

How the threat to lions, leopards and wolves endangers us all

Though fearsome killers, big carnivores are also a precious resource, as their feeding habits keep many delicate ecosystems in balance. But too many predators are now facing extinction

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Lions kill a buffalo in Kenya's Masai Mara National Reserve. Photograph: Jonathan & Angela Scott/Getty Images/AWL Images RM

They are the planet's most prolific killers – and also some of nature's most effective protectors. This is the stark conclusion of [an international report](#) that argues that lions, wolves, pumas, lynxes and other major carnivores play key roles in keeping ecosystems in balance. It also warns that the current depletion of numbers of major predators threatens to cause serious ecological problems across the globe.

The paper, written by a group of 14 leading ecologists and biologists from the US, Europe and Australia and published in the journal *Science*, calls for the establishment of an international initiative to conserve large carnivores and help them to coexist with humans. Failure to protect our top predators could soon have devastating consequences, they warn.

"Globally, we are losing our large carnivores," said William Ripple, the report's lead author. "Many of them are endangered and their ranges are collapsing. Many are at risk of extinction, either locally or globally. And, ironically, they are vanishing just as we are learning to appreciate their important ecological effects."

The report has been produced, in part, to show that the classic vision of a large predator, such as a lion or a wolf, being an agent of harm to [wildlife](#) and a cause of widespread depletion of animal

stocks is misguided. Careful analysis of predators' food chains reveals a very different picture. "In fact, the myriad social and economic effects [of large carnivores] include many benefits," it states.

Ripple, a professor at Oregon State University's department of forest ecosystems and society, and his colleague Robert Beschta, have documented the impact of wolves in Yellowstone and other national parks in North America. When wolf numbers have been reduced, usually by hunters, this has led to an increase in numbers of herbivores, in particular the elk.

Elks browse on trees such as aspen, willow, cottonwood, and various berry-producing shrubs, and the more elks there are, the more browsing damage is done to these trees. The knock-on effect is striking, says the report.

"Local bird populations go down because they have fewer berries to eat," added Ripple. "The same is true of bears, which also eat berries. Beaver populations are also affected. They have less plant life to eat and less wood for making their dams.

"For good measure, the roots of the willow and other shrubs help to hold the soil of river banks together, so they do not get washed away. This does happen, however, when you have no wolves, lots of elks and, therefore, poor levels of vegetation. So you can see that the wolf – which sits at the top of the food chain in midwest America – has an impact that goes right down to having an effect on the shapes of streams."

Yet wolves were once considered to be such a menace that they were exterminated inside Yellowstone national park in 1926. The park's ecology slowly transformed with their absence until, in 1995, they were reintroduced.

"Very quickly, the park's ecosystems returned to normal," said Ripple. "I was impressed with how resilient it proved."

Another example of the ecological importance of large carnivores is provided by lions and leopards. Both [animals](#) prey on olive baboons in Africa, and as numbers of these key predators have declined, numbers of olive baboons have increased. The population of lions in particular has been so reduced that it now only covers 17% of its historical range, while numbers of olive baboons have risen in direct proportion.

The consequence of this increase has been significant, say the authors. Olive baboons are omnivores and eat small primates and deer. When olive baboon numbers rise, populations of local monkeys and deer plummet. There is also an effect on human populations.

"Baboons pose the greatest threat to livestock and crops in sub-Saharan Africa, and they use many of the same sources of animal protein and plant foods as humans," states the *Science* paper. "In some areas, baboon raids in agricultural fields require families to keep children out of school so they can help guard planted crops."

Nor is the impact confined to land. Marine carnivores are also being depleted at alarming rates, with similar consequences for ecology of the seabed. Sea otters, which make their homes in the northern Pacific Ocean, control local populations of sea urchins by eating them.

When sea otter populations suffer, urchins do well and this has reverberations along the sea floor. Urchins attack and destroy the giant kelp that is found in vast forests in coastal waters in the Pacific, the scientists point out.

These forests are devastated, often with unfortunate results. Kelp forests dampen currents and storm surges and so protect coasts from erosion and damage. An absence of sea otters means no kelp forest and no seashore protection, in other words.

In addition, kelp absorbs carbon dioxide – just as trees and other plants do on land. And that it is another critical issue, Ripple added.

"Lions, leopards, wolves, sea otters and all those other carnivores at the top of food chains eat herbivores and keep their numbers under control. That in turn means there are fewer animals eating plants and so the planet has more trees or kelp that can absorb carbon dioxide and so help in some way to reduce amounts of the gas in the atmosphere," he said.

The problem for the planet is that across the world very few of the major carnivore populations are stable, the *Science* report reveals. In fact, numbers of virtually all of the major predators – including tigers, lions, pumas, leopards, cheetahs, jaguars, black bears and hyenas – are plummeting.

More than 75% of the 31 species of large carnivore that were studied are declining, it was found, and 17 species now occupy less than half of their former ranges. According to the report's authors, the majority of the large carnivores that they looked at were either labelled endangered, critically endangered or vulnerable, according to the International Union for the [Conservation of Nature](#).

Unfortunately for the biologists and ecologists who are trying to protect major predators, human tolerance of their presence is low. Farmers find their sheep and cattle are being killed and so view animals such as wolves as a straightforward threat to their livelihoods, for example.

"What is needed is a global initiative that is based on networks of local ecologists, landowners, hunters and other stakeholders who can work together to try to protect our key carnivores," said Ripple.

Carnivores are of immense value, he added. As well as helping protect the environment, they are of considerable tourist appeal. The wolves of Yellowstone bring in millions of dollars of tourist income every year, for example.

"Certainly it is true that these animals are killers, but they are also immensely important to the planet's ecosystems," Ripple told the *Observer*. "They are hard to live with. But equally they are

a precious resource. Yet they are dying out very rapidly. We should not stand by and let that happen."