The link between climate change and biodiversity loss: a call to action to protect the future of coming generations

By Stephan M Funk, 22 March 2023

Climate change and biodiversity loss are two of the most critical issues facing our planet today. The impact of climate change is already being felt worldwide, from rising sea levels to more frequent and intense natural disasters and climate extremes. But, humans are not the only ones affected; wildlife is also feeling the strain. While they may seem like separate problems, they are inextricably linked. Climate change is causing profound changes in natural habitats, in species distributions, as well as in species numbers. The result is the devastating biodiversity decline we are witnessing.

The change in the world's climate impacts biodiversity in many ways. Rising temperatures, changing rainfall patterns, extreme weather events, and ocean acidification, to name but a few effects, increase environmental stress on already threatened species. These changes disrupt the functioning of natural habitats and alter ecosystems in often unexpected ways. For example, some species attempt to move to places where they can take refuge from increasing temperatures by moving up mountains or travelling north or south. However, the speed by which species shift distributions might be too slow to catch up with the changing climate patterns. Other species are unable to migrate due to habitat destruction caused by human activities.

The consequence of all of this is a dramatic decrease in the number and variety of plants, animals, and other organisms (or the original nature) in many areas of the world. As a result the state of the original nature of many regions, measured as "biodiversity intactness," can drop significantly below the "safe limit" needed for the ecological processes essential for our survival. Current rates of biodiversity loss have been estimated to threaten with extinction at least one million animal and plant species. This figure is so alarming because it is more than has been

estimated for any other point in human history. The situation is so dire that some experts are calling it the sixth mass extinction, purely man-made, since previous mass extinctions have occurred due to natural disasters.

The impact of climate change on biodiversity is expected to increase in the coming years. If global temperatures continue to rise at the current rate, by 2030 temperatures could be more than 1.5°C of pre-industrial levels. This will lead not only to changed climate and weather patterns but also to an increase in the intensity and frequency of fires, storms, and droughts, which will have a devastating impact on the many already threatened species. In 2019/20 in Australia, intense fires devastated 97,000 km^2 of forest and surrounding habitats resulting in a 14% rise in the number of threatened species in the area. The likelihood, frequency and intensity of such fires have grown due to climate change. Even in the colder Arctic region, the number of fires rose by 50% in the first decade of the 21st century and has continued to soar since then, causing significant damage to the region. Recent scientific research suggests that fire frequency in the Arctic is higher than at any time in the past 3,000 to 10,000 years ago. The relationship between the climate crisis and biodiversity loss is a vicious circle. High temperatures caused by climate change have made our forests drier, not only changing species composition and distribution but also making forests more vulnerable to wildfires. In turn, these wildfires release yet more carbon into the atmosphere, speeding up the greenhouse effect even further.

Global climate change has also a significant impact on ecosystems, as it disrupts the distribution of animals, plants, and even humans. This can lead to increased opportunities for diseases to spread, which affects both animal and human health. Additionally, the loss of ecosystem services, such as food and medicine, can also have a negative impact on human well-being.

Natural habitats also have the potential to help reduce the impacts of climate change. Mangroves are significant sinks of carbon, and the Amazon rainforest is an enormous store of carbon, up to 100 billion tons. However, a recent study suggests that the Amazon may now be emitting more carbon than it absorbs as a result of the increased number of fires and

deforestation. Only if we limit or reduce climate change can we safeguard these natural carbon sinks from further damage.

Nature-based solutions, such as restoration, can be effective because they can tackle both climate change and biodiversity loss together. Unlike infrastructure-based interventions, actions that boost biodiversity can help mitigate and adapt against the negative impacts of climate change. Ecosystems help sequester and store carbon while providing numerous benefits to natural and human communities to adapt to the changing climate. The good news is that there is a way out if we act now and we do not continue to delay the implementation of the meaningful actions required. By restoring 30% of lands that have been converted for farming in priority areas, in addition to preserving natural ecosystems this would prevent over 70% of projected extinctions of mammals, birds, and amphibians. Furthermore, this action would put us on track to sequester almost half of all the CO2 increase in the atmosphere since the Industrial Revolution.

Climate change and the biodiversity crisis are inextricably linked global threats since environmental changes are being driven by climate change and vice versa. Urgent action to address these issues is urgently required or we risk finding ourselves in a widely impoverished natural world but also unstable ecosystems which we critically depend upon for our survival. WE MUST reduce our carbon emissions and protect our natural habitats so that we can safeguard the biodiversity that makes human life on Earth possible.