

Are We in the Middle of a Sixth Mass Extinction?

By Ann Gibbons

March 2, 2011 for *Science Magazine*

(<http://www.sciencemag.org/news/2011/03/are-we-middle-sixth-mass-extinction>)

Earth's creatures are on the brink of a sixth mass extinction, comparable to the one that wiped out the dinosaurs. That's the conclusion of a new study, which calculates that three-quarters of today's animal species could vanish within 300 years. "This is really gloom-and-doom stuff," says the study's lead author, paleobiologist Anthony Barnosky of the University of California, Berkeley. "But the good news is we haven't come so far down the road that it's inevitable."

Species naturally come and go over long periods of time. But what sets a mass extinction apart is that three-quarters of all species vanish quickly. Earth has already endured five mass extinctions, including the asteroid that wiped out dinosaurs and other creatures 65 million years ago. Conservationists have warned for years that we are in the midst of a sixth, human-caused extinction, with species from frogs to birds to tigers threatened by climate change, disease, loss of habitat, and competition for resources with nonnative species. But how does this new mass extinction compare with the other five?

Barnosky and colleagues took on this challenge by looking to the past. First, they calculated the rate at which mammals, which are well represented in the fossil record, died off in the past 65 million years, finding an average extinction rate of less than two species per million years. But in the past 500 years, a minimum of 80 of 5570 species of mammals have gone extinct, according to biologists' conservative estimates—an extinction rate that is actually above documented rates for past mass extinctions, says Barnosky. All of this means that we're at the beginning of a mass extinction that will play out over hundreds or thousands of years, his team concludes online today in *Nature*. [*Nature* is a journal or magazine that publishes some of the most popular recent findings by scientists.]

The picture gets even grimmer when all mammals currently endangered or threatened are added to the count. If those all disappear within a century, then by 334 years from now, 75% of all mammal species will be gone, says Barnosky. "Look outside of your window. Imagine taking away three-quarters of the living things you see and ask yourself if you want to live in that world."

The team extended the same methods of analysis to amphibians, reptiles, birds, plants, mollusks, and other forms of life. They found fairly consistent patterns: From amphibians to birds to mammals, about 1% to 2% of species already are extinct today, and 20% to 50% are threatened—numbers that approach those of the great mass extinctions of the past. "Our best guess is that the current extinction rate is between three to 80 times too high" even without counting all threatened species, says Barnosky. "Assuming threatened species would actually go extinct—which is not inevitable—puts the extinction rate off the charts."

"There's been a lot of general talk on this issue, but attempts to draw more rigorously on the lessons of the fossil record have been rare," says paleobiologist David Jablonski of the University of Chicago in Illinois, who was not involved in the study. "It's really valuable to look at how current losses stack up against the past extinction events."



The silver lining in this dark cloud is that if humans work quickly to protect endangered and threatened species and their habitats now, the mass extinction can be prevented or at least delayed by thousands of years, says Barnosky. Adds Jablonski, "This approach provides a way to gauge progress in walking the world back from that brink [of a mass extinction]."

Questions about the reading:

1. How does the article define "mass extinction"?
2. What is the "normal" rate of extinction?
3. What evidence do we have that we are losing species at more than the normal rate?
4. What evidence do we have that we are in a "mass extinction"? (Look back at the article's definition.)
5. What questions did you have about the article?

(You can talk about words or ideas you didn't understand from the reading, or you can list a couple of questions the article doesn't answer.)

