

WEEK 5 OUR WORLD TODAY: FACING A SIXTH EXTINCTION?

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ACT Hi, everyone. Welcome to the last week of Extinctions, Past and Present. Over the past few weeks we've already spoken about the big five extinction events that have occurred on our planet through deep time. This week our focus is on the current threat of extinctions that life on Earth faces.

Over the past few lectures we have seen that aside from the big five mass extinction events, there are always background extinctions that occur. This background extinction rate is generally at rather low levels of about one to five species per year. Several studies suggest that the current extinctions of organisms is at a rate that is much higher than the pre-human background extinction rates. Indeed, it has been proposed that if we do not intervene to stop these elevated rates of extinctions, about 50% of species on Earth will go extinct by the next century. If this happens, then the level of extinctions would be at rates equivalent to the big five mass extinction events of the past. This notion has led many biologists to suggest that we are currently on the verge of a sixth mass extinction event.

Of course this extinction event is very different to the previous five extinction events that have occurred. The others were all mediated by natural phenomena. We've seen volcanism, continental drift, asteroid impacts, were all the causes of those extinction events. But today's extinction events are being mediated by human activity. The main drivers for the current rate of extinction seem to be habitat loss and global climate change which are the direct result of human population growth and the indiscriminate exploitation of Earth's resources, as well as urbanisation.

So, what can we learn from the previous big five extinctions? We've seen that the big five extinctions tell us that biodiversity on our planet has been shaped by these extinction events. We've seen that different organisms respond differently to environmental catastrophes. Although many organisms go extinct at these extinction events, it appears that there are always a few survivors that help repopulate and help to re-establish ecosystems again.

It is interesting to know that if anyone of these previous extinction events had not occurred, we would have a very different biodiversity on the planet today. For example, if the dinosaurs had not gone extinct at the end of the Cretaceous, mammals would never have had the opportunity to radiate and, who knows, humans may not even have become dominant. They may not even have evolved. By studying the previous extinction events we can also approximate how long each of these events have lasted.

We know from the previous extinction events that recovery after mass extinction events can take thousands to several millions of years. It really all depends on the amount of devastation that had occurred at the time. The previous five extinction events thus allow us to understand our planet and how biodiversity responds to environmental crises at each mass extinction event. These data then allow us to make better models of how a sixth mass extinction event will affect biodiversity on our planet.

Already we can try to determine which species in particular environments are more susceptible to environmental change. And we can also possibly identify the so-called disaster species that would facilitate recovery afterwards. By doing this we can then focus conservation attention on these vulnerable species and on the ecosystems in which they reside. Furthermore, since our planet has had bouts of low carbon dioxide, for example, during the end of the Devonian, and also periods of high carbon dioxide content in the atmosphere during the end of the Triassic, for example, we can look at the fossil record to determine how species on land and in the seas have responded to these atmospheric levels of carbon dioxide.

By looking at the previous mass extinctions we can get a very good idea about how long it takes ecosystems to recover after, say, 50% loss of biodiversity or even after 75% loss of biodiversity. I must say though, unlike the doom-mongers who feel that everything is beyond our control and that our planet is doomed for a sixth mass extinction event, I am much more optimistic. If the current environmental changes were being driven by things beyond our control such as volcanic eruptions or asteroid impacts, we would not be able to do anything. However, since the current extinction events are being mediated by humans, we actually have the power to do something about it. It is simply a question of changing our attitudes and our behaviour in terms of how we use the resources on our planet and how we coexist with other life forms on Earth.

Although some issues such as curbing trafficking of endangered wildlife species require special interventions such as the regulation of trade in endangered species which need governments to legislate and support, there is still much that ordinary people on the ground can do. I honestly believe that for conservation agendas to be successful there has to be significant investment in education of all stakeholders including the general public and the policymakers. It is imperative that we need to all become better citizens of the world by constantly thinking about how our actions affect the environment and the planet.

The five Rs of conservation: reduce, reuse, recycle, restore and replenish, should become mainstream and integrated into everything that we do. According to BirdLife International, about 12% of Earth's 10,000 bird species are being threatened with extinction due to habitat loss and degradation. 2% of the world's birds are considered to be at extremely high risk of extinction. Later this week you will hear from Peter Ryan about how marine birds are being affected by human activities but also, very importantly, about what you can do to make things better.

We will hear from fisheries biologist, Denham Parker, about how overfishing is affecting fish stocks and about how freshwater ecosystems are being threatened by pollution. And he, too, will suggest ways in which we can better preserve our aquatic biodiversity.

Professor Muthama Muasya will talk about how plants are coping with the situation today and Professor Timm Hoffman will give us a good-news story about how a landscape once ravaged by overgrazing has come back because of positive human interventions. Lastly we will hear from Professor Lindsey Gillson about how there are many other constructive ways in which we can mitigate the sixth extinction.

I am confident that if we humans change our attitudes and if we begin to think of ourselves, not as owners but rather as protectors or stewards of our planet and its biodiversity, we will be able to avert the sixth extinction. I honestly believe it is not yet too late.



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