Thousands of Wild Bee Species Haven't Been Seen Since 1990

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By **Theresa Machemer**, SMITHSONIANMAG.COM FEBRUARY 2, 2021 HTTPS://WWW.SMITHSONIANMAG.COM/SMART-NEWS/THOUSANDS-WILD-BEE-SPECIES-HAVENT-BEEN-SEEN-1990-180976901/

A new analysis of bee sightings around the world since the year 1900 shows that about a quarter of bee species haven't been seen by scientists in about 30 years. The study was published on January 22 in the journal *One Earth*.

The findings line up with recent research about insect populations in peril worldwide. But the severe drop in bee species' sightings spells trouble especially because humans rely on bees to pollinate about 85 percent of food crops. Honeybees may get the lion's share of the credit for food pollination, but there are actually over 20,000 bee species in the world, and 4,000 species native to the United States.

Healthy wild bee populations can make up for losses in commercial honeybee hives, Liz Langley reports for *National Geographic*. But between 2006 and 2015, researchers worldwide observed 25 percent fewer bee species than they had before 1990

"We're learning how much a lot of crop yield depends on bees and not only honeybees, but *bees*," says lead author and National Scientific and Technical Research Council biologist Eduardo Zattara to Asher Jones at the *Scientist* magazine. "Oftentimes honeybees cannot replace other species."

The researchers turned to the Global Biodiversity Information Facility, which is a database of records from museum specimens, private collections and citizen science

observations, to search for bee-sighting data. The database holds millions of records, and some years included 100,000 bee-related datapoints.

Zattara and co-author Marcelo Aizen, a biologist at the National University of Comahue in Argentina, counted the number of species recorded each year, instead of counting the number of individuals within each species that were recorded. In theory, common bee species would appear every year, while rarer ones would only pop up in the records every few years. As species become rarer, they're recorded less often, and in some cases haven't been seen for decades.

Zattara points out that the research doesn't show whether or not any species has gone extinct. He tells *National Geographic*, "What we can say is that wild bees are not exactly thriving."

The researchers wanted to perform this study because there had been no recent research on global bee diversity and trends. Instead, most studies focus on the numbers of some specific species or region in the world. The long-term global study presents evidence that bee populations are declining everywhere except Australia, which didn't have very much data, and the perennially bee-free Antarctica.

However, most of the data used in the analysis comes from Europe and North America.

"For the rest of the world, we know much less about where bees live when using public data, much less where they may be declining," says Michael Orr, who studies bees at the Institute of Zoology at the Chinese Academy of Sciences, to *Inverse*'s Tara Yarlagadda. "This [report] is more about decline in places with data, like North America and Europe, and we can't say for sure that this is also the case in Asia or much of Africa since there are so few data points."

Speaking to the *Scientist* magazine, Zattara acknowledges the lack of data available outside of Europe and North America, and points to shifts in policies that have emerged in recent decades as countries take control of their biodiversity research.

"Each country should have the right and the decision to take care and count their own biodiversity," Zattara tells the *Scientist*. "But oftentimes those countries didn't have enough infrastructure to quickly catalog and digitize and make available what they have.

And so there is an obstacle, or at least an important delay, in these data and data mobilization [and] sharing."

The study also had to take into account other factors that could skew their results. For instance, researchers with a specific bee of interest might go out of their way to observe a rare species, which would boost its numbers in the annual counts. In recent years, photographs of bees observed in the wild may not have been identifiable to species-level granularity, so those records were removed from the dataset.

Given all of these factors, "the authors really did a good job dealing with possible biases," says Providence College ecologist Rachael Bonoan to *National Geographic*.

The researchers hope that their paper will inspire more institutions to make their data available online for future analyses, and that more members of the public will take an interest in wild bees.

"I think it's important that people should learn a bit more about wild bees. They're really nice, they're cute, they're important." Zattara tells the *Scientist*. Given threats from climate change, invasive species and habitat loss, he emphasizes the importance of policy changes, but adds that individuals can make small choices to help wild bees in their area.

He tells the *Scientist*, "Actions can go anywhere from thinking better about what you plant in your garden, thinking whether you really want to have that cleanly manicured lawn or you just leave it grow a bit more and leave it to flower."