

No joy in discoveries of new mammal species -- only a warning for humanity, Paul Ehrlich says

9 February 2009

In the era of global warming, when many scientists say we are experiencing a human-caused mass extinction to rival the one that killed off the dinosaurs, one might think that the discovery of a host of new species would be cause for joy. Not entirely so, says Paul Ehrlich, co-author of an analysis of the 408 new mammalian species discovered since 1993.

"What this paper really talks about is how little we actually know about our natural capital and how little we know about the services that flow from it," said Paul Ehrlich, the Bing Professor of Population Studies at Stanford.

"I think what most people miss is that the human economy is a wholly owned subsidiary of the economy of nature, which supplies us from our natural capital a steady flow of income that we can't do without," Ehrlich said. "And that income is in the form of what are called 'ecosystem services'-keeping carbon dioxide out of the atmosphere, supplying fresh water, preventing floods, protecting our crops from pests and pollinating many of them, recycling the nutrients that are essential to agriculture and forestry, and on and on."

Ehrlich conducted the analysis with Gerardo Ceballos, a professor of biology at the National University of Mexico. They are co-authors of a paper describing the work, scheduled to be published Monday, Feb. 9, in the online early edition of the *Proceedings of the National Academy of Sciences*.

The 408 newly discovered species amount to approximately 10 percent of the known species of mammals. As a group, mammals have been very well studied, Ehrlich said, and their size makes them relatively easy to spot compared to insects or

microbes. It is not that surprising that multitudes of new insect species are still being discovered, or that new extremophile species are found in hydrothermal vents on the ocean floor, he said. But the new mammals include a small antelope weighing approximately 200 pounds and surprisingly high numbers of primates, more than would be expected if the discoveries were randomly distributed across higher taxonomic groups.

"Our analysis indicates how much more varied biodiversity is than we thought and how much bigger our conservation problems are if we're going to maintain the life-support services that we need from biodiversity," Ehrlich said.

Among those ecosystem services is disease control.

"There's an important set of diseases called hantaviruses that infects human beings and quite frequently kills them. And it turns out that if you reduce the diversity of the different species of rodents, say, in a forest, the rodents that carry hantaviruses can become more common. And the results for human beings are more death and disease," Ehrlich said. "So by reducing the diversity of mouse-like creatures in a forest, you can make that forest more dangerous for people."

Many of the newly discovered species have small populations or limited geographic ranges, making them particularly vulnerable to extinction.

"The rarer of the species and the smaller of the populations often disappear without us even knowing that they are going," Ehrlich said.

Although not every species that goes extinct plays a crucial role in controlling diseases like hantaviruses, that doesn't necessarily mean we can

do without them.

Ehrlich said the answer to the question, "What difference does it make if we put a strip mall in here and this little fly goes extinct, or this little mouse goes extinct?" lies in the rivet-popper hypothesis, which he and his wife and colleague, Anne Ehrlich, a senior research scientist in the Department of Biology at Stanford, developed in the 1980s.

An airplane wing has a certain amount of redundancy in its design, as does much of nature. So you can pop off some of the rivets and the wing will still hold together and the plane will still fly. But at some point, you'll have removed one too many rivets and the plane will crash.

"Even though you don't know the value of each rivet, you know it's nuttier than hell to keep removing them," Ehrlich said. "There is some redundancy, but we don't know how much. And facing serious climate disruption, humanity is going to need more redundancy in the little rivets, the species and populations that run the world.

"We are facing for the first time the collapse of a global civilization," he said. "You have to reduce the scale of the human enterprise to having a chance at preventing that."

Ehrlich said that continually creating more mouths to feed will only chew up more of Earth's natural capital.

"The economy of nature is what allows us to have a human economy. If we let the infrastructure of nature go down the drain, then we just can't make up for it with human infrastructure," he added. "It just can't be done."

Source: Stanford University

APA citation: No joy in discoveries of new mammal species -- only a warning for humanity, Paul Ehrlich says (2009, February 9) retrieved 23 October 2021 from <https://phys.org/news/2009-02-joy-discoveries-mammal-species-.html>

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