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OPINION

# Establishing a climate target within the post-2020 Global Biodiversity Framework

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## Introduction and background

In late 2021, a range of experts from around the world were approached to provide expert input to the post-2020 Global Biodiversity Framework (GBF)–the new strategic framework under the Convention on Biological Diversity (CBD) that will guide interventions to conserve biodiversity and ecosystem services for the next three decades.

In this opinion piece, appearing as a companion to other opinion pieces addressing selected aspects of the GBF respectively, we discuss the science behind the climate targets and the state of play in international negotiations of the GBF. We conclude by commenting on what might (realistically) be expected in Montreal in December 2022. This opinion piece is based on analyses that were prepared in support of negotiations of the GBF and provided to governments and stakeholders by the CBD (CBD/WG2020/3/INF/11 and CBD/WG2020/4/INF/2/Rev.2) and follow-up work (see https://geobon.org/science-briefs/) that has been made available in the lead-up to the CBD COP-15 to be held in Montreal in December 2022.

Target 8 addresses climate change as a primary driver of biodiversity loss, as well as the critical roles of biodiversity in mitigating and adapting to climate change [1]. In addition, it touches on a potential link between the biodiversity and climate conventions and their implementation mechanisms, through combining a quantitative target for mitigation with specific safeguards for biodiversity-based climate actions. The text of first draft of the GBF has been discussed by governments at meetings in Geneva (March 2022) and Nairobi (June 2022), but no clear agreement on the final wording of the target has emerged.

> Target 8 wording in the first draft of the GBF is "*Minimize the impact of climate change on biodiversity, contribute to mitigation and adaptation through ecosystem-based approaches, contributing at least 10 GtCO2 per year to global mitigation efforts, and ensure that all mitigation and adaptation efforts avoid negative impacts on biodiversity*"

The importance of limiting climate change to minimize impacts on biodiversity is generally well accepted by governments—yet climate change mitigation objectives are seen by many governments as the mandate of the climate change convention (UNFCCC). As a result, some feel that no explicit objective for climate mitigation should be included in the GBF. On the other hand, setting an objective to reduce climate impacts is consistent with it being one of the five direct drivers of biodiversity loss, and predicted to emerge soon as the main driver [2]. Certain governments see the role of the GBF as being limited to focusing on reducing other stressors on biodiversity to help minimize impacts of climate change—yet it is clear that climate change mitigation objectives are critical to the T8 target.

In the next sections, we address each main element being considered in the Target text.

## Minimizing the impact of climate change on biodiversity, building resilience of biodiversity

Keeping climate change to the Paris Agreement objective of "well below 2˚C, and as close as possible to 1.5˚C" is essential to achieving the GBF objectives. Even at these levels, climate change will increase extinction risk, cause large shifts in species distributions, alter ecosystem functioning, and compromise nature's contributions to people. Fig 1 provides an overview of projected impacts of climate change and increased atmospheric $CO_2$ concentrations on biodiversity and ecosystem processes, including impacts across marine, terrestrial and freshwater realms. Robust evidence shows that many changes are already occurring [1–4]. Climate change is projected to outpace other drivers of biodiversity loss in the next few decades in some regions, even in low greenhouse gas concentration scenarios such as RCP 2.6 [3, 4].

Additional opportunities to minimize the impacts of climate change on biodiversity include reducing other stressors from land and sea use change, overexploitation, invasive alien species and pollution (IPBES 2019). This helps avoid the exacerbating effects of such interacting stressors; for example, how poorly designed and regulated coastal infrastructure can interact with sea level rise to have multiple negative effects on coastal and estuarine ecosystems. Other strategies include prevention of further loss of natural habitats and native species, restoring ecosystems to a natural condition, as well as sustainable and equitable use of natural resources [5].

## Contributing to climate change adaptation through ecosystem-based approaches

Frequently, the same actions that minimize loss of biodiversity strengthen the role of biodiversity in climate adaptation [1]. Protecting large areas of intact ecosystems and increasing connectivity in multifunctional land and sea-scapes are crucial for adaptation, since such actions can facilitate species and ecosystem responses to climate change, increasing resilience in both ecosystems and people. For example, protecting and restoring coastal wetlands, mangroves and coral reefs enhances the capacity of ecosystems and people to adapt to rising sea levels. Increasing the integrity of ecosystems used for agriculture, forestry and fisheries, in particular through management practices that reinforce biodiversity, can greatly improve the capacity of these ecosystems and users to adapt to climate change.

The biodiversity convention has accepted the term "ecosystem-based approaches", where the climate convention uses the term "nature-based solutions" in relation to biodiversity-based solutions, such as to carbon sequestration and building adaptive capacity (e.g. reducing the impact of sea level rise). The terms are not identical, but converge strongly where methods to which they refer are implemented using safeguards against negative impacts on biodiversity and people. Legitimate concerns remain about both of these terms, however, especially "nature-based solutions", because they have historically been associated with narrowly-focused optimisation of a single objective (e.g., 'natural climate solutions' focused on maximizing carbon sequestration by afforestation as a climate change mitigation measure, often harming

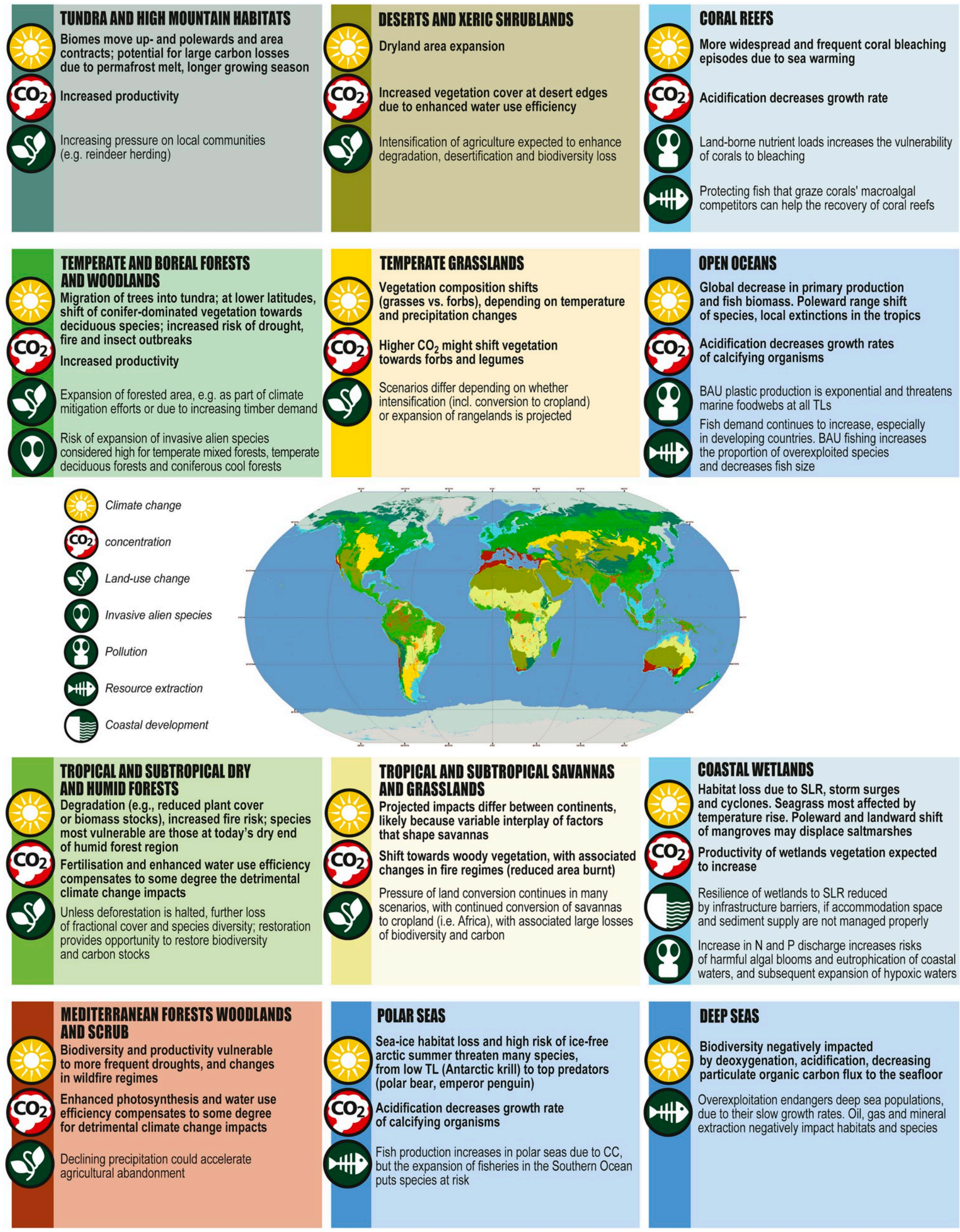


**Fig 1. Projected impacts of climate change and increased atmospheric $CO_2$ concentrations on biodiversity and ecosystem processes (republished from Arneth et al 2020 under a CC BY license, with permission from contributing author Almut Arneth, November 2022).**

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native biodiversity and nature's contributions to people). By addressing multiple objectives, such as to meet Sustainable Development Goals and/or secure multiple ecological functions and benefits to people, EBA and NBS practices may produce the same outcomes and could be used interchangeably. This would streamline implementation of biodiversity and climate frameworks and action plans.

While adoption of a resolution on NBS at the United Nations Environment Assembly [6] is streamlining broader acceptance of the term, governments largely agree that inclusion of an element in the GBF focusing on ecosystem-based approaches to climate change adaptation assures continuity with CBD terminology. Governments and stakeholders also largely agree that IPLCs should have a voice in identifying and implementing ecosystem-based approaches to adaptation.

## Contributing to climate change mitigation through ecosystem-based approaches, to an amount of 5–10 $GtCO_2eq$ per year

A combination of multiple NBS/EBA contributions to climate change mitigation can potentially provide between 5 and 10 $GtCO_2$-eq per year mitigation cost-effectively—achieving such levels needs substantial reductions in loss and degradation of natural ecosystems, and large increases in restoration compared to the period 2010–2020. The evidence base is strong that actions for achieving these levels of ecosystem-based mitigation are indeed feasible, and are broadly consistent with meeting targets for protection and restoration of natural ecosystems (especially in Goal A and Targets 1–3) and sustainable management of agricultural and managed forest ecosystems (Target 10). Setting an ambitious quantitative level of climate mitigation in Target 8 does not, therefore, necessarily impose actions in addition to those already planned for other targets, but does help ensure that associated climate benefits are also achieved. However, respecting safeguards and achieving the high-end estimate of 10 $GtCO_2$-eq per year requires ambitious and deep systemic changes both in production and consumption [1]. Importantly, setting an ecosystem-based mitigation target in the GBF would be an important complement to goals in the UNFCCC, because it can more explicitly stipulate safeguards for biodiversity.

As stated earlier, it should be noted that there is considerable reticence on the part of many governments to include climate change mitigation objectives, especially quantitative objectives in the GBF. The reasons for this include concerns that: i) this would create overlap or duplication of policy mandates of the UNFCCC and CBD, ii) UNFCCC and GBF objectives might not be quantitatively aligned, iii) mitigation measures will be imposed without consultation with local communities, and iv) a mitigation goal in the GBF could signal that ecosystem-based solutions should be the highest climate change mitigation priority, where in fact there is agreement that the highest priority should be to greatly reduce emissions from production sectors including energy, transport and agriculture (and that failing to do so will compromise nature's contributions to mitigation) (Table 1).

## Ensuring that all mitigation and adaptation efforts avoid negative impacts on biodiversity

Competition for land, in particular arising from climate change mitigation based on large-scale afforestation and bioenergy production (for example), could significantly negatively impact biodiversity. Adverse impacts on biodiversity arising from technological measures for adaptation such as construction of dams, seawalls and new irrigation capacity for agriculture should also be avoided.

Clear definitions and bounds on nature-based solutions for climate will ensure that they are truly ecosystem-based, thus avoiding perverse effects on nature and people. Involvement of local actors is essential, considering all forms of relevant information, including scientific, cultural and local knowledge, innovations and practices.

## What might realistically happen at CBD COP-15 in Montreal

As mentioned above, protecting biodiversity and avoiding dangerous climate change are complementary within the mandates of the CBD and the Paris Agreement of the UNFCCC, and

**Table 1. Summary of estimates of the potential contribution of ecosystem-based approaches (EBA) / nature-based solutions (NBS) to climate mitigation.**

| Study or Assessment | Mitigation potential from EBA/NBS | Comments |
|---|---|---|
| IPCC WGIII (2022) [7] | 8 to 14 $GtCO_2$-eq per year between 2020 and 2050 (high confidence) | "The projected economic mitigation potential of AFOLU options between 2020 and 2050. . .". The largest share of this economic potential [4.2–7.4 $GtCO_2$-eq $yr^{-1}$] comes from the conservation, improved management, and restoration of forests and other ecosystems (coastal wetlands, peatlands, savannas and grasslands), with reduced deforestation in tropical regions having the highest total mitigation." |
| Girardin et al. (2021) [8] | up to 10 Gt $CO_2$-eq per year by 2025 | EBA/NBS that include the constraints it is cost-effective; ensures adequate global production of food and wood-based products; involves sufficient biodiversity conservation; and respects land-tenure rights. |
| UNEP and IUCN (2021) | 5 to 11.7 $GtCO_2$-eq per year by 2030 10 to 18 $GtCO_2$-eq per year by 2050 | "A cautious interpretation . . . taking account of associated uncertainties and the time needed to deploy safeguards." Based on the analyses of Griscolm et al. (2017), Roe et al. (2021), Girardin et al. (2021), McKinsey (2021) and Wilkinson (2020) [8–12]. |
| Pörtner et al. (2021) IPBES-IPCC report on biodiversity and climate change [1] (see also Smith et al. 2022) [13] | > 5 $GtCO_2$-eq per year time frame not specified | Derived from following statements: "reducing deforestation and forest degradation can contribute to lowering annual anthropogenic greenhouse gas emissions. . . 0.4–5.8 $GtCO_2$-eq $yr^{-1}$". "Improved management of cropland and grazing systems such as soil conservation and reduction of fertilizer input is estimated to provide climate change mitigation potential of >3 to >6 $GtCO_2$-eq $yr^{-1}$." |
| Strassburg et al. (2020) | 10.8 $GtCO_2$-eq per year average over 2023–2050 | "Restoring 15% of converted lands in priority areas could avoid 60% of expected extinctions while sequestering 299 gigatonnes of $CO_2$." The value provided in this table is the corresponding average annual mitigation potential over the period 2023–2050. (see discussion of this estimate, [14, 15]). |

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both are intended to help countries deliver a good quality of life for all people under the UN Sustainable Development Goals (SDGs). Target framing must address these joint policy spheres to assure a multiple benefits approach—ideally, focusing on the synergies and minimizing the trade-offs in the delivery of biodiversity gains, support of climate mitigation and adaptation, and (equitable) provision of benefits to people. Finally (as with other targets) over wordy text overladen with concepts should be avoided.

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