23081 Biodiversity: What is a mass extinction and are we causing one?

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Five times in our planet's history, adverse conditions have extinguished most of life. Now, scientists say, life on Earth could be in trouble again, with some even saying we could be entering a sixth mass extinction.

Human-caused climate change, changes in land use and pollution are rapidly transforming the planet, making it harder for species to adapt and survive.

Mass extinctions are episodes in Earth's history when the planet rapidly loses three quarters or more of its species.

Scientists who study the fossil record refer to the previous "Big Five" mass extinctions that have taken place over the course of 540 million years.

"We're changing the path of evolution," says Dr Gerardo Ceballos, an ecologist at Mexico City's UNAM University. "Even if we're not in a mass extinction, what we're doing is putting at risk the system that has made it possible for us to survive."

Rates of extinction are hard to measure because even today, we don't know much about the majority of species - or how threatened they could be.

In 2015 scientists studied museum collections, records and expert accounts of 200 known species of land snails. They found that many hadn't been seen in the wild since originally being classified as a species and that a tenth were most likely already extinct.

It's estimated that global wildlife populations have declined on average by 69% in just 50 years.

Some scientists have doubts about the accuracy of these findings, but most experts agree that extinction rates are higher today than at most times in the past.

As leaders at the COP27 summit try to fix targets for protecting nature for the next decade, environmentalists hope that the world will commit to protecting 30% of the land and sea by 2030.

There is still hope we can help wildlife recover and save many species from going extinct if we limit global warming to 1.5°C and protect key habitats, experts say.

Habitats that can harbour ecological networks, rather than just individual species, seem to be the best way to help nature recover, says Prof David Jablonski, a palaeontologist at the University of Chicago.

"There are species that would have gone extinct if we hadn't tried to protect them," says Prof Stuart Pimm, a biologist at Duke University.

"We already know that conservation actions are slowing the rate of extinction. In other words, we're having an impact."

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