

Humans creating sixth great extinction of animal species, say scientists - “A rate far higher than in the last five mass extinctions”

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Study reveals rate of extinction for species in the 20th century has been up to 100 times higher than would have been normal without human impact.

The modern world is experiencing a “sixth great extinction” of animal species even when the lowest estimates of extinction rates are considered, scientists have warned.

The rate of extinction for species in the 20th century was up to 100 times higher than it would have been without man’s impact, they said.

Many conservationists have been warning for years that a mass extinction event akin to the one that wiped out the dinosaurs is occurring as humans degrade and destroy habitats.

But the authors of a study published on Friday said that even when they analysed the most conservative extinction rates, the rate at which vertebrates were being lost forever was far higher than in the last five mass extinctions [\[1\]](#).

“We were very surprised to see how bad it is,” said Dr Gerardo Ceballos of the National Autonomous University of Mexico. “This is very depressing because we used the most conservative rates, and even then they are much higher than the normal extinction rate, really indicating we are having a massive loss of the species.”

Previous studies have warned that the impact of humans taking land for buildings, farming and timber has been to make species extinct at speeds unprecedented in Earth’s 4.5bn-year history.

Ceballos said that his study, co-authored by Paul R Ehrlich who famously warned of the impact of humanity’s “population bomb”, employed better knowledge of natural or so-called background extinction rates. He said it was conservative because it looked only at species that had been declared extinct, which due to stringent rules can sometimes take many years after a species has actually gone extinct.

Under a “natural” rate of extinction, the study said that two species go extinct per 10,000 species per 100 years, rather than the one species that previous work has assumed.

Modern rates of extinction were eight to 100 times higher, the authors found. For example, 477 vertebrates have gone extinct since 1900, rather than the nine that would be expected at natural rates.

“It’s really signalling we’ve entered a sixth extinction and it’s driven by man,” said Ceballos.

Muller and Company, c 1870 by an unknown artist. Photograph: Corbis

However, Prof Henrique Miguel Pereira, the chair of the Group on Earth Observations Biodiversity Observation Network, said that the new paper did not add anything revolutionarily new.

“They argue that recent extinction rates are up to 100 times higher than in the past. I think it improves our documentation of the process but it does not yet confirm a sixth mass extinction. I tend to think we have a major biodiversity crisis, but it would take either a fast acceleration of current extinction rates or a couple of centuries at current extinction rates, for the current process to become a sixth mass extinction.”

The team behind the new analysis said “rapid, greatly intensified efforts” would be needed to stop or slow the extinctions currently underway.

Ceballos pointed to the Pope Francis’s encyclical on the environment, which was published on Thursday and lamented the loss of the world’s biodiversity, and interventions by Barack Obama, as signs of hope. “These important figures are starting to really grasp the problem,” he said.

On why people should be worried about the rate of extinctions, he said: “People say that’s really sad, but why does it affect me? There are many reasons we should care. We are the species that are causing the loss of all these other species.”

But the most important reason, he said, was that by losing species humanity was losing what enabled us to have a “good standard of living”.

The paper, Accelerated modern human-induced species losses: Entering the sixth mass extinction, was published in the journal Science Advances.

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<https://www.theguardian.com/environment/2015/jun/19/humans-creating-sixth-great-extinction-of-animal-species-say-scientists>

Earth faces sixth ‘great extinction’ with 41% of amphibians set to go the way of the dodo

Analysis for prestigious *Nature* magazine sounds alarm on the way that human activity, from overfishing to agriculture, is forcing a vast number of species to vanish from the wild

A stark depiction of the threat hanging over the world’s mammals, reptiles, amphibians and other life forms has been published by the prestigious scientific journal, *Nature*. A special analysis carried out by the journal indicates that a staggering 41% of all amphibians on the planet now face extinction while 26% of mammal species and 13% of birds are similarly threatened [2].

Many species are already critically endangered and close to extinction, including the Sumatran elephant, Amur leopard and mountain gorilla. But also in danger of vanishing from the wild, it now

appears, are animals that are currently rated as merely being endangered: bonobos, bluefin tuna and loggerhead turtles, for example.

In each case, the finger of blame points directly at human activities. The continuing spread of agriculture is destroying millions of hectares of wild habitats every year, leaving animals without homes, while the introduction of invasive species, often helped by humans, is also devastating native populations. At the same time, pollution and overfishing are destroying marine ecosystems.

"Habitat destruction, pollution or overfishing either kills off wild creatures and plants or leaves them badly weakened," said Derek Tittensor, a marine ecologist at the World Conservation Monitoring Centre in Cambridge. "The trouble is that in coming decades, the additional threat of worsening climate change will become more and more pronounced and could then kill off these survivors."

The problem, according to *Nature*, is exacerbated because of the huge gaps in scientists' knowledge about the planet's biodiversity. Estimates of the total number of species of animals, plants and fungi alive vary from 2 million to 50 million. In addition, estimates of current rates of species disappearances vary from 500 to 36,000 a year. "That is the real problem we face," added Tittensor. "The scale of uncertainty is huge."

In the end, however, the data indicate that the world is heading inexorably towards a mass extinction – which is defined as one involving a loss of 75% of species or more. This could arrive in less than a hundred years or could take a thousand, depending on extinction rates.

The Earth has gone through only five previous great extinctions, all caused by geological or astronomical events. (The Cretaceous-Jurassic extinction that wiped out the dinosaurs 65 million years ago was triggered by an asteroid striking Earth, for example.) The coming great extinction will be the work of *Homo sapiens*, however.

"In the case of land extinctions, it is the spread of agriculture that has been main driver," added Tittensor. "By contrast it has been the over-exploitation of resources – overfishing – that has affected sealife." On top of these impacts, rising global temperatures threaten to destroy habitats and kill off more creatures.

This change in climate has been triggered by increasing emissions – from factories and power plants – of carbon dioxide, a gas that is also being dissolved in the oceans. As a result, seas are becoming more and more acidic and hostile to sensitive habitats. A third of all coral reefs, which support more lifeforms than any other ecosystem on Earth, have already been lost in the last few decades and many marine experts believe all coral reefs could end up being wiped out before the end of the century.

Similarly, a quarter of all mammals, a fifth of all reptiles and a seventh of all birds are headed toward oblivion. And these losses are occurring all over the planet, from the South Pacific to the Arctic and from the deserts of Africa to mountaintops and valleys of the Himalayas.

A blizzard of extinctions is now sweeping Earth and has become a fact of modern life. Yet the idea that entire species can be wiped out is relatively new. When fossils of strange creatures – such as the mastodon – were first dug up, they were assumed to belong to creatures that still lived in other lands. Extant versions lived elsewhere, it was argued. "Such is the economy of nature," claimed Thomas Jefferson, who backed expeditions to find mastodons in the unexplored interior of America.

Then the French anatomist Georges Cuvier showed that the elephant-like remains of the mastodon were actually those of an "*espèce perdue*" or lost species. "On the basis of a few scattered bones, Cuvier conceived of a whole new way of looking at life," notes Elizabeth Kolbert in her book, *The*

Sixth Extinction: An Unnatural History. "Species died out. This was not an isolated but a widespread phenomenon."

Since then the problem has worsened with every decade, as the Nature analysis makes clear. Humans began by wiping out mastodons and mammoths in prehistoric times. Then they moved on to the eradication of great auks, passenger pigeons – once the most abundant bird in North America – and the dodo in historical time. And finally, in recent times, we have been responsible for the disappearance of the golden toad, the thylacine – or Tasmanian tiger – and the Baiji river dolphin. Thousands more species are now under threat.

In an editorial, Nature argues that it is now imperative that governments and groups such as the International Union for Conservation of Nature begin an urgent and accurate census of numbers of species on the planet and their rates of extinction. It is not the most exciting science, the journal admits, but it is vitally important if we want to start protecting life on Earth from the worst impacts of our actions. The loss for the planet is incalculable – as it is for our own species which could soon find itself living in a world denuded of all variety in nature. As ecologist Paul Ehrlich has put it: "In pushing other species to extinction, humanity is busy sawing off the limb on which it perches."

Robin McKie, science editor

* *The Guardian*. Sunday 14 December 2014 00.05 GMT Last modified on Monday 15 December 2014 09.26 GMT:

<https://www.theguardian.com/environment/2014/dec/14/earth-faces-sixth-great-extinction-with-41-of-amphibians-set-to-go-the-way-of-the-dodo>

Footnotes

[1] <http://advances.sciencemag.org/content/1/5/e1400253>

[2] <http://www.nature.com/news/biodiversity-life-a-status-report-1.16523>