

Understanding extinction — humanity has destroyed half the life on Earth

There's less life overall, and much of it is domesticated plants and animals instead of wildlife

CBC Radio · Posted: Oct 18, 2019 3:58 PM ET | Last Updated: October 18



A skull of a washed ashore fish lies amid destroyed soybeans on a field at a farm near Omaha, Nebraska that was flooded this past spring. (Johannes Eisele/AFP/Getty Images)

The increasing rate of species threatened with extinction that's alarming biologists is just one feature of the massive transformation humans have wrought on our planet. Another shocking reality is that Earth is far poorer not just in the diversity of life, but also in the raw amount of life.

Biomass — the mass of living material like plants, bacteria and animals on Earth — has [dropped precipitously](#) since we humans came to dominate the planet.

"If you take the overall biomass on Earth before humanity arrived on the scene, it was about twice

what it is now," said [Ron Milo](#), a professor of plant and environmental sciences at the Weizmann Institute of Science in Israel, in conversation with [Quirks & Quarks](#) host Bob McDonald.

I think we're at a point where everything around us is the 'canary in the coal mine' and the natural world is telling us that there's a big problem here.

- *Adam Smith, Canadian Wildlife Service*

Earth's population nears eight billion people, but that only accounts for 0.01% of our planet's overall biomass. Yet, despite the fact that we represent tiny fraction of life on Earth, humanity

has had an outsized impact on species around the world that are threatened with extinction.

This loss of biodiversity and numbers means we're eroding the ability of our planet to support life — both natural life and our own growing human population.

Bad news about species lost

"I think we're at a point where everything around us is the 'canary in the coal mine' and the natural world is telling us that there's a big problem here," said [Adam Smith](#), the senior biostatistician for the Canadian Wildlife Service in Ottawa.

Smith was one of the co-authors of a [recent comprehensive study](#) that revealed we've lost close to three billion North American birds, which is a 30 per cent drop in the last half a century.



(Cornell Lab of Ornithology)

Previous research has shown the main culprit behind the declining wildlife numbers — and birds in particular — is the loss and degradation of habitat.

And this issue goes far beyond birds.

The recent UN biodiversity report, the [IPBES global assessment](#), concluded that up to one

million wild species are now at risk of extinction due to human activities.

"Species are going extinct, it seems, many times more rapidly than they have in any time in recent history. And you have to go back towards the last major extinction event in order to find extinction rates of this nature. So it's somewhere at least 10 to 100 times — maybe even up to a 1,000 times more rapidly — that species are going extinct," said [Kai Chan](#), a professor at the Institute for Resources, Environment and Sustainability at the University of British Columbia and co-author of the UN report.

The thing that characterizes major extinctions is not only that we lose species, it's that even in the species that survive, most individuals die, resulting in much less life on Earth.

Humanity's impact on the Earth's biomass

One of the most significant ways we've reduced the biomass on the planet is by altering the kind of life our planet supports. One huge decrease and shift was due to the deforestation that's occurred with our increasing reliance on agriculture. Forests represent more living material than fields of wheat or soybeans.

But when it comes to animals, there's also been a major shift, from wild to domestic. Milo said our planet now has 20-fold more biomass in domesticated livestock like cows, pigs and sheep than in all the wild mammals — like elephants, caribou and whales — combined. And there are twice as many domesticated birds as there are wild ones.



Domestic poultry outweighs all the wild birds on Earth by a factor of two (Srdjan Zivulovic / REUTERS)

The more wild species we lose, the less diverse life on Earth becomes. This has consequences like increasing the vulnerability of our agricultural systems.

"The pathogens and parasites, etc., that tend to bring down the species that we're trying to prop up — those are largely held in check by other species within wild systems. It's only when the systems become degraded that those pests and parasites etc. can really explode in a way that becomes a huge problem for our agricultural efforts," said Chan.

Food choice matters

Milo says "there's no easy solution" to reversing this trend that could impact our global food security.

"There are some improvements that could be made," he added, such as improving land efficiencies and by adjusting what we eat.

(Credit to Curtis Marantz, Geoffrey A. Keller, Robert C. Stein, Wil Hersberger and The Macaulay Library at the Cornell Lab of Ornithology for the use of their bird song recordings.)

"We were also analyzing, for example, the dietary choices that people make. And we find that based on the things that you eat, it also has implications on the burdens that the environment or nature will experience as a result of that," said Milo.



If U.S. residents replaced all the beef they ate with either chicken or plant-based alternatives, we could free up land to feed 140 million people (Robyn Beck/AFP/Getty Images)

He points to the environmental impacts of eating beef, which can be very costly, compared to other types of protein, in that, if Americans were to switch [from beef to poultry or plant-based alternatives](#), it could spare enough land to grow food for another 140 million people, or allow land to be returned to wilderness.

Considering the disproportionate and detrimental effect humanity has had on life on Earth and the benefits richer nations have enjoyed, Milo said, "We should also take responsibility."