

On land and at sea, large animals are in 'double jeopardy'

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Elephant. Credit: Picture by Yathin S Krishnappa. Licensed under CCBY-SA3.0

Large animals hunted for their parts—such as elephant ivory and shark fins—are in double jeopardy of extinction due to their large body size and high value, according to a new analysis reported in the Cell Press

journal *Current Biology* on June 9. The study reveals underappreciated risk to marine species similar to that of iconic terrestrial species, but elevated by key differences in the sea.

"We typically assume that if a species is reduced to low numbers, individuals will be hard to find, hunters will stop hunting, and populations will be given a chance to recover," says Loren McClenachan of Colby College in Waterville, Maine. "But the extreme values of these species mean that without significant conservation intervention, they will be hunted to extinction."

In the new study, McClenachan, along with Andrew Cooper and Nicholas Dulvy of Simon Fraser University in Canada, identified a taxonomically diverse group of more than 100 large marine and [terrestrial species](#) that are targeted for international luxury markets. They estimated the value of these species across three points of sale and explored the relationships among [extinction risk](#), value, and body size. They also quantified the effects of two mitigating factors: poaching fines and geographic range size.

The analysis showed a threshold above which economic value is the key driver of extinction risk. Although lower-value species are influenced primarily by their biology, the most valuable species are at high risk of extinction no matter their size. Once mean product values are greater than US\$12,557 per kilogram, [body size](#) no longer drives risk, the report shows.

The researchers also uncovered important differences between marine and terrestrial species that point to elevated risk in the sea: although marine products are generally less valuable on a per kilogram basis, individual animals are still just as valuable as the most valuable terrestrial species. An individual whale shark, for example, is about as valuable as the most valuable terrestrial species: rhinoceroses and tigers.

"Hunters don't kill kilograms, they kill individuals, so we need to pay attention to these high values of individual animals," McClenachan says.

The risk to [marine species](#) isn't reduced for species with larger ranges as it is on land, either.

"The assumption that large ranges protect species from extinction is based on conservation science done on land—where animals found in multiple countries have a higher chance of protection in at least one location—and appears not to apply to marine species, where widespread and little-policed hunting contrasts with tighter controls on land," McClenachan says.

The study points to the importance of considering trade of marine animals and differences between terrestrial and marine animals when it comes to conservation.

"For too long, we have been reading wildlife trade reports with scant recognition of the diversity and value of the marine wildlife trade," Dulvy says.

"We need to pay attention to fundamental differences between marine and terrestrial species," McClenachan adds. "Conservation science began on land, so it is tempting to assume that underlying principles are the same in the ocean. However, as we found, this is far from the case. If we're not aware of these basic differences, it's impossible to design effective conservation."

The researchers say that the next step will be to design effective conservation strategies for these high-value, large-bodied, far-ranging [species](#). It's a challenging road ahead, but they say there are reasons for optimism, including signs that control of international trade via CITES (Convention on International Trade in Endangered Species) is working in

some cases and the increased use of new technologies like DNA forensics to detect wildlife crime.

More information: *Current Biology*, McClenachan et al.: "Rethinking Trade-Driven Extinction Risk in Marine and Terrestrial Megafauna" [www.cell.com/current-biology/f ... 0960-9822\(16\)30484-5](http://www.cell.com/current-biology/fulltext/S0960-9822(16)30484-5) , DOI: [10.1016/j.cub.2016.05.026](https://doi.org/10.1016/j.cub.2016.05.026)

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