

Curtailing the collapse of the living world

On 7 December of this year, the fate of the entire living world will be determined in Montreal, Canada, at the 15th Conference of the Parties (COP 15) of the UN Convention on Biological Diversity (CBD). If this triggers a sense of déjà vu, then that is because no more than a couple of weeks ago, we experienced a massive media blitz covering a different COP. That was COP 27, or the 27th Conference of the Parties of the UN Framework Convention on Climate Change (FCCC), held in Sharm el-Sheikh, Egypt. The timing is unfortunate because COP 15 of the CBD is vastly more important than COP 27 of the FCCC. In a century marked by horrific environmental crises, from mass extinction to emerging diseases to invasive species, all of which are anthropogenic and global in scale, climate change has been the main attention getter. Given the political and economic concerns surrounding fossil fuels and greenhouse gas emissions from industry and agriculture, it is perhaps not surprising that climate change dominates the global change agenda, but the CBD must take center stage. We say this because of the many dimensions of anthropogenic global change, the most critical, complex, and challenging of which is that of biodiversity loss.

We have an abundance of mitigation and adaptation options for addressing climate change but lack sufficient political will to implement them. In contrast, addressing biodiversity loss, which weakens and destabilizes all of Earth's ecological and biogeochemical systems, including its climate system, has only one option—to reverse biodiversity loss. Thus far, however, global agreements implemented on a decadal time scale to reverse biodiversity loss have largely failed. COP 15 is where the Post-2020 Global Biodiversity Framework will finally be hammered out among the CBD parties, with the goal to halt biodiversity loss by 2030 and reverse it by 2050. Failure is not an option this time as Earth's terrestrial, marine, and freshwater systems begin to collapse under the pressure to meet the needs of a global population that will soon approach 10 billion.

COP 15, hosted by China but relocated to Montreal because of COVID-19 concerns, has the potential to turn things around where other efforts have failed. Such optimism may seem naïve, but there are several reasons to have a sense of positivism about COP 15. First, a comprehensive body of scientific evidence has highlighted how global change, including climate change, is ultimately tied to biodiversity conservation. For example, three decades of global change research has shown that biodiversity conservation can improve the magnitude and resiliency of many ecosystem

functions and services, such as providing a large pool for carbon sequestration and storage for climate mitigation. Second, advances in global change biology have pinpointed the primary drivers of biodiversity loss, the most prominent being land/sea use change, overexploitation of marine and natural resources, and pollution, with climate change and invasive species contributing significantly but to a lesser degree (1). Such findings provide clear guidance for policy development.

Another reason for optimism stems from the impact of the COVID-19 pandemic on biodiversity, which revealed the often imagined but never demonstrated duality of humanity as both a threat to and custodian of biodiversity. Bates and over 300 coauthors (2) summarized the impacts of the COVID-19 pandemic leading to a worldwide reduction in human activity by 57%, often referred to as the anthropause. Their study documented how the reduction in traffic, industrial noise and pollution, and human-wildlife contact led to a wide range of positive impacts on nature around the world. Conversely, however, the reduction of human activity in species and habitat protection, conservation, and restoration adversely impacted biodiversity as illegal hunting, fishing, and habitat degradation went unchecked. Their take-home message was that stemming biodiversity loss can be achieved not only by just reducing human pressures but also by enhancing human activities in research, restoration, and conservation.

A final note of optimism is the growing popularity of the 30 × 30 target. The previous CBD targets, set in Aichi, Japan for the year 2020, went largely unmet despite a decade of effort by parties to the convention. Target 11, a conservation target, was modest, aiming for the protection of just 17% of lands and 10% of oceans, but this global target was missed because of disparities among countries. Increasingly, however, nations (63 have already pledged support) are willing to set aside 30% of land and 30% of marine habitats for biodiversity (with an interest in including 30% of freshwater habitats) by 2030 or the “30 × 30 target” (3).

Optimism that COP 15 in Montreal will be a turning point in biodiversity conservation faces significant challenges. The 30 × 30 target, for example, will need to recognize the needs and rights of individuals dependent on land- or marine-based resources and will require well-developed, spatially specific, and high-resolution implementation and management strategies (4). Another challenge concerns securing long-term, sustainable financing mechanisms to achieve CBD targets because many of the most diverse habitats are in low-income

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economies. Finally, emphasis has been overly focused on terrestrial ecosystems, while marine biodiversity and the nature-based services they provide are under significant threat from overfishing, pollution, climate change, and maritime traffic (5), pointing to the need to make marine conservation a top priority at COP 15.

The scientific community has been and remains a strong partner to the CBD, providing data, intellectual frameworks, syntheses, modeling, expert opinions, meta-analyses, consensus documents, biodiversity inventories and databases, metrics, indicators, and indices to advance its global agenda. The 15th COP of the CBD in Montreal should be a critical turning point in efforts to stem and reverse the loss of biodiversity. The role of science and the scientific community will be greater now and into the future than it ever has been before, but history tells us that we can meet the challenge.

– **Shahid Naeem, Yonglong Lu, Jeremy Jackson**

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