

# Outlook is grim for mammals and birds as human population grows, study says

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The ongoing global growth in the human population will inevitably crowd out mammals and birds and has the potential to threaten hundreds of species with extinction within 40 years, new research shows.

Scientists at The Ohio State University have determined that the average growing nation should expect at least 3.3 percent more threatened [species](#) in the next decade and an increase of 10.8 percent species threatened with [extinction](#) by 2050.

The United States ranks sixth in the world in the number of new species expected to be threatened by 2050, the research showed.

Though previous research has suggested a strong relationship between [human population density](#) and the number of threatened mammal and [bird species](#) at a given point in time, this study is the first to link an expanding [human population](#) to fresh threats of extinction for these other species.

The lead researcher created a model based on 2000 data to forecast future [threatened species](#) connected to human population growth projections, and published the predictions in 2004. In this new study, that model's predictions were confirmed by 2010 actual figures. The [scientists](#) then used the same model, containing data on 114 countries, to extend their predictions to the middle of this century.

"The data speak loud and clear that not only human population density,

but the growth of the human population, is still having an effect on extinction threats to other species," said Jeffrey McKee, professor of [anthropology](#) at Ohio State and lead author of the study.

The findings suggest that any truly meaningful biodiversity [conservation efforts](#) must take the expanding human population footprint into consideration – a subject that many consider taboo.

"Our projection is based on human population density alone. It doesn't take into account [climate change](#), [industrialization](#) or wars. So the actual numbers that we predict for 2050 will be very different because everything we do will exacerbate the problem," he said. "You can do all the conservation in the world that you want, but it's going to be for naught if we don't keep the human population in check."

McKee conducted the research with Ohio State undergraduate Julia Guseman and former graduate student Erica Chambers. The study is published this week in the journal *Human Ecology*.

McKee collected data on threatened species from the International Union for Conservation of Nature Red List, and obtained human census data for 2000 and 2010 from the world database of the U.S. Census Bureau. Overall species richness data came from the United Nations Environment Programme-World Conservation Monitoring Centre's Animals of the World Database. He created a model using equations to analyze relationships among these variables.

After using 2010 data to confirm that the decade-old predictions came true, the researchers used the same equations to determine that between now and 2050, the nations that see the most population density growth will experience higher numbers of species facing new threats of extinction.

Only five nations rank higher than the United States in predicted new species threats by 2050. The Democratic Republic of the Congo tops the list, with a predicted new threat to more than 20 species in that time frame. The analysis suggests about 11 species will be newly threatened with extinction in the United States.

The model also suggests that the 21 countries with projected declining human populations by 2050 will see an average reduction in threatened species of 2.5 percent. The findings were bolstered by the fact that nine of the 12 nations with population declines between 2000 and 2010 showed a modest decrease in the number of threatened species of [mammals](#) and [birds](#).

"We might be able to utilize that knowledge and use those countries to repopulate species that are native to those countries," said McKee, also the author of the book *Sparing Nature: The Conflict between Human Population Growth and Earth's Biodiversity*.

There are an estimated 12 million species of plants and animals on earth, and the human population exceeds 7 billion – with a gain of an estimated 214,000 people each day.

When the population stood at 6 billion, McKee led a project with his students in which the group divided the planet's land surface area among all the world's people to determine how much space was available to each person. At that time, each of the world's humans could claim space roughly equivalent to Ohio Stadium, which seats more than 102,000 football fans.

"If we get to 11 billion people, which is where we're supposed to peak, then the amount of space you have per person is a lot smaller than that stadium. When you're left with less space, there's virtually no space left for most other species," he said.

Loss of species, and especially so-called keystone species that are important to the environment because they function as significant predators and prey, can disrupt ecosystems. Plants and animals also help the planet adjust to climate change, provide oxygen and are sources of food and medicines, McKee noted.

An expanding human population footprint is "one of the biggest concerns of this century," McKee said. "Part of the resistance to addressing the problem is that human population size and growth is difficult to talk about and difficult to do anything about. To keep the human population in check, you have two options: increase the death rate or decrease the birth rate. I think the latter is the better choice."

**More information:** McKee J et al (2013). Human Population Density and Growth Validated as Extinction Threats to Mammal and Bird Species. Human Ecology; DOI 10.1007/s10745-013-9586-8

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