Animals Are Running Out of Places to Live

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WILDLIFE IS DISAPPEARING around the world, in the oceans and on land. The main cause on land is perhaps the most straightforward: Humans are taking over too much of the planet, erasing what was there before. Climate change and other pressures make survival harder.

This week and next, nations are meeting in Montreal to negotiate a new agreement to address staggering declines in biodiversity. The future of many species hangs in the balance. Meet some of the animals most affected as humans convert more and more land:

At least 60 percent habitat loss since 2001

At least 50 percent habitat loss since 2001

At least 45 percent habitat loss since 2001

At least 40 percent habitat loss since 2001

At least 35 percent habitat loss since 2001

At least 33 percent habitat loss since 2001

Common thick thumbed bat
Schmidt's spinythumb frog
Black headed nightingale thrush

These are some of the vertebrates that have lost the most habitat in the

last 20 years.

Each has seen at least a third of its natural environment vanish since 2001, research shows.

Many have lost much more.

Worldwide, most converted land is taken for agriculture, like clearing forests to graze cattle or to plant crops.

Other wild habitat is turned into cities, towns and roads.

The human population just surpassed 8 billion. Per capita consumption is soaring.

Can we find a way to share the planet with the rest of its inhabitants?

The groups of animals you just scrolled through aren't the only species that have lost a third or more of their global habitat. They're just some of the mammals, birds, amphibians and reptiles researchers can currently track. Most live in tropical forests.

"If the forest disappears, they will disappear," said Walter Jetz, a professor of biodiversity science at Yale University who leads Map of Life, a platform that combines satellite imaging with ecological data to determine how species ranges are changing around the world. Map of Life shared data with The New York Times.

Biodiversity, or all the variety of life on the planet — including plants, invertebrates and ocean species — is declining at rates unprecedented in human history, according to the leading intergovernmental scientific panel on the subject. The group's projections suggest that a million species are threatened with extinction, many within decades.

Nations are meeting in Montreal to try to chart a different path. Delayed two years because of the pandemic, delegations are working to land a new, 10-year agreement to tackle biodiversity loss under a United Nations treaty called the Convention on Biological Diversity.

“With our bottomless appetite for unchecked and unequal economic growth, humanity has become a weapon of mass extinction,” said António Guterres, the United Nations secretary general, in his opening remarks on Tuesday in Montreal.

The last global biodiversity agreement failed to meet a single target at the global level, according to the Convention on Biological Diversity itself, and wildlife populations continue to plummet.

Take the Honduran white bat.

Researchers estimate the Honduran white bat has lost about half its habitat since 2001.

Konrad Wothe/Alamy

At first glance, they resemble a cluster of cotton balls stuck under a leaf. But each tiny mound of fluff possesses an even tinier yellow snout and ears. Honduran white bats work together to fashion leaves into tent homes and are known to nurse each other's young. At night, they fly out in search of a specific species of fig, dispersing its seeds in return.

These bats offer potential benefits to people. Their cuteness makes them an ecotourism draw, and they have an ability that's rare in mammals to store carotenoids in their skin, which could hold promise for unlocking treatment for conditions like macular degeneration.

But in the last 20 years, Honduran white bats have lost about half their range in Central America as people clear rainforest for pasture, crops and homes. Not yet considered endangered, they are nevertheless in steep decline, one of countless examples in this worsening global crisis.

It's not only wildlife that will suffer as a result. Biodiversity loss can trigger ecosystem collapse, scientists say, threatening humanity's food and water supplies. Alarm is growing that the threat is comparable in significance to the climate crisis.

"Climate change presents a nearer-term threat to the future of human civilization," said Katharine Hayhoe, a prominent climate change researcher who also focuses on biodiversity as chief scientist at the Nature Conservancy. "The biodiversity crisis presents a longer-term threat to the viability of the human species."

Scientists emphasize that one can't be solved without the other because they are interconnected.

What's driving the loss?

The human population has doubled since 1970. While the rate of population growth is slowing, the sheer number of people continues to rise. Consumption levels in different parts of the world mean some people put more pressure on nature. In the United States, for example, each person uses the equivalent of eight global hectares on average, according to the Global Footprint Network, a nonprofit research group. In Nigeria, it's about one hectare per person.

All that is related to the causes of biodiversity loss, which scientists have ranked. First are changes in land and sea use. Then comes the direct taking of species, for example hunting, fishing and wildlife trafficking. Climate change is next, followed by pollution and invasive species. Unfortunately for wildlife, these pressures build on each other.

The yellow cheeked gibbon has lost nearly 30 percent of its habitat in the last 20 years, according to Map of Life researchers. Alamy

In the future, scientists expect climate change to become the main driver of biodiversity loss as changes in temperature, rainfall and other conditions continue to transform ecosystems. That shift is expected "some decades down the road," Dr. Jetz said. "But we might already be looking at a much-reduced set of species at that point."

For the best chance at adapting to climate change, plants and animals need robust populations and room to migrate. Instead, they are depleted and hemmed in.

Why are people taking over so much land? Mostly for agriculture. In many parts of the world, that means exports driven by booming global trade. In recent decades, for example, Southeast Asia has become a

major supplier of coffee, timber, rice, palm oil, rubber and fish to the rest of the world.

“All of that economic expansion has come at the cost of biodiverse habitat,” said Pamela McElwee, an environmental anthropologist at Rutgers University who studies the region.

Some momentum is building for companies to ensure their products are deforestation-free. Reducing meat consumption and food waste are key to freeing up land for other species, Dr. McElwee said.

In many places, poverty, powerful interests and a lack of law enforcement make habitat loss especially hard to address.

In Central America, illegal cattle ranching drives deforestation on protected state and Indigenous lands, said Jeremy Radachowsky, director for Mesoamerica and the Caribbean at the Wildlife Conservation Society. Wealthy individuals, often affiliated with drug cartels, grab land, sometimes through illegal payments. They raise beef, some of which ends up in the United States, he said.

Elsewhere in the region and beyond, desperation sometimes pushes people to find remote areas with little government presence where they can simply take land to make a living.

“They need land in order to feed their families,” said David López-Carr, a professor of geography at the University of California Santa Barbara who studies how people interact with tropical forests in Latin America.

Rainforest countries like Brazil and the Democratic Republic of Congo are known for widespread deforestation. But the species that have lost the largest portions of their habitats tend to be concentrated in places

that are geographically isolated in some way, like the isthmus of Central America and Madagascar. Because animals there often have smaller ranges to begin with, habitat loss hits them especially hard.

For example, 98 percent of lemurs, primates that only exist in Madagascar, are threatened. Almost a third are on the brink of extinction. “I don’t want to lose my hope,” said Jonah Ratsimbazafy, a primatologist who leads a nonprofit group on the island that seeks to save lemurs while helping people. Madagascar is among the poorest countries in the world.

Recognition is growing that stanching biodiversity loss requires addressing the needs of local communities.

“There needs to be a way that the people that live close to the forests benefit from the intact forests, rather than clearing the forest for short term gain,” said Julia Patricia Gordon Jones, a professor of conservation science at Bangor University in Wales. “That's the ultimate challenge of forest conservation globally.”

A decisive moment in Montreal

While countries in the global south are experiencing the most dramatic biodiversity losses right now, Europe and the United States went through their own severe declines hundreds of years ago.

“We lost pretty much 100 percent of primary forest in most parts of Europe,” Dr. Jetz said.

Now, with negotiations underway in Montreal, countries that are poor economically but rich in biodiversity argue that they need help from

wealthier countries if they're going to take a different route.

Overall, the financial need is daunting: hundreds of billions per year to help poorer countries develop and implement national biodiversity plans, which would include actions like creating protected areas, restoring degraded lands, reforming harmful agricultural, fishing and forestry practices; managing invasive species; and improving urban water quality.

On the other hand, failing to address biodiversity loss carries enormous financial risk. A report by the World Economic Forum found that $44 trillion of economic value generation is "moderately or highly dependent on nature and its services and is therefore exposed to nature loss."

Researchers estimate the helmet vanga of Madagascar has lost about 40 percent of its

habitat since 2001. Nick Garbutt/Minden Pictures

A vast source of funding could come from redirecting subsidies that presently support fossil fuels and harmful agricultural practices, said David Cooper, deputy executive secretary of the Convention on Biological Diversity.

“Currently, most governments spend far more on subsidies that actually are destroying nature than they do on financing conservation,” Mr. Cooper said. “So, certainly a change in that will be critical.”

The United States is the only country besides the Holy See that isn’t a party to the convention, so although the United States will attend the meeting, it will be participating from the sidelines.

“We can play a very constructive role from the outside,” said Monica Medina, an assistant secretary of state who is also special envoy for biodiversity and water resources. But she acknowledged that being a member would be better. “I hope that someday we will be,” she said.

Of the many targets being negotiated, the one that has gotten the most attention seeks to address habitat loss head on. Known as 30x30, it’s a plan to safeguard at least 30 percent of the planet’s land and oceans by 2030. More than 100 countries back the proposal. While some Indigenous groups fear it will lead to their displacement, others support the plan as a means to secure stronger land rights.

But experts emphasize that action will have to go further than lines on a map.

“You can set up a protected area, but you've not dealt with the fact that the whole reason you had habitat loss in the first place is because of

demand for land," Dr. McElwee said. "You have to tackle the underlying drivers, otherwise you're only dealing with like half the problem."

All estimates on habitat loss come from Map of Life and its Species Habitat Index. Habitat loss estimates since 2001 run through 2021 and are approximations, based on models of geographic range that incorporate remote sensing and expert research. Map of Life shared data for terrestrial vertebrate species for which the group's methods can confidently ascertain habitat loss. The researchers estimate many more species are experiencing significant habitat loss than are in the group's data.

Common names for species used in this article come from Map of Life. In the graphic showing the species that have lost a third or more of their habitat since 2001, they are grouped based on Map of Life's habitat loss estimates, which the researchers caution may be slightly higher or lower in the real world. Almost all animals in that Map of Life dataset are visually represented in this article, with a few exclusions.

Data used in the maps showing habitat loss also comes from Map of Life.

Map of Life is led by Walter Jetz, professor of ecology at Yale University and scientific chair at the E. O. Wilson Biodiversity Foundation. Other Map of Life contributors to the research shown in this story include Kalkidan Fekadu Chefira, John Wilshire, Ajay Ranipeta, Yanina Sica and Rohan Simkin.

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