

# Opinion: Humans could cause, or prevent, Earth's 6th mass extinction

By Scientific American, adapted by Newsela staff

Sep. 22, 2014 1:00 AM



A giant tortoise named “Lonesome George” is seen in the Galapagos islands, an archipelago off Ecuador’s Pacific coast. Lonesome George, the late reptile prince of the Galapagos Islands, may be dead, but scientists now say he may not be the last giant tortoise of his species after all.

The most famous mass extinction came from space, but the biggest might have been because of carbon dioxide. Cataclysmic events drove the first five mass extinctions in Earth’s history. An asteroid ended the age of the dinosaurs. Volcanic eruptions may have caused the Great Dying, which wiped out much of the earth’s marine life at the time.

Altogether, the five mass extinctions caused 75 percent of the planet’s life to die out. The sixth mass extinction may now be beginning—and we’re the cause of this one.

During the last several centuries we have burned through eons worth of fossil fuels, like oil, coal and natural gas. In the process, we’ve changed the climate. We use more than half of the planet’s unfrozen land for cities and logging or food, eliminating the habitats of animals and plants. Before we even achieved civilization, we had already helped hunt the biggest, fiercest animals—woolly mammoths, giant kangaroos and giant sloths—to extinction.

## The “Anthropocene Defaunation”

Biologists and paleoecologists (who study ancient ecosystems) estimate that humans have driven roughly 1,000 species extinct in our 200,000 years on the planet. Since 1500, we have killed off at least 322 types of animals. The passenger pigeon, the Tasmanian tiger and, most recently, the baiji, a freshwater dolphin in China are all gone forever.

Another 20,000 or more species are now threatened with extinction, according to the International Union for the Conservation of Nature, which keeps a list of all the known endangered plants and animals on the planet. There are 5 million or so animal species on the planet, and thanks to humans they are all 28 percent smaller on average. And as many as one third of all animals are either threatened or endangered, a new study in *Science* magazine finds.

Scientists call this sixth mass extinction the “Anthropocene defaunation.” The Anthropocene is a name some geologists use to mark the period of time that humans have dominated the Earth—and changed it.

Scientists can’t be sure how quickly it’s happening, perhaps because much of it is happening to beetles and other insects that are notoriously overlooked. But according to that new study in *Science*, their numbers fell by half over the past 35 years while the human population doubled. Other recent studies suggest that the current extinction rate is roughly 1,000 times faster than the average pace in Earth’s history. That makes this the fastest extinction event on record, even if it is not yet a mass die-off.

## It’s Not Too Late

The biggest, fiercest animals still left on the planet—elephants, tigers, whales, among others—are most at risk. And we humans have shown no desire to stop the activities—overexploitation for food, habitat destruction and others—that drive extinction.

And yet it’s not too late. In the past few decades, humans brought the black-footed ferret back from just seven individuals; condors have been nursed back through vaccinations and raising by hand; and hellbender salamanders have been restored, to name just a few in North America. According to another new study in *Science*, people have physically moved 424 species of plants and animals to protect them from extinction.

For such efforts to succeed, careful attention must be paid both to genetics and habitat. There is no point in bringing back the baiji dolphin, for example, if the Yangtze River remains polluted and overfished. But conservation efforts can work. Fishes can bounce back when overfishing is stopped, just as Maine haddock and Washington state coho salmon both have. The reforestation of the U.S.

East Coast shows that when farms go away, woodlands return. Then coyotes, deer, turkey and other wildlife move back in. The animals and plants of the Amazon rain forest have benefited from Brazil's efforts to curb deforestation.

And in what might provide a lesson in conservation, paleoecologists have shown that 20 out of 21 large mammals in India—from leopards to muntjac deer—have survived there for the past 100,000 years alongside one of the largest human populations on the planet.

## Conservation Is The Key

To avoid the sixth mass extinction we will probably have to be more aggressive about conservation. Endangered species may need to be moved to help them deal with a changing climate. Think re-wilding: reintroducing species like wolves or beavers that were once in a given ecosystem but have since disappeared. Aggressive conservation might also mean killing off newcomer species to preserve or make room for local plants and animals, as in New Zealand, where killing off local rats have helped non-flying kakapo parrots survive.

In the most extreme case aggressive conservation could involve bringing in new animals to fill the role of animals that have gone extinct. For example, European sailors ate their way through the Indian Ocean islands of Mauritius, killing off the dodo bird and the local tortoise species. But tortoises from the neighboring Seychelles archipelago have been imported recently. They have helped restore the island ecosystem, including bringing back the endangered local ebony trees. Similar projects are now being considered from Caribbean islands to Madagascar.

There is even some hope of bringing back entirely extinct species in the future using advances in genetics and synthetic biology. Bringing back extinct species, or replacing extinct animals with similar ones to restore ecosystems, could cause some of the same problems as invasive species, like the Asian carp invading U.S. lakes. We'll have to be careful.

But we are not doomed to cause a sixth mass extinction, at least not yet, despite consuming our way through the world's remaining big wild animals. Based on an estimate published in *Nature* in 2011, at our current rate we have a century or two before our actions assure a mass extinction. Unlike an asteroid, we could choose to change course.

*Reproduced with permission. Copyright 2014 Scientific American (<http://www.scientificamerica.com>), a division of Nature America, Inc. All rights reserved.*