Group 1

Why are forests Important?

As the world seeks to slow the pace of [climate change](https://www.nationalgeographic.com/environment/topic/climate-change), preserve wildlife, and support [more than eight billion people](https://www.nationalgeographic.com/environment/article/the-world-now-has-8-billion-people), trees inevitably hold a major part of the answer. Yet the mass destruction of trees—deforestation—continues, sacrificing the long-term benefits of standing trees for short-term gain of fuel, and materials for manufacturing and construction.

We need trees for a variety of reasons, not least of which is that they absorb the carbon dioxide we exhale and the heat-trapping [greenhouse gases](https://www.nationalgeographic.com/environment/article/greenhouse-gases) that human activities emit. As those gases enter the atmosphere, [global warming](https://www.nationalgeographic.com/environment/article/global-warming-overview) increases, a trend scientists now prefer to call climate change.

There is also the imminent danger of disease caused by deforestation. An estimated [60 percent of emerging infectious diseases](https://sdg.iisd.org/commentary/guest-articles/preventing-future-pandemics-starts-with-protecting-our-forests/) come from animals, and a major cause of viruses’ jump from wildlife to humans is habitat loss, often through deforestation.

But we can still save our forests. Aggressive efforts to rewild and reforest are already showing success. Tropical tree cover alone can provide 23 percent of the climate mitigation needed to meet goals [set in the Paris Agreement](https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement) in 2015, [according to one estimate](https://www.wri.org/blog/2018/10/numbers-value-tropical-forests-climate-change-equation)

Group 4

What are the causes of deforestation?

Forests still cover [about 30 percent](https://data.worldbank.org/indicator/AG.LND.FRST.ZS) of the world’s land area, but they are disappearing at an alarming rate. Since 1990, the world has lost more than 420 million hectares or about a billion acres of forest, [according to the Food and Agriculture Organization of the United Nations](https://www.fao.org/state-of-forests/en/)—mainly in Africa and South America. About [17 percent](https://www.amazonconservation.org/the-challenge/threats/) of the Amazonian rainforest has been destroyed over the past 50 years, and losses recently have [been on the rise](https://www.nationalgeographic.com/environment/article/how-cutting-the-amazon-forest-could-affect-weather). The organization Amazon Conservation reports that [destruction rose by 21 percent in 2020](https://www.reuters.com/article/us-environment-amazon/amazon-biome-hurtles-toward-death-spiral-as-deforestation-jumps-in-2020-idUSKBN29W20T), a loss the size of Israel.

Farming, grazing of livestock, mining, and drilling combined account for [more than half of all deforestation](https://www.wri.org/blog/2018/09/when-tree-falls-it-deforestation). Forestry practices, wildfires and, in small part, urbanization account for the rest. In Malaysia and Indonesia, forests are cut down to make way for producing [palm oil](https://www.nationalgeographic.com/magazine/article/palm-oil-products-borneo-africa-environment-impact), which can be found in [everything from shampoo to saltine](https://www.nationalgeographic.com/environment/article/palm-oil-destroying-rainforests-household-items) crackers. In the Amazon, cattle ranching and farms—particularly soy plantations—are [key culprits](https://e360.yale.edu/features/business-as-usual-a-resurgence-of-deforestation-in-the-brazilian-amazon).

Logging operations, which provide the world’s wood and paper products, also fell countless trees each year. Loggers, some of them [acting illegally](https://news.nationalgeographic.com/2017/08/wildlife-watch-illegal-logging-papua-new-guinea/), also build roads to access more and more remote forests—which leads to further deforestation. Forests are also cut as a result of growing urban sprawl as land is developed for homes.

Not all deforestation is intentional. Some is caused by a combination of human and natural factors like [wildfires](http://environment.nationalgeographic.com/environment/natural-disasters/wildfires/) and overgrazing, which may prevent the growth of young trees.

Group 6

Why does saving forests matter?

There are some [250 million people who live in forest and savannah areas](http://www.fao.org/state-of-forests/en/) and depend on them for subsistence and income—many of them among the world’s rural poor.

Eighty percent of Earth’s [land animals and plants live in forests](http://www.worldwildlife.org/habitats/forest-habitat), and deforestation threatens species including the [orangutan](https://www.nationalgeographic.com/animals/mammals/facts/orangutans), [Sumatran tiger](https://news.nationalgeographic.com/2017/12/palm-oil-sumatran-tigers-extinction-big-cats-animals/), and many species of birds. Removing trees deprives the forest of portions of its canopy, which blocks the sun’s rays during the day and retains heat at night. That disruption leads to more extreme temperature swings that can be harmful to plants and animals.

With wild habitats destroyed and human life ever expanding, the line between animal and human areas blurs, opening the door to [zoonotic diseases](https://www.nationalgeographic.com/science/article/how-do-animals-pass-dangerous-zoonotic-diseases-to-humans-zoonoses-coronavirus). In 2014, for example, the Ebola virus killed over 11,000 people in West Africa after [fruit bats transmitted the disease to a toddler](https://sdg.iisd.org/commentary/guest-articles/preventing-future-pandemics-starts-with-protecting-our-forests/) who was playing near trees where bats were roosting.

Some scientists believe there could be as many as 1.7 million currently “undiscovered” viruses in mammals and birds, of which up to 827,000 could have the ability to infect people, according to [a 2018 study](https://www.science.org/doi/10.1126/science.aap7463).

Deforestation’s effects reach far beyond the people and animals where trees are cut. The South American rainforest, for example, influences regional and perhaps even global water cycles, and it's [key to the water supply](https://www.nationalgeographic.com/environment/article/how-cutting-the-amazon-forest-could-affect-weather) in Brazilian cities and neighboring countries. The Amazon actually helps furnish water to some of the soy farmers and beef ranchers who are clearing the forest. The loss of clean water and biodiversity from all forests could have many other effects we can’t foresee, [touching even your morning cup of coffee](https://www.nature.com/articles/d41586-019-00150-9).

In terms of climate change, cutting trees both adds carbon dioxide to the air and removes the ability to absorb existing carbon dioxide. If tropical deforestation were a country, according to the [World Resources Institute](https://www.wri.org/blog/2018/10/numbers-value-tropical-forests-climate-change-equation), it would rank third in carbon dioxide-equivalent emissions, behind China and the U.S.

Group 8

What can be done to save our forests?

The numbers are grim, but [many conservationists see reasons for hope](https://news.nationalgeographic.com/2017/11/russ-mittermeier-global-wildlife-conservation/). A movement is under way to preserve existing forest ecosystems and restore lost tree cover by first reforesting (replanting trees) and ultimately rewilding (a more comprehensive mission to restore entire ecosystems).

Organizations and activists are working to fight illegal mining and logging—National Geographic Explorer Topher White, for example, has come up with a way to use recycled [cell phones to monitor for chainsaws](https://news.nationalgeographic.com/2017/06/topher-white-engineer-rainforests-explorer-festival/). In Tanzania, the residents of Kokota have [planted more than 2 million trees](https://www.nationalgeographic.com/environment/article/pemba-kokota-tanzania-islands-reforest-and-adapt-to-climate-change) on their small island over a decade, aiming to repair previous damage. And in Brazil, [conservationists are rallying](https://www.nationalgeographic.com/environment/article/amazon-rain-forest-conservation-chico-mendes-anniversary-jair-bolsanaro) in the face of [ominous signals](https://www.nationalgeographic.com/environment/article/brazil-president-jair-bolsonaro-promises-exploit-amazon-rain-forest) that the government may roll back forest protections.

Stopping deforestation before it reaches a critical point will play a key role in avoiding the next zoonotic pandemic. [A November 2022 study](https://www.nature.com/articles/s41586-022-05506-2) showed that when bats struggle to find suitable habitat, they travel closer to human communities where diseases are more likely to spillover. Inversely, when bats’ native habitats were left intact, they stayed away from humans. This research is the first to show how we can predict and avoid spillovers through monitoring and maintaining wildlife habitats.

For consumers, it makes sense to examine the products and meats you buy, looking for sustainably produced sources when you can. Nonprofit groups such as the [Forest Stewardship Council](https://us.fsc.org/en-us/market/find-products) and the [Rainforest Alliance](https://www.rainforest-alliance.org/find-certified) certify products they consider sustainable, while the [World Wildlife Fund has a palm oil scorecard](http://palmoilscorecard.panda.org/) for consumer brands.

**Group 2**

**What is Deforestation? How much of the Earth have we deforested?**

Deforestation can include clearing the land for farming or livestock, or using the timber for fuel, construction or manufacturing.

Deforestation is the permanent removal of trees from a forest. Deforestation can include clearing the land for farming or livestock, or using the timber for fuel, construction or manufacturing.

Forests cover more than 30% of  Earth's land surface, according to the [World Wildlife Fund](https://www.worldwildlife.org/threats/deforestation-and-forest-degradation#causes) (WWF). These forested areas produce oxygen and absorb [carbon dioxide](https://www.livescience.com/tag/carbon-dioxide)(CO2), and are home to an estimated 80% of Earth's terrestrial species. Forests also are a source of  food, medicine and fuel for more than a billion people. Worldwide, forests provide 13.4 million people with jobs in the forest sector, and another 41 million people have jobs related to forests.

Forests are an important natural resource, but humans have destroyed substantial quantities of forested land. In North America, about half the forests in the eastern part of the continent were cut down for timber and farming between the 1600s and late 1800s, according to [National Geographic](https://www.nationalgeographic.org/encyclopedia/deforestation/).

Today, most deforestation is happening in the tropics. Areas that were inaccessible in the past are now within reach as people build new roads through the dense forests. The world has lost about 10% of its tropical tree cover since 2000, and nearly 47,000 square miles (121,000 square kilometers) were destroyed in 2019 alone, [The New York Times reported](https://www.nytimes.com/2020/06/02/climate/deforestation-climate-change.html) in 2020.

[The World Bank](https://blogs.worldbank.org/opendata/five-forest-figures-international-day-forests) estimates that about 3.9 million square miles (10 million square km) of forest have been lost since the beginning of the 20th century. In the past 25 years, forests shrank by 502,000 square miles (1.3 million square km) — an area bigger than the size of South Africa.

Group 3

**WHY DO PEOPLE DESTROY FORESTS?**

Often, deforestation occurs when people cut or clear forested area to make way for agriculture or grazing. The [Union of Concerned Scientists (UCS)](https://www.ucsusa.org/global-warming/stop-deforestation/whats-driving-deforestation) reports that just four commodities are mostly responsible for the vast majority of tropical deforestation: beef, soy, palm oil and wood products. UCS estimates that an area the size of Switzerland (14,800 square miles, or 38,300 square km) is lost to deforestation every year.

People often light fires to clear land for agricultural use. First, workers harvest valuable timber, then burn the remaining vegetation to make way for crops like soy, or for cattle grazing. In 2019, the number of human-lit fires in Brazil skyrocketed. As of August 2019, more than 80,000 fires burned in the Amazon, an increase of almost 80% from 2018, [National Geographic reported](https://go.redirectingat.com/?id=92X1590019&xcust=livescience_us_6621671179390760000&xs=1&url=https%3A%2F%2Fwww.nationalgeographic.com%2Fenvironment%2F2019%2F08%2Fwildfires-in-amazon-caused-by-deforestation%2F&sref=https%3A%2F%2Fwww.livescience.com%2F27692-deforestation.html).

Many forests are cleared to make way for palm oil plantations. Palm oil is the most commonly produced vegetable oil and is [found in half of all supermarket products](https://www.rainforest-rescue.org/topics/palm-oil). Growing the trees that produce the oil requires the leveling of native forest and the destruction of local peatlands — which [doubles the harmful effect](https://www.ucsusa.org/global-warming/stop-deforestation/whats-driving-deforestation) on the ecosystem., The global palm oil market was valued at $36.71 billion in 2019 and has been "witnessing unprecedented growth," according to a 2020 report published by [Business Wire](https://www.businesswire.com/news/home/20200407005439/en/Global-Palm-Oil-Market-2020-to-2025---Drivers-Restraints-Trends---ResearchAndMarkets.com).

Group 5

**WHAT ARE THE EFFECTS OF DEFORESTATION?**

Forests can be found from the tropics to high-latitude areas and contain a wide array of trees, plants, animals, fungi and microbes, according to WWF. Some places are especially diverse — the tropical forests of New Guinea, for example, contain more than 6% of the world's species of plants and animals.

When forests are destroyed, complex ecosystems are disrupted or perish. Human communities that depend on forests also suffer the consequences of widespread deforestation. In countries like Uganda, people rely on trees for firewood, timber and charcoal. From 2000 to 2020, , Uganda lost more than 3,500 square miles (9,200 square kilometers) of its forest cover, [Global Forest Watch reported](https://www.globalforestwatch.org/dashboards/country/UGA/?category=forest-change&dashboardPrompts=eyJzaG93UHJvbXB0cyI6dHJ1ZSwicHJvbXB0c1ZpZXdlZCI6WyJzaGFyZVdpZGdldCIsImRvd25sb2FkRGFzaGJvYXJkU3RhdHMiXSwic2V0dGluZ3MiOnsic2hvd1Byb21wdHMiOnRydWUsInByb21wdHNWaWV3ZWQiOlsic2hhcmVXaWRnZXQiXSwic2V0dGluZ3MiOnsic2hvd1Byb21wdHMiOnRydWUsInByb21wdHNWaWV3ZWQiOltdLCJzZXR0aW5ncyI6eyJvcGVuIjpmYWxzZSwic3RlcEluZGV4IjowLCJzdGVwc0tleSI6IiJ9LCJvcGVuIjp0cnVlLCJzdGVwSW5kZXgiOjAsInN0ZXBzS2V5Ijoic2hhcmVXaWRnZXQifSwib3BlbiI6dHJ1ZSwic3RlcEluZGV4IjowLCJzdGVwc0tleSI6ImRvd25sb2FkRGFzaGJvYXJkU3RhdHMifSwib3BlbiI6dHJ1ZSwic3RlcHNLZXkiOiJ3aWRnZXRTZXR0aW5ncyJ9&location=WyJjb3VudHJ5IiwiVUdBIl0%3D&map=eyJjZW50ZXIiOnsibGF0IjoxLjM3ODA0NDQzODg3MDY5OTQsImxuZyI6MzIuMjkwNDc3NzU0OTkzNjR9LCJ6b29tIjo1LjgxMTg5MTU4MzE0MTE3NCwiY2FuQm91bmQiOmZhbHNlLCJkYXRhc2V0cyI6W3sib3BhY2l0eSI6MC43LCJ2aXNpYmlsaXR5Ijp0cnVlLCJkYXRhc2V0IjoicHJpbWFyeS1mb3Jlc3RzIiwibGF5ZXJzIjpbInByaW1hcnktZm9yZXN0cy0yMDAxIl19LHsiZGF0YXNldCI6InBvbGl0aWNhbC1ib3VuZGFyaWVzIiwibGF5ZXJzIjpbImRpc3B1dGVkLXBvbGl0aWNhbC1ib3VuZGFyaWVzIiwicG9saXRpY2FsLWJvdW5kYXJpZXMiXSwiYm91bmRhcnkiOnRydWUsIm9wYWNpdHkiOjEsInZpc2liaWxpdHkiOnRydWV9LHsiZGF0YXNldCI6InRyZWUtY292ZXItbG9zcyIsImxheWVycyI6WyJ0cmVlLWNvdmVyLWxvc3MiXSwib3BhY2l0eSI6MSwidmlzaWJpbGl0eSI6dHJ1ZSwidGltZWxpbmVQYXJhbXMiOnsic3RhcnREYXRlIjoiMjAwMi0wMS0wMSIsImVuZERhdGUiOiIyMDIwLTEyLTMxIiwidHJpbUVuZERhdGUiOiIyMDIwLTEyLTMxIn0sInBhcmFtcyI6eyJ0aHJlc2hvbGQiOjMwLCJ2aXNpYmlsaXR5Ijp0cnVlfX1dfQ%3D%3D&showMap=true&treeLossPct=eyJoaWdobGlnaHRlZCI6ZmFsc2V9). Families send children — primarily girls — to collect firewood, and kids have to trek farther and farther to get to the trees, Ugandan entrepreneur Sanga Moses told the website [Good Black News](https://goodblacknews.org/2015/04/23/uganda-native-sanga-moses-awarded-1-million-to-boost-his-innovative-energy-business-eco-fuel-africa/) (GBN) Collecting enough wood often takes all day, so the children miss school, GBN reported.

According to the United Nation's 2020 [State of the World's Forests report](https://www.fao.org/state-of-forests/en/), three-quarters of Earth’s freshwater comes from forested watersheds, and the loss of trees can worsen water quality. The report also found that over half the global population relies on forested watersheds for their drinking water as well as water used for agriculture and industry.

Deforestation in tropical regions can also affect the way water vapor forms over the canopy, which can reduce rainfall. A 2019 study published in the journal [Ecohydrology](https://onlinelibrary.wiley.com/doi/abs/10.1002/eco.2126) showed that parts of the Amazon [rainforest](https://www.livescience.com/63196-rainforest-facts.html) that were converted to agricultural land had higher soil and air temperatures, which can exacerbate drought conditions. In comparison, forested land had rates of evapotranspiration that were about three times higher, adding more water vapor to the air.

Trees also absorb carbon dioxide, mitigating the emission of [greenhouse gases](https://www.livescience.com/37821-greenhouse-gases.html) produced by human activity. As climate change continues, trees play an important role in carbon sequestration, or the capture and storage of excess carbon dioxide. Tropical trees alone are estimated to provide about 23% of the climate mitigation that's needed to offset [climate change](https://www.livescience.com/planet-earth/climate-change), according to the [World Resources Institute](https://www.wri.org/blog/2018/10/numbers-value-tropical-forests-climate-change-equation), a nonprofit global research institute.

Deforestation not only eliminates vegetation that is important for removing carbon dioxide from the air, but the act of clearing the forests also produces greenhouse gas emissions. The Food and Agriculture Organization of the United Nations says that deforestation is the [second-leading cause of climate change.](http://www.fao.org/state-of-forests/en/) (The first is the burning of fossil fuels.) In fact, deforestation accounts for nearly 20% of greenhouse gas emissions.

Group 7

**ARE THERE SOLUTIONS TO DEFORESTATION?**

Developing alternatives to deforestation can help decrease the need for tree clearing. For example, the desire to expand the amount of land used for agriculture is a compelling economic reason to deforest an area. But if people adopted sustainable farming practices or employed new farming technologies and crops, the need for more land might be diminished, according to the [UN's Sustainable Forest Management Toolbox.](http://www.fao.org/sustainable-forest-management/toolbox/modules/reducing-deforestation/in-more-depth/en/)

Forests can also be restored, through replanting trees in cleared areas or simply allowing the forest ecosystem to regenerate over time. The goal of restoration is to return the forest to its original state, before it was cleared, according to the [U.S. Forest Service](https://www.fs.fed.us/forestmanagement/vegetation-management/reforestation/index.shtml). The sooner a cleared area is reforested, the quicker the ecosystem can start to repair itself. Afterward, wildlife will return, water systems will reestablish, carbon will be sequestered and soils will be replenished.

Everyone can do their part to curb deforestation. We can buy [certified wood products](https://us.fsc.org/en-us/certification) — made from wood that has been sustainably harvested — go paperless, limit our consumption of products that use palm oil and plant a tree when possible. However, deforestation is a global problem that won't be overcome by individual actions, and will require large-scale efforts by nations' leaders to change course and reduce forest destruction.

In 2020, more than 100 countries pledged to end and reverse deforestation by 2030, signing an agreement at the 26th annual United Nations Climate Change Conference (COP26) in Glasgow. A dozen countries that signed the pledge promised to provide $12 billion between 2022 and 2025 to mitigate the damage to forests from wildfires, to restore land and to assist Indigenous communities, [The Guardian reported](https://www.theguardian.com/world/2022/jan/03/brazil-deforestation-cerrado-scientists-alarm) on Jan. 3. Other donors in the private sector pledged $7.2 billion, to support the development of agriculture strategies that do not rely on deforestation.