategies to protect [species diversity](#) worldwide as part of the Convention on Biological Diversity, an international treaty with the aim of conserving and managing global biodiversity which is assessing progress towards those goals.

Jetz and his team have created one of the key tools used by world leaders to monitor, research, and create policies that protect species worldwide—[the Map of Life](#).

In the new study, the researchers present a framework to help pinpoint where additional monitoring is most needed. While there has been a dramatic increase in the amount of data collected on [vertebrate species](#) in the past 20 years, they find, not all of this data has yielded new insights on biodiversity. For instance, data on [bird species](#) shared by citizen scientists and others tend to be redundant due to the popularity of certain species commonly found in highly populated areas. Most new data collected on birds are from the same species and places.

The analysis was conducted by Yale's Ruth Oliver, an associate research scientist at the Center for Biodiversity and Global Change, Jetz, and colleagues.

Alarmingly, the study finds that data critical for characterizing biodiversity in many countries has levelled off or, in some cases, even decreased. According to the analysis, 42% of countries have inadequate information on vertebrate biodiversity and have seen either no increase or a decrease in data coverage. Only 17% of countries have achieved sufficient data coverage and also seen an increase in new information on species.

"We hope our work quantifying the tremendous complementary value of observations of underreported biodiversity can support more effective data collection going forward," Oliver said. "It's amazing how much we still don't know about the known species on this planet."

While the indices used in the study were used to demonstrate the biological diversity of [terrestrial vertebrates](#), they can be readily updated as new data becomes available and expanded to other taxa, such as marine and invertebrate species. This work is supported by the Map of Life team and the results are available for exploration at mol.org/indicators/coverage.

More information: Oliver RY, Meyer C, Ranipeta A, Winner K, Jetz W (2021) Global and national trends, gaps, and opportunities in documenting and monitoring species distributions. *PLoS Biol* 19(8): e3001336. doi.org/10.1371/journal.pbio.3001336

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