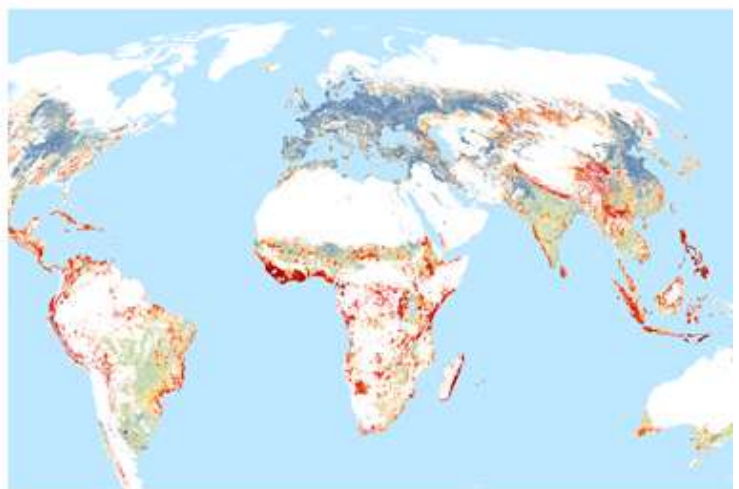INTERNATIONAL INSTITUTE FOR SUSTAINABILITY

IIS

Ambitious goals require inclusive and integrated spatial planning

Recommendations for the post-2020 Global Biodiversity Framework

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TRADE, DEVELOPMENT & THE ENVIRONMENT HUB

This document consists of a multi-institutional effort developed by these authors:

Joana M. Krieger[1], Gabriela T. Duarte[1], Elizabeth Boakes[2], Renata Capellão[1], Rebecca Chaplin-Kramer[3,4], Brian J. Enquist[6,7], Xiao Feng[8], Fernanda D. Gomes[1,9], Samantha Hill[10,11], Alvaro Iribarrem[1], Eduardo Lacerda[1], David Leclère[12], Cory Merow[13], Sara Mortara[1], Tim Newbold[14], Luiz Gustavo Oliveira[1], Diogo Rocha[1], Patrick R. Roehrdanz[15], James E.M. Watson[16], Bernardo Strassburg[1,9]

1 International Institute for Sustainability, Rio de Janeiro, Brazil

2 Institute for Sustainable Resources, Bartlett School of Environment, Energy and Resources, University College London, London, UK

3 Natural Capital Project, Woods Institute on the Environment, Stanford University, Stanford, California, USA

4 Institute on the Environment, University of Minnesota, Minnesota, USA

5 SPRING, 5455 Shafter Ave., Oakland, California. springinnovate.org

6 Department of Ecology and Evolutionary Biology, University of Arizona, Tucson, AZ, USA

7 The Santa Fe Institute, Santa Fe, NM, USA

8 Department of Geography, Florida State University, Tallahassee, Florida, USA.

9 Rio Conservation and Sustainability Science Centre, Department of Geography and the Environment, Pontifícia Universidade Católica, Rio de Janeiro, Brazil

10 Department of Life Sciences, Natural History Museum, London, UK

11 UN Environment, World Conservation Monitoring Centre (UNEP-WCMC), Cambridge, UK

12 Biodiversity and Natural Resources (BNR) Program, International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria

13 Eversource Energy Center, University of Connecticut, Storrs, CT, USA

14 Centre for Biodiversity & Environment Research (CBER), Department of Genetics, Evolution and Environment, University College London, London, UK

15 Moore Center for Science, Conservation International, Arlington, Virginia, USA

16 School of Earth and Environmental Sciences, University of Queensland, St Lucia QLD 4072, Australia

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KEY MESSAGES

- It is possible to halt and potentially reverse biodiversity decline, but high efforts to tackle different threats should be taken simultaneously as the relative importance of each threat is likely to change in the future.

  (Section 2 of this document)

- A holistic spatial planning effort that considers emergent properties of different management actions and multiple indicators is key to integrate biodiversity goals, achieve positive outcomes for people and nature and the broader Sustainable Development Agenda.

  (Section 3 of this document)

- Meeting increasing food demands while supporting biodiversity conservation through preservation and restoration of natural vegetation is a formidable challenge. Among the factors that must be addressed is a substantial effort to sustainably increase food production while reducing the overall land footprint. This needs to be complemented through the incorporation of environmental sustainability standards on trade agreements.

  (Section 4 of this document)

1. Introduction

The role of international agendas: Human activities have been pushing Earth's complex living system towards a direction of irreversible change. Unprecedented biodiversity loss is both a consequence of this path and a cause of drastic shifts in ecological processes that put human livelihoods in jeopardy. To tackle these ongoing challenges, the period between the years 2020 and 2030 was proclaimed as the United Nations (UN) Decade on Ecosystem Restoration under the banner of Building Back Better. This ten-year period also marks the deadline for achieving the ambitious Sustainable Development Goals (SDGs) that nations signed in 2015. In addition, the 2021 UN Climate Change Conference (COP26) was remarkable for a growing recognition of the role of the food system, forests, land use, and nature as both a source of, and solution to, climate change. Leaders from more than 100 countries - containing 85% of the world's forests - promised to halt and reverse forest loss and land degradation by 2030. Other highlights were the acknowledgement of the role of nature-based solutions and the Article 6 of the Paris Agreement which finalized the Paris "rulebook". With this spirit of taking strong and urgent actions to overcome environmental challenges, ambitious goals are expected to be proposed in the Convention of Biological Diversity's (CBD) post-2020 Global Biodiversity Framework (GBF).

CHALLENGES ADDRESSED HERE

This document summarises conclusions and recommendations of an integrated modelling exercise conducted by IIS and partners to support the development of the Global Biodiversity Framework. Through the assessment of the impacts for people and nature based on several indicators and in future scenarios, it hopes to orient the goals related to biodiversity and nature's contributions to people (NCPs) and the actions regarding conservation and restoration.

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2. Reducing threats and increasing adaptation capacity

2.1 NATURAL ECOSYSTEMS: A HEALTH ISSUE

A look at ecosystems' health: The GBF is already considering ecosystems' health with metrics related to their area, integrity, and connectivity. These metrics aim to guarantee the quality of internal ecological processes that underpin life within all types of ecosystems. Although ecosystems are just one critical biodiversity level, it can serve as a surrogate for species, communities, physicochemical conditions, and ecological processes that sustain biodiversity and NCPs. Highly healthy ecosystems must be preserved for climate and biodiversity ambitions to be achieved (Watson et al. 2020). Less healthy ecosystems, but with high potential to serve as habitat and/or to provide benefits, need to be restored.

Current condition: Scientists have been trying to globally evaluate ecosystems' condition. A recent study, which used terrestrial ecoregions as proxy, demonstrated that most of these regions are highly impacted and degraded (74%) and just 6% are on improving trajectories (Beyer et al. 2020). It states that policymaking should look beyond habitat area and integrate multiple indicators of health and resilience in order to achieve effective outcomes related to ecosystems' conservation. This recommendation is considered within Goal A of the GBF (Draft 1), that aims to enhance ecosystems' health allowing countries to decide how to address specific aspects related to it, gaining flexibility to achieve better outcomes when determining national and sub-national actions.

Projected pressures: Historically, land use change has played a main role in degrading ecosystems through the reduction in their area, integrity, and/or connectivity. However, under a projected scenario for 2050 with high levels of population and consumption growth, the Shared Socioeconomic Pathway 3 (SSP3), other human pressures will have an even greater impact than land use change per se (IIS and partners in prep). Hence, prioritizing systems that minimise competition with food production while increasing connectivity, accompanied by restoration of degraded natural areas and rehabilitation of degraded productive lands within highly populated landscapes, could offer key contributions towards achieving Goal A (Draft 1) of the GBF. Target 2 (Draft 1) must

specify this notion directly by including ecosystems' integrity as another metric that restoration actions should ensure. Certainly, actions to achieve targets that directly address these other pressures, such as overexploitation, species invasion, pollution, and climate change (Action Targets 4-7; Draft 1) should be implemented simultaneously to mitigate the impacts of human population growth.

2.2 SIGNIFICANT EFFORT NOW NEEDED TO HALVE SPECIES EXTINCTION RISK

Preserving ecosystems' health to reduce species extinction risk: Conserving remaining healthy natural ecosystems and ecologically restoring landscapes are central actions to safeguard biodiversity and limit species extinctions (Di Marco et al. 2019). Ecosystems' health is a direct factor of its capacity to support individual species' populations. Threats to biodiversity may alter the resources available and the environmental conditions that species communities were adapted to. To date, changes in human pressures have driven an unprecedented number of species towards extinction (IPBES 2019). Therefore, to reverse this trend, future policies must consider species distribution, status, habitat demands and sensitivities.

Outcomes of a global restoration effort: A global study using vertebrates (mammals, birds, and amphibians) as surrogates demonstrated that it is possible to substantially decrease species extinction risk, with relatively low implementation and opportunity costs, by net increasing the amount of natural ecosystems in priority areas (Strassburg et al. 2020). For instance, accounting only for habitat loss as a threat, a net increase of 430 million hectares of natural areas (i.e., equivalent of 3.5% of the current remaining global natural areas or 15% of current agricultural areas) in optimal locations could avoid up to 60% of expected extinctions while sequestering almost 300 gigatonnes of CO_2 — 30% of the total CO_2 increase in the atmosphere (or 14% of emissions) since the Industrial Revolution (about AD 1750; Strassburg et al. 2020). Even though megadiverse tropical countries have knowledge gaps related to the number of existing species and their habitat range, which makes it hard to estimate their current status, restoring species habitat is presented in this study as an important path that needs to be included in the policy-making process (as in

Target 2; Draft 1). However, this step should be taken considering different threats beyond habitat loss.

A strong interlinkage with climate change: Climate change is already amplifying the impacts of habitat loss and fragmentation (Segan et al. 2016, Northrup et al. 2019) and research is demonstrating that it is likely to exert substantial pressure on biodiversity even under the highest levels of international ambition toward mitigation (Newbold et al. 2018, IIS and partners in prep.). In particular, it directly threatens the achievement of Goal A, Milestone A.2 (Draft 1). This pattern is consistent across taxa, including plants, vertebrates, and insects, as well as biodiversity indicators, such as species geographic range, local richness, and population size (Warren et al. 2018, Newbold et al. 2018). When considering the land cover and climate projections of the SSP3 RCP 7.0 scenario for 2050, species' extinction risk could increase between 35 and 150% (IIS and partners in prep.). Considering the growing recognition of the fundamental role of climate change mitigation and adaptation in achieving multiple biodiversity goals, the GBF should incorporate this message within its targets (*e.g.*, Action Targets 1-3, besides Target 8; Draft 1). For instance, it is necessary to pursue paths that result in gains for both biodiversity and carbon sequestration through ecological restoration. The potential of nature-based solutions to mitigate climate change and conserve biodiversity is reinforced by multiple studies (IPBES 2019, Keith et al. 2021, Seddon et al. 2021). Although trade-offs exist, allocating restoration of 15% of the anthropic areas focusing simultaneously on reducing species extinction risk and carbon sequestration would deliver approximately 90% of the maximum potential gains for both these goals (Strassburg et al. 2020). These results highlight the importance of multi-objective planning. Additionally, reduce other stressors to species and ecosystems (Action Targets 4-7; Draft 1) is necessary to help them adapt to a changing climate. Species range shifts to track suitable climate is another potential species adaptive response (Hannah et al. 2020) that needs to be considered under the landscape connectivity cited in Targets 2 and 3 (Draft 1) as means to reduce risks of extinction.

3. Towards a holistic spatial planning

The land and seascape planning described in Target 1 has the potential to integrate Goals A and B (Draft 1): Decisions driven by focusing only on biodiversity or NCPs will likely generate considerable trade-offs between Goals A and B (Draft 1; Girardello et al. 2019, Chaplin-Kramer et al. in prep., IIS and partners in prep.). To create synergies, inclusive and integrated spatial planning should consider multiple criteria and indicators, using the information obtained across spatial and temporal scales (from local to global and from past and now to future) to induce cooperation and efficiencies towards better outcomes for people and nature (Chaplin-Kramer et al. 2021).

Inclusive and integrated planning across multiple objectives: Conserving remaining natural ecosystems, through both protection and sustainable management, is still the most important action to safeguard biodiversity, but large-scale restoration is seen as critical to limit impacts and regain ecological processes that sustain life on Earth. As these actions have different roles to protect biodiversity, they both should be considered simultaneously for policy making and planning process. Additionally, it is important to better understand relationships between nature conservation and economic development. The productivity and security of many human enterprises rely on material and regulating contributions of nature and, if its role is not adequately represented in our economic forecasts, we will continue to make decisions that erode the long-term viability of these activities. Last, the inclusion of indigenous peoples' and local communities' knowledge, innovations, practices, institutions, and values in the spatial planning process is a key factor to thrive in the achievement of any biodiversity related goals. These specific stakeholders traditionally own, manage, use, or occupy around a quarter of the global land area (IPBES 2019). Thus, any spatial planning must recognize their contributions in a participatory way, increasing the sense of legitimacy and chance of implementation of the plan (Posner et al. 2016, IPBES 2019). In conclusion, to support the goals and targets actions of the post-2020 GBF, spatial planning (Action Target 1; Draft 1) should address the challenge of inclusively setting priorities for different management actions simultaneously, considering their interaction and emergent properties, and the resulting socio-ecological impacts that feed into our economy and wellbeing.

Acknowledge threats, vulnerability, and equity: As the relative importance of the major threats to biodiversity are expected to change within the time frame determined for the goals, inclusive and integrated planning should anticipate exposure and deal with socio-ecological vulnerabilities. The general idea is to plan actions now towards a future scenario where human-driven impacts on nature are reduced with healthy and functioning ecosystems. For instance, well planned actions for conservation and restoration can substantially enhance ecosystems health while diminishing ecoregions' vulnerability in 2050 (IIS and partners in prep.). These inputs need to be combined with socio-economic metrics of human vulnerability to assess who will benefit and bear the costs of different management decisions, and to address concerns over equity to ensure that future development is not only sustainable but equal.

4. Sustainable agriculture production and trade

Challenges in the food production system: Over-exploitation of natural resources, biodiversity loss, and climate change impacts are listed among the major threats that food and agriculture systems face when moving towards a sustainable future (FAO 2021). For instance, studies based on the SSP3 scenario project an extensive conversion of natural areas into agricultural lands in Sub-Saharan Africa (Doelman et al. 2018, IIS and partners in prep.). However, many lands located in this region are within the top 10% global terrestrial priority areas for conservation (Hannah et al. 2020, Jung et al. 2021). Hence, one of the biggest challenges for society is building a food system that can sustain a rapidly growing human population, in an equitable way, while being able to set aside lands for conservation and restoration of natural vegetation (Fastré et al. 2021). Besides behavioural and cultural changes (*e.g.*, dietary changes, reduction of food loss and waste; Leclère et al. 2020, Stratton et al. 2021), two other fronts – directly related to conservation and restoration global planning – could help reverse this path:

a. Sustainable agriculture production intensification: To provide a global net increase in natural areas (Goal A; Draft 1) and still meet the increasing demand for food, the GBF must promote the sustainable intensification of agricultural production over area expansion

(Action Target 10; Draft 1). For instance, it would be necessary to close at least 70% of yield gaps of crops and pastures to spare enough land to net increase the current amount of natural areas by 7% (around 750 Mha), while also assuring the projected agricultural production of the SSP3 2050 scenario (IIS and partners in prep.). However, this agricultural intensification is not trivial and may have negative externalities related to some important NCPs such as water quality regulation and pollination, especially due to the increase of fertilizers, chemical inputs, and decrease of natural habitats within agricultural lands (Chaplin-Kramer et al. 2019). It will require investments and innovative policies that minimize trade-offs and ensure food security among other Sustainable Development Goals (Leclère et al. 2020, Garnett et al. 2013).

b. International food trade with safeguards: Agriculture intensification is not the only factor directly related to global conservation and restoration planning that GBF should address. In the SSP3 projected scenario, countries have a focus on achieving food provision within their own region, with a small share of agricultural goods expected to be internationally traded (Popp et al. 2017). Preliminary results demonstrate that even with high levels of yield growth until 2050, some countries, especially in Africa, would still need to convert natural areas to meet the SSP3 agricultural demands, while in other countries, current agricultural lands could be restored (IIS and partners in prep.). Hence, international trade also has an important role to help bend the curve of biodiversity (Leclère et al. 2020). Future trade agreements should consider multiple biodiversity goals and key human needs. They could help reconcile food production, conservation and restoration of natural areas. Incorporating these environmental sustainability standards in global trade is crucial to reach the biodiversity outcomes of the GBF.

5. Expectations for the next decade

Operationalisation across scales: Multinational agreements have the role to protect globally important species and ecosystems. However, at national and sub-national scales different biodiversity patterns and processes are operating which sustain life and livelihoods (Chaplin-Kramer et al. 2021). Therefore, cooperation between decision makers

and other stakeholders across these scales is mandatory to ensure the achievement of the post-2020 GBF expected outcomes.

Integrated agenda: There are many impacts of climate change on ecosystems and biodiversity and high awareness of possible tipping points that will affect human well-being. Yet, the contribution of conservation and restoration activities in the mitigation and adaptation through ecosystem-based approaches brings hope to tackle this challenge. In the latest United Nations Climate Change Conference, the COP26, the Glasgow Climate Pact was clear on this linkage and on the urgency of addressing these issues in a more synergetic way (UNFCCC 2021). The next GBF should echo this message, specifically recognizing the major role that addressing climate change possesses in meeting biodiversity goals.

Cooperative and well-planned actions: The achievement of ambitious goals related to complex natural processes and human livelihoods require coordination among all actors involved in the implementation of the GBF. It is essential that they are fully engaged in the planning process and are committed to put it into practice. This can only be done through strong communication, cooperative and well-planned actions towards a sustainable future.

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