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OPINION

Actions needed to achieve ambitious objectives of net gains in natural ecosystem area by 2030 and beyond

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Introduction

In late 2021, experts from around the world were approached to provide input to the post-2020 Global Biodiversity Framework (GBF)—the new 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 article, we discuss the science behind the goals and targets of the GBF related to natural ecosystem area and integrity. We conclude by commenting on the state of play in negotiations and provide recommendations for addressing impasses in the final negotiations of the GBF at the COP-15 of the CBD in December 2022. This is one of a collection of articles based on analyses prepared in support of negotiations of the GBF and provided to governments and stakeholders by the CBD [1,2].

The GBF includes four goals for 2050 and accompanying intermediate objectives for 2030. Goal A of the first draft of the GBF includes ambitious quantitative objectives for net gain in the area and integrity of natural ecosystems: 5% net gain relative to the current state by 2030 and 15% by 2050 [3]. These net gains are critical for conserving and restoring biodiversity, as well as for ensuring multiple benefits to people such as support for food security, water security, climate mitigation, and climate adaptation [4,5].

The first draft of the GBF was most recently discussed by governments in Geneva (March 2022) and Nairobi (June 2022), but no agreement has emerged either on the wording and quantitative objectives of Goal A, or on targets associated with protection and restoration of natural ecosystems [6]. We address some of the key unresolved issues by focusing on how ambitious objectives for net gain in the extent of natural terrestrial ecosystems in Goal A could be achieved through actions in the targets that address natural ecosystem protection (Targets 1 and 3 of the GBF), restoration (Target 2), and spatial planning (Target 1).

Achieving net gains in natural terrestrial ecosystem area at the global level

Net gains in natural ecosystem area occur when the restoration of transformed ecosystems, such as farmlands or managed forests towards a natural state exceeds losses of natural ecosystems (Table 1; [7]). Calculations based on simple assumptions illustrate the levels of restoration and conservation necessary to achieve the quantitative objectives for net gain set in Goal A (Table 1). These calculations show that net gains of 5% in the global area of natural terrestrial ecosystems by 2030, and 15% by 2050 can be met through greatly reduced rates of loss of natural ecosystems starting now and no losses after 2030, coupled with the initiation of restoration of about 400 Mha of transformed to natural ecosystems by 2030 and 1,000 Mha by 2050. Business-as-usual scenarios that continue current rates of loss and restoration result in increasing net loss of natural ecosystem area in 2030 and 2050.

Comparing these calculations with Integrated Assessment Models illustrates the feasibility and means of achieving the high ambition scenario (see [1] for details). Scenarios designed to achieve positive outcomes for biodiversity—also referred to as scenarios that "bend the curve" for biodiversity [8–11]—project net gains in natural ecosystem area of about 10% with a range of −1% to 20% by 2050. In contrast, business-as-usual scenarios result in large net area losses and degradation of biodiversity. These analyses indicate that a 15% increase in natural ecosystem area by 2050 requires transformative change that includes strong conservation measures, systemic changes to increase the sustainability of production and consumption, and biodiversity-inclusive spatial planning [5,12].

Table 1. Changes in natural terrestrial ecosystem area by 2030 and 2050 as an outcome of actions to restore (Target 2) and reduce losses of natural ecosystem area (Targets 1 and 3).

	100 × (Restoration to natural area − Losses of natural area) / Natural area = % Net change in natural ecosystem area					
	2030			2050		
	Restoration	Losses	Net Change	Restoration	Losses	Net Change
High ambition, meet objectives of Goal A	400 Mha	72 Mha	5%	1,050 Mha	72 Mha	15%
	Restoration of transformed, mostly agricultural ecosystems, to natural. Based on what is needed to achieve the 5% net gain target	75% reduction of losses of natural ecosystem area from current rates	2030 objective of Goal A achieved: 5% increase in natural ecosystem area	Restoration needed to achieve the 15% net gain target	Halt all further losses of natural ecosystem area starting in 2031	2050 objective Goal A achieved: 15% increase in natural ecosystem area
Business-as-usual	150 Mha	200 Mha	−0.8%	450 Mha	600 Mha	−2.3%
	About half of the Bonn Challenge for forest restoration	Continued losses at current rates, 2021−2030	Net loss	Continued restoration rate at same rate, 2021−2050	Continued losses at current rates, 2021−2050	Continued net loss

Two scenarios are shown: (i) a high-ambition scenario that aims at achieving the quantitative objectives for 2030 and 2050 as they appear in the first draft of the GBF [3]; and (ii) a "business-as-usual" scenario that assumes current rates of losses continue and a much lower restoration ambition. Values for areas in the table are cumulative global totals for each time period expressed in millions of hectares (Mha). Natural area in 2020 is estimated to be half of the global ice-free land surface (≈ 6,500 Mha = 65 Mkm^2). Current rates of natural ecosystem area loss are approximated using 10 Mha/year for forests (moderate uncertainty) and the same loss for other habitats (high uncertainty). High-ambition restoration rates were set based on what is needed to meet the net gain in natural ecosystem area after accounting for assumed loss rates. Business-as-usual restoration of transformed towards natural condition is assumed to be about half of the 350 Mha of forest restoration per decade foreseen in the Bonn Challenge, because most of the committed restoration does not increase natural ecosystem area. Full details and assumptions can be found in [2].

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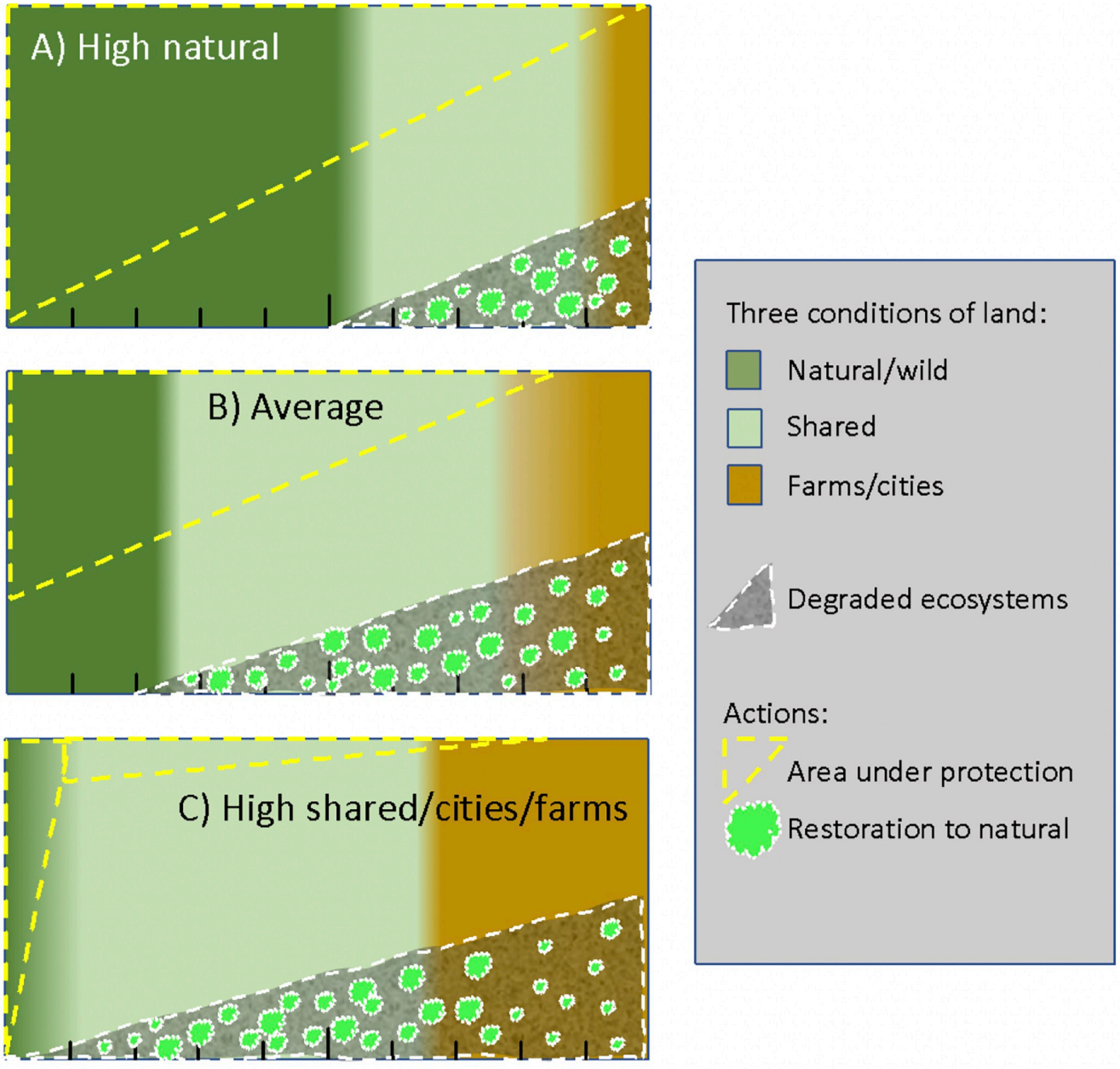

Fig 1. Illustration of three country-level cases with different current land conditions and their potential for restoration and conservation. (**A**) High proportion of large contiguous natural areas, (**B**) average global proportions, and (**C**) high proportion of shared areas plus cities and farms (see text). These cases are based on realistic examples of the average and of the spectrum of the three conditions across countries (naturebeyond2020.com/3conditions/; [13]). The shading illustrates the proportion of each condition. The proportion of degraded land ecosystems is shown in the lower patterned triangles. The area under protection by 2030 (Target 3) is shown in the upper yellow-dashed triangles (dispersed over shared and cities and farms categories to show the current reality, and representing 50%, 30%, and 10% of total area under protection in A, B, and C, respectively). Restoration of transformed to natural ecosystems by 2030 (Target 2 of the GBF) is shown by the green blobs spread across the degraded area (representing 20% of the degraded area in each case).

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Importantly, "no-net-loss" and "net-gain" policies for nature have generally only been successful when clear limits on losses and clear objectives for restoration are set, such as strict like-for-like compensation of losses [4]. Without explicit numerical objectives for reducing losses (such as in Target 1 or Goal A), ambitious objectives for net gain could be met by

focusing on restoration instead of slowing losses. This would result in adverse outcomes for biodiversity and ecosystem integrity, because newly created natural areas typically take decades or even centuries to reach high integrity, and often never reach the levels of integrity of natural ecosystems that were lost [4,5].

Implementing global objectives for gains in natural ecosystem area at national scales

Fig 1 illustrates how existing land conditions influence potential national contributions to increasing natural ecosystem area and integrity through conservation and restoration actions (see "Three Conditions" in [13]). Large contiguous natural areas provide opportunities for protecting vast areas of high ecosystem integrity. In these, there is little need, nor opportunity, for restoration to increase natural ecosystem area, although restoration can be important for improving natural ecosystem integrity. Shared spaces—mosaics of natural and transformed ecosystems—provide opportunities for protecting remaining natural ecosystem fragments, as well as multiple options for restoration to increase the area and integrity of natural ecosystems. Areas dominated by cities and farms provide only modest potential in this regard. There are, however, substantial opportunities to increase natural ecosystem area by restoring degraded farmlands, abandoned lands, and managed forests towards a natural state, as well as greatly increasing the integrity of transformed ecosystems. Importantly, ecosystem restoration in densely populated areas also provides a wide range of benefits to growing populations.

Countries with a substantial fraction of large contiguous natural areas can make significant contributions to safeguarding these areas, but generally less to increases in natural ecosystem area (Fig 1, panel A). Countries with a substantial fraction of farmland and cities can make lower contributions to conservation of natural area, but can contribute more to restoration actions that increase natural ecosystem area (Fig 1, panel C). Differences in national conditions highlight the importance of national spatial planning (Target 1) as the basis for understanding current conditions and translating global ecosystem objectives to national levels, including balancing trade-offs within and between countries [12]. Additional national circumstances need to be considered, including the level of resource mobilization needed for implementation and the rights and needs of local communities. This further emphasizes the need for international collaboration to ensure that efforts are effective and equitably shared [5].

State of play in negotiations and recommendations

The wording and quantitative objectives of Goal A, and Targets 1, 2 and 3 have been extensively discussed during negotiations of the GBF. We highlight three key unresolved issues and potential ways forward.

Many governments would prefer to keep the wording of the goals and targets simple to facilitate communication. Simple wording is, however, at odds with the need to have coherence across targets and goals. Coherence requires detail that can be challenging to negotiate, as the case of natural ecosystem area and integrity illustrates. Determining the relationship between Goal A and Targets 1 to 3 requires specific quantitative objectives for reducing losses of natural ecosystems and for restoring transformed ecosystems towards a natural state, which should not be conflated with general wording concerning restoration of all degraded ecosystems. Potential solutions include accepting additional complexity in the wording of targets (see [2] for suggestions), or explicitly addressing this complexity elsewhere in the framework (such as in technical annexes). Not addressing these issues increases the risk that there will be misinterpretations, large inconsistencies in implementation, and challenges in traceability.

Explicitly addressing these issues will guide effective action and clarify the indicators and reporting needed in the GBF monitoring framework.

Governments are also concerned about how to translate global quantitative objectives to national objectives. The first draft of the GBF states in the preamble to the targets that actions should "take into account national socioeconomic conditions." Understanding what this means in practice, and making sure that national biodiversity strategic action plans (NBSAPs) add up to global targets, will require more concrete framing of how global and national objectives are related. One possible mechanism for doing this would be regular evaluation of the national implementation of targets and their contribution to achieving global goals, and adjustment of implementation when and where necessary [5]. This type of mechanism for "course correction" is under discussion for the GBF monitoring framework and would be extremely valuable.

Clear definitions and consistent wording across goals and targets are essential for the implementation, monitoring, and coherence of the GBF. Lack of common ground on the use of terminology is severely hindering negotiations. A glossary is available to governments, and is being updated, but many of the definitions would benefit from more detail and clarity, and process for updating and formalizing the glossary could be better defined. This article, other articles in this collection, and previous CBD information documents provide scientific foundations on which to strengthen the glossary [1,2].

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