Science briefs

Ecosystem objectives and selected targets of post-2020 Global Biodiversity Framework

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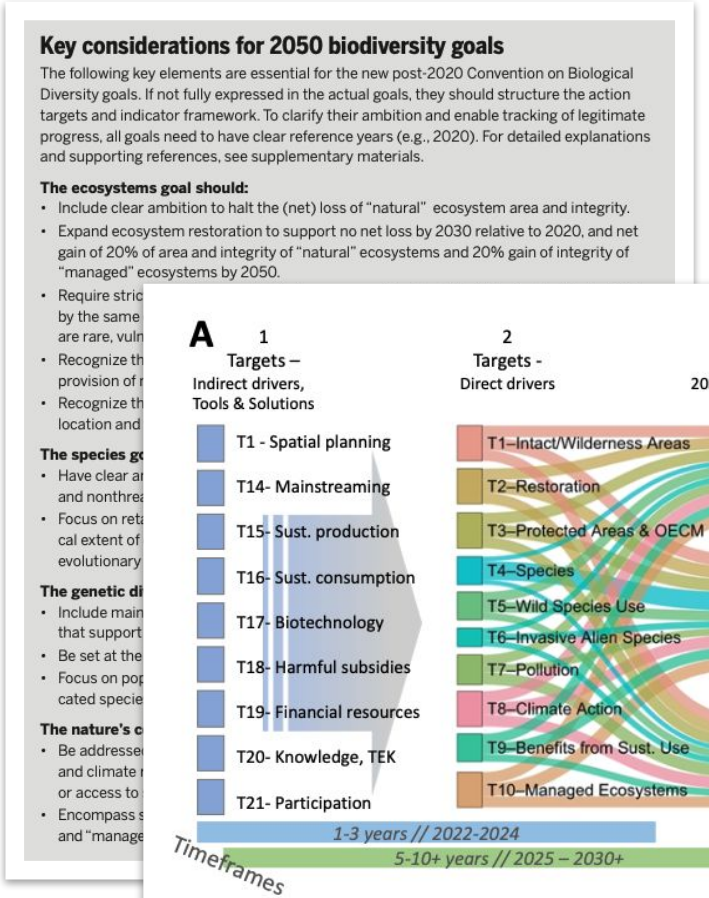
History

- Jan – May 2020: INF doc for SBSTTA 23 (Future Earth) + Diaz et al. 2020
- Sept 2021 – Mar 2022: INF doc for SBSTTA 24/OEWG 3 (bioDISCOVERY/Future Earth and GEO BON) + Leadley et al. 2022
- Apr – Jun 2022: Target-focused briefs, INF doc for OEWG 4 and monitoring workshop
- *50+ experts involved in the INF docs and papers: mostly IPBES authors, or participants in Future Earth or GEO BON programs*



Diaz et al. (2020) Science

Science briefs for WG2020-4

- Ecosystem area and integrity: ecosystem objectives of Goal A and targets
- Target 10 – Sustainable agriculture, aquaculture and forestry
- Target 3 – Protected areas and OECMs
- Target 8 – Climate change impacts, adaptation and mitigation
- Target 7 – Pollution (nitrogen/phosphorus and pesticides)
- Monitoring framework

Leadley et al. (2022) One Earth

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OPEN-ENDED WORKING GROUP ON
THE POST-2020 GLOBAL
BIODIVERSITY FRAMEWORK
Fourth meeting
Nairobi, 21-26 June 2022
Item 4 of the provisional agenda*

SCIENCE BRIEFS ON TARGETS, GOALS AND MONITORING IN SUPPORT OF THE POST-2020 GLOBAL BIODIVERSITY FRAMEWORK NEGOTIATIONS

Note by the Executive Secretary

1. The Executive Secretary is pleased to circulate herewith, for the information of participants in the fourth meeting of the Open-ended Working Group on the Post-2020 Global Biodiversity Framework, an information document providing scientific information on the proposed targets and goals of the post-2020 global biodiversity framework and associated monitoring issues. The document has been prepared by the bioDISCOVERY programme of Future Earth and the Secretariat of the Group on Earth Observations Biodiversity Observation Network (GEO BON). This document has been revised from an earlier version. It is provided in the form and language it was received by the Secretariat.

2. The document complements other documents made available on this issue for previous meetings including documents CBD/WG2020/3/INF/11, and CBD/SBSTTA/24/INF/9. This note is also relevant to the workshop on options to enhance the planning, monitoring, reporting and review mechanism being held in Nairobi, from 17 to 18 June 2022 and the technical meeting on indicators for the post-2020 global biodiversity framework being held in Bonn, from 29 June to 1 July 2022.

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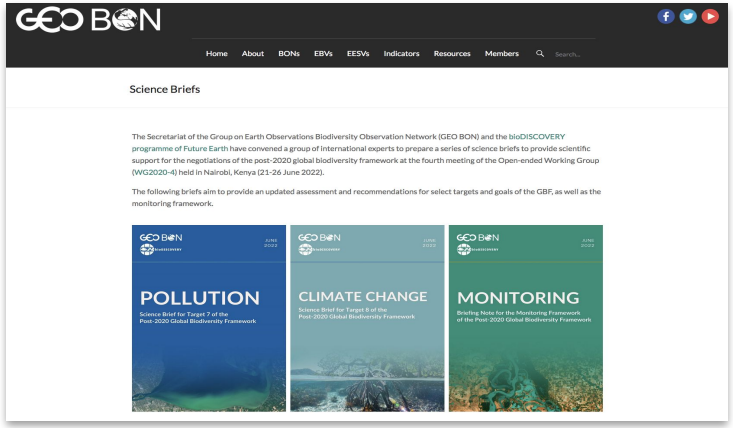

See also a video on the Ecosystem brief on this site

https://doi.org/10.1016/j.oneear.2022.05.009

One Earth

CellPress

Commentary

Achieving global biodiversity goals by 2050 requires urgent and integrated actions

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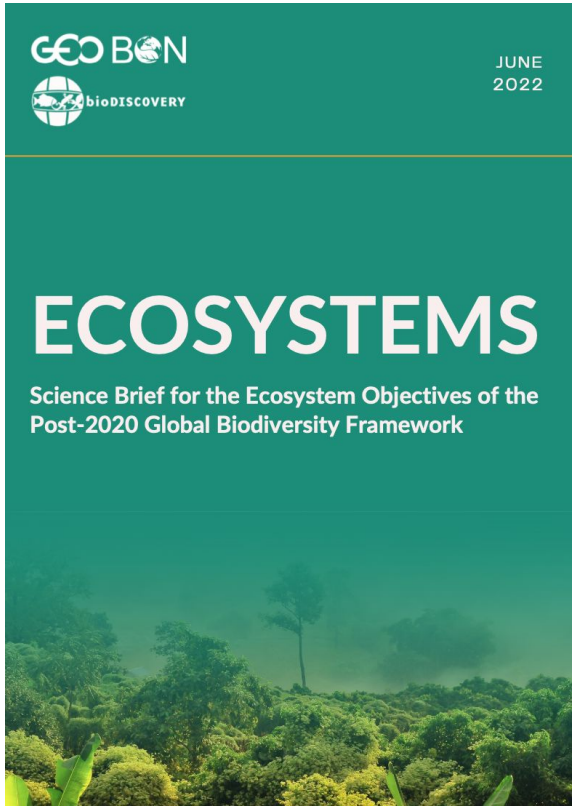
Ecosystem Area and Integrity



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Ecosystem area and integrity: overview

- Actions in targets to increase the area of natural ecosystems and integrity of all ecosystems are essential for achieving Goal A and the broader objectives of the Global Biodiversity Framework (GBF)
- Targets 1, 2 and 3 are area-based targets and should have clear links to ecosystem area objectives of Goal A. This is lacking in the first draft of the GBF.
- All targets contribute to ecosystem integrity and should have clear links to the ecosystem integrity objectives of Goal A. This is lacking in the first draft of the GBF.
- Clear definitions are essential. Negotiating complex targets with only partially-agreed definitions and terms is very tricky!!!

Ecosystem area: global net gains

Net gain or loss in natural ecosystem area = Restoration - Losses

% Net gain or loss = (Restoration – Losses) / (Ice free land area X fraction that is "natural" ecosystems) X 100

2030 Scenario: Achieve 5% net gain in natural ecosystem area on land

(**400** Mha – **72** Mha) / (**13000** Mha / **2**) X 100 = **5%**

Net gain in natural area

Restore

Target 2: restoration of transformed to natural
Needed to achieve 5% net gain

Reduce losses

Target 1: greatly reduce loss of natural ecosystem area & T**arget 3**: area-based conservation
Losses reduced by 75%

Global natural area

Key Assumptions:

- Global ice free land area is about 13000 million hectares (Mha)
- Natural ecosystems are about 50% of total ice free land area (depends on definition)
- Losses of natural ecosystem area are currently approximatley 20 Mha / year (large uncertainty)
- Assume losses reduced by 75% from 2023-2030
- Restoration calculation is based on what is needed to reach 5% net gain

Ecosystem area: two global scenarios

2030 Scenario: Achieve 5% net gain in natural ecosystem area

(**400** Mha – **72** Mha) / (**13000** Mha / **2**) X 100 = **5%** **Net gain in natural area**

Restore

Reduce losses
Losses reduced by 75%

Natural area

2050 Scenario: Achieve 15% net gain

(1050 Mha – 72 Mha) / (13000 Mha / 2) X 100 = **15%**

Net gain in natural area

Restore

Reduce losses
Halt all losses starting in 2031

2030 Scenario: Business-as-usual

(150Mha – 200 Mha) / (13000 Mha / 2) X 100 = **-0.8%**

Net loss in natural area

Restore
≈ ½ Bonn Challenge

Continued losses

2050 Scenario: business-as-usual

(450 Mha – 600 Mha) / (13000 Mha / 2) X 100 = **-2.3%**

Net loss in natural area

Restore
150 Mha / decade

Continued losses

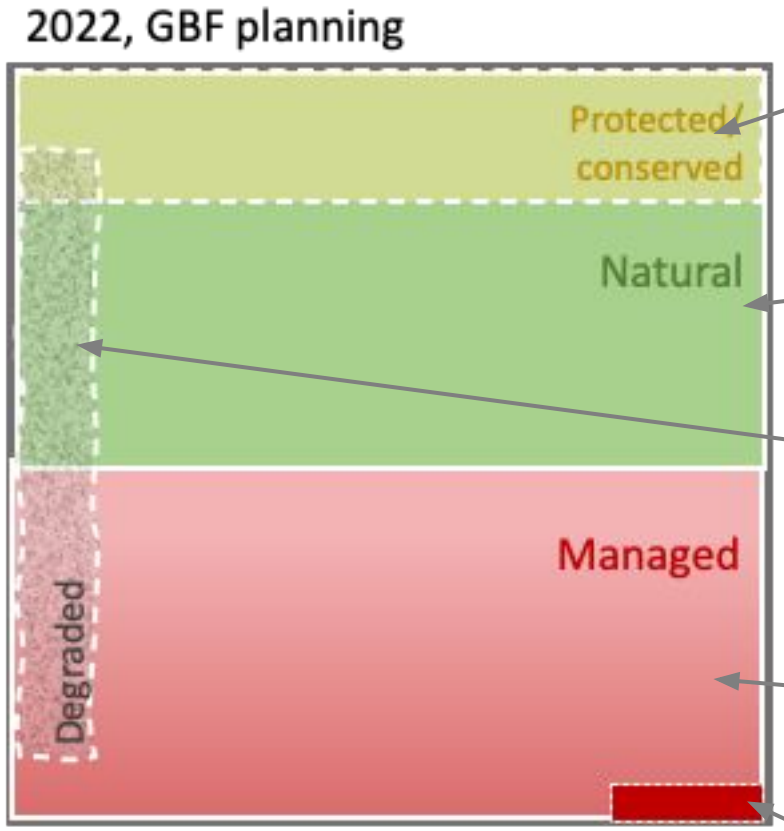
Note: 1 Mha = 10 000 km2. Africa ≈ 30 million km² = 3000 Mha

Ecosystem area and integrity: suggestions
Ecosytem objectives of Goal A

Wording, definitions and quantitative elements of Targets 1 and 2 fail to make a coherent connection to Goal A in the first draft of the Global Biodiversity Framework

- Goal A: 5% net gain in area by 2030 and integrity of natural terrestrial ecosystems and 15% by 2050 (feasible, though highly ambitious, requiring deep, systemic changes).
- Target 1: Spatial planning is important, but will be most effective with explicit objectives for reducing loss of area of natural ecosystems.
- Target 2: There are many objectives for restoration, so there is a need to be explicit about the quantitative contributions of restoration actions to increase area of natural ecosystems and the integrity of ALL ecosystems.

National contributions: average case = global levels



Planning areas in 2020		%
T1a	Planning coverage	100
T1b	Natural	53
T2	Degraded areas (1/3 managed)	16
T3	Protected and conserved, 2020	17
T10	Managed (production)	48

Aichi Target 11 = 17%, predominantly natural/intact areas

Natural ecosystems = 53%

Degraded ecosystems, across natural and managed lands = 16%

Converted/transformed ecosystems, under 'managed' production = 48%

Cities/ infrastructure ≈ 1%

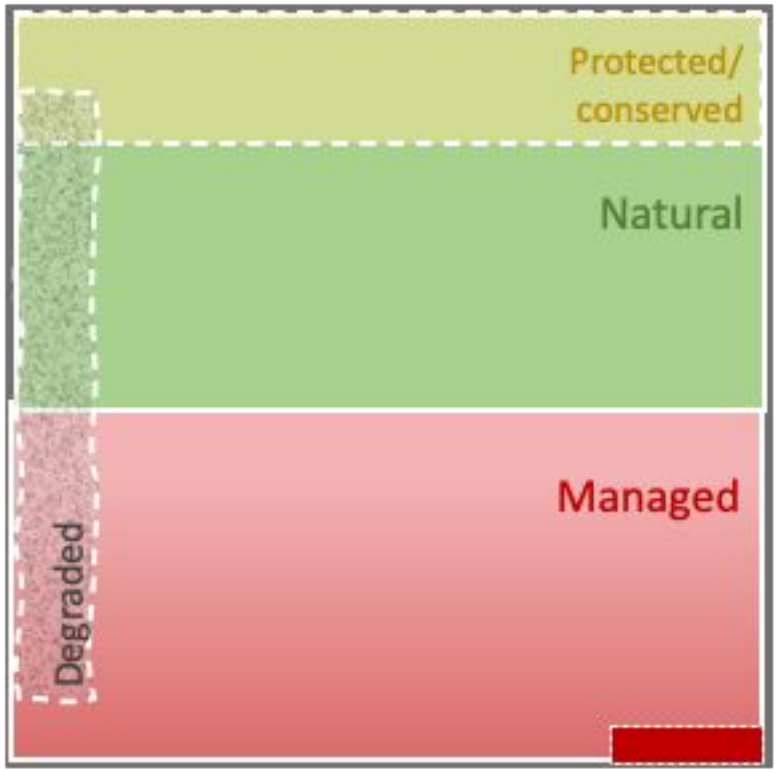
Hypothetical national cases to illustrate GBF area-based targets (1, 2, 3, 10) and achievement of Goal A (ecosystem area).

<u>Assumptions</u>

- Land only, but similar approaches possible for freshwater and ocean
- 5% net gain in ecosystem area in 2030
- Integrity targets will be met in the future.

National contributions: average case = global levels

2022, GBF planning



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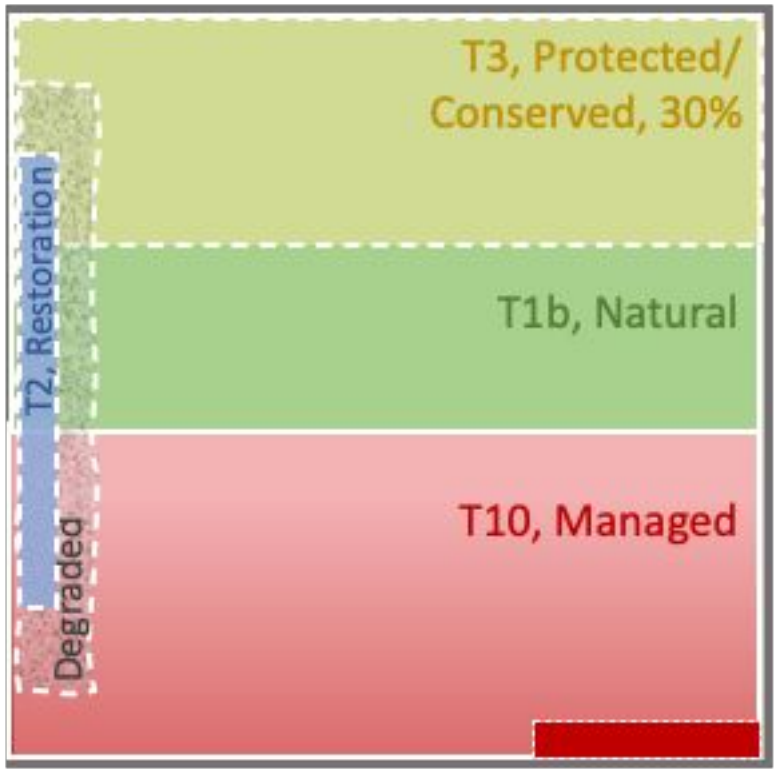
2030 (targets and goal A)

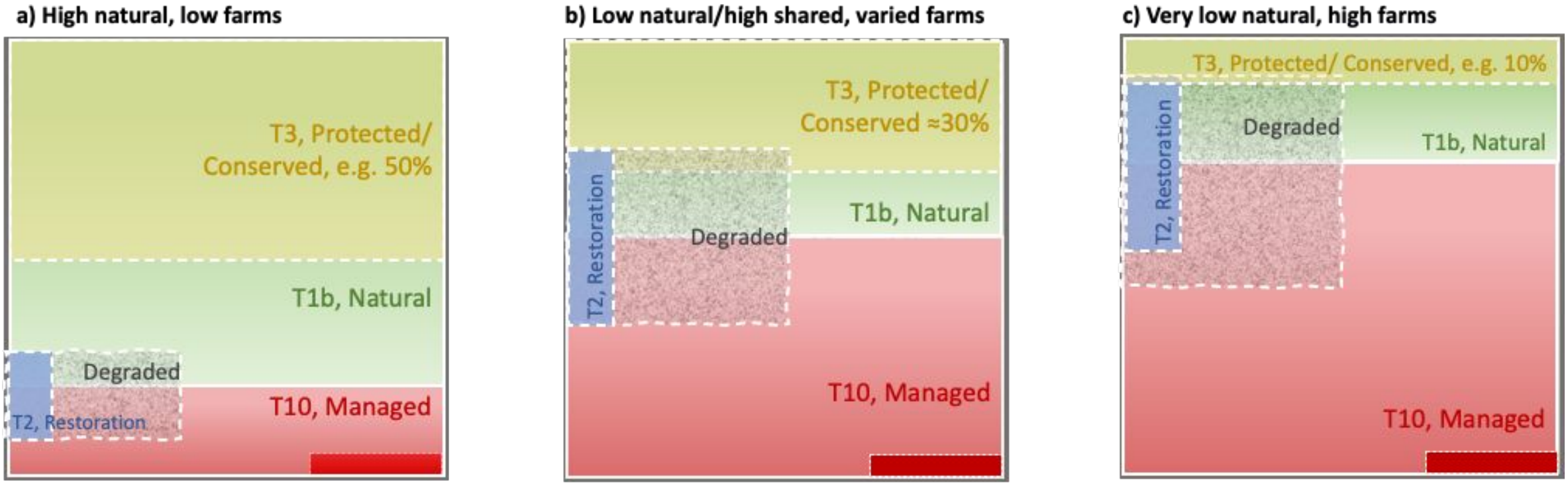


Target/goal achievement in 2030		%
T1a	Planning coverage	100
T1b	Natural increased by 5%	55
T2	Restoration of degraded (20%)	3
T3	Protected and conserved, 2030	30
T10	Sustainable production	45

Key transitions

- Spatial planning across 100% of territory (T1a)
- Prevent/minimize losses of natural ecosystems (T1b)
- Increase in restoration (T2)
- Increase in protected & conserved areas (T3)
- Sustainable management of managed lands (T10)

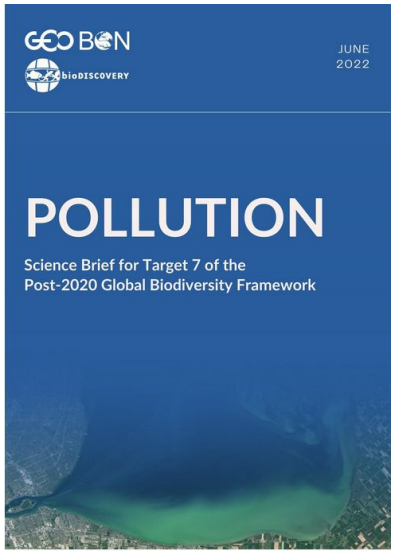
National contributions: 3 cases



- Directly translating global objectives, especially quantitative objectives, to national and local levels will likely result in sub-optimal use of resources and outcomes for biodiversity, as well as setting levels of ambition that are too low in some areas, and unrealistically high in others.
- National targets can be set based on national contexts, with international cooperation to balance contributions to the global targets, and resource mobilization to support implementation.

Target 7 - Pollution

Target 7. Reduce pollution from all sources to levels that are not harmful to biodiversity and ecosystem functions and human health, including by reducing nutrients lost to the environment by at least half, and pesticides by at least two thirds and eliminating the discharge of plastic waste.



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Target 7 - Pollution

- Pollution, especially nutrients (mostly nitrogen and phosphorus) and pesticides, is a major driver of biodiversity loss.

- Reducing pollution is good for biodiversity, nature's contributions to people, human health, and climate change (N fertilizer is a major source of greenhouse gas emissions).

- Quantitative global objectives will not work well if directly translated to national levels. Measures to reduce pollution should be adapted to national contexts because sources, levels and impacts of pollution; effects on food production; and feasibility of reductions vary greatly.

Target 7 - Pollution: pesticides

- It is important to frame pesticide policies in terms of risk instead of quantity.
- This could be reflected in the wording of Target 7 by replacing “by reducing…pesticides by at least two thirds“ with “…risks associated with pesticide use by at least X%”.
- Reductions of 20-50% in pesticide risk are achievable now without compromising food security by increasing efficiency and through substitution.
- Systemic changes and innovation in agriculture and food systems would allow considerably larger reductions.
- risk based indicators are available at the global scale and can be calculated nationally

Target 7 - Pollution: nutrients (nitrogen and phosphorus)

- Based on the best available scientific evidence, the Target 7 objectives for nutrients are technically feasible and coherent with other international policies.

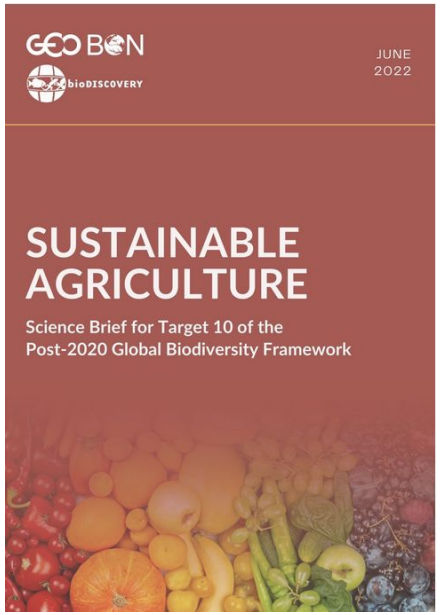
- Agriculture is the primary source of nutrient pollution globally and in many places, but other sources such as combustion and waste water are important. To effectively reduce nutrient pollution Target 7 should include all important sources.

- Nutrient losses from agriculture can be reduced by up to 50% at local, national and global scales by 2030 without compromising food security, using existing farm-level practices and technologies as well as through landscape management.

- Available cost-effective mitigation technologies can reduce nutrient pollution from non-agricultural sources such as wastewater and fossil fuel combustion by far more than 50%.

Target 10 - Sustainable Agriculture

Target 10. Ensure all areas under agriculture, aquaculture and forestry are managed sustainably, in particular through the conservation and sustainable use of biodiversity, increasing the productivity and resilience of these production systems



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Target 10 – Sustainable production

- Sustainable production systems are key to reducing pressures on biodiversity and preventing the transgression of planetary boundaries.

- Agriculture as a key production sector (example)
  - actions here can reduce its 30% contribution to global greenhouse gas (GHG) emissions, 70% of freshwater use and 80% of land conversion
  - 18 - 33% of agricultural lands currently have insufficient biodiversity: this degrades ecosystem functions, reduces food security

- Production systems – similar take on forestry, aquaculture … fisheries

- Spatial planning aspects and target interactions:
  - 40% of area under spatial planning (Target 1a)
  - distinct from intact ecosystems and wilderness areas (Target 1b, 3)
  - complex relationships with restoration (Target 2)

- Key requirement – increase food/other security while reducing impacts, waste, etc <-> complementary roles with production agencies

Target 10 – Sustainable production

Sustainability across various production systems relates to:

- Change in biodiversity and production of nature's contribution to people (NCP), and their inter-linkages
- Effects of supply-side (production) and demand-side (consumption) factors,
- Diversification and integration strategies
- Land use change, to (land)scape & basin scales
- Regenerative and other novel practices – agroecology

Restoration/regeneration (Target 2) in managed ecosystems:

- to increase area of natural ecosystems, must convert some managed ecosystems to natural
- increased integrity of managed ecosystems supports higher resilience and/or sustainability of production.
- can also support natural ecosystems and species – e.g. connectivity/migration corridors, critical habitat (feeding, nesting, etc);
- at scale, improving ecosystem functions in converted lands and waters is crucial to meet global climate, water, and biodiversity targets and goals;

Target 10 – Sustainable production

Sustainable production combined with healthy, diversified diets as key drivers of food systems change and increased resilience and food security - enhancing production of more diverse foods can be a win-win solution for both improved nutrition and biodiversity **(high agreement, robust evidence)**

Policy integration of conservation/GBF with national and international frameworks:

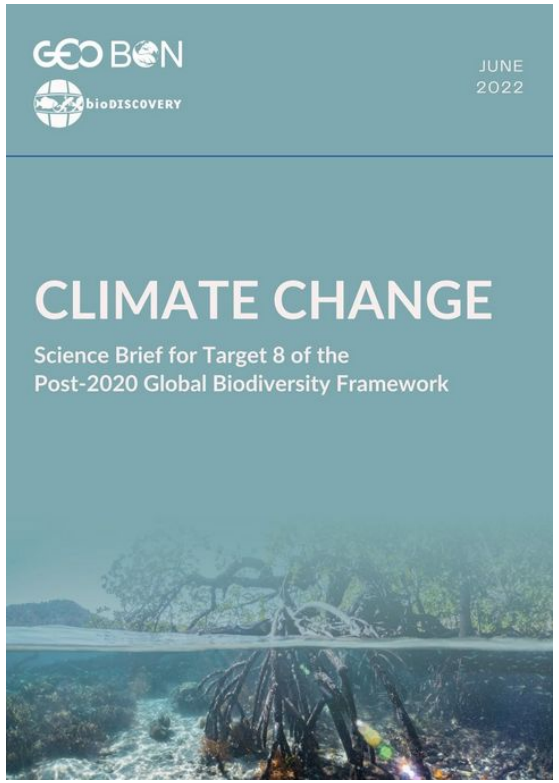
- Spatial planning/national
- Food and other production systems (forestry, aquaculture, fisheries, etc)
- Water and other environmental flows/benefits

Target elements:

- … conservation and sustainable use of biodiversity in managed ecosystems
- … improving productivity and resilience of managed ecosystems

Target 8 - Climate Change

Target 8. Minimize the impact of climate change on biodiversity, contribute to mitigation and adaptation through ecosystem-based approaches, contributing at least 10 $GtCO_2e$ per year to global mitigation efforts, and ensure that all mitigation and adaptation efforts avoid negative impacts on biodiversity.



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Target 8 – climate change

- Strong co-dependence of climate and biodiversity objectives: Paris Agreement and the Global Biodiversity Framework.
- Growing importance of climate change as a dominant driver of biodiversity change/loss in coming decades
- Reducing additional and interacting pressures on biodiversity is essential for improving the resilience of species and ecosystems in the face of climate change.
- Strong science foundation for Target 8 in IPCC-IPBES joint workshop report (2021); IPCC AR6 WGII and WGIII assessments (2022); and rapidly growing literature.

Target 8 – climate change

Ecosystem-based approaches / nature based solutions:

- Can play an essential role in climate mitigation and adaptation – done right
- No recommendation on choice of terminology, but emphasize the importance of definition and safeguards focusing on “wins” for climate, biodiversity and human well-being.
- Involvement of local actors is essential, taking into account all forms of relevant information.

Nature-based solutions/ecosystem-based approaches for climate mitigation by 2030

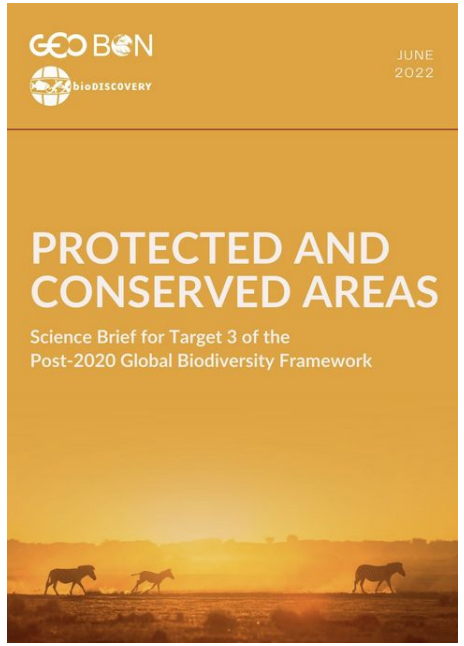
- 5 $GtCO_2e$ / year – ambitious, strongly supported - Cost-effective, food-secure, with biodiversity (and social) safeguards & benefits
- 10 $GtCO_2e$ / year – very ambitious, top-of-range - Only achievable with rapid transformative change

Target 8 of the GBF is an important complement to the UNFCCC

- The mitigation and adaptation potential of biodiversity will be severely undermined by continued greenhouse gas emissions: full emission reductions from energy and transport sectors must be the top priority.
- Climate mitigation based on very large-scale afforestation and bioenergy production should be avoided: they are very likely to be detrimental to biodiversity and compromise food security.

Target 3 - Protected and Conserved Areas

Target 3. Ensure that at least 30 per cent globally of land areas and of sea areas, especially areas of particular importance for biodiversity and its contributions to people, are conserved through effectively and equitably managed, ecologically representative, and well-connected systems of protected areas and other effective area-based conservation measures and integrated into the wider landscapes and seascapes.



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Target 3 – Protected and conserved areas

- "at least 30%" is well supported in the scientific literature.

- To sustain a range of biodiversity values, higher proportions are needed – species, ecosystems, representativity, ecological viability, geographically restricted species, in-site carbon, etc

- Must not repeat Aichi Target 11 experience – quality elements must also be met.
  - Areas of importance for biodiversity
  - Representative
  - Well-connected ('scapes)
  - Nature's contributions to people
  - Effectively managed
  - Equitably governed – IPLC

National contributions – countries may contribute different levels depending on their national circumstances, representative biodiversity, to meet the global aggregate

Other Effective (area-based) Conservation Measures (OECM) *(associated ecosystem functions and services and cultural, spiritual, socio-economic and other locally relevant values)* – founded in interests, rights and agency at local levels. Need transformation to bottom-up and 'shared spaces' approaches to conservation planning.
But are OECMs enough? Call from indigenous

Target 3 – Protected and conserved areas

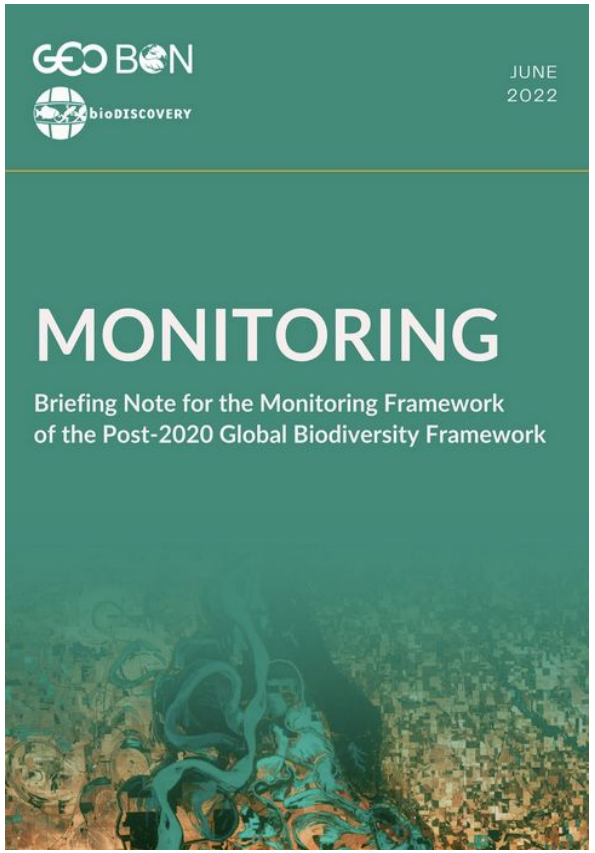
Integrated targets – Target 3, protecting 30%, cannot succeed in isolation from all other targets and the overarching GBF

- Clear from 'bending the curve' scenarios -> need for reducing production/consumption drivers, restoration, sustainable use
- Caution over isolation/disaggregation of targets.

People- and nature- positive frameworks –

- realizing the full potential for OECMs (and other mechanisms)
- three conditions (focus in shared lands/waters), shared spaces/bottom-up approaches,
- importance of nature within production/populated landscapes, to 1 km^2 scale.

Monitoring Framework



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Thanks for your attention

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