

## Transcript of the Video

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In this chapter we will explore biodiversity and learn about its status nowadays. We will start by defining biodiversity, then learning about the number of existing species. We will explore the latest assessment of about the status and trends. The main threatened species, why it is important for us. And finally, what can be done to improve the situation.

So first, let's just clarify what we mean by biodiversity. Biodiversity refers to all variety of life that can be found on Earth. Plants, animals, fungi and microorganisms, as well as the communities that they form and the habitats where they live. It is the shortened form of two words "biological" and "diversity". In the article 2 of the Convention on Biological Diversity, a United Nations treaty, gives a formal definition of biodiversity that is often used.

Biological diversity is often understood at three levels. Species diversity refers to the variety of species (animals, plants, fungi and micro-organisms). Genetic diversity corresponds to the variety of genes contained in these organisms; ecosystem diversity refers to all the different habitats that exist, like forests, deserts, wetlands, coral reefs, etc.

Now let's analyze how much biodiversity is in our planet. Researchers estimate that there are about 8.7 million species globally. However, we have barely scratched the surface! Science has only described 1.2 million species or so insofar. Some studies estimate that we have yet to discover around 86% of the species on Earth and 91% in the ocean. If you ever wanted to discover a new species, plan your next trip to tropical rainforests, or to the deep ocean, or actually don't move because much of this undiscovered life is likely to be in these places or hidden in the soil.

But let's focus on what we know.

1.2 million species. How are all these species doing? As per today only a few of these species have been assessed. There are several assessments at different levels: international, multi-country and national level, focusing on different species groups. For example, we have the IUCN red list of threatened species. The IUCN Red List index, the Living Planet Index or the IPBES Global Assessment Report.

The IUCN Red List is considered the most comprehensive international information source on the global extinction risk for species. It is a critical indicator of the health of the world's biodiversity and it is used by most assessments worldwide.

And as per today, it has assessed 120,000 species, that is about 10% of the known species.

As per data from November 2020, from the total assessed species in the Red List, 32,000 species (that is almost a third of assessed species!), are threatened with extinction.

Based on data from the IUCN Red List of Threatened Species, the Red List index shows how likely a species – or group of species- could survive over time. A Red List Index value of 1.0 equates to all species qualified as

Least Concern (which means, not expected to become Extinct in the near future). An index value of 0 however, equates to species having gone Extinct. Thus, a decline such as the corals' line shows in this graph, indicates that species are being driven towards extinction at an accelerating rate. If the rate of biodiversity loss were reducing, the index would show an upward trend, but as we can see in this graph, none of these groups of species are in that scenario.

The Living Planet Index (LPI), which mainly focuses on populations trends of mammals, birds, fish, amphibians and reptiles, and is another tool to measure biodiversity. In its 2020 report, the LPI showed how these populations have declined 68%, since 1970.

And we can see in this graph how this trend is observed almost worldwide.

The IPBES Global Assessments are mostly based on IUCN Red List data. As you can see in this chart extracted from their 2020 global assessment report, it is possible to see how the global extinction risk in different species' groups has alarming percentages, especially in amphibians and cycads.

The most threatened group, Cycads are plants that have been growing on our planet for over 250 million years. Who would have thought that plants that managed to survive ice ages, asteroids and being munched on by dinosaurs, are now threatened by habitat degradation and poaching... just to embellish our gardens.

According to IUCN Red List, the imperiled species are mainly threatened by habitat loss due to agriculture and aquaculture practices,...

...urban development,...

... deforestation...

... and invasive species and pests.

So we have seen how species are declining at alarming rates, due to several factors.

So what? Species come and go... extinction is a natural process. Indeed – but not at this rate.

Studies have compared the current extinction rates with what would be expected from the fossil record and have concluded that the loss of species since 1970, is accelerating in a dramatic and serious way. Today, the loss of species now classed as 'critically endangered' could propel the world into a sixth mass extinction

“So what? Too bad. Sorry! Why would we be interested in saving a creature such as... this one?” Some may still say. This is the naked mole-rat. He is the longest living rodent on Earth – up to 37 years, and it turns out that it has an exceptional resistance to cancer. Turns out that this animal's immune system, the result of millions of years of genetic evolution, could maybe help us find a cure to cancer.

On Earth, each species has evolved over millions of years and has adapted to survive, its own way. Every time we lose one of them, due to human pressures, we lose a heritage of 4 billion years of nature's evolutionary wisdom. The current situation can be compared to an immense library with millions of books. Each day, hundreds of books disappear, and we did not even have time to read the title of these books. This genetic loss, is irreversible, and it's a huge loss of opportunity for humanity.

Besides the intrinsic value of nature, the reality is that biodiversity is also essential for human wellbeing. Morphine, corticoids, antibiotics... Up to 50% of the approved drugs are derived from plants. All food systems depend on biodiversity and a broad range of ecosystem services that support agricultural productivity. For example bees with pollination, spiders and other insects for pest control. These are just examples. The list

of benefits we get for free from nature are countless. The TEEB study is trying to estimate the economic value of biodiversity's contribution to people. For example, it is estimated that for an annual investment of US\$45 billion into protected areas alone, the delivery of ecosystem services worth some US\$5 trillion a year could be secured.

Well, so what can we do? Since 1993, conservation efforts have saved up to 48 mammal and bird species from extinction. Without such interventions, extinction rates for mammals and birds over the past 27 years would be three to four times higher. But we need more efforts. The Global Biodiversity Outlook 5, published in September 2020, provides an interesting graph with various areas of action that, in combination, could bend the curve and halt this biodiversity decline. These actions are, from bottom to top: (1) Enhance conservation and restoration of ecosystems; (2) climate change mitigation; (3) reduce other drivers such as pollution, invasive alien species and overexploitation; (4) more sustainable production of goods and services, especially food; and (5) reduce consumption and waste. None of the areas of action alone, nor in partial combinations, can bend the curve of biodiversity loss. The effectiveness of each area of action is enhanced by the other areas, but they all require a collective effort.

In 2020, the world has faced a pandemic that, interestingly, is related to biodiversity. We know that there are many more waves to come. On our current trajectory, biodiversity, and the absolutely essential services it provides to humanity, is projected to decline, jeopardizing the delicate balance of our common home, the Earth. With the assessments and the data that we currently have, we cannot look the other way anymore. We've been warned. But the good news, is that we are still on time to bend the curve of this decline and its consequences.