

Discussion Paper: Nature's Contributions to People and the Post-2020 Global Biodiversity Framework

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This discussion paper provides Parties and others with scientific inputs and suggestions related to aspects of the Post-2020 Global Biodiversity Framework related to nature's contributions to people to consider as they prepare for forthcoming negotiations. We highlight:

- New research that allows for the prioritization of areas most important to providing nature's contributions to people.
- Suggested revisions to the existing text of Goal B and associated targets and indicators that are formulated based on nature's regulating, provisioning and non-material services for food, water and climate and the extent/condition/flow of these services.
- Linkages of suggested indicators to the United Nations System of Environmental-Economic Accounting— Ecosystem Accounting Framework which can provide a standardized methodology for measurement needed for monitoring and reporting.

Introduction

Healthy ecosystems provide a range of goods and services to people such as supporting economic growth, sustaining livelihoods, and providing the basis for food and water security as well as a stable climate. These are collectively described here as ecosystem services or “Nature's Contributions to People” (NCP)¹. Just as some places in the world are more important for avoiding species extinctions than others, there are some places that are more important for delivering high levels of ecosystem services. Achieving the 2050 Vision of living in harmony with nature will require identifying these places that need special management to stay healthy and to continue delivering these important benefits. Depending on the relative importance, context, and vulnerability of different places, management may require a range of efforts, from implementation of sustainable use areas to community-led conservation efforts to strict protection.

This discussion paper provides information on recent **scientific advances that make it possible to identify the globally important places that are providing these critical services for humanity**. We recommend including these important places as part of the goals, targets, and indicators in the post-2020 Global Biodiversity Framework (GBF) so they can be prioritized for protection, conservation, and sustainable management in support of the 2050 Vision.

The scope of this discussion paper has been kept narrow so as to focus on the latest scientific research on nature's contributions to people as it relates to climate, food, and water. We recognize there are important considerations related to nature's contribution to livelihoods and culture that deserve further deliberation. Nature's relationship to human health, including pandemic prevention, is somewhat addressed in our recommendations through targets on water and food, however these issues also deserve additional consideration. We have also excluded indicators related to production yield as we see those as most appropriate to include in Target 14 and/or Target 4 under sustainable production

¹ While recognizing there are some differences in interpretation, we use them synonymously hereon.

practices. Finally, while we are aware that efforts to meet Target 1 and 2 will contribute to ensuring that places important for nature’s contributions to people are maintained we have not focused on this relationship in this paper.

The Science: Nature’s Contributions to People

Recent scientific advances allow us to map the global distribution of places that can be considered “high performing” in terms of delivering ecosystem services or “Nature’s Contributions to People”, per IPBES.² Conservation International and partners with the Natural Capital Project³ have mapped the places globally that provide the highest levels of a range of multiple ecosystem services. Figure 1 displays concentrations of 12 NCPs delivered in different places around the world, where darkest areas are delivering the highest levels of NCPs. The NCPs mapped are related to water quality regulation (nitrogen, sediment), food provision (pollination, grazing, riverine and marine fish), timber and fuel production, flood regulation and coastal risk reduction, and other human needs (access to marine and terrestrial areas for recreation and gathering of resources). To maintain 90% of current levels of provision of these NCPs, we would need to conserve 39% of land and 24% of marine exclusive economic zones.

These are the places globally that are essential for providing ecosystem services for human wellbeing and, therefore, for achieving any goals or targets related to meeting peoples’ needs from nature. These global priorities can also be refined at national scale to consider country context and specific needs for defining national priorities. **As such, we recommend including the conservation, sustainable use, and restoration of these places in the GBF and encourage countries to refine the identification of such places at the national level. We also recommend for countries to monitor the extent and condition of these ecosystems and the flow of ecosystem services that they provide in alignment with the UN System of Environmental Economic Accounting (SEEA).**⁴

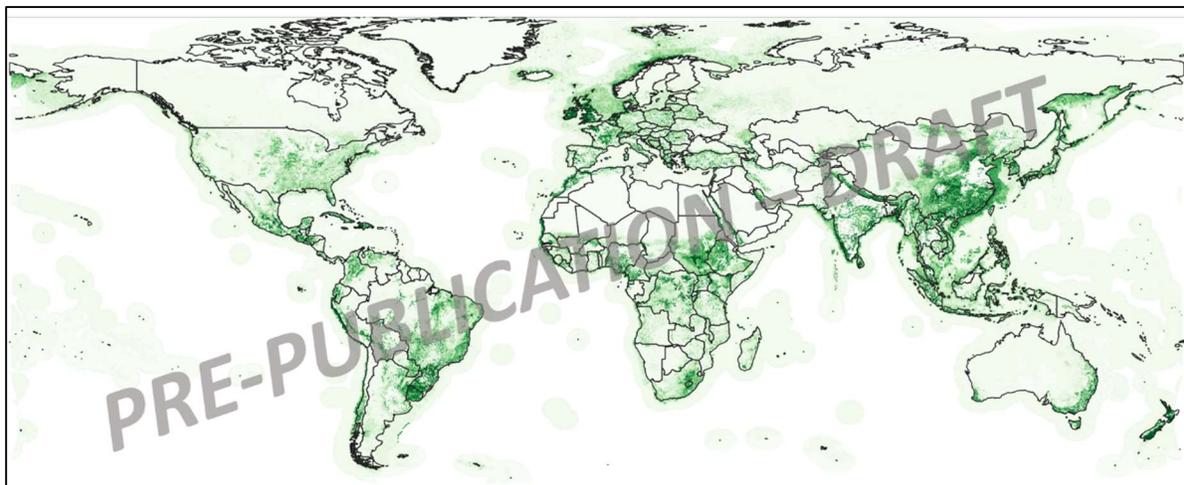


Figure 1. Global ranking of Nature’s Contributions to People

² Nature’s contributions to people include: habitat creation and maintenance, pollination and dispersal of seeds and other propagules, regulation of air quality, regulation of climate, regulation of ocean acidification, regulation of freshwater quantity, location and timing, regulation of freshwater and coastal water quality, formation, protection and decontamination of soils and sediments, regulation of hazards and extreme events, regulation of organisms detrimental to humans, energy, food and feed, materials and assistance, medicinal, biochemical and genetic resources, learning and inspiration, physical and psychological experiences, supporting identities, and maintenance of options. *Adapted from:* IPBES. (2017) Update on the classification of nature’s contributions to people by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. <https://ipbes.net/sites/default/files/downloads/pdf/ipbes-5-inf-24.pdf>.

³ Partners on mapping multiple ecosystem services: Natural Capital Project, Stanford University, University of Minnesota, King’s College London and many additional data providers . Further details on data and methodology can be provided upon request. Note these maps are pre-publication drafts and subject to change.

⁴ In this paper, SEEA refers to both the overall SEEA system of statistics and the Ecosystem Accounting framework.

Nature's Contributions to People (NCP) Modeled: nitrogen retention for water quality regulation, sediment retention for water quality regulation, crop pollination, fodder for livestock, timber production, fuelwood production, flood regulation, riverine fish harvest, marine fish harvest, coast risk reduction (terrestrial and marine), access to terrestrial nature (for local recreation and gathering), marine recreation (coral-reef tourism and associated livelihoods). Green areas represent the highest performing areas.

Continued provision of these contributions from nature to people, as well as the survival of many species will be impacted by a changing climate and avoiding the worst of those impacts will require maintaining much of the carbon that is stored across the globe in the Earth's biomass and soils. "Irrecoverable carbon" is considered the carbon that would be impossible to recover by 2050 if exposed and lost to the atmosphere due to land development activities. Human land-use decisions are the primary determinant of whether irrecoverable carbon remains stored or is released to the atmosphere, thus it is critical that these places be maintained if we want to avoid the worst impacts of climate change. **As such, we recommend including the conservation, sustainable use, and restoration of high carbon ecosystems, including irrecoverable carbon in the GBF. We also recommend for countries to monitor the extent and condition of these ecosystems and the flow of ecosystem services that they provide in alignment with the SEEA.**

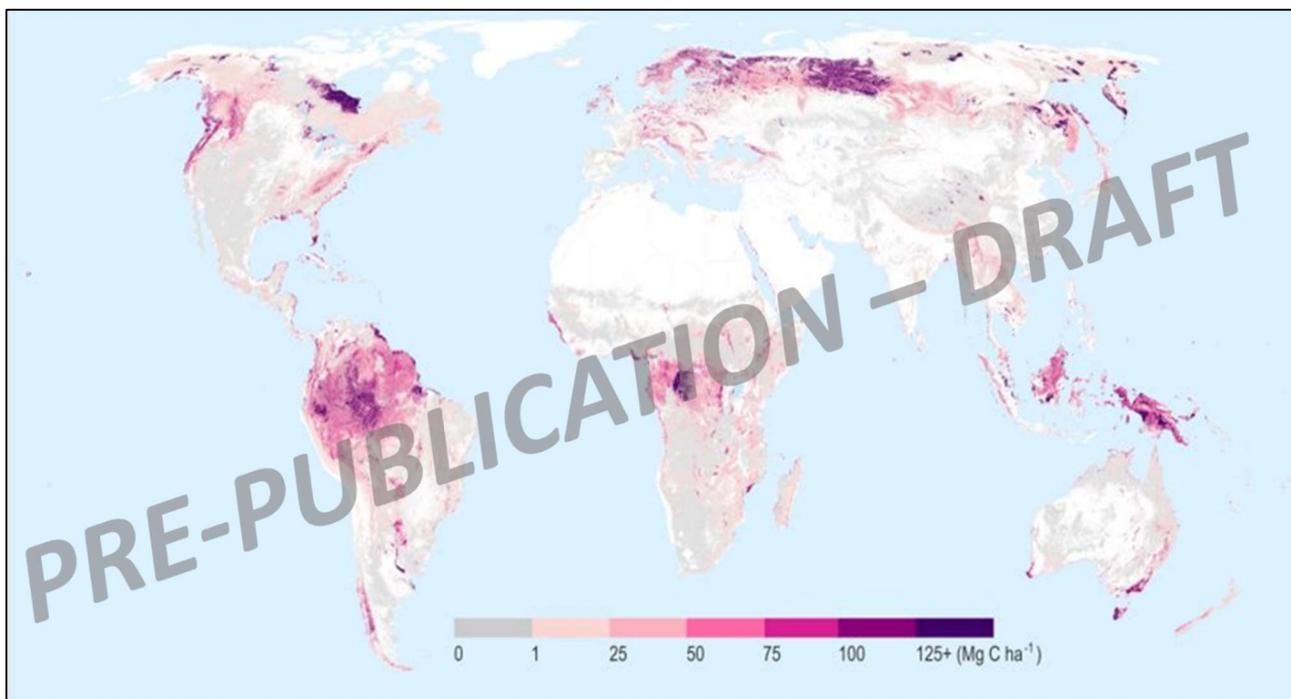


Figure 2. Map of Irrecoverable Carbon

Source: Noon et al. 2021. Mapping the irrecoverable carbon in Earth's ecosystems. *Under review.*⁵

Using this science to guide decision making

This new information can guide choices for how we manage different resources to ensure that we keep the places we most need for our own wellbeing and to support a transition to a greener and more resilient model of economic development – both at global and national scales. The key will be to ensure that the most important places are prioritized, while still making management choices that maintain a large proportion of nature through a variety of measures and use levels depending on the sensitivity of the ecosystem and the services it provides. Some examples of how this approach might be applied:

⁵ Based on published concept: Goldstein et al. 2020. Protecting the irrecoverable carbon in Earth's ecosystems. *Nature Climate Change*. Available at: <https://www.nature.com/articles/s41558-020-0738-8>. Further details on data and methodology can be provided upon request. Note these maps are pre-publication drafts and subject to change.

- Upland and upstream forests and other source water areas that contribute to the provision and regulation of water for local and downstream uses may be conserved while still allowing certain kinds of sustainable use;
- Peatlands that hold irrecoverable carbon may require strict protection to ensure that the emissions are not released to the atmosphere;
- Mangroves that act as nurseries for fisheries and that provide coastal protection can be conserved through community management that also allows for other uses.

These maps show priorities on a global scale. The methodologies used to develop them can also be used to refine priorities at national scale, including through the integration of national data sources that can provide a more detailed picture. They are also compatible with measurement approaches proposed by SEEA, so that interested countries can refine national priorities through implementation of SEEA while enabling continuous measurement and reporting.

What this means for the Global Biodiversity Framework

To ensure that these places essential for delivering high levels of ecosystem services are kept healthy, the GBF will need to specify which places are of highest priority and what actions are needed to maintain them, from the goal level down to the indicator level. Without this approach, there is the risk of implementing broader efforts that may maintain places that are important for species or ecosystem representation - but that allow the loss of places providing vital ecosystem services that underpin human development like those that support food security, water regulation, climate mitigation and others. Also, focusing interventions on areas that are both important for species or ecosystem representation and vital ecosystems services can support a more efficient investment of effort.

The current structure of the GBF has some of the right elements related to Nature’s Contributions to People but there is a lack of alignment between the benefits to people and the ecosystems that provide them that are mentioned in the 2050 Goal, the 2030 Milestones and Action Targets and the monitoring framework.

We propose instead to restructure these elements of the GBF around the categories of Nature’s Contributions to People⁶ as described in the recent IPBES report⁷ at the goal level and highlight a few specific ecosystem services of high importance for human wellbeing and the ecosystems that provide them at the target and indicator level.

- **Goal/milestone level:** Nature is contributing regulating, provisioning, and non-material elements that humans need, both now and in the future, and places most important for providing these contributions are conserved, sustainably managed, and restored.
- **Target level:**
 1. **Water:** Ensure benefits from nature related to water quality and water quantity for human use, through the conservation, sustainable management, and restoration of 100% of the ecosystems most important for delivering these contributions.

⁶ According to [IPBES](#), the three groups of Nature’s Contributions to People (NCPs) are:

Regulating contributions: Functional and structural aspects of organisms and ecosystems that modify environmental conditions experienced by people, and/or sustain and/or regulate the generation of material and non-material benefits (i.e., water purification, climate regulation, or soil erosion regulation).

Provisioning contributions: Material elements from nature that sustain people’s physical existence and infrastructure (i.e., food, energy, or materials for shelter or ornamental purposes).

Non-material contributions: Nature’s contribution to people’s subjective or psychological quality of life, individually and collectively (i.e., animals in recreational or ritual fishing or hunting and/or individual trees or ecosystems as sources of inspiration).

⁷ IPBES. (2017) Update on the classification of nature’s contributions to people by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. <https://ipbes.net/sites/default/files/downloads/pdf/ipbes-5-inf-24.pdf>.

2. **Food:** Ensure benefits from nature important for food security and nutrition through the conservation, sustainable management, and restoration of 100% of the ecosystems most important for delivering these contributions.
 3. **Climate:** Ensure benefits from nature important for climate change mitigation, adaptation and disaster risk reduction through the conservation, sustainable management, and restoration of 100% of the ecosystems most important for delivering these contributions.
- **Indicators:** As the goals and targets will define desired outcomes and, potentially, actions, at a high level then the indicator framework should provide the specificity needed to monitor progress towards achieving the 2030 mission. For the goal and targets we propose above, we suggest monitoring:
 - **Extent:** the extent (area) of places most important for delivering ecosystem services, measured as the area of an ecosystem.
 - **Condition:** the quality of places most important for delivering ecosystem services, measured as biotic i.e., (composition, structure, functional), abiotic (i.e., physical, and chemical state), and landscape (including freshwater), and seascape characteristics.
 - **Flows:** the flows of ecosystem services, measured through biophysical measurements (e.g., volume of water).

For example, for the target focused on water quality, the indicators would include the extent and condition of ecosystems such as the area of wetlands that provide water filtration and purification and/or regulating services. They would also include measures of the flow of the desired ecosystem service, in this case regulation of water purification, which would be measured by flows of removal of nutrients and other pollutants by ecosystem components through for example, nitrogen retention.

Other considerations for indicators

Parties have repeatedly stressed the need for ease of implementation of the GBF monitoring. Measuring ecosystem extent and perhaps some indicators of condition is possible with remote sensing data on spatial and temporal resolutions that are meaningful for national-level annual monitoring programs. Flows of ecosystem services can be estimated from spatial data on ecosystem condition and extent using modelling techniques and, ideally, verified with direct observation.⁸

Additionally, recognizing the need for indicators to be feasible for implementation, **we recommend that wherever possible and appropriate, drawing on the SEEA for indicators to monitor progress towards goals and targets related to NCPs.**

Alignment of GBF indicators and SEEA

The SEEA (System of Environmental Economic Accounting) is the UN statistical standard for the development of a system of national environmental-economic accounts. SEEA Ecosystem Accounting aims to measure five different elements of ecosystems and their contributions to humans: 1) ecosystem extent 2) ecosystem condition; 3) ecosystem services; and 4) monetary assets (i.e., monetary value of all ecosystem within an ecosystem accounting area) and 5) thematics such as land, water, carbon, and biodiversity. This standard is expected to be adopted as an international statistical standard under the United Nations in March 2021, providing countries with the integrated statistical framework for a)

⁸ While numbers of people benefitting from a particular natural area is an attractive indicator, it is very difficult to further estimate from estimated service flows because allocating services to people depends on the level of dependency a population has on the service (direct vs peripheral). Further, field verification of population benefitting is challenging due the high cost of conducting household surveys.

organizing biophysical data; b) measuring ecosystem services, tracking changes in ecosystem assets; and c.) linking this information to economic and other human activity.⁹

Use of the SEEA by all countries is included in the updated zero draft of the GBFG as a headline indicator for Target 13. Also, many of the indicators needed to monitor the condition and extent of areas important for NCP are already included in the SEEA. Some 100 countries have expressed interest in SEEA implementation and there are efforts underway to support them in data development to do so.¹⁰ Therefore, if the GBF indicators are aligned with the SEEA indicators, then these countries will already be gathering necessary data to monitor many elements of the GBF related to NCP and will be doing so using standards that allow for replication and comparison as official statistics.

If we continue with the example of wetlands and water quality above, the SEEA ecosystem accounts and water accounts would provide several useful indicators. These include areas covered by mangroves (hectares), their condition in terms of nitrogen retention (composite index), and the flows of water purification, measured as for example, the retention of nitrogen originating from fertilizer run-off from adjacent agricultural fields (reduced tons per year of nitrogen and its related monetary value).

Closing

As Parties consider their positions on the updated zero draft of the Global Biodiversity Framework, Conservation International highlights research advances in the spirit of providing a strong scientific foundation for prioritizing the specific areas that are essential to maintain nature’s contributions to people. In the event the suggested revisions of the goal and targets are not incorporated into the next draft of the GBF, the headline and component indicators we suggest are still relevant. Further discussion around the information presented in this paper and the proposed goals, targets and indicators that flow from this line of thinking are welcome and encouraged.

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⁹ See <https://seea.un.org/ecosystem-accounting>.

¹⁰ For example, the Earth Observation for Ecosystem Accounting Initiative (EO4EA) of the Group on Earth Observations is developing guidelines for “account ready data” bringing together the data and accounting communities to coordinate efforts.

Annex I: Suggested Language for Goals/Milestones, Targets and Indicators Related to Nature’s Contributions to People: This table combines our proposals for an updated milestone under Goal B, targets and indicators based on the framework presented in the discussion paper. We have retained some text from the updated zero draft of the GBF that complement this approach (those sections of text are in italics) and we have also indicated where component indicators can be derived from SEEA accounts. The following table utilizes the definitions for headline indicators, components, component indicators as described in SBSTTA CBD/SBSTTA/24/3Add.1.¹¹

Proposed Goal, Milestones and Targets	Proposed Headline Indicator	Proposed Components of the Goal and Targets	Proposed Component Indicator
<p><i>Nature’s contributions to people have been valued, maintained, or enhanced through conservation and sustainable use supporting global development agenda for the benefit of all people. (Goal B)</i></p> <p>Ensure the benefits from nature’s contribution to regulating, provisioning and non-material elements that humans need, both now and in the future, and places most important for providing these contributions are</p>	<p>Trends in extent and condition of places most important for delivering regulating, provisioning, and non-material ecosystem services, and trends in flows of benefits from those places.</p>	<p>Nature’s regulating contributions related to climate and disaster prevention.</p>	<p>Extent and condition of places most important for delivering ecosystem services related to climate and disaster prevention, and trends in flows of benefits. (Covered in SEEA’s Ecosystem Accounts)</p>
		<p>Nature’s material contributions related to food and water.</p>	<p>Extent and condition of places most important for delivering ecosystem services related to food and water and trends in flows of benefits. (Covered in SEEA’s Ecosystem Accounts)</p>

¹¹ Headline indicators: A minimum set of high-level indicators which capture the overall scope of the goals and targets of the post-2020 global biodiversity framework which can be used for tracking national progress, as well as for tracking regional and global progress. These indicators could also be used for communication purposes. Additionally, some countries may wish to use a subset of these indicators or only the goal level headline indicators for high-level communication and outreach.

Component indicators: A set of indicators for monitoring each component of each goal and target of the post-2020 global biodiversity framework at the national level as well as for tracking regional and global progress. They relate to the components of the goals and targets of the post-2020 Global Biodiversity Framework rather than directly to goals and targets. Many of the component indicators are disaggregations of the headline indicators. This level of indicator also includes disaggregated information which is not included at the headline level.

Proposed Goal, Milestones and Targets	Proposed Headline Indicator	Proposed Components of the Goal and Targets	Proposed Component Indicator
conserved, sustainably managed and restored.			
<i>Nature is valued through green investments, ecosystem service valuation in national accounts, and public and private sector financial disclosures. (Goal B.2)</i>	<i>Value of all final ecosystem services (Gross Ecosystem Product) (B.0.2.)</i>		<i>Value of all final ecosystem services (Gross Ecosystem Product) (B.0.1) for material service-related ecosystem services (B.1.3.)</i> <i>Natural capital component of inclusive wealth (B.1.4.)</i> <i>Value of all final ecosystem services (Gross Ecosystem Product) (B.0.1) for non-material service-related ecosystem services (B.1.5.)</i> (Covered in SEEA’s Ecosystem accounts)
Ensure benefits from nature important for climate change mitigation, adaptation and disaster risk reduction through the conservation, sustainable management, and restoration of 100% of the ecosystems most important for delivering these contributions.	State and trends in extent and condition of places providing globally important services for climate mitigation, adaptation, and disaster resilience, and trends in flows of benefits from those places.	Nature’s contributions to climate mitigation. <i>Minimized negative impacts on biodiversity from any mitigation, adaptation and disaster risk reduction measures. (7.2)</i>	State and trends in extent (hectares) and condition (% change) of places important for climate mitigation, particularly high carbon ecosystems, especially those containing global Irrecoverable Carbon. (Covered in SEEA Carbon accounts and Ecosystem services accounts) Flows from places providing climate mitigation services as measured by amount of carbon dioxide retained/sequestered in tonnes. (Covered in SEEA Ecosystem and Carbon Accounts)
		Nature’s contributions to Disaster Risk Reduction and Disaster Resilience.	State and trends in extent and condition of places providing Disaster Risk Reduction or Disaster Resilience as measured by number of properties or area of coast protected (coastal protection services). (Covered in SEEA Ecosystem Accounts) Flow of benefits as measured by lives protected.

Proposed Goal, Milestones and Targets	Proposed Headline Indicator	Proposed Components of the Goal and Targets	Proposed Component Indicator
		Nature's contributions to climate adaptation.	Indicators relevant to adaptation are captured in indicators for food, water, and disaster risk resilience.
Ensure benefits from nature important for food security and nutrition through the conservation, sustainable management, and restoration of 100% of the ecosystems most important for delivering these contributions.	State and trends in extent, condition of places providing globally important services for food security and nutrition, and trends in flows of benefits from those places.	Nature's contributions to crop pollination.	<p>State and trends in extent (hectares) and condition (physical structure, species composition) of places providing habitat for pollinators (Covered in SEEA Ecosystem Accounts)</p> <p>Condition (diversity, abundance, and distribution) of pollinator species as measured by Red List Index. (Covered in SEEA Biodiversity accounts)</p> <p>Flow of pollination services as measured by the pollination yield gap. (Covered in SEEA Ecosystem accounts)</p>
		Nature's contributions to freshwater and marine fisheries.	<p>State and trends in extent (hectares) and condition (physical structure, species composition) of important freshwater and marine fish habitat, especially spawning locations. (Covered in SEEA Ecosystem Accounts)</p> <p>Flow of fish as measured by quantity and age structure of fishery stocks. (Covered in SEEA Ecosystem Accounts)</p>
		Nature's contributions to moisture recycling for non-irrigated crops.	State and trends in extent (hectares) and condition (physical structure, species composition) of places most important for moisture recycling that benefits rain-fed crop production as identified by atmospheric flow modeling.-
		Nature's contributions to	State and trends in extent (hectares) and condition (physical structure, species composition) of places providing grazing space

Proposed Goal, Milestones and Targets	Proposed Headline Indicator	Proposed Components of the Goal and Targets	Proposed Component Indicator
		fodder and grazing for range livestock.	and fodder for non-feedlot livestock. (Covered in SEEA Ecosystem Accounts) Flows originating from places under sustainable and regenerative agriculture as measured by gross tonnes of crop biomass harvested. (Covered in SEEA Ecosystem Accounts)
		Nature's contributions to wild harvest foods.	State and trends in extent (hectares) and condition (physical structure, species composition) of places providing habitat for wild plants and animals that are used for food. (Covered in SEEA Ecosystem Accounts) Flow measured as proportion of caloric, protein, and/or micronutrient need met by wild harvested foods.
Ensure benefits from nature related to water quality and water quantity for human use, through the conservation, sustainable management, and restoration of 100% of the ecosystems most important for delivering these contributions.	State and trends in extent and condition of places providing globally important services for the regulation of water quantity, quality, location, and timing, and trends in flows of benefits from those places.	Nature's contribution to water purification (quality).	State and trends of extent (hectares) and condition (physical structure or species composition) of ecosystems that remove pollutants from water and/or yield clean water for dilution. (Covered in SEEA Ecosystem Accounts) Water purification flows providing water quality amelioration as measured by nitrogen retention. (Covered in SEEA Ecosystem Accounts)
		Nature's contribution to regulating water flows (quantity and timing).	State and trends of extent (hectares) and condition (physical structure or species composition) of ecosystems that regulate water flow through storage and delayed release. (Covered in SEEA Ecosystem Accounts) Trends of quantity and timing of water flow by volume (m3) to track changes in baseline flow maintenance and flood dynamics (Covered in SEEA Ecosystem Accounts)

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