The Sixth Extinction

Where will you be tomorrow?

Introduction to Extinction

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THE EXTINCTION CRISIS

It's frightening but true: Our planet is now in the midst of its sixth mass extinction of plants and animals — the sixth wave of extinctions in the past half-billion years. We're currently experiencing the worst spate of species die-offs since the loss of the dinosaurs 65 million years ago. Although extinction is a natural phenomenon, it occurs at a natural "background" rate of about one to five species per year. Scientists estimate we're now losing species at up to 1,000 times the background rate, with literally dozens going extinct every day [1]. It could be a scary future indeed, with as many as 30 to 50 percent of all species possibly heading toward extinction by mid-century [2].

Some mammal populations are growing:

Can you guess which ones? That's right—they're the ones we like to eat.
https://www.worldatlas.com/articles/most-populous-mammals-on-earth.html

And don't forget chickens!

https://www.worldatlas.com/articles/how-many-chickens-are-there-in-the-world.html

1. Video Discussion of the Sixth Extinction

https://www.youtube.com/watch?v=kWrPo02e4fo

2. Evidence and Causes of Extinction

Human beings eating wild animals to brink of extinction: study

https://www.deccanchronicle.com/lifestyle/pets-and-environment/191016/human-beings-eating-wild-animals-to-brink-of-extinction-study.html

New maps show food production now takes up 40 percent of the Earth's land surface, revealing the extent to which farming has changed the face of the planet, scientists say.

3 MINUTE READ

BY JAMES OWEN

PUBLISHED DECEMBER 9, 2005

Farming or agriculture is destroying wildlife habitat and the wild species

Farming Claims Almost Half Earth's Land, New Maps Show

Food production takes up almost half of the planet's land surface and threatens to consume the fertile land that still remains, scientists warn.

The global impact of farming on the environment is revealed in new maps, which show that 40 percent of the Earth's land is now given over to agriculture.

University of Wisconsin-Madison scientists compiled the maps using satellite images and crop and livestock production data from countries around the world. The team presented their picture of global land use this week at a meeting of the American Geophysical Union in San Francisco.

"The satellite data tells us where cultivation is occurring with good spatial accuracy, while the census data is able to tell us what is being grown there," said Navin Ramankutty, a land-use researcher with Wisconsin-Madison's Center for Sustainability and the Global Environment (SAGE).

The maps suggest that an area roughly the size of South America is used for crop production, while even more land—7.9 to 8.9 billion acres (3.2 to 3.6 billion hectares)—is being used to raise livestock.

And with the world's population growing rapidly, the pressure is on farmers to find new land to cultivate, the study team says.

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"How can we continue to produce food from the land while preventing negative environmental consequences, such as deforestation, water pollution, and soil erosion?" Ramankutty said.

Past Picture

The researchers also used past land-use data to create maps showing how agriculture has spread over the centuries. In 1700, for example, just 7 percent of the world's land was used for farming.

Figures from the Food and Agriculture Organization of the United Nations suggest that total farmland increased by 12.4 million acres (5 million hectares) annually between 1992 and 2002.

The SAGE scientists identified specific crops that help account for this growth.

In Brazil, for example, huge areas of rain forest have been replaced by soybeans, which aren't a traditional crop in South America. Production has been fueled by demand for soy from China.

Brazil's Mato Grosso state has seen the biggest expansion of soybean farming. A study by researchers at the University of Maryland found that 72 percent of land cleared for crops in that region between 2001 and 2003 was previously pasture for livestock.

"It is not clear how much of this expansion is replacing forests versus other land cover," Ramankutty said. "However, it is very likely that these pastures were formerly rain forest. So the transition may have been from forest to pasture to soybeans."

SAGE researcher Amato Evan said, "If current trends continue, we should expect to see increased agricultural production at the cost of increased tropical deforestation."

"And the production that is really driving the tropical cropland expansion are crops that are used as feed for cattle."

Farmland Potential

Countries with the least suitable agricultural lands are likely to be the ones hardest hit by increased food demand.

The team identified 16 such regions by comparing remaining potential arable land with projected population growth over the next 45 years.

The regions include several parts of Asia, North Africa, and the Middle East.

"Most of the best lands are already cultivated, for sure," Ramankutty said. "But by some estimates, we can potentially double the amount of cultivated land by using the unrealized potential in Latin America and Africa."

He says, however, that these remaining unexploited areas are not necessarily best suited for agriculture, and that using them for farming would often mean clearing valuable natural ecosystems.

"I don't think we are in danger of running out of food," Ramankutty said. "The issue is about what we are going to do to the environment in the process of producing that food."

One potential solution could be "precision farming." The model uses new technology to improve productivity while reducing the use of water and the application of fertilizer and other potentially harmful chemicals.

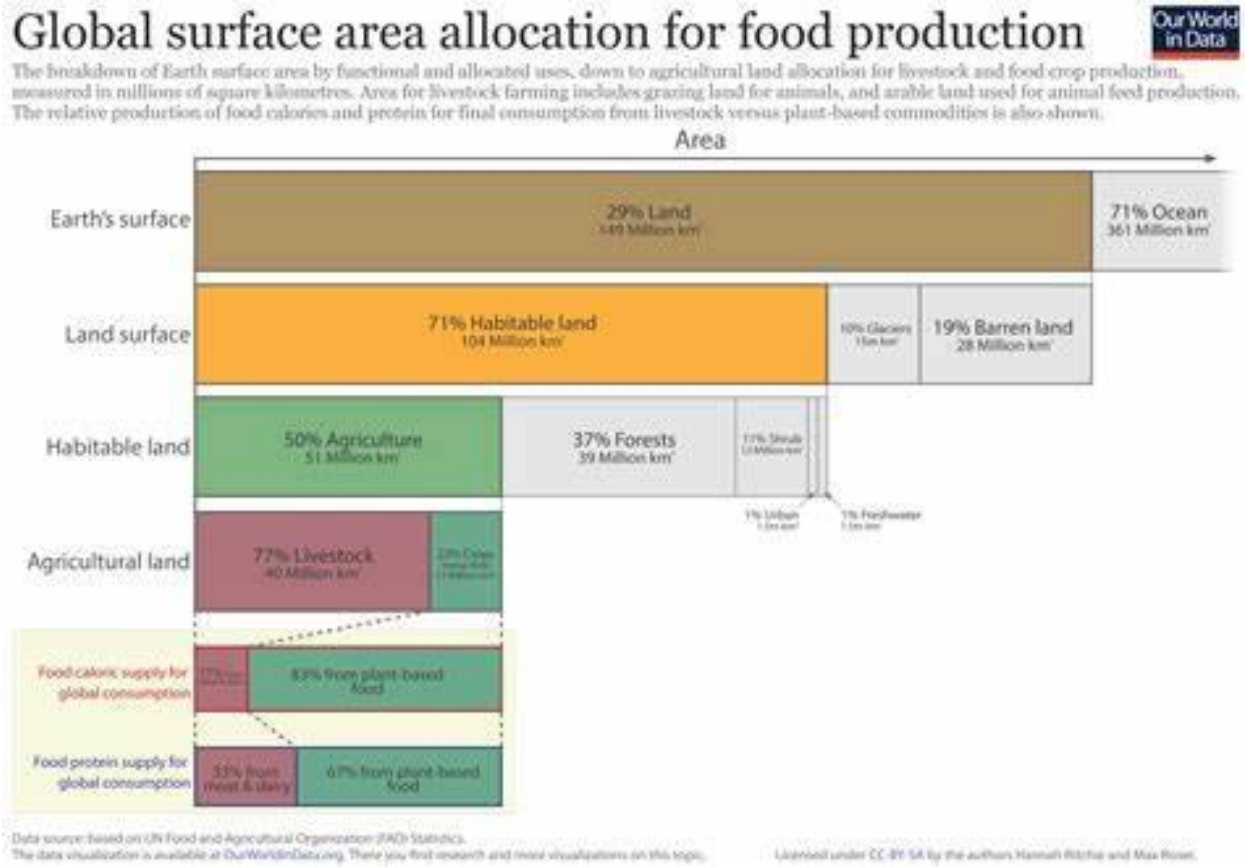
According to Evan, heavy fertilizer use is a major problem in farming areas, such as Madison, where the runoff pollutes nearby lakes.

The precision system, currently being developed by NASA geoscientists, would work by using satellite data to help farmers decide how to use their resources with pinpoint accuracy based on the requirements of different areas of each field.

Meanwhile, the next phase of the SAGE project is to build an Internet-based database called the Earth Collaboratory. The resource would draw on the knowledge of scientists, local environmentalists, and the general public to help design localized plans for land use.

Jonathan Foley, director of SAGE, said the project "will truly be a brave new experiment that effectively bridges science, decision-making, and real-world environmental practice—collectively envisioning a new way to live sustainably."

https://www.nationalgeographic.com/news/2005/12/agriculture-food-crops-land/



As of 2019, we use about 37% of the land on earth for agriculture

https://www.bettermeetsreality.com/how-much-land-in-the-world-is-used-for-agriculture-do-we-have-enough-arable-agricultural-land-left-for-food-other-resources-in-the-future/

Plummeting insect numbers 'threaten collapse of nature'

Insects could vanish within a century at current rate of decline, says global review

Damian Carrington*Environment editor,* Fri 5 Jul 2019 11.46 BST

The rate of insect extinction is eight times faster than that of mammals, birds and reptiles. Photograph: Courtesy of Entomologisher Verein Krefeld

The world's insects are hurtling down the path to extinction, threatening a "catastrophic collapse of nature's ecosystems", according to the first global scientific review.

More than 40% of insect species are declining and a third are endangered, the analysis found. The rate of extinction is eight times faster than that of mammals, birds and reptiles. The total mass of insects is falling by a precipitous 2.5% a year, according to the best data available, suggesting they could vanish within a century.

The planet is at the start of a sixth mass extinction in its history, with huge losses already reported in larger animals that are easier to study. But insects are by far the most varied and abundant animals, outweighing humanity by 17 times. They are "essential" for the proper functioning of all ecosystems, the researchers say, as food for other creatures, pollinators and recyclers of nutrients.

Mass animal-die-offs 2019

https://www.thebigwobble.org/p/mass-animal-die-offs-2019.html

Nearly 3 Billion Birds Have Disappeared

North American birds are in peril with 29% of U.S. and Canadian bird populations having been lost since 1970. In a finding researchers called "staggering,"[1] ornithologists analyzed decades of data from multiple and independent monitoring networks to estimate bird populations.[2]

https://articles.mercola.com/sites/articles/archive/2019/10/08/why-birds-are-disappearing.aspx

Mangroves disappearing faster than land-based forests

https://edition.cnn.com/2010/WORLD/asiapcf/07/16/mangroves.threat.un.report/

3. Accelerating Extinction

History's Largest Mining Operation Is About to Begin: It's underwater—and the consequences are unimaginable.

https://www.theatlantic.com/magazine/archive/2020/01/20000-feet-under-the-sea/603040/

https://www.aircrap.org/2019/01/17/our-cellphone-addiction-is-turning-wireless-tech-into-an-invisible-weapon-thats-destroying-wildlife/

4. The Wilson Solution to Extinction

By Edward O. Wilson

- March 12, 2016

DURING the summer of 1940, I was an 11-year-old living with my family in a low-income apartment in Washington, D.C. We were within easy walking distance of the National Zoo and an adjacent strip of woodland in Rock Creek Park. I lived most of my days there, visiting exotic animals and collecting butterflies and other insects with a net that I had fashioned from a broom handle, coat hanger and cheesecloth. I read nature books, field guides and past volumes of National Geographic. I had already conceived then of a world of life awaiting me, bottomless in variety.

Seventy-six years later, I have kept that dream. As a teacher and scientist I have tried to share it. The metaphor I offer for biological diversity is the magic well: The more you draw, the more there is to draw.

But today the dream is at risk. Civilization is at last turning green, albeit only pale green. Our attention remains focused on the physical environment — on pollution, the shortage of fresh water, the shrinkage of arable land and, of course, the great, wrathful demon that threatens all our lives, human-forced climate change. But Earth's living environment, including all its species and all the ecosystems they compose, has continued to receive relatively little attention. This is a huge strategic mistake. If we save the living environment of Earth, we will also save the physical, nonliving environment, because each depends on the other. But if we work to save only the physical environment, as we seem bent on doing, we will lose them both.

So, what exactly is the current condition of the living environment, in particular its biological diversity and stability? How are we handling this critical element of Earth's sustainability?

To begin, how many species of organisms are known on the planet? Here, our knowledge is pathetically weak. At the present time, about two million species have been discovered, described and given a Latinized scientific name. But how many are there actually, known and unknown? Putting aside the bacteria and a distinctive group of microbes called the archaea (which I like to call together the dark matter of biology because so little is understood of their diversity), the best estimate we have of all the rest (the fungi, algae, plants and animals) is roughly 10 million, give or take a million.

Except for the vertebrates (consisting of 63,000 described species of birds, mammals, reptiles, amphibians and fishes) and the flowering plants (with approximately 270,000 species), relatively little is collectively known about millions of kinds of fungi, algae and most diverse of all, the insects and other invertebrate animals. And that matters, a lot: These least understood minions are the foundation of the living world. They are the little things that run the Earth.

In short, we live on a little-known planet. E.T. and other alien biologists visiting Earth would, I suspect, be appalled at our weak knowledge of our homeland. They would be mystified by the scant attention humanity gives to the life-forms on which our existence depends.

The one major reserve in the United States that has been subjected to a complete census is the Great Smoky Mountains National Park. Fifty thousand hours of field work there by specialists and assistants have yielded records of 18,000 species of animals and microorganisms alone, with 40,000 to 60,000 considered likely on the roster when all transients, as well as rare and undescribed species, have been registered.
The mapping of Earth's biodiversity was not, as many assume, mostly completed in the 19th and 20th centuries. It has only begun. The study of biological diversity is absurdly slow. Today, only about 18,000 new species are being discovered and described each year. If we continue at this rate (I've described only about 450 new ant species in my own lifetime), the task of mapping life on Earth, or what is left of it, will not be completed until the 23rd century.

That brings me to the extinction rate of species around the world. With data on the best known vertebrate species, and a lot of additional information from fossil studies and genetics, we can put the fraction of species disappearing each year at upward of a 1,000 times the rate that existed before the coming of humans.

Most of this loss is occurring in tropical countries, and especially tropical forests on islands. But to bring it home to the United States, consider that from 1895 to 2006, 57 species and distinct geographic races of freshwater fishes were driven to extinction, which is 10 percent of the total previously alive; hence the rate of extinction was just under 900 times that which existed before the coming of humans.

The global conservation movement, pioneered by the United States, has raised awareness of nature's plight, and stimulated a great deal of excellent research. It has slowed the hemorrhaging of species, but is still a long way from stopping it. Conservation efforts are concentrated on the roughly one-fifth of vertebrate species worldwide that are ranked as endangered to some degree. We have managed to stabilize or reverse the decline of one-fifth of the species in this group. A better record has been achieved within the United States by the Endangered Species Act of 1973, which has brought 10 times more species back to health than have been lost in the same time period to extinction.

All this is progress, but the prospects for the rest of the century remain grim. The global conservation movement is like a surgeon in an emergency room treating an accident victim: He has slowed the bleeding by half. Congratulations, we might say — even though the patient will be dead by morning.

Unless we wish to pauperize the natural world drastically and permanently, believing that later generations will be smart enough to find a way to bring equilibrium to the land, seas and air, then we, the current inheritors of this beautiful world, must take more serious action to preserve the rest of life.

There is only one rational way to accomplish this goal, and that is to bring the extinction rate back to the level that existed before the worldwide expansion of human populations. The disappearance of natural habitat is the primary cause of biological diversity loss at every level — ecosystems, species and genes, all of them. Only by the

preservation of much more natural habitat than previously envisioned can extinction be brought close to a sustainable level.

The only way to save upward of 90 percent of the rest of life is to vastly increase the area of refuges, from their current 15 percent of the land and 3 percent of the sea to half of the land and half of the sea. That amount, as I and others have shown, can be put together from large and small fragments around the world to remain relatively natural, without removing people living there or changing property rights. This method has been tested on a much smaller scale at the national and state park levels within the United States.

This step toward sustained coexistence with the rest of life is partly a practical challenge and partly a moral decision. It can be done, and to great and universal benefit, if we wish it so.

I have to think that the dream of a boy from so long ago has a chance to endure.

Edward O. Wilson, a professor emeritus at Harvard University, is the author of "Half-Earth: Our Planet's Fight for Life."

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5. Nativism as the Solution

Saving the World's Nature and Biodiversity

Islands of Nature in a Sea of Decline – Indigenous and Local Knowledge, Action and Contributions

https://www.globalresearch.ca/saving-the-worlds-nature-and-biodiversity/5676712

https://www.forestpeoples.org/