In the Game of Extinction, It’s Good to Be Average

A new study finds that the world’s largest and smallest species are closest to the brink of oblivion.

October 20, 2017 Jason Bittel

The Somali ostrich is in big trouble.

Ninara/Flickr

According to a recent study, almost all it takes to predict an animal’s likelihood of extinction is to put it on a scale. Species with high or low body masses are disproportionately threatened, compared with those that are medium-size.

The research, published recently in the journal *PNAS*, is the latest, biggest news from the world of extinction science. The scientists found that in any given group of animals—from bony fishes and birds to mammals and reptiles—species at the size extremes tend to be in the most trouble. For each group, species with a certain body mass are least likely to be threatened with extinction, and the farther a given species strays from that number, the worse off it tends to be. The safe(ish) zone for bony fishes,

for instance, is around eight pounds. A bony fish just one order of magnitude larger—around 80 pounds—would be 294 percent more likely to be at risk.

Big Macs

William Ripple, an ecologist at Oregon State University, is no newbie in this realm of research. In 2015 he published a paper that found that of the 74 species of large herbivores left on earth, 44 are threatened with extinction.

Humans are the one of the biggest threats to larger species like elephants.

Charles J. Sharp via Wikimedia Commons

Scientists had long suspected that the earth's more voluminous inhabitants are more vulnerable, but studies had returned mixed results. But now, by gathering up the body masses for 27,647 vertebrates and checking them against each species' threat status (as decided by the International Union for the Conservation of Nature), Ripple and his coauthors have shown definitively that it's bad to be big.

"That just makes sense," he says. Larger species are the ones humans more often come into conflict with and the ones we harvest for skins and other parts. "And, there's more meat," Ripple adds.

Habitat loss is also a contributing factor—another no-brainer when you consider that heftier animals, such as elephants, require more area to fulfill their daily needs than, say, a lemur. Ripple, however, was shocked to find that the world's littlest vertebrates were equally effed.

Small Fry

Ripple says tiny species are much less affected by large-scale harvesting by humans, since exploiting such animals requires more effort with less gain. For example, when deer are available, hunters won't spend most of their time targeting shrews.

What, then, is putting the world's pipsqueaks at risk? Small geographic ranges and habitat degradation. Think about species that live on just one island or rely on a particular watershed or type of forest. Should anything happen to that ecosystem—be it a new coal mine, a hurricane, or a new logging contract—that whole population could disappear in a flash. Their eggs are all in one basket, so to speak, and more and more of those baskets are sitting on the edge of a cliff.

Captive breeding brought the tiny Kihansi spray toad back from the brink of extinction.

Josh More/Flickr

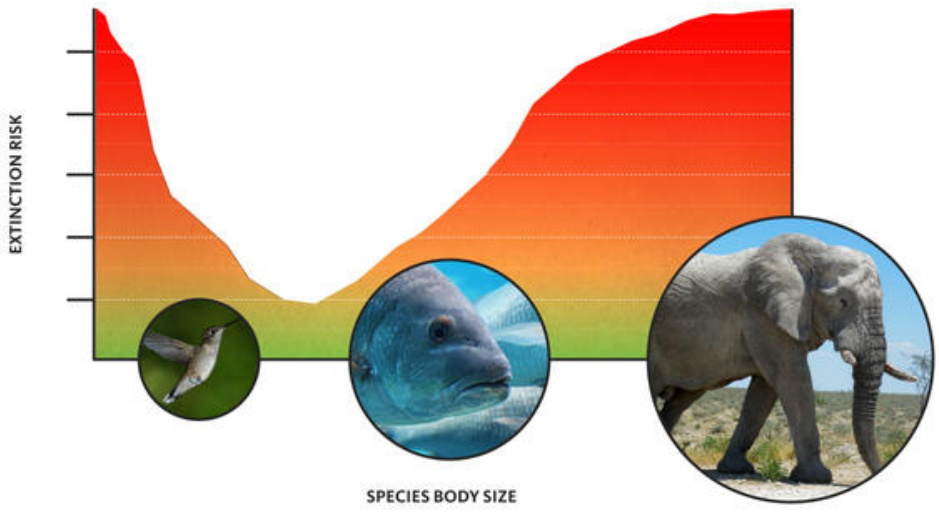
You might wonder why losing something like the Devils Hole pupfish or the rufa red knot or the Kihansi spray toad matters. After all, if you could save only one species, would you pick a sea snail or the Attwater's prairie chicken over a jaguar?

But Ripple says devaluing a species just because it's itty-bitty is foolish. Bats and birds, for instance, play huge roles in their ecosystems through pollination, insect predation, seed dispersal, and much else.

"It's important for us to be humble," says Ripple, "in that humans do not understand all of the functions that are provided by wildlife species."

Juuust Right

So what is it about all of those in-betweeners? What makes them so special?



Oliver Day, Oregon State University

Extinction risks are greater for animals at the small and large ends of the scale.

They aren’t hardier or better survivors or genetically superior to the big and small in any way, says Ripple. Medium-size animals are just more likely to occupy a Goldilocks-like niche. Humans are less apt to exploit them to the point of extinction, their habitat requirements are not as expansive, and their population distributions are not so specific. Medium-size species also typically reproduce faster than larger animals (which have longer gestation periods, and whose young take longer to reach sexual maturity), and they tend to have lengthier life spans than smaller animals.

None of which is to say that all the world’s moderates are bulletproof. Far from it—just ask any Tasmanian tiger. (Oh wait, you can’t.) But when you zoom out on the extinction crisis, you can see that those bodies on the edges tend to be the ones about to fall into the void.