In collaboration
with PwC China

WORLD ECONOMIC FORUM

The Post-2020 Global Biodiversity Framework and What it Means for Business

WHITE PAPER

JANUARY 2023

Images: Getty Images

Contents

Foreword

Business will be critical to delivering the innovation, investment and business models needed to halt and reverse biodiversity loss.

Raymund Chao
Network Leadership Team, PwC

Akanksha Khatri
Head, Nature and Biodiversity, World Economic Forum

In 2015, the Paris Agreement set clear direction for governments, businesses and civil society to contribute towards the global goal of fighting climate change. In December 2022, governments came together to negotiate and adopt the post-2020 Global Biodiversity Framework (GBF). They not only agreed on a plan of action to fight biodiversity loss, but also provided direction to all sections of society on the urgency of the issue and the need for collective action. The global goal of halting and reversing biodiversity loss by 2030 and the shared vision of living in harmony with nature by 2050 can only be possible if economic actors are active partners in the process.

In recent years, there has been growing awareness among businesses of nature-related risks. More than half of the world's GDP is at risk of disruption due to nature loss[1] – and no sector is immune to this. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) identified the five direct drivers of biodiversity loss as changes in land and sea use, direct exploitation of organisms, climate change, pollution and invasive alien species.[2] These are all highly relevant to business operations, associated with, for example, supply chain disruption, commodity shocks and energy transition trade-offs. But it is not only about risks – the World Economic Forum's research shows that the shift towards nature-positive business models could generate $10 trillion in annual business opportunities and create 395 million jobs by 2030.[3]

This white paper presents case studies of companies that are already taking actions to mitigate nature-related risks in their operations and investing in new business opportunities that contribute positively to the targets of the GBF. However, this behaviour needs to move from niche to mainstream. The GBF provides concrete policy direction, signalling goals for biodiversity conservation, restoration and sustainable use, similar to the role the Paris Agreement played for climate change. Nature-related frameworks and tools, some of which are highlighted in this paper, can provide businesses and financial institutions with additional guidance and best business practices to invest in and shape the prosperity of our planet and people.

While nature is clearly complex, it does not need to be complicated to set priorities and take action. This paper identifies the most business-relevant targets within the GBF, translates them into business-relevant action items and helps anticipate future regulatory and consumer demands. This is a key part of the work of the World Economic Forum's Champions for Nature community, which is committed to advancing a nature-positive economy and supporting the goals and targets of the GBF in the coming years.

Executive summary

Biodiversity is declining faster than at any time in human history, threatening the ecosystem services on which our lives and livelihoods depend. The Global Biodiversity Framework aims to reverse this decline. This report looks at the implications for business.

The biosphere is being altered to an unparalleled degree,[4] eroding the very foundations of our economies, food security, health and quality of life worldwide.[5] This decline is projected to continue or worsen under a business-as-usual scenario.[6]

The post-2020 Global Biodiversity Framework (GBF) – adopted during December 2022's COP15 (15th Conference of the Parties to the United Nations Convention on Biological Diversity) – aims to galvanize urgent and transformative action to halt and reverse biodiversity loss by 2030. It is the biodiversity equivalent of the 2015 Paris Agreement on climate change. Implementing the GBF will address the direct drivers of biodiversity loss, significantly mitigating the nature-related physical and systemic risks faced by business, society and the global economy.

BOX 1 **Report overview**

This report introduces the most business-relevant aspects of the post-2020 Global Biodiversity Framework (GBF) and examples of approaches that will contribute to achieving its targets, illustrated by case studies.

- Chapter One introduces the current conditions that make the GBF important for business.
- Chapter Two covers the context and potential implications of the 10 most business-relevant targets of the GBF.
- Chapter Three highlights six trends in regulator- and business-driven approaches to halting and reversing biodiversity decline.
- Chapter Four introduces frameworks, guidance and tools that are available to help companies map out their nature-positive journey, assess their dependencies and impacts on nature, manage the associated risks and opportunities, and report on their plans and progress.
- Annex 1 details the UN's list of ecosystem services, provided by nature to societies and businesses.
- Annex 2 presents the physical, transition and systemic risks faced by businesses due to the decline in nature and the societal efforts to halt that decline.
- Annex 3 outlines the climate mitigation potential of 20 nature-based solutions.

Post-COP15 revision: This white paper was originally published on 5 December 2022, based on the draft GBF available at that time. It has been updated to reflect the finalized text of the GBF that was adopted at COP15 in December 2022.

Biodiversity loss and climate change are inextricably linked. Delivering on the goals and targets of the GBF is essential to meeting the objectives of the Paris Agreement and vice-versa.

Companies and financial institutions that fail to act will face not only nature-related physical and systemic risks, but also transition risks due to growing regulatory and societal expectations, and accountability for the biodiversity impacts of their operations, value chains, lending and investments.

This white paper provides context and potential implications for 10 of the GBF's 23 action targets that are most relevant to business strategies and operations. Target 15 is the GBF's target for businesses and financial institutions to assess, report and manage the risks, dependencies and impacts on biodiversity in their operations, supply chains and portfolios.

The white paper then covers the GBF targets that will accelerate regulator and stakeholder

expectations for companies to address the direct drivers of biodiversity loss (see Box 2): Target 2 – restore ecosystems, Target 3 – protect land and sea, Target 5 – harvest, trade and use of wild species, Target 6 – invasive alien species, Target 7 – reduce pollution and Target 8 – minimize impact of climate change. Also relevant are Targets 18 and 19, which aim to reduce harmful subsidies and increase financial flows to protect biodiversity, plus Target 22 on engaging Indigenous peoples and local communities in decision-making.

Just as the 2015 Paris Agreement led to a wave of climate action during subsequent years, the targets and goals of the GBF will accelerate changes in policies, regulations, stakeholder expectations and the market environment. Regulators, companies and financial institutions, for example, are already moving forward with approaches to reduce or eliminate deforestation and other habitat conversion in supply chains and projects (e.g. construction, infrastructure, mining), as well as in lending and investment portfolios.

New approaches to agriculture and forestry, plus innovative public and private sector incentive schemes, (e.g. payment for ecosystem services), will need to be adopted at scale to protect biodiversity and safeguard the ecosystem services on which our lives and livelihoods depend.

Business leaders can take actions immediately using the frameworks and targets being developed by the Taskforce on Nature-related Financial Disclosures (TNFD) and the Science Based Targets Network (SBTN), which provide guidance for companies on assessing impacts and dependencies on nature, managing and reporting nature-related risks and opportunities, and setting nature-related targets.

↓ Wildlife in Etosha National Park, Namibia, Africa

1 Why the GBF is important for business

Companies face physical and systemic risks from biodiversity loss due to their dependence on ecosystem services. In addition, companies that fail to act will face growing transition risks if they fall out of step with developments in regulations, technology, markets and consumer preferences.

Biodiversity is declining faster than at any time in human history and the biosphere is being altered to an unparalleled degree,[7] eroding the very foundations of our economies, food security, health and quality of life worldwide.[8] This decline is projected to continue or worsen under business-as-usual scenarios.[9]

> **The post-2020 Global Biodiversity Framework (GBF) aims to galvanize urgent and transformative action to halt and reverse biodiversity loss by 2030**

1.1 The GBF and biodiversity-related risks and opportunities for business

Business leaders are aware of the alarming trends related to biodiversity and climate change. "Climate action failure", "Extreme weather" and "Biodiversity loss" were identified as the three most severe risks for the next decade by a World Economic Forum poll of nearly 1,000 global experts and leaders, as reported in the *Global Risks Report 2022*.[10] The Forum's report *Nature Risk Rising* found that more than half the world's total GDP is moderately or highly dependent on nature and ecosystem services, and thus potentially exposed to risks due to nature loss.[11]

At the same time, leading companies are increasingly recognizing the value and fragility of critical ecosystems, rethinking their strategies and value chains, and innovating to reduce their negative impacts on nature. The Forum's report *The Future of Nature and Business*[12] identified business opportunities worth $10 trillion that could create 395 million jobs by 2030 and pave the way towards a people- and nature-positive economy. Business leaders can see that consumers are increasingly demanding – and willing to pay for – products and practices with a reduced environmental footprint.

BOX 2 **Five direct drivers of biodiversity loss**

Halting and reversing the decline of nature requires action to stop the five main drivers of biodiversity loss, listed here in order of impact:[13]

1. **Land- and sea-use change** (e.g. deforestation)
2. **Direct exploitation of organisms** (e.g. overfishing)
3. **Climate change**
4. **Pollution**
5. **Invasive alien species**

The world needs a global goal to unify efforts towards halting and reversing biodiversity loss, backed by sufficient finance and the inclusion of all sections of society. In December 2022, at COP15 (the 15th Conference of the Parties to the UN Convention on Biological Diversity), the nations of the world adopted the post-2020 Global Biodiversity Framework (GBF).[14] It is the biodiversity equivalent of the 2015 Paris Agreement on climate change, aiming to galvanize urgent, transformative action by governments, business and society to halt and reverse biodiversity loss by 2030.

1.2 Physical, transition and systemic risks

The GBF addresses the five main direct drivers of biodiversity loss at a global level. From a corporate perspective, this will help mitigate companies' biodiversity-related physical risks. Societal efforts to halt biodiversity loss, in line with the goals of the GBF, will bring an additional set of "transition risks" to businesses that fail to reverse nature loss in their value chains, while expanding opportunities for businesses that are proactive in addressing their impacts on nature. The compounding of these physical and transition risks could in turn lead to more serious systemic risks, as outlined below:

- **Physical risks** reflect companies' dependence on ecosystem services (e.g. provision of crops, fish, timber and water; regulation of climate, rainfall, soil, air quality; mitigation of natural hazards) and the deterioration of those services.[15]

- **Transition risks** result from the misalignment of business strategy and management with society's developments aimed at halting or reversing biodiversity loss (e.g. government policies and regulations, technological developments, market changes, litigation, changing consumer preferences.)[16]

- **Systemic risks** arise from the breakdown of an entire system rather than the failure of individual parts, characterized by tipping points combining to produce larger failures, with cascading interactions (contagion) between physical and transition risks.[17]

To understand how these corporate biodiversity-related risks can be transmitted to financial institutions, see Figure 7. For more detail on the ecosystem services on which companies depend, see Annex 1. For an overview of the interactions between physical, transition and systemic risks, see Annex 2.

↓ River meandering through the Amazon rainforest in Ecuador, South America

2 What is the GBF and what does it mean for business?

Of the GBF's 23 targets, this chapter highlights the 10 most relevant to business strategies and operations, and profiles companies taking action towards reversing nature loss and protecting biodiversity.

2.1 "Living in harmony with nature" – the GBF's vision, goals and targets

The post-2020 Global Biodiversity Framework is centred on its vision of a world living in harmony with nature, where: "By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people."

The GBF's 2030 mission is: "To take urgent action to halt and reverse biodiversity loss to put nature on a path to recovery for the benefit of people and planet by conserving and sustainably using biodiversity, and ensuring the fair and equitable sharing of benefits from the use of genetic resources, while providing the necessary means of implementation."

Based on this vision and mission, the GBF sets goals, milestones and targets to be implemented via national biodiversity strategies and action plans (NBSAPs), the equivalent of nationally determined contributions (NDCs) for climate action. The targets will also drive action by other stakeholders, including subnational governments, NGOs, financial institutions and industry groups.

The GBF's four long-term goals for 2050 cover the following areas:

1. Ecosystems, species extinction and genetic diversity
2. Sustainable use of biodiversity and nature's contributions to people
3. Access and benefit-sharing related to genetic resources and the associated traditional knowledge
4. Means of implementation

To support progress towards these goals, the GBF includes 23 action targets that need to be initiated immediately and completed by 2030. These targets will both impact business and be impossible to achieve without aligned corporate action.

This chapter highlights the context and implications for the 10 GBF targets that are most relevant to business strategies and operations. The chapter also presents case studies of companies and organizations taking action towards reversing nature loss and protecting biodiversity through their business models and sustainability goals.

Given the business focus of this white paper, we start with Target 15, which specifically addresses the actions required of companies and financial institutions in the whole-of-society effort to halt and reverse biodiversity loss. The 10 business-relevant GBF targets we cover in this chapter are as follows:

- **Target 15:** Sustainable business, production and supply chains
- **Target 2:** Ecosystem restoration
- **Target 3:** Protect/conserve land and sea
- **Target 5:** Harvest, trade and use of wild species
- **Target 6:** Invasive alien species (IAS)
- **Target 7:** Reduce pollution
- **Target 8:** Minimize impact of climate change
- **Target 18:** Eliminate harmful incentives
- **Target 19:** Financial resources
- **Target 22:** Indigenous people and local community (IPLC) participation in decision-making

For more details of the GBF's structure and targets, see Figure 1.

BOX 3 | **Post-COP15 revision**

This white paper was originally published on 5 December 2022, based on the draft post-2020 Global Biodiversity Framework available at that time. The paper has been updated to reflect the finalized text of the GBF that was adopted at COP15 in December 2022.

FIGURE 1 | **Overall structure of the GBF**

Source: United Nations Environment Programme Convention on Biological Diversity (UNEP CBD), Kunming-Montreal Global biodiversity framework, 18 December 2022.

2.2 Target 15: Sustainable business, production and supply chains

Take legal, administrative or policy measures to encourage and enable business, and in particular to ensure that large and transnational companies and financial institutions:

a. Regularly monitor, assess and fully and transparently disclose their risks, dependencies and impacts on biodiversity, including with requirements for all large as well as transnational companies and financial institutions along their operations, supply chains and value chains and portfolios;

b. Provide information needed to consumers to promote sustainable consumption patterns;

c. Report on compliance with access and benefit-sharing regulations and measures, as applicable;

in order to progressively reduce negative impacts on biodiversity, increase positive impacts, reduce biodiversity-related risks to business and financial institutions, and promote actions to ensure sustainable patterns of production.

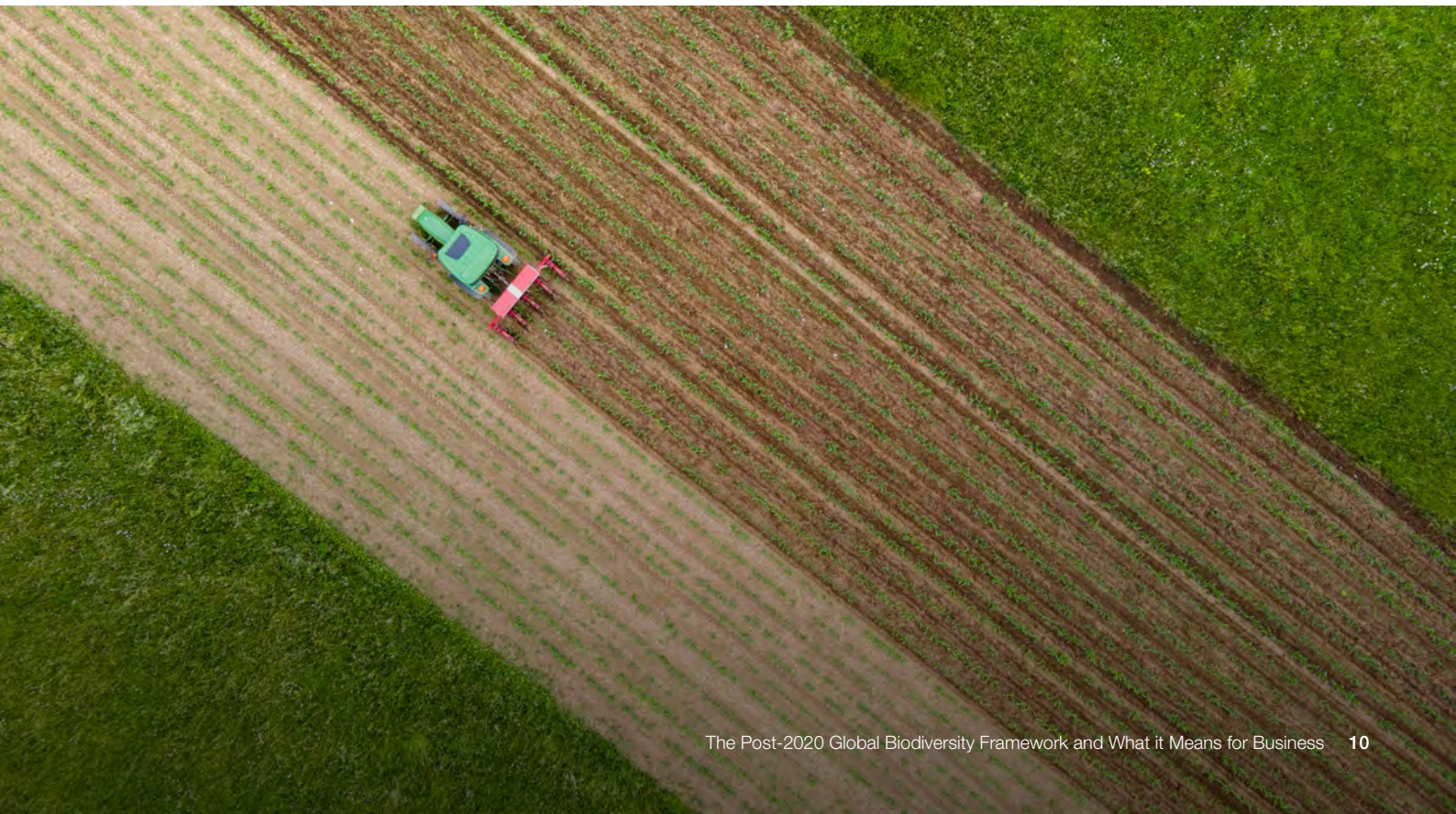
Unsustainable production and supply chains are among the main drivers of biodiversity loss, and contribute to unsustainable consumption. Reducing the negative impacts of production and supply chains and increasing their positive impacts will be essential to achieve the other 2030 action targets and to make progress towards the 2050 vision for biodiversity.[18]

The increasing awareness of biodiversity loss is resulting in growing regulatory and stakeholder demands for companies and financial institutions to assess, report and manage their biodiversity-related dependencies and impacts. The GBF will add to this momentum. This is similar to the evolution of regulatory and other stakeholder expectations related to corporate performance reporting on climate change and pollution.

Assessing, reporting and managing biodiversity-related risks, dependencies and impacts will require a new set of expertise and skills. Fortunately, there is an emerging set of frameworks, guidance and tools that can help business leaders on this journey. (These are described in Chapter Four.)

When companies carry out the actions described in Target 15, they not only reduce adverse impacts on biodiversity, but they also enhance their own resilience by reducing their nature-related physical, transition and systemic risks. Transitioning to more efficient processes with reduced impacts on nature can improve efficiency, enhance brand value, and increase access to green financing and ecosystem service-related incentives (e.g. payments for sustainable farming practices).

The following examples illustrate efforts by companies that are already acting to assess their impacts and dependencies on nature, reduce their negative impacts and move towards positive impacts.



CORPORATE CASE STUDY

Holcim commits to measurable positive impact on biodiversity

Holcim, a building materials company, has committed to making a positive impact on biodiversity by 2030, as measured by the Biodiversity Indicator and Reporting System (BIRS). BIRS was developed in partnership with the International Union for Conservation of Nature (IUCN) in 2014 for companies in the cement and aggregates sector.[19]

Holcim aims to enhance biodiversity through, for example, "transformative rehabilitation" of quarries into important biodiversity sites (e.g. wetlands and lakes), which are optimized for habitats, species populations and ecosystem services.[20] The company has experimented with restoration measures such as introducing species from IUCN's Red List,[21] enhancing sites' biodiversity index, improving habitat for pollinators, and creating habitats for cliff-nesting bird species.[22]

Examples of Holcim's biodiversity-related commitments include:[23]

- 100% of quarries with high biodiversity value to have rehabilitation plans in place, by the end of 2022 (up from 93% in 2021)
- Baseline biodiversity assessments to be completed on all active and non-active quarries, by 2024 (up from 35% in 2021)
- All suppliers identified as having a high environmental impact to have a recognized system in place to identify and manage the environmental impacts of their operations, by 2022 (up from 66% in 2021)
- No new sites or exploration in protected areas declared under World Heritage or IUCN categories I and III

Complementing its biodiversity commitments, Holcim has achieved validation from the Science Based Targets initiative (SBTi) for its net-zero commitment on greenhouse gas (GHG) emissions[24] and has also made ambitious commitments to reduce its water footprint.[25]

Holcim assesses and annually reports[26] its economic, social and environmental impacts (triple bottom line) in monetized terms to enhance decision-making and to better understand and share with stakeholders the extent of its impacts.[27]

CORPORATE CASE STUDY

Kering commits to net positive impact on biodiversity[28,29]

Kering, a luxury fashion group, has committed to have a net-positive impact on biodiversity by 2025, by regenerating and protecting an area of around six times its total land footprint. The company estimated its value chain land footprint to be around 350,000 hectares, of which 94% is farmland, rangeland, mining sites and other areas that produce raw materials. Its biodiversity-related commitments include the following:

- Supporting 1 million hectares of regenerative agriculture projects that offer both biodiversity and carbon benefits, with a focus on four of its key raw materials: leather, cotton, wool and cashmere
- Protecting 1 million hectares of critical "irreplaceable" habitat outside its supply chain by 2025, through UN REDD+ and other programmes that offer biodiversity protection, carbon sequestration and livelihood improvements[30]
- Restoring habitats where mining and other extractive activities have occurred, covering an area three times larger than Kering's total "direct" footprint – which includes all stores, warehouses and offices
- Expanding the range of materials sourced to include forgotten plant varietals and livestock breeds, with a view to contributing towards agricultural resilience and shifting away from monocropping

Complementary to its biodiversity-related commitments, Kering has set an SBTi-validated target for GHG emissions.[31]

Kering reports its environmental profit and loss statement (EP&L), which quantifies in monetary terms its environmental impact at each stage of its supply chain along six parameters: air pollution, water pollution, GHG emissions, water consumption, waste production and land use (including biodiversity proxies). The EP&L supports decision-making on where to focus sustainability efforts, for example, by showing that 65% of Kering's environmental impact is in the raw material production stage of its supply chain, where land use is the most important impact category.

The company collaborated with the Cambridge Institute for Sustainability Leadership (CISL) to develop a biodiversity impact metric (BIM) tool.[32] This provides an initial risk screening of biodiversity impacts from agricultural production by, for example, comparing the biodiversity impact of organic or conventional cotton sourced from various countries based on metrics including farming intensity, the range and rarity of local species in relevant geographies, and so on.

CORPORATE CASE STUDY

Amaggi commits to 100% traceable, deforestation- and conversion-free (DCF) soy by 2025

Amaggi, a Brazilian company, is one of the world's largest soybean exporters. Six per cent of the soy that it trades is grown on its own farms,[33] with the remainder sourced from direct (87%) and indirect (13%) suppliers.[34] It received a score of 82% for its approach to deforestation in its supply chains, the best among 350 companies assessed for 2021 in Global Canopy's Forest 500 company rankings.[35]

The company has committed to achieving 100% traceable and DCF agricultural products (using 2020 as a reference) by 2025, including those sourced from direct, intermediary and indirect suppliers, and from all biomes. As an interim target, the company is aiming for 100% traceability and DCF products from direct suppliers in Brazil by 2022.[36]

Amaggi's own farms have been DCF since 2008. For soy produced on other farms, the company initially focused on the Amazon and Cerrado biomes and has achieved 99.7% traceability and monitoring of direct suppliers in those biomes.[37] Of its monitored soy, 99% comes from sources that have been DCF since 2017.[38] The company does not sell products that are sourced from areas under government embargo for illegal deforestation, areas in the Amazon biome deforested after 2008, or Indigenous lands and conservation units.[39]

Amaggi's internally developed ORIGINAR 2.0 platform incorporates geospatial tools that enable monitoring of deforestation and fires on both its own and suppliers' farms. The platform is also able to cross-check supplier information with areas embargoed by environmental agencies, the Brazil government's "Dirty List" of slave labour and the company's own social and environmental standards.[40]

Amaggi has committed to set SBTi-validated targets to achieve net-zero GHG emissions in line with the SBTi's recently published methodology for forest, land and agriculture-related emissions.[41]

To reduce emissions while enhancing biodiversity, the company is adopting zero-tillage practices at 100% of company farms.[42]

2.3 Target 2: Ecosystem restoration

Ensure that by 2030 at least 30% of areas of degraded terrestrial, inland water, and coastal and marine ecosystems are under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity.

Three-quarters of the terrestrial environment and two-thirds of the marine environment have been severely altered by humans, with 85% of the world's wetlands, 50% of coral reef systems and 32% of the world's forests already lost.[43]

Degraded ecosystems "under restoration" could include:[44]

- Restoring converted areas back to natural states
- Improving the ecological integrity of degraded natural areas
- Rehabilitating converted and degraded areas (e.g. degraded agricultural lands) to improve both productivity and integrity

Relevant sectors

Target 2 (Ecosystem restoration) and Target 3 (Protect and conserve land and sea) both involve increasing restoration and conservation to address land- and sea-use change – the leading driver of biodiversity loss.

- There could be implications for businesses whose operations or value chains are associated with land- and sea-use change, e.g. food and agriculture, forestry, fisheries and aquaculture, construction, energy and extractive industries
- Sectors such as ecotourism could benefit from increased restoration and protection of conservation areas

Demand for agricultural production is expected to grow by 25-30% between 2022 and 2050.[45] At the same time, there will be increasing limitations on the conversion of natural habitats to farmland (in line with Target 3). Farmers and foresters looking to increase their productive land area will need to prioritize the rehabilitation of degraded areas, which offers a more sustainable path to increasing output than business-as-usual practices involving deforestation or conversion of other habitats.

> **Restoring coral reefs for coastal defence may cost as little as 10% of the price of building artificial breakwaters[46]**

Restoration of ecosystems can improve resilience, delivering benefits in the form of avoided costs. Restoring mangroves and coral reefs, for example, can protect against damage from waves, storm surges and flooding. At least 119 locations in the Caribbean have been identified where the present value of avoided costs from future flood damage would be greater than the cost of restoring mangrove ecosystems.[47] Research suggests that restoring coral reefs for coastal defence may cost as little as 10% of the price of building artificial breakwaters.[48]

↓ Frailejones plants in the páramo of the Los Nevados National Park, Colombia

2.4 Target 3: Protect and conserve land and sea

Ensure and enable that by 2030 at least 30% of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well connected and equitably governed systems of protected areas (PAs) and other effective area-based conservation measures (OECMs),

- recognizing Indigenous and traditional territories, where applicable, and
- integrated into wider landscapes, seascapes and the ocean, while
- ensuring that any sustainable use, where appropriate in such areas, is fully consistent with conservation outcomes,
- recognizing and respecting the rights of Indigenous peoples and local communities, including over their traditional territories.

Protected areas (PAs) and other effective area-based conservation measures (OECMs) now account for about 17% of global land and inland water ecosystems and 8% of coastal waters and the ocean – up from about 15% and 2.6%, respectively, in 2010.[49]

Relevant sectors

Target 2 (see above) and Target 3 both involve increasing restoration and conservation to address land- and sea-use change – the leading driver of biodiversity loss.

- There could be implications for businesses whose operations or value chains are associated with land- and sea-use change, e.g. food and agriculture, forestry, fisheries and aquaculture, construction, energy and extractive industries
- Sectors such as ecotourism could benefit from increased restoration and protection of conservation areas

Target 3 does not require that land and sea areas should be completely closed off to human or economic activities. It includes both PAs – which can apply a wide range of different management approaches and can allow for sustainable resource use[50] – and OECMs, where de facto effective long-term conservation is taking place outside designated PAs under a range of governance and management regimes, including IPLCs, the private sector and government agencies.[51]

Expanding PAs and OECMs can lock in economic benefits from avoided costs. Coastal wetlands, for example, are estimated to provide storm protection services worth $447 billion annually, saving approximately 4,600 lives each year.[52]

> **Coastal wetlands are estimated to provide storm protection services worth $447 billion annually, saving approximately 4,600 lives a year[53]**

Increasing the area covered by PAs is expected to bring a significant increase in ecotourism revenues.[54] The World Economic Forum's report *The Future of Nature and Business*[55] identified ecotourism as the fastest-growing market in the tourism sector, valued at $300 billion in 2019, with the potential to create a further $290 billion in annual revenue opportunities by 2030. Another study estimated that expanding PAs to cover 30% of the Earth's land and ocean areas by 2030 could bring, respectively, $96 billion and $66 billion in additional annual nature tourism revenues.[56]

The associated restrictions on new conversion of natural habitats for agriculture and forestry could result in higher values for agriculture and forestry products than in a scenario with no increase in PAs and OECMs.[57] Higher prices could incentivize innovation to increase productivity and long-term soil health as well as investment in the restoration of degraded land to increase productive farmland and forestry areas.

In the wild-capture fisheries sector, catch values are expected to decline under the business-as-usual scenario in coming years due to overfishing and climate change. PAs that place areas off-limits to unsustainable fishing could further reduce catch values in the near term but would help regenerate fish stocks and accelerate the recovery of catch values in the longer term[58] – an investment that contributes to long-term food security and sustainability of livelihoods.

Based on the global locations of areas most important for biodiversity and carbon sequestration, 70-90% of the implementation costs for protecting 30% of global land area would most likely fall on low- and middle-income countries (LMICs).[59]

BOX 4 **Ecotourism revenues support gorilla habitat conservation and local communities**

In the 1980s, the known population of mountain gorillas had dwindled to just 240 due to habitat loss, hunting and other threats. With intensive conservation efforts and funding from ecotourism, the estimated population had increased to about 1,070 by 2019.[60]

Their habitat is restricted to about 792 km^2 of protected areas (PAs) located in a transboundary area spanning the Democratic Republic of Congo, Rwanda and Uganda. These PAs are surrounded by intensively cultivated land and an increasingly dense human population,[61] many of whom depend on the mountain forest ecosystem for food, medicine, timber and clean water.[62]

Revenue from gorilla tourism has become an important component of funding for conservation and management of the PAs, as well as for local and national economies.[63] For example, tourists pay over $1,000 for treks to see gorillas, with the proceeds going to support conservation efforts and local communities. Visitors to Rwanda's Volcanos National Park contributed more than $400 million to the national economy over two years, of which 10% was returned to local communities.[64]

The success of tourism and conservation efforts is dependent on the commitment and enthusiasm of local communities around the parks. Cooperation between conservation NGOs, governments and local communities has helped create revenue sharing and other mechanisms to ensure that local communities benefit directly from tourism.[65]

2.5 Target 5: Harvest, trade and use of wild species

Ensure that the use, harvesting and trade of wild species is sustainable, safe and legal,

- preventing overexploitation,
- minimizing impacts on non-target species and ecosystems, and
- reducing the risk of pathogen spill-over,

applying the ecosystem approach, while respecting and protecting customary sustainable use by Indigenous peoples and local communities.

The exploitation of wild species is the largest direct driver of biodiversity loss in marine ecosystems and the second largest in terrestrial and freshwater ecosystems.[66] Actions to address the legality, sustainability and safety of the use of wild species of fauna and flora need to take place across the value chain, at the point of harvest or landing, during transportation and trade, and at the point of final consumption. Measures can be taken at the consumption stage to shift overall demand away from products that have been unsustainably harvested.[67]

Relevant sectors

- There could be implications for companies with fish in their products or value chains; wild catch accounts for 54% of global fish production.[68]
- On land, overexploitation of wild species mainly involves unsustainable logging and poaching.[69]
- Trade in wild animals and their products is a major contributor to the risk of zoonotic disease transmission.[70]

Over one-third of global fish stocks were overfished by 2017, up from 10% in 1974. More than 20% of marine fish landings come from unsustainable stocks.[71] Achieving Target 5 for fisheries will likely entail international agreements to limit wild catch to sustainable levels, national and international measures to reduce illegal, unreported and unregulated (IUU) fishing and bycatch, and the reduction of harmful subsidies for excess fishing fleet capacity. Researchers have estimated that the elimination of all harmful fisheries subsidies would result in a 12.5% rise in fish biomass by 2050 (compared to 2018), an increase of 35 million tons.[72]

> **The elimination of all harmful fisheries subsidies would result in a 12.5% rise in fish biomass by 2050 (compared to 2018) – an increase of 35 million tons[73]**

Traceability and certification will play major roles in curbing illegal and unsustainable logging and fishing, bringing opportunities to businesses providing relevant services. Companies whose value chains include these sectors could face increasing traceability or certification requirements from regulators, civil society organizations, downstream procurement policies and consumers.

CORPORATE CASE STUDY

Wild Planet Foods' sustainably caught tuna[74]

Wild Planet Foods' procurement choices are governed by three principles:

1. Select fish only from stocks that are not overfished
2. Do not source fish from fisheries using gear that damages the marine habitat
3. Do not source fish from fisheries that have excessive bycatch discard mortality of non-target species[75] or of small juveniles of the target species

The company has been recognized by Greenpeace[76] as the most sustainable choice for canned tuna. It sources 100% of its albacore, skipjack and yellowfin tuna from pole and line, troll or handline fisheries. Pole and line and troll fishing (dragging lines with hooked lure or bait) have a bycatch rate of less than 0.5%. The company does not purchase any fish from any vessel that participates in the use of fish aggregating devices (FADs) or any vessels where at-sea trans-shipments have taken place.

Currently all lot codes for albacore, skipjack and yellowfin tuna are traceable to individual pole and line or troll fishing vessels comprising each lot code. This information is available for environmental NGOs or retail auditing on https://www.traceregister.com/.

Wild Planet Foods does not source from marine protected areas, nor from areas being proposed as protected areas. It sources 95% of its tuna from fisheries rated as green by the Monterey Bay Aquarium Seafood Watch, with the remainder sourced from areas rated as yellow.

A school of tuna

2.6 Target 6: Invasive alien species (IAS)

Eliminate, minimize, reduce and/or mitigate the impacts of invasive alien species on biodiversity and ecosystem services by

- identifying and managing pathways of the introduction of alien species,
- preventing the introduction and establishment of priority invasive alien species,
- reducing the rates of introduction and establishment of other known or potential invasive alien species by at least 50%, by 2030,
- eradicating or controlling invasive alien species especially in priority sites, such as islands.

Invasive alien species (IAS) are one of the main direct drivers of biodiversity loss at the global level. In some ecosystems (e.g. many island ecosystems), they are the leading cause of biodiversity decline.[77] Some IAS are also agents of infectious disease.[78]

Relevant sectors

- Forestry and agriculture, whose products can be key pathways for IAS
- Other sectors that involve cross-border shipping, travel or infrastructure (e.g. canals)

There has been a 70% increase in numbers of IAS since 1970 across 21 countries with detailed records.[79] The number of new introductions of species to areas outside their natural range is growing at an unprecedented pace among all taxonomic groups and on all continents, with no sign of saturation.[80]

The global cost of damage from IAS has been conservatively estimated at $890 billion between 1970 and 2017, increasing six-fold every decade.[81] A separate study estimated the annual economic cost of invasive insects alone to be about $70 billion.[82] Preventing the international movement of IAS and rapid detection at borders is far less costly than post-invasion control and eradication.[83]

The UN Convention on Biological Diversity has identified 44 different pathways by which IAS are introduced to new environments,[84] including the following examples:[85]

- Contaminants of agricultural or forestry products (e.g. diseases, parasites, pests, weeds)
- Deliberate import as traded commodities (e.g. pets, ornamental plants)
- Stowaways on or in mail, luggage, shipping containers, aircraft, ocean going vessels etc.

Table 1 presents some illustrative examples of potential policies for enhancing the management of IAS pathways.[86]

TABLE 1 **Examples of potential policies to enhance the management of invasive alien species pathways**

Pathway category	Examples of potential policy measures
Release in nature	Legislation that makes parties undertaking assisted colonization responsible for any costs arising from the impacts and management of such introductions (e.g. assurance bonds)
Escape from confinement	Promote a whitelist approach to the trade in wild pet species that is based on sound risk assessment while offering significant commercial benefits
Transport – contaminant	Extend existing policies on preventing risks of emerging diseases to address the threats posed to biodiversity and ecosystem functions
Transport – stowaway escape	Robust codes of practice for tourism operators that aim to prevent the introduction and movement of IAS
Anthropogenic corridors	International legislation to support environmental risk assessments of major infrastructure projects that include transboundary consequences
Unaided	Apply the "polluter pays" principle where countries fail to contain or eradicate an IAS with potential to cause detrimental impacts should it spread beyond national borders

Source: Hulme, Philip, Invasion pathways at a crossroad: policy and research challenges for managing alien species introductions, 20 May 2015.

2.7 Target 7: Reduce pollution

Reduce pollution risks and the negative impact of pollution from all sources, by 2030, to levels that are not harmful to biodiversity and ecosystem functions and services, considering cumulative effects, including:

- reducing excess nutrients lost to the environment by at least half including through more efficient nutrient cycling and use;
- reducing the overall risk from pesticides and highly hazardous chemicals by at least half including through integrated pest management, based on science, taking into account food security and livelihoods; and also
- preventing, reducing, and working towards eliminating plastic pollution

Between 300 and 400 million tons of heavy metals, solvents and other wastes from industrial facilities are dumped annually into the world's waters.[87] The local severity of industrial and municipal wastewater issues tends to be inversely correlated to income levels. On average, high-income countries treat about 70% of their wastewater, but that ratio falls to 38% in upper-middle income countries, 28% in lower-middle income countries and 8% in low-income countries.[88]

Measures to address pollution are relevant to a wide range of industries. Table 2 identifies the most relevant industry sectors for high-impact categories of freshwater pollution.

TABLE 2 **Relevant sectors for industrial freshwater pollution**

Pollution type	Identified industry practices	Relevant industries (GICS)[89]
Eutrophication[90]	– Farm use of fertilizer and manure (e.g. food, grains, cotton) – Consumer use of soaps and detergents	– Food products – Beverage – Household products – Textiles
Pesticide pollution	– Pesticide use on farms (e.g. food, cotton) – Pesticide production	– Food products – Chemicals – Textiles
Plastics, microplastics and phthalates	– Consumer use of personal products – Plastic manufacturing wastewater – Laundry – Automobile tyre wear	– Personal products – Textiles – Automobiles – Chemicals
Pharmaceutical pollution	– Pharmaceutical consumer use – Veterinary pharmaceutical use	– Pharmaceuticals – Food products
PFAs and PFOA[91]	– Industrial wastewater – E-waste leaching	– Chemicals – Semiconductors and circuit boards
Metals contamination (e.g. heavy metals, rare earth elements)	– Acid mine drainage and metal leaching – Electronics manufacturing wastewater	– Metals and mining – Semiconductors and circuit boards – Batteries – High-tech electronics
Dyes	– Textile wastewater	– Textiles

Source: Ceres, Global Assessment of Private Sector Impacts on Water, April 2022.

Note: Table includes industrial freshwater pollution types rated as "very high" overall impact.

Reducing excess nutrients and risks from pesticides

Reducing excess nutrient runoff and risks from pesticides will require both incremental and transformative actions that tackle root causes and shift market demand, coupled with supportive and enabling measures.[92]

Transitioning from agriculture practices with heavy reliance on chemical inputs to regenerative or conservation agricultural practices requires financial support and capacity building for farmers. Downstream food and textile companies can provide financial and technical support to the farmers in their supply chain, and can use certifications, labelling and traceability to help translate consumer demand for sustainably grown products into differentiated pricing.

Relevant sectors

- Agriculture accounts for most of the world's nutrient runoff,[93] while aquaculture is a growing source
- Crop production accounts for 85-90% of pesticide use[94]
- Major food and textile industry companies will increasingly be expected to manage agricultural practices in their supply chains
- Producers of chemical fertilizers and pesticides will also be impacted by these targets

> **Agriculture accounts for most of the world's excessive nutrient runoff – the cause of more than 245,000 km² of oceanic dead zones[95]**

Eutrophication due to excessive nutrient runoff entering coastal ecosystems has produced more than 400 oceanic "dead zones", covering more than 245,000 km².[96] Excess nutrients consist mainly of nitrogen and phosphorus from chemical and organic fertilizers, plus animal waste. These are normally found in water as nitrate, ammonia or phosphate. Faeces and uneaten food from aquaculture are also important sources.[97]

BOX 5

New York City pays upstream farmers to control nutrient runoff

Nitrate and phosphorus runoff can cause algal growth in surface waters, affecting the quality and safety of drinking water.[98] To avoid building a $5 billion[99] filtration plant to meet national drinking water quality regulations, New York City funds the adoption of best practices by farmers to avoid polluting relevant watersheds.

The city provides financial incentives to farmers to take voluntary measures on private land that benefit the general public. Examples include:[100]

- Following prescribed plans for the spreading of manure or fertilizer on fields to maximize plant uptake for crop production while minimizing nutrient runoff and erosion
- Precision feed management for dairy cows and beef cattle to minimize phosphorus and nitrogen excretion
- Forage management practices for protecting water quality (e.g. prescribed grazing plans, annual crop plans, use of cover crops to prevent soil erosion while maximizing crop yields)
- Payments to conserve natural ecosystems and riparian buffers (i.e. conservation easements)

The city also funds programmes to support the economic viability of participating farmers (e.g. the "Pure Catskills" label that encourages consumers to buy from local farms)[101]

Pest management in agriculture is critical for food security but can have adverse effects on the environment and human health.[102] About 4.1 million tons of pesticide active ingredients were used globally in 2016, twice the volume applied in 1990.[103] Pesticides are persistent and their degraded products are ubiquitous in the environment, including soils, surface water and groundwater.[104] Adverse impacts of pesticides have been observed on bees (the annual value of whose pollination services has been estimated at over $200 billion)[105] as well as on predators of pests, bird populations, aquatic organisms and biodiversity.[106]

BOX 6 | **Europe's first large-scale pesticide-free production standard**[107]

In 2018, IP-SUISSE (the Swiss Association of Integrated Producing Farmers – comprising 18,500 members) introduced a pesticide-free wheat programme, amid strong public demand for more sustainable production and lower pesticide use.

IP-SUISSE's pesticide-free wheat production requirements have significantly fewer barriers to adoption than organic farming, which imposes full-farm restrictions on all synthetic inputs over the full crop rotation cycle and requires a multi-year transition period.

In addition to benefitting from reduced pesticide purchasing expenses, farmers who grow and sell pesticide-free wheat receive direct payments of CHF650 per hectare from the government and a price premium of CHF150 CHF per tonne from IP-SUISSE. These payments make the transition to pesticide-free wheat production economically viable, despite lower yields. Farmers in Switzerland can also receive direct government payments for implementing soil conservation or organic production practices.

Switzerland's largest food retailer, Migros, has announced that, from 2023, it will only sell bread made from pesticide-free cereals – expected to account for 20% of Swiss wheat production. Such products will carry a "pesticide-free" label.

Reducing plastic waste discharge

Marine plastic pollution has increased tenfold since 1980, affecting at least 267 species, including 86% of marine turtles, 44% of seabirds and 43% of marine mammals.[108] Accumulated plastic in the ocean is projected to increase from 150 million tons in 2016 to more than 640 million tons by 2040 in a business-as-usual scenario.[109] Most plastics are expected to remain intact for decades or centuries after use, and those that erode end up as microplastics, making their way into the global food chain.[110]

> "Annual plastic production was 330 million tons in 2016 – only 15% is recycled"[111]

Relevant sectors

Reducing or eliminating the discharge of plastic waste into the environment is particularly relevant to the following sectors:

- Companies in the consumer goods value chain that depend on single-use plastic packaging and utensils
- The automobile tyre industry, whose products are a significant source of microplastics
- The fishing industry, whose plastic gear is a significant source of ocean pollution

Annual plastic production grew from 2 million tons in 1950 to more than 330 million tons in 2016 and is expected to double by 2040. An estimated 90 million tons of plastic waste was mismanaged in 2016, ending up in terrestrial and ocean environments or disposed of by open burning. Only 15% of plastic produced is recycled.[112]

Business will need to innovate and take action to reduce both the use of plastics and the mismanagement of plastic waste. Given the diversity of plastic materials and uses, as well as the variety of local economic, regulatory and waste management conditions, corporate action will need to encompass a wide range of solutions that involve each stage of the value chain and that are tailored to specific jurisdictions and products.

Government-mandated extended producer responsibility (EPR) schemes for single-use plastics and plastic packaging are being implemented in a growing number of jurisdictions,[113] and are recognized by business leaders as an effective approach.[114] For more information, see the section on EPR in Chapter Three.

Experts have identified eight interventions based on existing technologies that together could reduce the annual amount of mismanaged plastic waste by over 50% by 2040 from the 2016 baseline, even as overall plastic production continues to increase (see Table 3).[115]

TABLE 3 | **Eight potential interventions to reduce plastic waste discharge using existing technology**

Intervention	Applicability to plastic categories				Main responsible stakeholders
	Rigid	Flexible	Multi-layer	Micro-plastic	
Reduce growth in plastic consumption	●	●	●	●	Consumer goods brands; retailers
Replace plastics with suitable alternative materials	◐	●	◐	○	Consumer goods brands; retailers
Design products and packaging for recycling	◐	◐	●	○	Consumer goods brands
Expand waste collection in LMICs	●	●	●	●	Local governments
Increase mechanical recycling capacity globally	●	◐	○	○	Waste management companies
Scale up global capacity of chemical conversion recycling	○	●	●	○	Waste management companies; petrochemical industry
Build safe waste disposal facilities	●	●	●	●	National governments
Reduce plastic waste exports from high- and middle-income countries	●	◐	○	○	National governments

Source: Reddy et al., Breaking the Plastic Wave, July 2020.

● Highly applicable ◐ Somewhat applicable ○ Not applicable

CORPORATE CASE STUDY

Coca-Cola plastics and packaging goals

In 2021, The Coca-Cola Company received a "B" grade in the Corporate Plastic Pollution Scorecard, published by US non-profit As You Sow,[116] which rates the largest US consumer-facing companies on their efforts to reduce plastic pollution. This "B" grade was the highest score of the 50 companies ranked.

Coca-Cola's goals related to plastics production and waste include the following:[117]

- Make 100% of packaging recyclable globally by 2025 *(achieved in 2021: 90%)*
- Use at least 50% recycled content across all packaging materials by 2030 *(achieved in 2021: 23% for all packaging types and 13.6% for polyethylene terephthalate (PET) plastic packaging)*
- Collect and recycle a bottle or can for each one sold by 2030 *(achieved in 2021: 61%)*

2.8 Target 8: Minimize the impact of climate change

Minimize the impact of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation, and disaster risk reduction actions,

- including through nature-based solutions and/or ecosystem-based approaches,
- while minimizing negative and fostering positive impacts of climate action on biodiversity.

Biodiversity loss and climate change are inextricably linked. Limiting global warming to ensure a habitable climate and protecting biodiversity are mutually supporting goals.[118] Delivering on the targets of the GBF is essential to achieving the objectives of the Paris Agreement and vice-versa.

Relevant sectors

Target 8 will require action from various sectors, for example:

- Agriculture and forestry sectors need to stop deforestation and conversion, improve soil health and address GHG emissions from sources such as animal husbandry and synthetic fertilizer
- Carbon-intensive sectors such as thermal power generation, oil and gas, transportation, construction and buildings, steel and cement manufacturing will need to accelerate their emissions reductions

Climate change, along with associated ocean acidification, is already impacting biodiversity and is projected to become the largest direct driver of biodiversity loss after 2050. Climate action, including reduction in fossil fuel use, is essential to halting and reversing biodiversity loss.[119]

Ecosystem-based approaches, including conservation and restoration – as well as improved management of agriculture, forestry, fisheries and aquaculture – can contribute to both climate change mitigation and adaptation, while also supporting biodiversity goals and the provision of ecosystem services,[120] such as water filtration, flood buffering, soil health, biodiversity habitat, enhanced climate resilience and disaster-risk reduction. The conservation and restoration of mangroves and wetlands, in particular, provide cost-effective coastal protection while absorbing and storing significant amounts of carbon. Mangrove forests, for example, store an estimated 3-5 times more CO_2 per hectare than tropical forests.[121]

> **Mangrove forests store an estimated 3-5 times more CO_2 per hectare than tropical forests, while providing cost-effective coastal protection[122]**

According to estimates,[123] 20 types of nature-based solutions (NBS) could potentially provide 11 billion tons (11 Gt) of GHG emission reductions per year by 2030, at a cost of $100 per ton of CO_2-equivalent (tCO_2e) or less, including 4 billion tons per year at a cost of $10/$tCO_2e$ or less (see Annex 3 for more detail).

The Forum's report *The Future of Nature and Business*[124] estimated that five of the 20 NBS (reforestation, peatland restoration, avoided forest conversion, avoided grassland conversion and avoided peatland impacts) could attract around $85 billion of new investment per year, if all those NBS-related mitigation opportunities costing $50/$tCO_2e$ or less were implemented.[125]

CORPORATE CASE STUDY

Lowering Emissions by Accelerating Forest finance (LEAF) Coalition

Ending tropical and subtropical forest loss by 2030 is a crucial part of meeting global climate, biodiversity and sustainable development goals. Protecting tropical forests offers one of the biggest opportunities for climate action.[126]

The LEAF Coalition – a partnership between more than 20 leading corporations and the governments of Norway, the United Kingdom and the United States – aims to halt deforestation by providing financial support to forest countries for large-scale forest protection. Since its launch in 2021, the coalition has mobilized more than $1 billion in financing.[127]

To join the coalition, companies must have committed to science-based targets, set 2050 net-zero targets across Scopes 1, 2 and 3 GHG emissions, and joined the UN Race to Net Zero. LEAF provides them an opportunity to accelerate their climate commitments through high-integrity tropical forest protection.[128] Crucially, when companies purchase emissions reduction credits through LEAF, these must be *in addition to* (not a substitute for) CO_2 abatement in their own value chains, in line with the Paris Agreement.[129]

Tropical and subtropical forest countries and sub-national jurisdictions can submit proposals to supply emissions reductions to the LEAF Coalition over a five-year period.[130]

As of November 2021, countries including Costa Rica, Ecuador, Nepal and Vietnam had signed letters of intent for LEAF transactions of ART-certified TREES credits,[131] while 23 jurisdictions had submitted eligible proposals.[132] For crediting years 2022-2026, the price floor will be $10/t$CO_2$e.[133]

LEAF uses the independent ART/TREES standard to ensure environmental and social integrity. Recognizing the critical role of Indigenous peoples and local communities (IPLCs) in stewarding and safeguarding the world's forests, ART/TREES requires IPLCs to be full and effective partners in the design, implementation and periodic assessment of REDD+ actions, including, if applicable, through free, prior and informed consent.[134]

The jurisdictional REDD+ approach operationalized by ART/TREES is defined as national or subnational in scale, with the boundaries of a subnational area corresponding to the entire area of one or more administrative jurisdictions no more than one level down from the national level.[135] It offers strong assurances of environmental and social integrity by accounting for actions of all actors across a jurisdiction. Working at jurisdictional scale also aims to prevent leakage (the risk that deforestation is displaced elsewhere).[136]

Dense rainforest near the Malaysia-Kalimantan Border

2.9 Target 18: Eliminate harmful subsidies and incentives

Identify by 2025, and eliminate, phase out or reform incentives, including subsidies, harmful for biodiversity, in a proportionate, just, fair, effective and equitable way, while

- substantially and progressively reducing them by at least $500 billion per year by 2030,
- starting with the most harmful incentives, and
- scale up positive incentives for the conservation and sustainable use of biodiversity.

Governments are estimated to be providing nearly $2 trillion per year – around 2% of global GDP – on environmentally harmful subsidies.[137] Reforming these subsidies could go a long way towards addressing the estimated $700 billion gap in annual funding required to reverse biodiversity loss by 2030 (Target 19).

> **Governments are providing nearly $2 trillion per year on environmentally harmful subsidies[138]**

Relevant sectors

Target 18 is relevant to businesses whose value chains involve fossil fuels, agriculture, forestry, industrial-scale water provision or usage, construction, transport or fishing

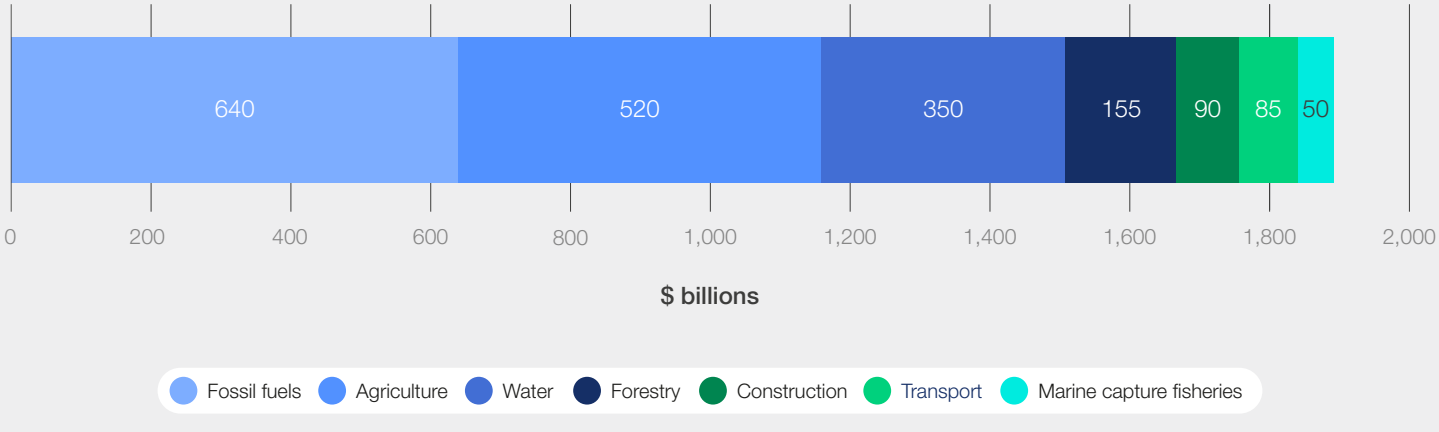
Harmful economic incentives and policies are among the main indirect drivers of biodiversity loss.[139] These can take the form of direct spending, tax breaks, extension of sovereign credit, provision of goods or services on favourable terms, absorption of private risks or selective regulatory exemptions.[140]

Policies that incentivize unsustainable practices in fisheries, aquaculture, horticulture (including excessive synthetic fertilizer and pesticide use), livestock management, forestry, mining and energy (including fossil fuels and biofuels) are often associated with land- and sea-use change, overexploitation of natural resources, pollution, GHG emissions and inefficient production.[141]

Reforming harmful incentives can help level the playing field for companies that embrace sustainable practices. Companies in relevant sectors that help their upstream suppliers adopt more sustainable practices could see their value chains benefit when subsidies shift towards nature-positive incentives. Companies that fail to take action could face reputational risks and could see their profitability impacted when harmful subsidies are reduced.

An example of a country reducing harmful incentives and increasing nature-positive incentives can be seen in the Costa Rica illustration in section 3.5 Payment for ecosystem services.

FIGURE 2 **Estimated global environmentally harmful subsidies**



Source: Koplow D. and Steenblik R., Protecting Nature by Reforming Environmentally Harmful Subsidies: The Role of Business, February 2022.

2.10 Target 19: Financial resources

Substantially and progressively increase the level of financial resources from all sources, in an effective, timely and easily accessible manner, including domestic, international, public and private resources, in accordance with Article 20 of the Convention, to implement national biodiversity strategies and action plans (NBSAPs), by 2030 mobilizing at least $200 billion per year, including by:

a. Increasing total biodiversity-related international financial resources from developed countries, including official development assistance, and from countries that voluntarily assume obligations of developed country Parties, to developing countries, in particular the least developed countries and small island developing States, as well as countries with economies in transition, to at least $20 billion per year by 2025, and to at least $30 billion per year by 2030;

b. Significantly increasing domestic resource mobilization, facilitated by the preparation and implementation of national biodiversity finance plans or similar instruments according to national needs, priorities and circumstances;

c. Leveraging private finance, promoting blended finance, implementing strategies for raising new and additional resources, and encouraging the private sector to invest in biodiversity, including through impact funds and other instruments;

d. Stimulating innovative schemes such as payment for ecosystem services, green bonds, biodiversity offsets and credits, benefit-sharing mechanisms, with environmental and social safeguards;

e. Optimizing co-benefits and synergies of finance targeting the biodiversity and climate crises;

f. Enhancing the role of collective actions, including by Indigenous peoples and local communities, Mother Earth-centric actions and non-market-based approaches including community-based natural resource management and civil society cooperation and solidarity aimed at the conservation of biodiversity;

g. Enhancing the effectiveness, efficiency and transparency of resource provision and use.

Achieving the goals and targets of the GBF will depend on resource mobilization. Lack of financial resources has frequently been noted as a key obstacle to the conservation and sustainable use of biodiversity.[142]

> **The gap between current and required annual funding for biodiversity protection is roughly $700 billion[143]**

Relevant sectors

- Public sector organizations, including governments and development banks, must align their policies and funding to support sustainable use of biodiversity
- Private sector companies can invest in their operations and supply chains to reduce their negative biodiversity impacts and move towards positive impacts, for example, by supporting the transition to sustainable agricultural practices
- Financial institutions will play key roles in shifting financial flows away from activities with adverse biodiversity impacts

The latest estimates of current spending on biodiversity conservation, the amount needed and the gap in funding are summarized in Box 7. Figures 3 and 4 break down current global biodiversity spending and estimated needs by sector.

Estimates for the amount of funding needed to halt biodiversity loss range from $722 billion to $967 billion per year. Averaging out the estimates suggests that roughly $850 billion is needed every year to fund global biodiversity protection, including the following:[144]

- Transitioning the agricultural sector to conservation/regenerative agricultural practices in croplands
- Increasing terrestrial and marine protected areas
- Transitioning global rangelands to sustainable management practices by 2030
- Safeguarding biodiversity against the impact of polluted water from urban environments

- Minimizing and mitigating the biodiversity impact of invasive species
- Transitioning the global fisheries sector to sustainable practices
- Restoring degraded coastal ecosystems (mangroves, seagrasses and saltmarshes)
- Transitioning the forestry sector to sustainable forestry management practices

The gap between current and required annual funding is estimated to be roughly $700 billion. The GBF looks to close this gap through raising around $200 billion in new funding combined with the repurposing of $500 billion of harmful subsidies.[145]

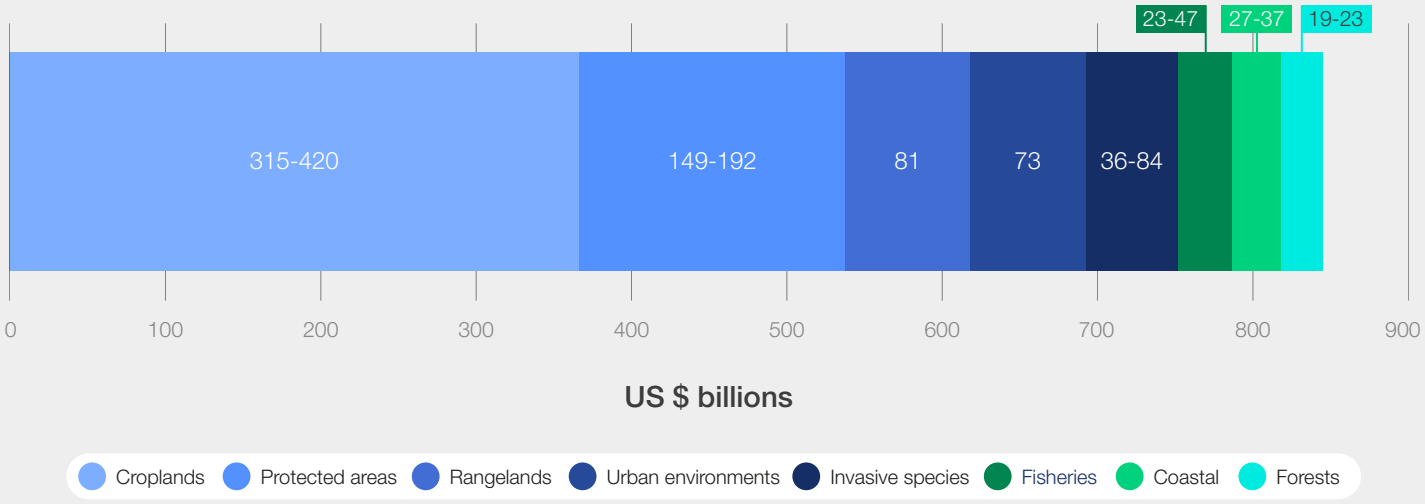
BOX 7

The gap in biodiversity conservation funding

- The gap between the amount currently spent on biodiversity conservation and what is needed is large, but it can be closed
- As of 2019, spending on biodiversity conservation is estimated at between $124 and $143 billion per year against a total estimated need of between $722 and $967 billion per year
- This leaves a biodiversity financing gap of between $598 billion and $824 billion per year

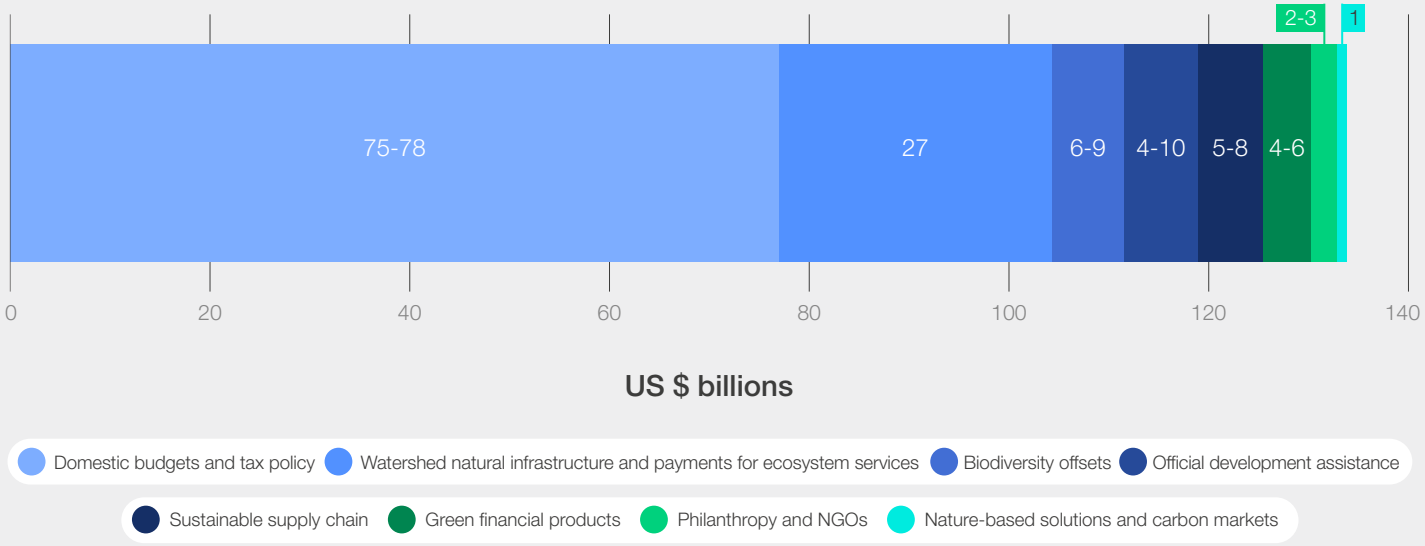
Source: Deutz, et al., Financing Nature: Closing the Global Biodiversity Financing Gap, 2020.

FIGURE 3 | **Estimated global annual biodiversity funding needs**



Source: Deutz, et al., Financing Nature: Closing the Global Biodiversity Financing Gap, 2020.

FIGURE 4 | **Estimated 2019 global biodiversity financing**



Source: Deutz, et al., Financing Nature: Closing the Global Biodiversity Financing Gap, 2020.

2.11 Target 22: Indigenous people and local community (IPLC) participation in decision-making

Ensure the full, equitable, inclusive, effective and gender-responsive representation and participation in decision-making, and access to justice and information related to biodiversity by Indigenous peoples and local communities,

- respecting their cultures and their rights over lands, territories, resources, and traditional knowledge,
- as well as by women and girls, children and youth, and persons with disabilities and
- ensure the full protection of environmental human rights defenders.

IPLCs should be acknowledged as critical rights-holders and decision-makers in the conservation and sustainable use of natural resources. They will play a disproportionately large role as vital custodians of the world's remaining natural landscapes.[146] IPLCs' customary sustainable use practices and management systems are increasingly recognized as effective conservation approaches,[147] and their custodianship is associated with areas of high conservation value and diverse biomes, including intact forests, areas of low human impact, healthy marine areas and habitats important for species.[148]

Relevant sectors

- Target 22 is relevant to companies whose value chains involve lands and waters under IPLC stewardship, including those in the consumer goods, food, agriculture, forestry, fisheries, extractive and infrastructure sectors, as well as water utilities whose watersheds are in IPLC lands.

At least 32% of land and associated inland waters (excluding Antarctica) is owned or governed by IPLCs, either through legal or customarily held means, including 36% of the global area covered by designated Key Biodiversity Areas (KBAs). Two-thirds (65%) of IPLC lands have zero to low levels (<10%) of human modification, while a further 27% has only moderate levels of modification, indicating that IPLC custodianship is consistent with the conservation of biodiversity.[149]

↓ Two Navajo women looking out over Monument Valley Navajo Tribal Park, Arizona, USA

> **Indigenous people and local communities own or govern at least 32% of the planet's land and associated inland waters (excluding Antarctica) – two-thirds of this land is less than 10% modified by humans** [150]

At the same time, poverty rates tend to be high in the areas of low-income countries that have high forest cover and high forest biodiversity.[151] The sustainable use of biodiversity related to nutrition, food security, livelihoods, health and well-being of IPLCs and the most vulnerable people, including youth and people living in vulnerable situations must be protected.

CORPORATE CASE STUDY

Natura – sourcing from Amazon communities to support the "standing forest" economy

Natura is Brazil's largest cosmetics company. It produces a range of soaps, creams, shampoos and other products using natural formulations. The company sources traditional knowledge and more than 40 biodiversity ingredients from the Amazon region, including derivatives, extracts, essential oils, other oils, and butters.[152] Ingredients from the Amazon account for more than 15% (by value) of the inputs used by Natura in Brazil.[153]

The company works with more than 8,155 families from 40 communities in the Amazon region.[154] These include Indigenous people such as the Cinta Larga in Mato Grosso, who supply Natura with Brazil nuts, and the Deni do Xeruã people in the Médio Juruá region, who supply andiroba seeds.[155] Natura maintains these relationships through local communities or cooperatives.[156]

The concept of the "standing forest economy" is central to Natura's sourcing from the Amazon.[157] The company's business model supports the livelihoods of local and traditional communities by developing products based on the region's biodiversity. This provides IPLCs with alternative streams of income, based on fair trade, which do not involve cutting down the forest. This income includes earnings from fruits and seeds of standing trees, such as ucuuba, patauá, andiroba, açai and tukumã[158] plus, in some cases, payments to smallholders for environmental conservation services, such as the avoidance of carbon emissions.[159] Natura's approach has facilitated the conservation of 2 million of hectares of land.[160]

Natura is also investing in the development of regenerative agriculture, including sourcing palm oil from an agroforestry project that grows oil palm among native species such as açai and andiroba, a method found to be more productive (per tree) than monoculture, and more successful in capturing carbon.[161]

→ A toucan perched in an açai tree in the Amazon rainforest, Brazil.

3 Regulator- and business-driven approaches to halting and reversing biodiversity decline

This chapter highlights six trends in regulator- and business-driven approaches to halting and reversing biodiversity decline. Scaling up these types of approaches will be necessary to achieve the GBF's targets.

Just as the 2015 Paris Agreement led to a wave of climate action during subsequent years, the targets and goals of the GBF will accelerate changes in policies, regulations, stakeholder expectations and the market environment. These will help level the playing field for businesses that have been proactive in addressing their impacts on nature, while those that fail to work towards a nature-positive approach will face growing transition risks.

This chapter covers the following six trends in regulator- and business-driven approaches to halting and reversing biodiversity decline, and maps them against the relevant GBF targets:

1. Deforestation-free supply chains and supply-chain environmental and social due diligence
2. Net positive impact (NPI) approaches
3. Financial institutions' policies to address drivers of biodiversity loss
4. Extended producer responsibility (EPR) schemes
5. Payment for ecosystem services (PES)
6. Regenerative agriculture

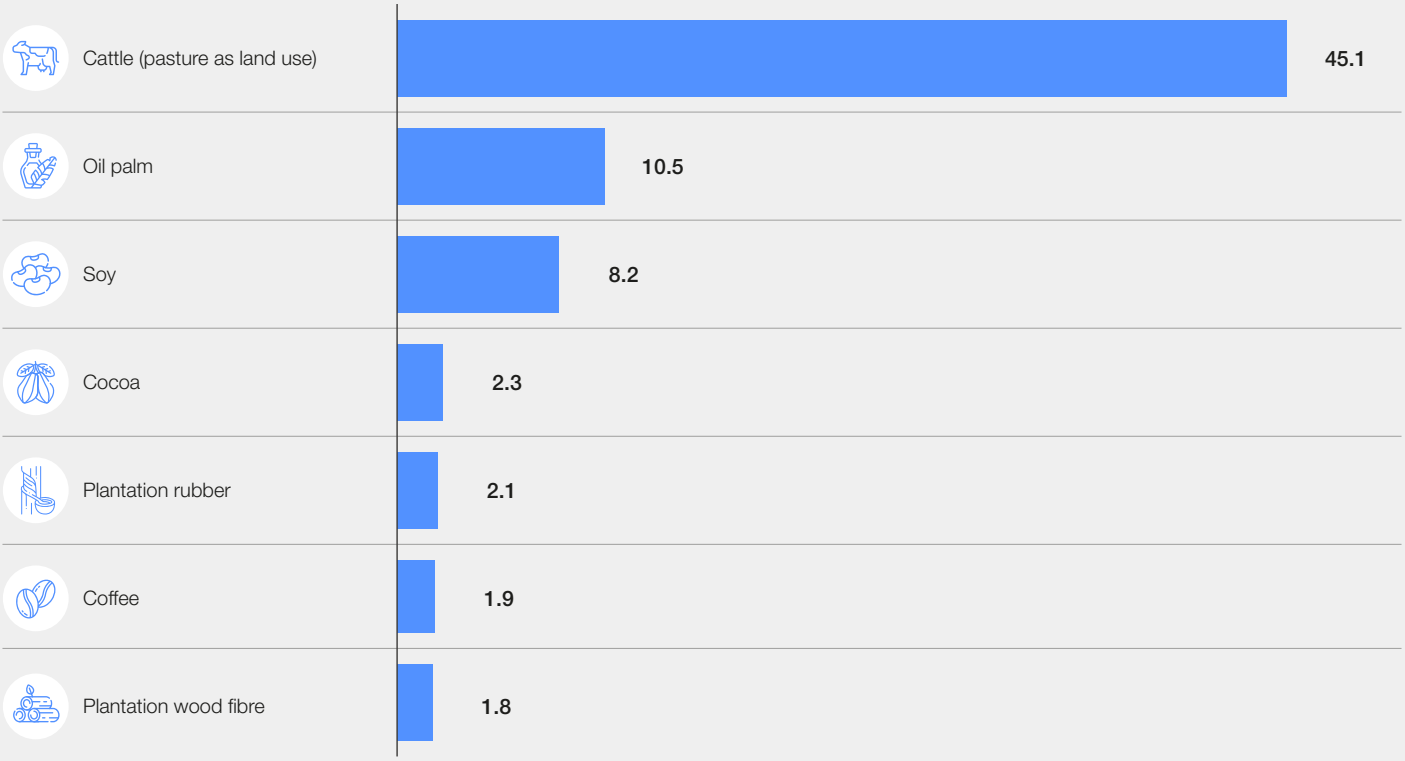
3.1 Deforestation-free supply chains and supply-chain environmental and social due diligence

Relevant GBF targets	
3 Protect/conserve land and sea	10 Sustainable agriculture, aquaculture and forestry
5 Harvest, trade and use of wild species	11 Regulation of air, water, hazards and extreme events
6 Invasive alien species	15 Sustainable business, production and supply chains
7 Reduce pollution	19 Financial resources
8 Minimize impact of climate change	22 Indigenous people and local community participation
9 Sustainable use and benefit-sharing	

A range of stakeholders, including investors, banks, consumers and civil society, increasingly expect companies to take responsibility for the environmental and social impacts of their supply chains, especially the cross-border impacts that are often not covered by national regulations.

The increasing awareness of deforestation's impact on both biodiversity loss and climate change is drawing attention to products made from commodities that are associated with the conversion of natural habitats to agricultural land, for example, beef, palm oil, soy, cocoa, natural rubber, coffee and wood products. Aquaculture is a leading driver of mangrove deforestation[162] and could become an area of focus in the future.

FIGURE 5 **Deforestation caused by selected commodities (2001-2015, million hectares)**



Source: World Resources Institute, Estimating the Role of Seven Commodities in Agriculture-linked Deforestation, October 2020.

A growing number of companies are making voluntary commitments to reduce or eliminate deforestation and other adverse environmental and social impacts from their supply chains, and to report on those impacts and the measures being taken to mitigate them.

The recently proposed EU measures on deforestation-free products (see Box 8) and supply-chain sustainability due diligence (see Box 9) reflect growing demands from citizens to address the negative impacts of global supply chains, while also recognizing the importance of levelling the competitive playing field when it comes to internalizing the associated costs.

BOX 8 **Proposed EU regulation on commodities associated with deforestation[163]**

A regulation recently proposed by the European Commission aims to halt the consumption of products coming from supply chains associated with deforestation or forest degradation, while increasing EU demand for (and trade in) legal and deforestation-free products and commodities.

For products made from cattle, palm oil, soy, wood, cocoa or coffee, the regulation will only permit those with zero or negligible risk of deforestation in their relevant supply chains to be placed on the EU market.

The proposed risk assessment is based on geo-located coordinates of all plots of land where the relevant commodities and products are produced, enabling the use of satellite images to check compliance. Only products sourced from land put into production prior to the expected cut-off date of 31 December 2020 will be permitted.

BOX 9 | **Proposed EU directive on corporate sustainability due diligence[164]**

The European Commission has proposed a directive on corporate sustainability due diligence in recognition of the fact that companies' behaviour is key to achieving European environmental and human rights-related objectives. Around 80-90% of the environmental harm caused by EU production may occur outside the bloc's borders. In addition, European companies' global value chains are connected to millions of workers around the world, bringing a responsibility for companies to address any adverse impacts on the rights of those workers.

The directive will require companies to:

a. identify actual and potential adverse human rights impacts and adverse environmental impacts arising from their own operations or those of their subsidiaries and established business relationships, and

b. take appropriate measures to prevent or mitigate those potential adverse impacts.

3.2 Net positive impact (NPI) approaches

Relevant GBF targets	
1 Land- and sea-use planning	11 Regulation of air, water, hazards and extreme events
2 Ecosystem restoration	12 Access to green and blue spaces
3 Protect/conserve land and sea	14 Mainstreaming biodiversity
4 Species and biodiversity management	15 Sustainable business, production and supply chains
7 Reduce pollution	19 Financial resources
9 Sustainable use and benefit-sharing	22 Indigenous people and local community participation
10 Sustainable agriculture, aquaculture and forestry	

Net positive impact (NPI), biodiversity net gain (BNG) and no net loss (NNL) are biodiversity goals for development projects, policies, plans or activities in which adverse biodiversity impacts are outweighed (or offset in the case of NNL) by measures taken in accordance with the mitigation hierarchy (see Figure 6).[165]

The mitigation hierarchy is a widely accepted approach for biodiversity conservation, which calls for the following actions (in order of priority) to address the negative impacts of development on biodiversity and ecosystem services:

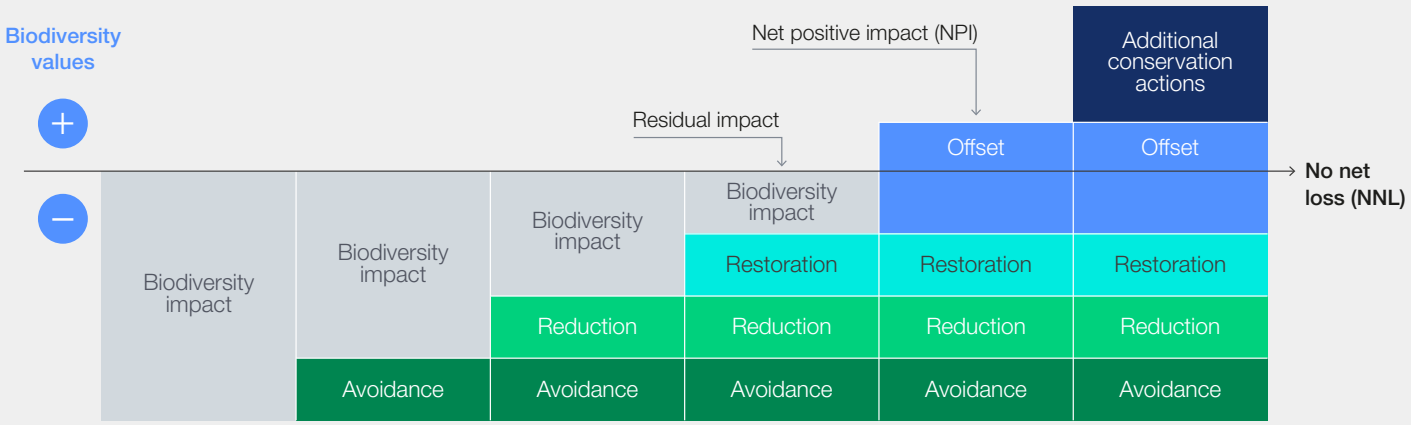
1. Avoid and reduce those impacts
2. Restore affected species and landscapes
3. Offset any residual impacts

Biodiversity is location-specific – some biodiversity will always be lost in offset exchanges as no two areas of habitat or species populations are identical. Offsetting must therefore be a measure of last resort after all other attempts at preventing or reducing impacts have been considered.[166]

NPI approaches can require close cooperation between companies, governments and local communities.[167]

> **Biodiversity is location-specific – the impact in one ecosystem cannot simply be offset in another**

FIGURE 6 | **The mitigation hierarchy and net positive impact**



Source: Adapted from IUCN, *No Net Loss and Net Positive Impact Approaches for Biodiversity – Exploring the potential application of these approaches in the commercial agriculture and forestry sectors*, 2015.

An estimated $6.3-9.2 billion was spent on biodiversity offsets in 2019.[168] Biodiversity compensation (including offsets) is legally required in 37 countries as a direct prerequisite for the permitting of projects in certain infrastructure sectors or habitat types. An additional 64 countries provide guidance on compensatory measures or enable offsets as a voluntary practice. Biodiversity compensation offset schemes are primarily embedded in environmental impact assessment frameworks and justified by the "polluter pays" principle. Most of these policies, however, still appear to fall short of what would be required to consistently to achieve NNL. For example, less than a quarter of countries that require or enable biodiversity compensation (including offsets) require that compensation be used only as a last resort after the rest of the mitigation hierarchy.[169]

> **An estimated $6.3-9.2 billion was spent on biodiversity offsets in 2019[170]**

Governments, businesses, financial institutions and other organizations are increasingly adopting NPI-type policies and commitments that can be applied at the project, site, landscape or organizational level.[171] Box 10 outlines the UK government's mandate to ensure that all new development projects deliver a net gain in biodiversity.

BOX 10 **UK requires 10% biodiversity net gain (BNG) for development and infrastructure projects**

Under the UK Environment Act 2021, new development and infrastructure projects in England will be required to deliver a minimum of 10% BNG via enhancements to existing habitats or new habitat creation. These can be delivered on-site, offsite or via biodiversity credits, although the mitigation hierarchy still applies as follows: avoidance, mitigation, then compensation for biodiversity loss.[172] The relevant habitats must be secured, managed and maintained for at least 30 years.

BNG is measured in "biodiversity units", using the government's biodiversity metric to assess an area's value to wildlife.[173] The metric enables stakeholders to assess changes in biodiversity value brought about by development or changes in land management.[174] The calculation is underpinned by four key factors:[175]

- Habitat size (the size of each habitat located on a given site)
- Habitat condition (how well the habitat is functioning compared to one in full working order)
- Habitat distinctiveness (the particular ecological importance of the habitat)
- Strategic significance (whether or not the habitat is a local priority or located in a priority area for habitat creation/enhancement)

If sufficient biodiversity units cannot be delivered onsite, offsite biodiversity units can be delivered via new habitat creation/enhancement on other landholdings or via habitat banks – where landowners can deliver net gain on their sites in advance and sell biodiversity units to developers.[176] As a last resort, developers can purchase biodiversity credits from the government, the proceeds of which will fund habitat enhancement projects.[177]

3.3 Financial institution policies to address drivers of biodiversity loss

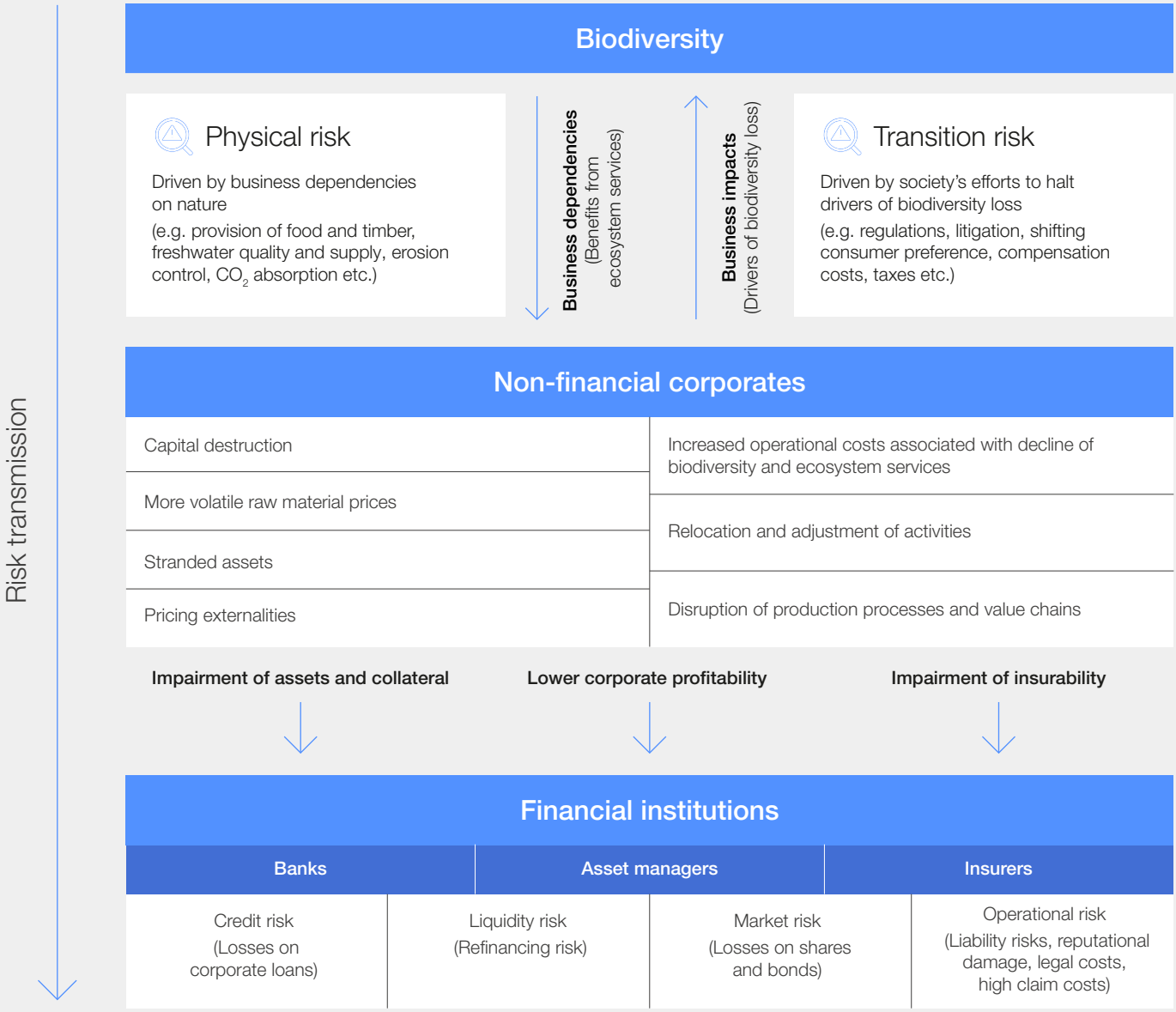
Relevant GBF targets	
1 Land- and sea-use planning	9 Sustainable use and benefit-sharing
2 Ecosystem restoration	10 Sustainable agriculture, aquaculture and forestry
3 Protect/conserve land and sea	11 Regulation of air, water, hazards and extreme events
4 Species and biodiversity management	15 Sustainable business, production and supply chains
7 Reduce pollution	19 Financial resources
8 Minimize impact of climate change	22 Indigenous people and local community participation

There are growing expectations from regulators, investors and other stakeholders for financial institutions (FIs) to assess, report and reduce the biodiversity-related risks and impacts of their lending and investment portfolios. For example:

- Over 100 FIs from 19 countries, with about €15 trillion of assets under management, have committed to the Finance for Biodiversity Pledge[178] to protect and restore biodiversity through their finance activities and investments, by engaging with companies, assessing impact, setting targets and reporting publicly on these topics by 2025.
- Biodiversity-related regulatory requirements for FIs are beginning to emerge. Article 29 of the French Law on Energy and Climate,[179] for example, will require FIs to disclose how their financial activities depend on and impact both climate and biodiversity, as well as their strategy for reducing biodiversity impacts, including specific targets and a measure of alignment with international biodiversity goals.[180]

Financial institutions are vulnerable to biodiversity-related risks through the physical and transition risks of companies they finance (see Figure 7).

FIGURE 7 | **Biodiversity-related risk transmission via corporates to financial institutions**



Source: Adapted from NGFS and INSPIRE, Biodiversity and financial stability – building the case for action, October 2021.

In 2021, for example, French central bank researchers found that 42% of the value of securities held by French FIs is in issuers that are highly dependent on one or more ecosystem services.[181]

> **42% of the value of securities held by French financial institutions is in issuers that are highly dependent on one or more ecosystem services[182]**

At the same time, FIs can exacerbate those risks by financing activities associated with the drivers of biodiversity loss,[183] for example, agricultural land expansion, construction or extractive activities that impact natural habitats.

A growing number of FIs are setting restrictions on financing activities related to commodities with deforestation risk, such as beef, palm oil and soy, as well as business activities in locations with high biodiversity value.

Biodiversity no net loss (NNL)[184] policies adopted by FIs for project financing can play an important role in helping to limit the adverse impacts of infrastructure development and other projects during the coming decades. Over $60 trillion worth of new infrastructure is predicted to be built by 2040, with major transportation and energy infrastructure, as well as mineral extraction projects, planned within some of the world's most biodiverse and carbon-rich regions.[185]

As a result of such FI policies, companies that do not address deforestation and other adverse biodiversity impacts in their own value chains and development projects could find it more difficult or expensive to obtain financing.

Box 11 and the BNP Paribas case study provide examples of FI policies that address biodiversity risks. For more background on NNL, see section 3.2 on net positive impact (NPI) approaches.

BOX 11

The World Bank's biodiversity no net loss (NNL) requirement for project financing

For the financing of projects that have the potential to adversely affect natural habitats, the World Bank's environmental and social framework[186] requires appropriate mitigation measures, in accordance with the mitigation hierarchy, to achieve NNL and preferably a net gain of biodiversity over the long term. For more background on the mitigation hierarchy, see section 3.2 on net positive impact (NPI) approaches.

Residual impacts may remain despite best efforts to avoid, minimize and mitigate those impacts. In such cases, mitigation measures – where appropriate and supported by relevant stakeholders – may include biodiversity offsets adhering to the principle of "like-for-like or better". Similar policies are in place for other multilateral development banks.[187,188,189,190]

CORPORATE CASE STUDY

BNP Paribas' approach to drivers of biodiversity loss

BNP Paribas received a score of 57% in Global Canopy's 2021 Forest 500 assessment of financial institution approaches to deforestation associated with certain agricultural commodities (beef and leather, palm oil, soy, timber and paper). This was the best score among the 150 financial institutions that were assessed.[191] The bank has implemented several policies to address drivers of biodiversity loss, outlined below.

High biodiversity value areas

- Exclusion of project funding for selected sectors (e.g. agriculture, palm oil, mining, unconventional oil and gas) in areas classified for biodiversity (e.g. IUCN categories I-IV, wetlands listed in the RAMSAR Convention, UNESCO World Heritage sites, Alliance for Zero Extinction sites etc).[192]
- Exclusion of financing for any oil and gas exploration activities in the Arctic offshore or in the Arctic National Wildlife Refuge.[193]
- Exclusion from its trading activities of any maritime oil exports from the Amazon Sacred Headwaters in the Esmeraldas region in Ecuador.[194]

Beef and soy[195, 196]

- For companies producing or purchasing beef or soy in the Brazilian Amazon and Cerrado, financial services are only provided to companies (e.g. producers, meat conditioners and traders) with a strategy to achieve zero deforestation in their production and supply chains by 2025 at the latest.
- No financing for customers producing or buying beef or soybeans from land in the Amazon that was cleared or converted after 2008.
- All customers are required to have full traceability of beef and soy channels (direct and indirect) by 2025.

Palm oil[197]

- Upstream palm oil clients must be members of the Roundtable for Sustainable Palm Oil (RSPO) and have a time-bound plan for full RSPO certification of their operations.
- Palm processors and traders must have a time-bound plan to trade and process only RSPO-certified palm oil.
- Producers must have policies in place to ensure the following, and processors/traders must have a time-bound plan to ensure their palm oil is sourced from producers with the following policies in place:
  - Conduct high conservation value (HCV) and high carbon stock (HCS) assessments before development of new plantations, and protect HCV and HCS areas in their concessions.
  - Prohibit development of plantations using burning or peatlands.
  - Minimize pesticides and artificial fertilizer use.

Climate change[198]

- Total exit from thermal coal (including extraction, dedicated infrastructure and power production) by 2030 for countries in the EU and OECD countries, and 2040 for the rest of the world.
- As part of the Net-Zero Banking Alliance and the Net-Zero Asset Owner Alliance, BNP Paribas will transition their lending and investment portfolios to net-zero GHG emissions by 2050 on a pathway consistent with a 1.5°C temperature increase scenario.

3.4 Extended producer responsibility (EPR) schemes

Relevant GBF targets

- 7 Reduce pollution
- 8 Minimize impact of climate change
- 14 Mainstreaming biodiversity
- 15 Sustainable business, production and supply chains
- 16 Eliminate unsustainable consumption

The linear economic model of "take-make-dispose" does not provide sufficient incentives for companies to make their products more circular.[199] In the case of packaging, for example, the cost of collection, sorting and recycling typically exceeds the value of recycled materials.[200] Extended producer responsibility (EPR) schemes can be considered for a range of resource-intensive sectors where the potential for circularity is high, for example in packaging, plastics, electronics, batteries, vehicles, textiles, construction and buildings, water and nutrients.

EPR is an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of the product's lifecycle. This alleviates the burden on municipalities and taxpayers for managing end-of-life products, while reducing the amount of waste destined for final disposal and increasing recycling rates.

> **"Without such policies [as EPR], packaging collection and recycling is unlikely to be meaningfully scaled and tens of millions of tons of packaging will continue to end up in the environment every year[201]**

In practice, producers take responsibility for collecting end-of-life products and for sorting them before their final treatment, which ideally involves recycling.[202] They do this either by providing the financial resources required or by assuming the operational and organizational aspects of the process through "producer responsibility organizations" (PROs).[203]

Mandatory EPR schemes are often augmented by product- or material-specific regulatory targets for recycling, recyclability or incorporation of recycled materials (see Box 13). Deposit schemes (e.g. for glass or plastic bottles) or buy-back policies can enhance end-of-life collection rates.

EPR schemes can level the playing field for companies that embrace sustainable practices, by ensuring market-wide incorporation of end-of-life costs into product prices and by incentivizing product design that accounts for recyclability, reusability, repairability, product lifespan and hazardous substances.

BOX 12 Leading businesses call for implementation of EPR for packaging[204]

In June 2021, more than 100 leading corporations, including consumer and retail brands, manufacturers, recyclers and investment managers, as well as more than 50 other organizations, signed a statement – under the auspices of the Ellen MacArthur Foundation – calling for the implementation of extended producer responsibility (EPR) schemes for packaging.

The signatories recognize that: "EPR schemes, through which all industry players that introduce packaging to the market provide funding dedicated to its collecting and processing after use, are the only proven and likely pathways to provide the required funding. Without such policies, packaging collection and recycling is unlikely to be meaningfully scaled and tens of millions of tons of packaging will continue to end up in the environment every year."

BOX 13 | **European Union's EPR and recycling targets for packaging and single-use plastics**

The EU requires Member States to set up extended producer responsibility (EPR) schemes for all packaging by 2024; and it has set recycling targets for six types of packaging materials – as summarized in the table below.[205]

To address the problem of plastic ocean litter, the EU has also mandated EPR schemes for the collection of single-use plastics and plastic fishing gear. It has set overall targets for separate collection (for recycling) of 77% of single-use plastic beverage containers by 2025 and 90% by 2029. In addition, the EU requires that bottles made from PET contain at least 25% recycled plastic by 2025 and 30% by 2030.[206]

EU recycling targets for packaging waste

Material type	2025	2030
Plastic	50%	55%
Wood	25%	30%
Ferrous metals	70%	80%
Aluminium	50%	60%
Glass	70%	75%
Paper and cardboard	75%	85%
Total packaging waste	**65%**	**70%**

Source: EU Directive 2018/852 on Packaging and Packaging Waste, May 2018.

3.5 Payment for ecosystem services (PES)

Relevant GBF targets

- 1 Land- and sea-use planning
- 2 Ecosystem restoration
- 3 Protect/conserve land and sea
- 4 Species and biodiversity management
- 5 Harvest, trade and use of wild species
- 7 Reduce pollution
- 9 Sustainable use and benefit-sharing
- 10 Sustainable agriculture, aquaculture and forestry
- 11 Regulation of air, water, hazards and extreme events
- 14 Mainstreaming biodiversity
- 15 Sustainable business, production and supply chains
- 19 Financial resources
- 22 Indigenous people and local community participation

Payment for ecosystem services (PES) is a market-based instrument providing nature-positive incentives that influence the economics of business-related decisions that affect land use, pollution, GHG emissions and so on. PES schemes pay people (or entities) who own or manage natural resources to conserve ecosystems so that they can continue to provide essential nature-based services. This brings additional revenue streams to farmers, businesses, landowners and local communities that own or manage natural resources and adopt practices that enhance or conserve ecosystem services. Payments are often based on the opportunity cost of conservation rather than the monetary value of the ecosystem services themselves.[207]

At the same time, PES can bring higher costs to activities with significant water usage, air or water pollution, or GHG emissions via, for example, water-usage fees, cap-and-trade schemes, carbon taxes and pollution-based charges.

PES can be applied to a range of ecosystem enhancement or conservation actions, such as restoration or conservation of forests, soil conservation practices, watershed protection, limiting GHG emissions or sequestering carbon in forests or soil.

There are a variety of payment schemes that can be employed, including:[208]

- Direct public payments (e.g. from national/subnational governments or multilateral institutions)
- Direct private payments (e.g. from NGOs or companies)
- Tax incentives (e.g. for landowners who grant conservation easements)
- Cap-and-trade markets (e.g. for water pollution, GHGs and other air pollution)
- Voluntary markets (e.g. for carbon credits and biodiversity credits)
- Certification programmes (e.g. to facilitate premium prices for goods produced using sustainable practices)

Examples of PES schemes include Costa Rica's scheme, in operation since 1997 (see Box 14), as well as the previously cited cases of payments to Swiss farmers for pesticide-free, organic and no-till farming, New York City's payments to farmers for controlling nutrient runoff, payments by the LEAF Coalition for forest conservation, and payments to habitat banks for biodiversity units purchased to meet the UK's biodiversity net gain requirements.

An emerging innovation in PES is voluntary markets for biodiversity credits, with a number of initiatives underway to test the market and programme designs.[209] Similar to carbon credits that finance GHG reductions, biodiversity credits can be purchased to help fund actions that result in measurable positive outcomes for biodiversity. Biodiversity credits are similar in design to biodiversity offsets, but unlike offsets, they are not intended to compensate for adverse impacts on biodiversity elsewhere.[210] Biodiversity credits are an investment in nature's recovery that can be part of a company's efforts to make a positive impact beyond its own operations and value chains; they fall into the "additional conservation actions" category in the mitigation hierarchy (see Figure 6).

BOX 14

Costa Rica's Payment for Environmental Services programme

Costa Rica's Payment for Environmental Services programme has helped advance the country's shift away from subsidizing deforestation-led agricultural expansion towards paying private and IPLC land holders for restoring and conserving forests, largely funded by fossil fuel and water users.[211] The country's success in protecting biodiversity has helped establish its world-renowned green trademark and eco-tourism industry.[212]

Costa Rica's dense forest cover fell from 77% in 1943 to 21% in 1987,[213] driven by a national strategy that looked to agriculture for economic growth.[214] Cattle ranchers received incentives such as subsidized bank credit and price guarantees, while farmers could secure land titles by clearing forest for agriculture.[215]

By 1997, however, many incentives for deforestation were phased out, and the government implemented its Payment for Environmental Services programme. The National Forestry Financing Fund pays owners and holders of forests and forest plantations for reforestation or the provision of ecosystem services, such as carbon sequestration, biodiversity protection, water regulation, and landscape beauty for tourism and research. Dense forest cover increased by nearly 150% between 1987 and 2010.[216]

The programme is designed to transfer funds from the beneficiaries of ecosystem services to the providers. A sales tax on fossil fuels helps pay for mitigating GHG emissions, while charges to large-scale agricultural and industrial water-users (including hydroelectricity generators) recognize the value of the services that forests provide,[217] such as water filtration and flow regulation, in their watersheds. Other funding sources include certificates of conservation of biodiversity, carbon credits and strategic alliances with the public and private sectors[218] (e.g. Green Climate Fund,[219] the World Bank[220] and the LEAF Coalition[221]).

3.6 Regenerative agriculture

Relevant GBF targets	
2 Ecosystem restoration	9 Sustainable use and benefit-sharing
3 Protect/conserve land and sea	10 Sustainable agriculture, aquaculture and forestry
4 Species and biodiversity management	11 Regulation of air, water, hazards and extreme events
7 Reduce pollution	15 Sustainable business, production and supply chains
8 Minimize impact of climate change	19 Financial resources

One of the most precious and finite resources we have is productive and fertile soil. The equivalent of one soccer pitch of soil is eroded every five seconds and 90% of soils could become degraded by 2050.[222] Many leading companies across the food, consumer goods and apparel sectors are promoting and supporting the transition from chemical input-heavy farming to regenerative agriculture, both inside and outside their supply chains, through procurement policies, financial support for farmers, research and training.

> **33% of the Earth's soils are already degraded and over 90% could become degraded by 2050**
>
> – FAO[223]

Regenerative agriculture, broadly speaking, is focused on soil health and conservation. It entails minimal tillage, minimal chemical inputs (i.e. fertilizers and pesticides), crop rotation, soil protection with cover crops and crop residues, as well as, where applicable, the integration of livestock operations via rotational grazing of pastures or cover crops.[224]

Regenerative agriculture methods enhance biodiversity, both in and above the soil. Undisturbed by mechanical tilling, the soil ecosystem (encompassing root systems, insects, earthworms, fungi, bacteria and other organisms) both stabilizes the soil and performs "biological tillage". Soil's water infiltration capacities are improved, significantly reducing runoff and soil erosion while helping to recharge groundwater supplies. At the same time, no-till fields act as a sink for CO_2, which could provide a major contribution to climate mitigation if applied on a global scale.[225]

Crop residues and cover crops protect the soil against rain and sun, enhancing the microclimate and reducing erosion, while also providing "food" for soil organisms.[226]

Rotational grazing contributes to increased soil organic matter and microbial density.[227] It prevents overgrazing, thus fostering deeper root systems and preventing the release of carbon from the soil. Methane emissions from manure deposited in fields are significantly lower than from manure stored in lagoons or pits, a common industrial farming approach.[228]

Adopting regenerative farming practices may reduce yields in the short term, so transition financing from corporations, governments and other organizations is vital in the early stages. But over time, regenerative agriculture can bring livelihoods benefits to farmers, such as:

- **Reduced expenditure:** Transitioning to regenerative agriculture practices can reduce the need for chemical inputs, labour and machinery. The financial benefits from reducing fertilizer use, in particular, became more significant after prices surged in some regions by more than 300% between September 2020 and January 2022.[229]
- **Improved crop yields and resilience** against severe weather events, pests and disease.[230]
- **Additional revenue streams**: With an enabling market and regulatory environment, regenerative agriculture practices can enable farmers to earn payment for ecosystem services income by selling carbon credits through voluntary markets[231] and receiving payments for controlling nutrient runoff,[232] eliminating pesticide use and implementing soil conservation practices such as no-till farming.[233]

CORPORATE CASE STUDY

Danone's commitments to source from and promote regenerative agriculture[234]

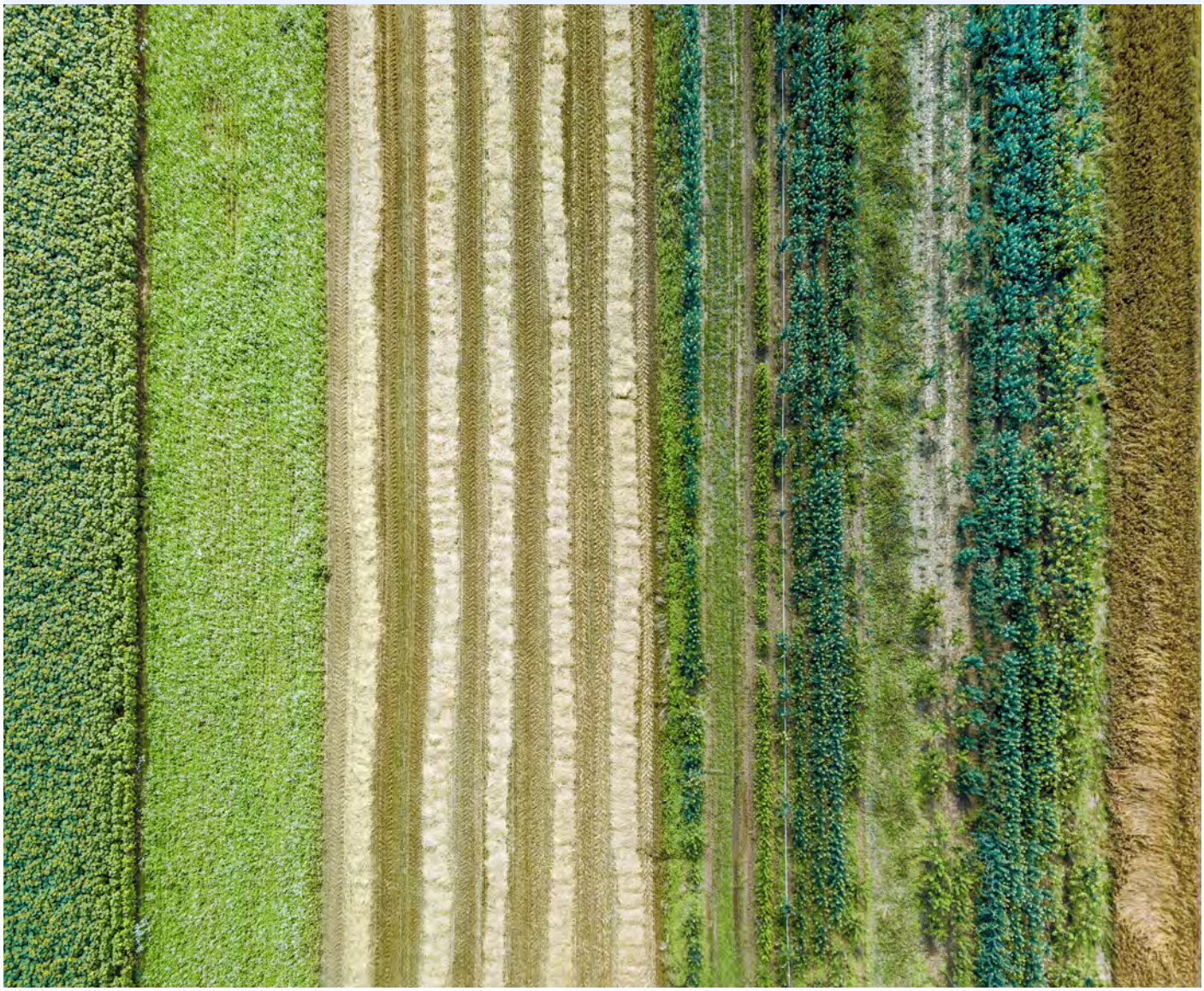
Agriculture accounts for 60% of Danone's GHG emissions and about 90% of its water footprint. Regenerative agriculture is at the heart of the company's commitments to achieve net-zero emissions by 2050 and to be a water impact-positive company. In 2020, Danone reduced its GHG footprint by more than 500,000 tonnes of CO_2-equivalent (tCO_2e) through regenerative agriculture.

Globally, the company works directly with 50,000 farmers and with many more indirectly. It has regenerative agriculture programmes in Algeria, Egypt, France, Mexico, Morocco, Romania, Spain and the US. By June 2021, it had converted over 150,000 hectares to regenerative agriculture, representing more than 12% of direct sourcing.

Danone has committed to sourcing 100% of ingredients produced in France, including fresh milk, fruits, vegetables and sugar beet, from regenerative agriculture. It has invested over €40 million since 2016 to help cover farm costs as farmers transition to regenerative practices. Through these efforts, Danone achieved a 3.6% reduction in GHG emissions per litre of milk in 2020 and aims to reduce its dairy carbon footprint in France by 15% by 2025.

In the US, the company has reduced GHG emissions by 80,000 tCO_2e and sequestered more than 20,000 tCO_2e with its regenerative dairy farming programme, which covers over 32,000 hectares. Danone's US brand, Horizon Organic, has pledged to be carbon positive by 2025, primarily through regenerative agriculture practices.

In Mexico, Danone is working with 140 strawberry farmers to transition to regenerative practices, aiming to secure 30% higher income for farmers, 20% less water usage and fewer agro-chemicals for 50% of its North American strawberry sourcing. The company is also co-leading a programme with the Inter-American Development Bank to provide technical and financing support for 500 smallholder dairy farmers in Mexico who are transitioning to practices that protect soil health and animal welfare.



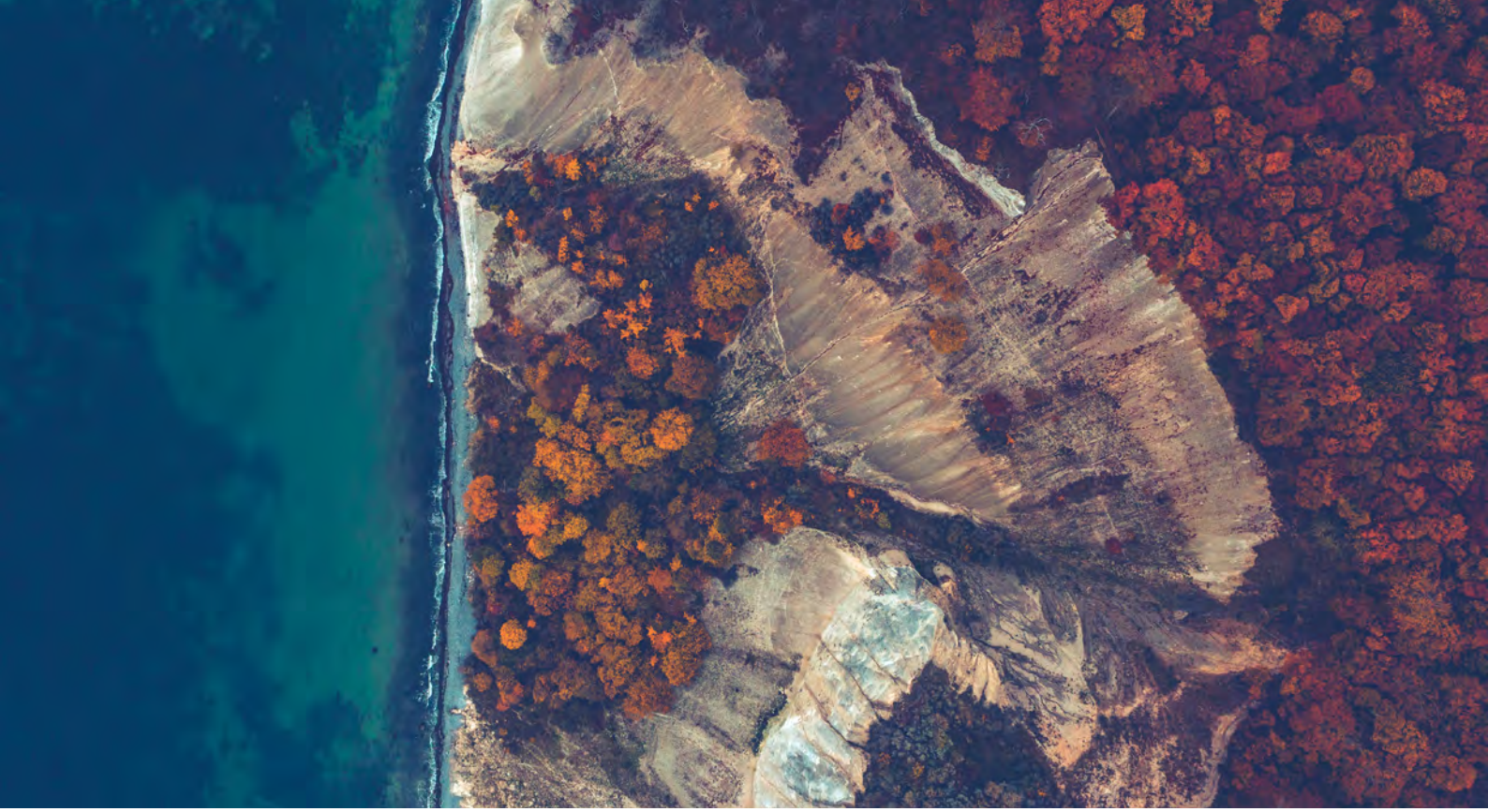
4 How companies can take action on their nature-related risks and opportunities

Companies will need to halt and reverse their negative impacts on nature during this decade. A growing body of guidance is now available to help companies on this journey.

4.1 Frameworks and guidance on assessing dependencies and impacts on nature, and managing and reporting the associated risks and opportunities

There is a growing body of frameworks and guidance that can help companies and financial institutions on the journey to assess, manage and report their nature-related risks and opportunities. Companies that apply this guidance will not only increase resilience in their value chains, they will also get an early start on meeting growing stakeholder expectations around restoring and conserving biodiversity and potential future regulatory requirements aligned with Target 15 of the GBF. Examples include:

- The Taskforce on Nature-related Financial Disclosures (TNFD) framework offers end-to-end guidance for companies, from making an initial assessment of their dependencies on nature, through to developing a strategy and organization to manage the relevant risks and opportunities, and finally for reporting on all of these in a format based on the structure of the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) that is familiar to investors (see Box 15).
- Companies can use the Science Based Targets Network's (SBTN) interim targets to set their nature-related ambition using key metrics (see Box 16).
- Business for Nature, a global coalition of businesses and conservation organizations, has created a series of "high-level business actions on nature" based on its ACT-D framework. This framework builds on a range of existing guidance (see Box 17).
- The Accountability Framework Initiative (AFI) provides guidance to help companies establish or support ethical supply chains, with a particular focus on ecosystem conversion and human rights in agricultural and forestry product supply chains.
- The Partnership for Biodiversity Accounting Financials (PBAF) provides financial institutions with practical guidance on assessing and disclosing the biodiversity impacts and dependencies of their loan and investment portfolios.
- The Natural Capital Protocol provides a framework for companies to identify, measure and value their direct and indirect impacts and dependencies on natural capital. It helps identify significant risks and opportunities that may be hidden in supply chains.



↑ Møns Klint nature reserve facing the Baltic Sea on the Danish island Møn.

4.2 Tools to zero-in on specific sites and sectors

Understanding a company's biodiversity- and nature-related dependencies and impacts requires biodiversity information related to the specific locations of its value chain and an understanding of how its activities interface with ecosystems. Some tools to help assemble the right data include:

- The Integrated Biodiversity Assessment Tool (IBAT), which provides site-specific information on proximate threatened species and critical habitats
- The ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure) tool, which captures the natural capital dependencies and impacts of various industries and sub-industries, and can be particularly useful in helping financial institutions understand biodiversity- and nature-related exposures in their portfolios

BOX 15 The Taskforce on Nature-related Financial Disclosures (TNFD) framework[235]

The TNFD was established in 2021 in response to a growing appreciation of the need to factor nature into financial and business decisions. The TNFD framework, beta versions of which have been published in 2022, provides a risk management and disclosure framework for organizations to report and act on evolving nature-related risks and opportunities. Its ultimate aim is to support a shift in global financial flows away from nature-negative outcomes and towards nature-positive outcomes.

The framework is intended for use globally by corporates and financial institutions of all sizes. It builds on the TCFD reporting structure (i.e. governance, risk management, strategy, metrics and targets), but focuses on ensuring that nature-related dependencies, impacts, risks and opportunities are effectively understood and communicated by corporates to the financial community. It also provides guidance to financial institutions to conduct corresponding assessments and reporting on their lending and investment portfolios.

As a complement to its reporting framework, the TNFD provides a prototype integrated assessment process for nature-related risk and opportunity management called LEAP, based on the following high-level steps:

- **L**ocate your interface with nature
- **E**valuate your dependencies and impacts
- **A**ssess your risks and opportunities
- **P**repare to respond to nature-related risks and opportunities and report

The TNFD will continue releasing beta versions of its framework, with the launch of a final version anticipated in September 2023.

FIGURE 8 | **TNFD's LEAP approach for corporates**

Locate

L1
Business footprint

Where are our direct assets and operations, and our related value chain (upstream and downstream) activities?

L2
Nature interface

Which biomes and ecosystems do these activities interface with?

What is the current integrity and importance of the ecosystems at each location?

L3
Priority location identification

At **which** locations is our organization interfacing with ecosystems assessed as being low integrity, high biodiversity importance and/or areas of water stress?

L4
Sector identification

What sectors, business units, value chains or asset classes are interfacing with nature in these priority locations?

Evaluate

E1
ID of relevant environmental assets and ecosystem services

What are our business processes and activities at each priority location? What environmental assets and ecosystem services do we have a dependency or impact on at each priority location?

E2
ID of dependencies and impacts

What are our nature-related dependencies and impacts across our business at each priority location?

E3
Dependency analysis

What is the size and scale of our dependencies on nature in each priority location?

E4
Impact analysis

What is the size and scale of our nature impacts in each priority location?

Assess

A1
Risk and opportunity ID

What are the corresponding risks and opportunities for our business?

A2
Existing risks mitigation and risk and opportunity management

What existing risk mitigation and risk and opportunity management approaches are we already applying?

A3
Additional risk mitigation and risk and opportunity management

What additional risk mitigation and risk and opportunity management actions should we consider?

A4
Risk and opportunity materiality assessment

Which risks and opportunities are material and should be disclosed in line with the TNFD disclosure recommendations?

Prepare

Strategy and resource allocation

P1
Strategy and resource allocation

What strategy and resource allocation decisions should be made as a result of this analysis?

P2
Performance measurement

How will we set targets and define and measure progress?

Disclosure actions

P3
Reporting

What will we disclose in line with the TNFD disclosure recommendations?

P4
Presentation

Where and how do we present our nature-related disclosures?

Stakeholder engagement (in line with the TNFD Disclosure Recommendations)

Review and repeat

Source: TNFD, The TNFD Nature-related Risk and Opportunity Management and Disclosure Framework Beta v0.3, November 2022.

BOX 16 | **Science-based targets for nature**

Science-based targets (SBTs) are defined as measurable, actionable and time-bound objectives, based on the best available science. They allow actors to align with Earth's limits and society's sustainability goals,[236] such as the goals set forward by the UN Framework Convention on Climate Change, the UN Convention on Biological Diversity, the UN Convention to Combat Desertification and the Sustainable Development Goals (SDGs).

The Science Based Targets Network (SBTN) is expected to publish its SBTs for nature in early 2023, but they have issued interim targets that companies can use today, which can be accessed here.[237]

TABLE 4 | **Summary of SBTN's interim science-based targets for nature**

Action	Interim target
Avoid	**Zero deforestation** from 2020 in all corporate supply chains
	Zero conversion of all natural habitats (land, freshwater, marine) from 2020
	Zero conversion of all areas that meet the criteria of Key Biodiversity Areas (KBAs) and High Conservation Value (HCV) areas (including High Carbon Stock (HCS) or Irrecoverable Carbon Areas) from 2020 in all corporate supply chains
	Exceptionally, for specific extractive sector projects: **No net loss of non-forest natural habitats** across all realms (land, freshwater, marine) from 2020, and net gain by 2030
Reduce and regenerate	Ensure that in **working lands** supplying your value chain(s), at least X% natural or semi-natural habitat is **retained and/or regenerated**, per km^2, from 2020 (X should be at least 10-20%, determined by national regulations)
	By 2030, **reduce water withdrawals** in high water impact parts of your value chain(s) by X% in line with environmental flow needs. (Locally dependent, following CEO Water Mandate Site Water Targets Informed by Catchment-Context)
	By 2030, **reduce** water quality pressures in high impact parts of your value chain by X% to align with good ambient water quality. (Locally dependent, following CEO Water Mandate Site Water Targets Informed by Catchment-Context)
	By 2030, **reduce value chain GHG emissions** by 50%, and by 90-95% further by 2050, in accordance with sectoral ambitions
	In addition to emissions reductions: – For forestry-related companies, **increase carbon removals** to a level that exceeds their emissions by 2030 – For all other AFOLU-related companies (agriculture, forestry and other land use), **increase carbon removals** in line with the global carbon removal goal of 4.7 $GtCO_2e$ by 2030
Restore	**Increase area under restoration** in all ecosystems (land, freshwater, marine) in your area of influence. (Note: SBTN is still determining sufficient interim target levels)
Transform	Take actions contributing to system-wide change, notably to **alter the drivers of nature loss**, e.g. through technological, economic, institutional, and social factors and changes in underlying values and behaviours

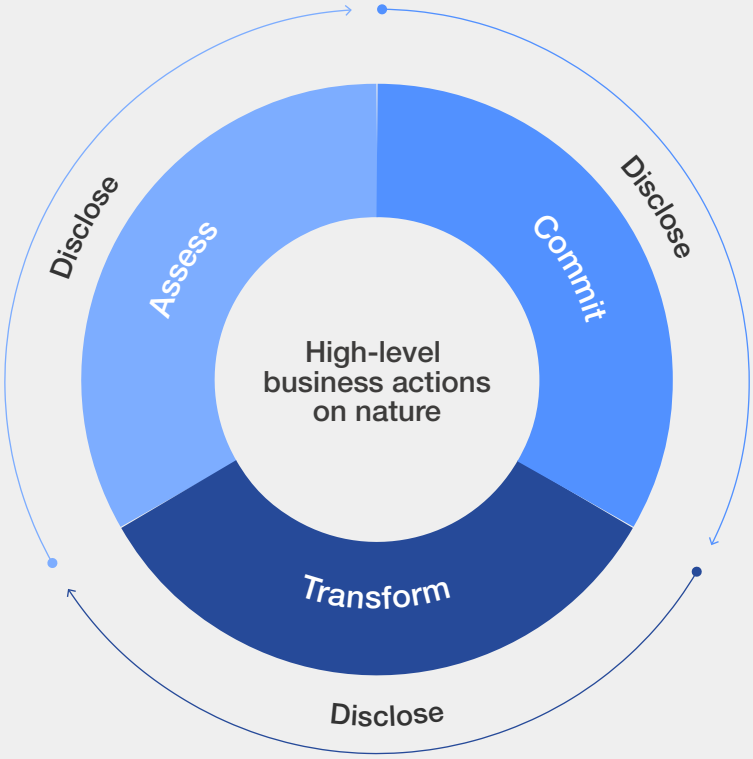
Source: SBTN, SBTN Interim Targets.

BOX 17 | **Business for Nature's ACT-D framework of high-level business actions on nature**

The ACT-D framework proposes four key activities:

- **Assess**: Conduct an initial materiality assessment to prioritize efforts across the production and consumption value chain – from the extraction of raw materials to post-consumer waste
- **Commit**: Measure your baseline impacts and set measurable targets across priority locations for how much you will reduce your impact and contribute positively by restoring ecosystems, including land, fresh water and oceans
- **Transform**: Adapt your company strategy and business model to "give back more than you take", by restoring ecosystems with collective, measurable, reported and verified positive impacts, while also ensuring your negative impact is as small as possible
- **Disclose**: Align reporting on biodiversity impacts and dependencies with existing reporting standards (e.g. GRI, SASB, EU Non-Financial Reporting Directive etc.), and monitor and report progress on science-based nature commitments

FIGURE 9 | **Business for Nature's ACT-D framework**



Assess

Measure, value and prioritize your impacts and dependencies on nature to ensure you are acting on the most material ones.

Commit

Set science-based targets to put your company on the right track towards operating within the Earth's limits.

Transform

Avoid and reduce negative impacts, restore and regenerate, collaborate across land and seascapes, shift business strategy and models, and advocate for policy ambition.

Source: Business for Nature, High-level Business Actions on Nature

Conclusion

Business has an essential role to play

Humanity is facing a crisis in nature, involving an accelerating decline in biodiversity and a warming climate. The impact on society, including our economies, health, food security and quality of life is growing more evident by the day, with lives and livelihoods threatened by pandemics, floods, droughts, wildfires, heat waves and storms.

"Nature-positive" is a succinct societal goal that calls for zero net loss of nature from 2020, a net increase by 2030 and full recovery by 2050, in alignment with the GBF.[238]

Biodiversity loss and climate change are inextricably linked and mutually reinforcing. At the same time, the people most vulnerable to severe weather events and climate- and biodiversity-related risks are often the least equipped to protect themselves. The overarching goal of "an equitable, nature-positive, carbon-neutral world" recognizes that an integrated approach will be required to fulfil the UN's Sustainable Development Goals (SDGs), the objectives of the Paris Agreement on climate and the mission of the GBF – and that none of these are achievable without the others.[239]

An integrated, whole-of-society approach is needed to realize this goal of an equitable, nature-positive and carbon-neutral world. Business has a critical and irreplaceable role to play in delivering innovation, investment and business models that will improve quality of life, achieve sustainable prosperity and ensure that our planet remains hospitable to human life.

The time for corporate action on biodiversity is now

Ultimately, all companies will be impacted by and required to act on climate change and biodiversity loss. With over half the world's economy dependent on nature, the cost is simply too high to ignore.

Sixty-three per cent of Fortune 500 companies[240] have made a significant climate commitment,[241] but most are just beginning their journey towards halting and reversing biodiversity loss. Of the 2021 Global Fortune 100 companies, 61 mention biodiversity in their corporate reports and 46 have some form of biodiversity commitment. But only nine have made SMART (specific, measurable, accepted, realistic and time-bound) commitments.[242]

Companies should take action based on the available guidance (outlined in Chapter Four) to assess their value chain dependencies and impacts on nature, and manage and report on their nature-related risks and opportunities. Such action will increase resilience while preparing for growing stakeholder expectations and regulatory requirements related to Target 15.

While individual companies must take the initiative in their own supply chains, regulatory measures can strengthen efforts to protect biodiversity by extending requirements horizontally across sectors, thus reducing leakage and free-rider[243] problems that can occur when some, but not all, companies internalize[244] the cost of protecting public goods such as ecosystem services. Business leaders can do their part by advocating for bold government action and by engaging in pre-competitive or landscape-level stakeholder initiatives to support ecosystem restoration and conservation.

Companies that seize the opportunity to adopt nature-positive strategies will build stakeholder confidence and better manage growing regulatory risks. The GBF will help level the playing field for companies that are already taking actions and will create growing transition risks for those that do not.

Annexes

A1 Ecosystem services

UN System of Environmental-Economic Accounting's list of ecosystem services		
Regulating and maintenance services	Global climate regulation	
	Rainfall pattern regulation	
	Local climate regulation	
	Air filtration	
	Soil quality regulation	
	Soil/sediment retention	– Retention and breakdown of nutrients – Retention and breakdown of other pollutants
	Solid waste remediation services	
	Water purification	– Retention/breakdown of nutrients – Retention/breakdown of other pollutants
	Water flow regulation	– Baseline flow maintenance – Peak flow mitigation
	Flood control	– Coastal protection – River flood mitigation
	Storm mitigation	
	Noise attenuation	
	Pollination services	
	Biological control	– Pest control – Disease control
	Nursery population and habitat maintenance	
	Other regulating and maintenance	
Provisioning services	Biomass	– Crops – Grazed biomass – Livestock – Aquaculture – Wood – Wild fish and other aquatic biomass – Wild animals, plants and other biomass
	Genetic material	
	Water supply	
	Other provisioning	
Cultural services	Recreation-related	
	Visual amenities	
	Education, scientific and research	
	Spiritual, artistic and symbolic	
	Other cultural services	
Flows related to non-use values	Ecosystem and species appreciation	

Source: UN, System of Environmental-Economic Accounting – Ecosystem Accounting (SEEA EA), September 2021.

Note: TNFD aligns with this UN SEEA Ecosystem Accounts list of ecosystem services.[245]

A2 Nature-related physical, transition and systemic risks

Physical risk

Acute risk

E.g. natural disasters exacerbated by loss of protection from coastal ecosystems (coral reefs, mangroves, wetlands etc.), leading to increased damage from storms and floods

Chronic

E.g. loss of crop yields due to decline in pollination services, drought, soil salination

Transition risk

Policy and legal

Introduction of new regulations or policies, e.g. new water quality requirements or increased land/marine area protections

Market

Shifting supply, demand and financing conditions due to e.g. changing consumer or investor preferences

Technology

Substitution of products or services with alternatives that result in a lower impact on natural capital or lower dependence on ecosystem services

Reputation

Changing societal, customer or community perceptions as a result of an organization's role in nature loss

Systemic risk

Ecosystem collapse

Risk that a critical natural system no longer functions, e.g. tipping points are reached and the natural ecosystem collapses, resulting in wholesale geographic or sectoral losses

Aggregated risk

Linked to fundamental impacts of nature loss on levels of transition and physical risk across one or more sectors in a financial or corporate portfolio

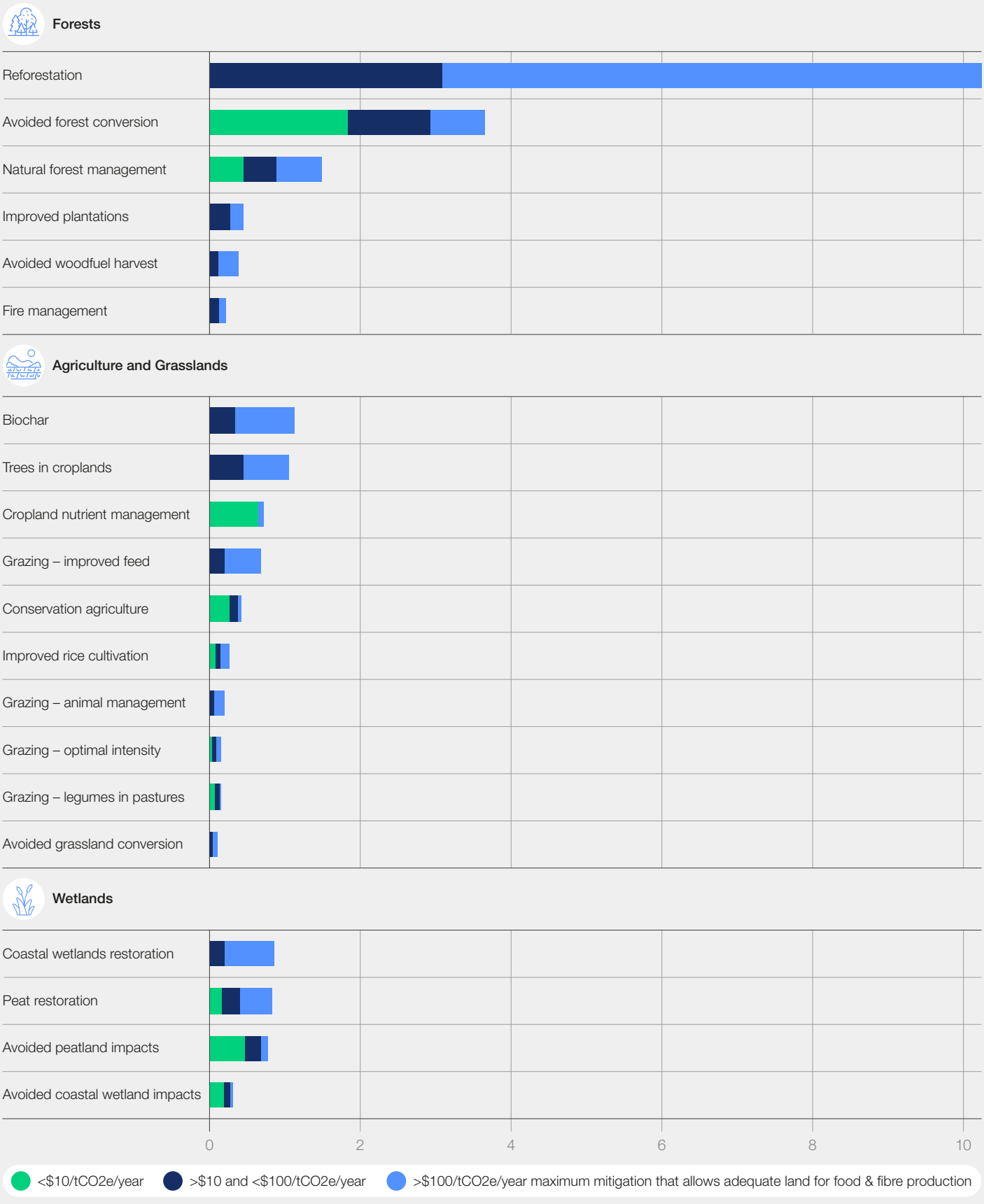
Contagion

Risk that financial difficulties at one or more financial institutions, linked to unmanaged exposure to nature-related risks, spill over to the financial system as a whole

Source: Adapted from TNFD, The TNFD Nature-related Risk & Opportunity Management and Disclosure Framework, Beta v0.1 Release, March 2022.

A3 Climate mitigation potential of nature-based solutions

Estimated 2030 climate change mitigation potential of nature-based solutions ($GtCO_2e$/year)[246]



Source: Griscom et al., Natural climate solutions, 2017.

Contributors

World Economic Forum

Chunquan Zhu
Head, China Nature Initiatives

Akanksha Khatri
Head, Nature and Biodiversity

Yuan Zhang
China Specialist, Tropical Forest Alliance

Xinqing Lu
Community Lead, Champions for Nature

Susan Hu
Specialist, Nature Action Agenda

PwC China

Amy Cai
Managing Partner, ESG, PwC China

Ni Qing
ESG Markets Leader, PwC China

Callum Douglas
Corporate Sustainability Leader, PwC China

Brian Marterer
Senior Manager, ESG, PwC China

Crystal Zhang
Associate Director, ESG, PwC China

Acknowledgements

The project team highly appreciates in-depth contributions and support from Business for Nature, and from the following individuals:

Christine Black
Special Adviser, Government and Stakeholder Relations, The Coca-Cola Company

Bianca Brasil
Program Manager, Business Engagement, United Nations Convention on Biological Diversity

Dan O'Brien
Partner, Sustainability and Climate Change, PwC Canada

Zoe Carton
Group Affairs, Natura & Co.

Patricia Chu
Managing Director, Mana Impact

Emma Cox
Global Climate Leader, PwC UK

Gill Einhorn
Head of Innovation and Transformation, World Economic Forum

William Evison
Global Director, Climate and Nature Strategy, PwC UK

Basile van Havre
Co-Chair of the post-2020 Global Biodiversity Framework

Rebecca Ivey
Head of Platforms and Impact, World Economic Forum

Pengyu Li
China Specialist, Tropical Forest Alliance, World Economic Forum

Elizabeth Mrema
Executive Secretary, United Nations Convention on Biological Diversity

Maelle Pelisson
Advocacy Director, Business for Nature

Renata Pollini
Head, Nature, Holcim

Geraldine Vallejo
Sustainability Programme Director, Kering Group

Xi Xie
Project Lead, Friends of Ocean Action, World Economic Forum

Eva Zabey
Executive Director, Business for Nature

Editing and Design

Jonathan Walter
Editor

Laurence Denmark
Designer, Studio Miko

Endnotes

1. World Economic Forum, Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy, January 2020.
2. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2019.
3. World Economic Forum, The Future of Nature and Business, July 2020.
4. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2019.
5. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), Media Release: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating', 6 May 2019.
6. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2019.
7. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2019.
8. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), Media Release: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating', 6 May 2019.
9. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2019.
10. World Economic Forum, The Global Risks Report 2022, January 2022.
11. World Economic Forum, Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy, January 2020.
12. World Economic Forum, The Future of Nature and Business, July 2020.
13. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2019, p.12.
14. United Nations Environment Programme Convention on Biological Diversity (UNEP CBD), Kunming-Montreal Global biodiversity framework, 18 December 2022.
15. Central Banks and Supervisors' Network for Greening the Financial System (NGFS) and International Network for Sustainable Financial Policy Insights, Research, and Exchange (INSPIRE), Biodiversity and financial stability – exploring the case for action, March 2021.
16. Taskforce on Nature-related Financial Disclosures (TNFD), The TNFD Nature-related Risk & Opportunity Management and Disclosure Framework Beta v0.1 Release, March 2022.
17. Taskforce on Nature-related Financial Disclosures (TNFD), The TNFD Nature-related Risk & Opportunity Management and Disclosure Framework Beta v0.1 Release, March 2022.
18. United Nations Convention on Biological Diversity (UN CBD), One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework, 6 August 2021.
19. International Union for Conservation of Nature (IUCN), Biodiversity management in the cement and aggregates sector: Biodiversity Indicator and Reporting System (BIRS), 2014.
20. Holcim, Biodiversity.
21. International Union for Conservation of Nature (IUCN), The IUCN Red List of Threatened Species.
22. Lammerant, Johan, Business and Natural Capital Accounting Study: Quarry restoration by Holcim – Spain, United Nations Statistics Division, Department of Economic and Social Affairs, 2021.
23. Holcim, Biodiversity; email correspondence with Holcim, October 2022.
24. Science Based Targets initiative, Companies Taking Action.
25. Holcim, Water.
26. Holcim, Integrated Profit & Loss Statement 2021, April 2022.
27. Holcim, Biodiversity; email correspondence with Holcim, October 2022.
28. Kering, Biodiversity Strategy: Bending the Curve on Biodiversity Loss, July 2020.

29. Kering, Climate Strategy 2021.
30. UN REDD+ is defined as "reducing emissions from deforestation and forest degradation in developing countries, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks"; it is a climate change mitigation approach developed by the Parties to the United Nations Framework Convention on Climate Change (UNFCCC). Source: UN-REDD Programme, Fact Sheet, 2021.
31. Science Based Targets initiative, Companies Taking Action.
32. University of Cambridge Institute for Sustainability Leadership, Measuring Business Impacts on Nature, 2020.
33. Southey, F., Soy major Amaggi talks monitoring deforestation, the cost of sustainability, and whether collaboration really is a 'silver bullet', Food Navigator, 7 June 2022.
34. Amaggi, Sustainability Report 2020, August 2021.
35. Global Canopy, Forest 500 Company Rankings, (Assessment year 2021).
36. Amaggi, Amaggi ESG Report 2021, 2022.
37. Amaggi, 2021 Progress Report.
38. Amaggi, Sustainability Bond Report 2019, 2020, 2021.
39. Amaggi, 2021 Progress Report.
40. Amaggi, Sustainability Bond Framework December 2020, 2021.
41. Science Based Targets initiative, Companies Taking Action.
42. Amaggi, Amaggi ESG Report 2021, 2022.
43. United Nations, UN Report: Nature's Dangerous Decline 'Unprecedented', Species Extinction Rate 'Accelerating, 6 May 2019.
44. United Nations Convention on Biological Diversity (UN CBD), One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework, 6 August 2021.
45. Assumes linear growth in the value of agricultural production demand between 2012 and 2030 in the business-as-usual (BAU) scenario of the Food and Agriculture Organization of the United Nations (FAO). Source: FAO, The Future of Food and Agriculture: Alternative Pathways to 2050, 2018.
46. 1) United States Geological Survey (USGS), Coral Reefs are Critical for Risk Reduction & Adaptation, 13 May 2014.
    2) Ferrario et al., The effectiveness of coral reefs for coastal hazard risk reduction and adaptation, Nature Communications, 13 May 2014.
47. Beck et al., Return on Investment for Mangrove and Reef Flood Protection, Ecosystem Services, August 2022, Volume 56.
48. 1) United States Geological Survey (USGS), Coral Reefs are Critical for Risk Reduction & Adaptation, 13 May 2014.
    2) Ferrario et al., The effectiveness of coral reefs for coastal hazard risk reduction and adaptation, Nature Communications, 13 May 2014.
49. United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) & International Union for Conservation of Nature (IUCN), Protected Planet Report 2020, May 2021.
50. International Union for Conservation of Nature (IUCN), Guidelines for Applying Protected Area Management Categories, 2008.
51. International Union for Conservation of Nature (IUCN), Other Effective Area-based Conservation Measures (OECMs) Specialist Group.
52. Costanza et al., The global value of coastal wetlands for storm protection, Global Environmental Change, September 2021, Volume 70.
53. Costanza et al., The global value of coastal wetlands for storm protection, Global Environmental Change, September 2021, Volume 70.
54. Waldron et al., Protecting 30% of the planet for nature: costs, benefits and economic implications, 2020.
55. World Economic Forum, The Future of Nature and Business, July 2020.
56. Estimated additional revenue potentials based on differences between Global Deal for Nature (GDN) scenario and REF (no PA expansion) scenario; Waldron et al., Protecting 30% of the planet for nature: costs, benefits and economic implications, 2020.
57. Waldron et al., Protecting 30% of the planet for nature: costs, benefits and economic implications, 2020.
58. Waldron et al., Protecting 30% of the planet for nature: costs, benefits and economic implications, 2020.
59. Waldron et al., Protecting 30% of the planet for nature: costs, benefits and economic implications, 2020.
60. Cannon, J., Mountain gorilla census reveals further increase in numbers, Mongabay, 17 December 2019.
61. International Union for Conservation of Nature (IUCN), Fin Whale, Mountain Gorilla recovering thanks to conservation action – IUCN Red List, 14 November 2018.
62. Sadler, R., Uganda: Save Kafuga Forest and gorillas from tea plantations, The Ecologist, 27 January 2016.
63. International Gorilla Conservation Programme (IGCP), Tourism.
64. Fitzgerald, K., Mountain gorilla tourism drives economic growth and conservation, African Wildlife Foundation.

65. International Gorilla Conservation Programme (IGCP), Tourism.

66. United Nations Convention on Biological Diversity (UN CBD), One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework, 6 August 2021.

67. United Nations Convention on Biological Diversity (UN CBD), One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework, 6 August 2021.

68. Food and Agriculture Organization of the United Nations (FAO), Towards Blue Transformation: A vision for transforming aquatic food systems.

69. Worldwide Fund for Nature (WWF), Halve Humanity's Footprint on Nature to Safeguard our Future, August 2021.

70. World Wildlife Fund (WWF), Reducing Zoonotic Disease Risk from Wildlife Trade.

71. Food and Agriculture Organization of the United Nations (FAO), Towards Blue Transformation: A vision for transforming aquatic food systems.

72. The Pew Charitable Trusts, Ending Harmful Subsidies Could Increase Amount of Fish in the Ocean, Research Shows, 7 June 2021.

73. The Pew Charitable Trusts, Ending Harmful Subsidies Could Increase Amount of Fish in the Ocean, Research Shows, 7 June 2021.

74. Wild Planet, Wild Planet Tuna Procurement Policy, January 2022.

75. Bycatch is "the unwanted fish and other marine creatures trapped by commercial fishing nets during fishing for a different species" and often thrown back into the sea dead. Source: Oxford Languages. See also: WWF Bycatch Overview.

76. 1) Greenpeace, 2017 Tuna Shopping Guide, 2017.

    2) Seafood Source, Greenpeace Ranks the Best – and Worst – Canned Tuna Choices for American Consumers, 19 April 2017.

    3) Greenpeace, 2015 Tuna Shopping Guide, 2015.

77. United Nations Convention on Biological Diversity (UN CBD), One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework, 6 August 2021.

78. United Nations Convention on Biological Diversity (UN CBD), One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework, 6 August 2021.

79. United Nations, UN Report: Nature's Dangerous Decline 'Unprecedented', Species Extinction Rate 'Accelerating, 6 May 2019.

80. 1) Essl et al., The Convention on Biological Diversity (CBD)'s Post-2020 target on invasive alien species – what should it include and how should it be monitored?, NeoBiota, 15 October 2020.

    2) Seebens et al., No saturation in the accumulation of alien species worldwide, Nature Communications, 15 February 2017.

81. Diagne et al., High and rising economic costs of biological invasions worldwide, Nature, 31 March 2021.

82. Bradshaw et al., Massive yet grossly underestimated global costs of invasive insects, Nature Communications, 4 October 2016.

83. United Nations Convention on Biological Diversity (UN CBD), Invasive Alien Species: What Needs to be Done?, 2 July 2008.

84. United Nations Convention on Biological Diversity (UN CBD), Pathways of Introduction of Invasive Species, their Prioritization and Management, 26 June, 2014.

85. Hulme, P., Advancing One Biosecurity to Address the Pandemic Risks of Biological Invasions, BioScience, July 2021.

86. Hulme, P., Invasion pathways at a crossroad: policy and research challenges for managing alien species introductions, Journal of Applied Ecology, 20 May 2015.

87. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2019.

88. United Nation World Water Assessment Programme (UN WWAP), The United Nations world water development report 2017. Wastewater: the untapped resource, 2017.

89. GICS is the Global Industry Classification Standard, an industry taxonomy that categorizes all companies by sector and industry.

90. Eutrophication is the process by which a body of water becomes enriched with dissolved nutrients (e.g. nitrogen and phosphorus) that stimulate the growth of aquatic plant life, usually resulting in the depletion of dissolved oxygen. Source: Merriam-Webster.

91. PFAs are per- and polyfluoroalkyl substances. They are widely used, long-lasting chemicals, components of which break down very slowly over time. They may be linked to harmful health effects in humans and animals. PFOA (perfluorooctanoic acid) is a subset of PFAs. Source: US Environmental Protection Agency.

92. United Nations Environment Programme (UNEP), Environmental and Health Impacts of Pesticides and Fertilizers and ways of minimizing them: Summary for Policymakers, January 2021.

93. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), IPBES Global Assessment Report on Biodiversity and Ecosystem Services, 2019.
94. United Nations Environment Programme (UNEP), Environmental and Health Impacts of Pesticides and Fertilizers and ways of minimizing them: Summary for Policymakers, January 2021.
95. United Nations, UN Report: Nature's Dangerous Decline 'Unprecedented', Species Extinction Rate 'Accelerating', 6 May 2019.
96. United Nations, UN Report: Nature's Dangerous Decline 'Unprecedented', Species Extinction Rate 'Accelerating', 6 May 2019.
97. Food and Agriculture Organization of the United Nations (FAO), Water Pollution from Agriculture: a Global Review – Executive Summary, 2017.
98. Watershed Agricultural Council, Guide to Nutrient Management Planning.
99. Kelley, T., Watershed Deal Calls for City to Act, but Saves it Billions, New York Times, 26 November 2002.
100. Watershed Agricultural Council, Nutrient Management.
101. Pure Catskills, Supporting Working Landscapes in the Catskills.
102. Möhring et al., Pathways for advancing pesticide policies, Nature Food, 15 September 2020.
103. United Nations Environment Programme (UNEP), Environmental and Health Impacts of Pesticides and Fertilizers and ways of minimizing them: Summary for Policymakers, January 2021.
104. United Nations Environment Programme (UNEP), Environmental and Health Impacts of Pesticides and Fertilizers and ways of minimizing them: Summary for Policymakers, January 2021.
105. Science News, Economic Value of Insect Pollination Worldwide Estimated at $217 billion, 15 September 2008.
106. United Nations Environment Programme (UNEP), Environmental and Health Impacts of Pesticides and Fertilizers and ways of minimizing them: Summary for Policymakers, January 2021.
107. Möhring et al., Pesticide-free but not organic: Adoption of a large-scale wheat production standard in Switzerland, Food Policy, January 2022.
108. United Nations, UN Report: Nature's Dangerous Decline 'Unprecedented', Species Extinction Rate 'Accelerating', 6 May 2019.
109. Reddy et al., Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution, The Pew Charitable Trusts and SYSTEMIQ, 23 July 2020.
110. United Nations Convention on Biological Diversity (UN CBD), One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework, 6 August 2021.
111. Reddy et al., Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution, The Pew Charitable Trusts and SYSTEMIQ, 23 July 2020.
112. Reddy et al., Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution, The Pew Charitable Trusts and SYSTEMIQ, 23 July 2020.
113. European Union (EU), EU Directive 2018/852 on Packaging and Packaging Waste, 30 May 2018.
114. Ellen MacArthur Foundation, Extended Producer Responsibility – A Necessary Part of the Solution to Packaging Waste and Pollution.
115. Reddy et al., Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution, The Pew Charitable Trusts and SYSTEMIQ, 23 July 2020.
116. As You Sow, 2021 Corporate Plastic Pollution Scorecard, September 2021.
117. Coca-Cola, 2021 World Without Waste Report, June 2022.
118. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)- Intergovernmental Panel on Climate Change (IPCC) Co-Sponsored Workshop, Biodiversity and Climate Change Workshop Report, 2021.
119. United Nations Convention on Biological Diversity (UN CBD), One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework, 6 August 2021.
120. United Nations Convention on Biological Diversity (UN CBD), One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework, 6 August 2021.
121. Center for International Forestry Research (CIFOR) Forest News, Land Use Change Has a Big Impact on the Carbon Stored in Mangroves, 10 February 2020.
122. Center for International Forestry Research (CIFOR) Forest News, Land Use Change Has a Big Impact on the Carbon Stored in Mangroves, 10 February 2020.
123. Griscom et. al., Natural climate solutions, Proceedings of the National Academy of Sciences of the USA, 16 October 2017.
124. World Economic Forum, The Future of Nature and Business, 14 July 2020.
125. For the methodology behind the $85 billion estimate p. 16 ofAlphaBeta, Identifying Biodiversity Threats and Sizing Business Opportunities: Methodological Note to the New Nature Economy Report II: The Future of Nature and Business, 15 July 2020.

126. The Lowering Emissions by Accelerating Forest finance (LEAF) Coalition.
127. Emergent, Taking Action to Halt Tropical Deforestation with the LEAF Coalition, July 2022.
128. Emergent, Taking Action to Halt Tropical Deforestation with the LEAF Coalition, July 2022.
129. The Lowering Emissions by Accelerating Forest finance (LEAF) Coalition.
130. The Lowering Emissions by Accelerating Forest finance (LEAF) Coalition.
131. Architecture for REDD+ Transactions (ART) is an independent organisation that serves as the first global voluntary carbon programme that purely recognizes jurisdictionally created and guaranteed tropical forest reductions. ART is governed by an independent Board of Directors, the members of which represent a diverse group of objective, globally recognized experts. ART issues credits under The REDD+ Environmental Excellence Standard (TREES). Source: Emergent, FAQs.
132. Architecture for REDD+ Transaction (ART), LEAF Coalition Announces $1 Billion Mobilized, Intent for REDD+ Transactions and New Participants, 8 November 2021.
133. The Lowering Emissions by Accelerating Forest finance (LEAF) Coalition.
134. The Lowering Emissions by Accelerating Forest finance (LEAF) Coalition.
135. The Lowering Emissions by Accelerating Forest finance (LEAF) Coalition.
136. Emergent, Taking Action to Halt Tropical Deforestation with the Lowering Emissions by Accelerating Forest finance (LEAF) Coalition, July 2022.
137. Koplow and Steenblik, Protecting Nature by Reforming Environmentally Harmful Subsidies: The Role of Business, Earth Track, February 2022.
138. Koplow and Steenblik, Protecting Nature by Reforming Environmentally Harmful Subsidies: The Role of Business, Earth Track, February 2022.
139. United Nations Convention on Biological Diversity (UN CBD), One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework, 6 August 2021.
140. Koplow and Steenblik, Protecting Nature by Reforming Environmentally Harmful Subsidies: The Role of Business, Earth Track, February 2022.
141. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2019.
142. United Nations Convention on Biological Diversity (UN CBD), One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework, 6 August 2021.
143. 1) United Nations Convention on Biological Diversity (UN CBD), One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework, 6 August 2021.

    2) Deutz et al., Financing Nature: Closing the Global Biodiversity Financing Gap, The Paulson Institute, The Nature Conservancy, Cornell Atkinson Center for Sustainability, 2020.
144. Estimate based on average value of ranges provided for each category of funding needs and sources; Deutz, et al., Financing Nature: Closing the Global Biodiversity Financing Gap, The Paulson Institute, The Nature Conservancy, Cornell Atkinson Center for Sustainability, 2020.
145. 1) United Nations Convention on Biological Diversity (UN CBD), One-pagers on the goals and targets in the first draft of the Post-2020 Global Biodiversity Framework, 6 August 2021.

    2) Deutz et al., Financing Nature: Closing the Global Biodiversity Financing Gap, The Paulson Institute, The Nature Conservancy, Cornell Atkinson Center for Sustainability, 2020.
146. Worldwide Fund for Nature (WWF) et al., The State of Indigenous Peoples' and Local Communities' Lands and Territories, 2021.
147. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), IPBES Global Assessment Report on Biodiversity and Ecosystem Services, 2019.
148. Worldwide Fund for Nature (WWF) et al., The State of Indigenous Peoples' and Local Communities' Lands and Territories, 2021.
149. Worldwide Fund for Nature (WWF) et al., The State of Indigenous Peoples' and Local Communities' Lands and Territories, 2021.
150. Worldwide Fund for Nature (WWF) et al., The State of Indigenous Peoples' and Local Communities' Lands and Territories, 2021.
151. Food and Agriculture Organization of the United Nations (FAO), In Brief: State of the World's Forests 2020, 2020.
152. Natura Cosmeticos S/A, Natura & Co Communication on Progress 2022, 12 May 2022.
153. Natura, Natura Cosmeticos 2020 Annual Report, 2021.
154. Natura Cosmeticos S/A, Natura & Co Communication on Progress 2022, 12 May 2022.
155. Natura, Natura Cosmeticos 2020 Annual Report, 2021.
156. Email correspondence with Natura, October 2022.

157. Ellen MacArthur Foundation, Creating a Regenerative Economy in the Amazon Forest: Natura Brazil.
158. Natura Cosmeticos S/A, Natura & Co Communication on Progress 2022, 12 May 2022.
159. Natura Cosmeticos S/A, Communication on Progress, 20 December 2019.
160. Natura Cosmeticos S/A, Natura & Co Communication on Progress 2022, 12 May 2022.
161. Natura Cosmeticos S/A, Natura & Co Communication on Progress 2022, 12 May 2022.
162. Murdiyarso et al., Land use change has a big impact on the carbon stored in mangroves, Forests News, Center for International Forestry Research (CIFOR), 10 February 2020.
163. European Commission, Proposal for a Regulation of the European Parliament and of the Council on the Making Available on the Union Market as Well as Export from the Union of Certain Commodities and Products Associated with Deforeatation and Forest Degradation and Repealing (EU) No 995/2010, 17 November 2021.
164. European Commission, Directive of the European Parliament and of the Council on Corporate Sustainability Due Diligence and Amending Directive (EU) 2019/1937, 23 February 2022.
165. Forest Trends, Business and Biodiversity Offsets Programme (BBOP): Glossary, 2018.
166. International Union for Conservation of Nature (IUCN), Issues Brief – Biodiversity Offsets, September 2016.
167. International Union for Conservation of Nature (IUCN), Net Positive Impact on biodiversity: the conservation case, 2015.
168. Deutz et al., Financing Nature: Closing the Global Biodiversity Financing Gap, The Paulson Institute, The Nature Conservancy, Cornell Atkinson Center for Sustainability, 2020.
169. Ermgassen et al., The Role of "No Net Loss" Policies in Conserving Biodiversity Threatened by the Global Infrastructure Boom, One Earth, 22 November 2019.
170. Deutz et al., Financing Nature: Closing the Global Biodiversity Financing Gap, The Paulson Institute, The Nature Conservancy, Cornell Atkinson Center for Sustainability, 2020.
171. International Union for Conservation of Nature (IUCN), Net Positive Impact on biodiversity: the conservation case, 2015.
172. UK Local Government Association, Biodiversity Net Gain Now and in the Future, 2022.
173. UK Government, Biodiversity Metric: Calculate the Biodiversity Net Gain of a Project or Development, 7 July 2021.
174. UK Local Government Association, Biodiversity Net Gain Now and in the Future, 2022.
175. Natural England, Biodiversity Net Gain: An Introduction to the Benefits, March 2022.
176. Natural England, Biodiversity Net Gain: An Introduction to the Benefits, March 2022.
177. Government of the United Kingdom, Environment Act 2021.
178. Finance for Biodiversity, About the Pledge.
179. République Française, Légifrance, Article 29 - Loi no 2019-1147 de 8 novembre 2019 relative à l'énergie et au climat.
180. Taskforce on Nature-related Financial Disclosures (TNFD), France's Article 29: Biodiversity Disclosure Requirements Sign of what's to Come, 17 March 2021.
181. Svartzman et al., A "Silent Spring" for the Financial System? Exploring Biodiversity-related Financial Risks in France, Banque de France, August 2021.
182. Svartzman et al., A "Silent Spring" for the Financial System? Exploring Biodiversity-related Financial Risks in France, Banque de France, August 2021.
183. Central Banks and Supervisors' Network for Greening the Financial System (NGFS) and The International Network for Sustainable Financial Policy Insights, Research, and Exchange (INSPIRE) Joint Study Group on Biodiversity and Financial Stability, Biodiversity and financial stability: building the case for action, October 2021.
184. 'No Net Loss' is a goal for a development project, policy, plan or activity in which the impacts on biodiversity it causes are balanced or outweighed by measures taken to avoid and minimize the impacts, to restore affected areas and finally to offset the residual impacts, so that no loss remains. Where the gain exceeds the loss, the term 'Net Gain' may be used instead. No Net Loss or Biodiversity Net Gain must be defined relative to an appropriate reference scenario ('NNL of what compared with what?'). Source: https://www.forest-trends.org/bbop/bbop-key-concepts/no-net-loss-and-net-gain-of-biodiversity/.
185. Ermgassen et al., The Role of "No Net Loss" Policies in Conserving Biodiversity Threatened by the Global Infrastructure Boom, One Earth, 2019.
186. World Bank, The World Bank Environmental and Social Framework, 2017.
187. International Finance Corporation (IFC), Performance Standard 6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources, 1 January 2012.
188. Asian Infrastructure Investment Bank, Environmental and Social Framework, May 2021.
189. Inter-American Development Bank, Environmental and Social Policy Framework, 2020.
190. Himberg, H., Comparative Review of Multilateral Development Bank Safeguard Systems, World Bank, 2015.
191. Global Canopy, Forest 500 Financial Institutions Rankings, (Assessment year 2021).
192. BNP Paribas, BNP Paribas and the Preservation of Biodiversity, May 2021.
193. BNP Paribas, Natural Capital and Biodiversity.

194. BNP Paribas, Natural Capital and Biodiversity.
195. BNP Paribas, BNP Paribas and the Preservation of Biodiversity, May 2021.
196. BNP Paribas, Agriculture Sector Policy.
197. BNP Paribas, Sector Policy – Palm Oil, 2017.
198. BNP Paribas, Climate Analytics and Alignment Report, April 2022.
199. European Commission, A New Circular Economy Action Plan for a Cleaner and More Competitive Europe, 11 March 2020.
200. Ellen MacArthur Foundation, Extended Producer Responsibility – A necessary part of the solution to packaging waste and pollution, 2021.
201. June 2021 statement signed by more than 100 leading corporations, Ellen MacArthur Foundation, Extended Producer Responsibility – A necessary part of the solution to packaging waste and pollution, 2021.
202. Organization for Economic Cooperation and Development (OECD), Extended Producer Responsibility – Policy Highlights – Guidance for Efficient Waste Management, September 2016.
203. Organization for Economic Cooperation and Development (OECD), Extended Producer Responsibility – Policy Highlights – Guidance for Efficient Waste Management, September 2016.
204. Ellen MacArthur Foundation, Extended Producer Responsibility – A necessary part of the solution to packaging waste and pollution, 2021.
205. European Union (EU), EU Directive 2018/852 on Packaging and Packaging Waste, 30 May 2018.
206. European Union (EU), EU Directive 2019/904 on the Reduction of the Impact of Certain Plastic Products on the Environment, 5 June 2019.
207. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), Policy Instrument – Payment for Ecosystem Services.
208. Ecosystem Marketplace, Payments for Ecosystem Services.
209. World Economic Forum, Biodiversity Credits: Unlocking Financial Markets for Nature-Positive Outcomes, September 2022.
210. Porras and Steele, Making the market work for nature: How biocredits can protect biodiversity and reduce poverty, International Institute for Environment and Development (IIED), March 2020.
211. The National Foundation for Forestry Financing (FONAFIFO), Costa Rica Tropical Forests: A Motor for Green Growth, June 2012.
212. Organisation for Economic Co-operation and Development (OECD), OECD Economic Surveys: Costa Rica 2018, 17 April 2018.
213. The National Foundation for Forestry Financing (FONAFIFO), Ministry of the Environment, Energy and Telecommunications (MINAET), Costa Rica Tropical Forests: A Motor for Green Growth, June 2012.
214. Watson et al., Making space for better forestry: Costa Rica country study, International Institute for Environment and Development (IIED), 1998.
215. World Bank, Costa Rica: Forest Strategy and the Evolution of Land Use, 2000.
216. The National Foundation for Forestry Financing (FONAFIFO), Ministry of the Environment, Energy and Telecommunications (MINAET), Costa Rica Tropical Forests: A Motor for Green Growth, June 2012.
217. The National Foundation for Forestry Financing (FONAFIFO), Ministry of the Environment, Energy and Telecommunications (MINAET), Costa Rica Tropical Forests: A Motor for Green Growth, June 2012.
218. United Nations Framework Convention on Climate Change (UNFCC), Payments for Environmental Service Program | Costa Rica.
219. Green Climate Find, FP144 Costa Rica REDD-plus Results Based Payments for 2014 and 2015, 13 November 2020.
220. World Bank, Costa Rica and World Bank sign US$60 million agreement to boost emission reductions through forest conservation, 11 December 2020.
221. Emergent Climate, Leaf Coalition Mobilizes $1 Billion for Tropical Forest Conservation, 2 November 2021.
222. Food and Agriculture Organization of the United Nations (FAO), Global Symposium on Soil Erosion.
223. Food and Agriculture Organization of the United Nations (FAO), Global Symposium on Soil Erosion.
224. 1) Chesapeake Bay Foundation, Regenerative Agriculture's Top Eight Conservation Practices, 15 February 2022.
2) Food and Agriculture Organization of the United Nations (FAO), Introduction to Conservation Agriculture: Principles and Benefits, 2012.
225. Food and Agriculture Organization of the United Nations (FAO), Introduction to Conservation Agriculture: Principles and Benefits, 2012.
226. Food and Agriculture Organization of the United Nations (FAO), Introduction to Conservation Agriculture: Principles and Benefits, 2012.
227. The Center for Regenerative Agriculture and Resilient Systems, California State University, Chico, Livestock and Crop Integration.

228. Bertrand et al., The Climate and Economic Benefits of Rotational Livestock Grazing, Environmental and Energy Study Institute, 3 May 2022.

229. Elkin, E., Fertilizer Costs are Surging Again Just as US Farmers Look to Buy, Bloomberg UK, 2 September 2022.

230. Food and Agriculture Organization of the United Nations (FAO), Introduction to Conservation Agriculture: Principles and Benefits, 2012.

231. Olick, D., Farmers are making thousands of dollars from carbon credits through this climate start-up, Consumer News and Business Channel (CNBC), 11 July 2022.

232. Watershed Agricultural Council, Nutrient Management.

233. Möhring et al., Pesticide-free but not organic: Adoption of a large-scale wheat production standard in Switzerland, Food Policy, January 2022.

234. Danone, For a Regenerative Future, 2021.

235. Taskforce on Nature-related Financial Disclosures (TNFD), Homepage.

236. Science Based Targets Network, What are SBTs.

237. Science Based Targets Network, SBTN Interim Targets.

238. Locke et al., A Nature-Positive World, The Global Goal for Nature, 2021.

239. Locke et al., A Nature-Positive World, The Global Goal for Nature, 2021.

240. Climate Impact Partners, Imperial College Business School, If Not Now, When? How are companies stepping up with the urgency required to deliver climate impact, 2022.

241. "Major climate commitment" in this case refers to one or more of the following: Science Based Target, RE100, net zero or carbon neutrality.

242. Ermgassen et al., Are corporate biodiversity commitments consistent with delivering 'nature-positive' outcomes? A review of 'nature-positive' definitions, company progress and challenges. SocArXiv, 23 July 2022.

243. The free-rider problem is ubiquitous among public goods. It occurs when those who benefit from goods or services do not have to pay for the full social cost, leading to under-provision of those goods and services. Because many ecosystem services are public goods, they tend to be exposed to free-rider problems – often resulting in undersupply or under-provision. Source: Obeng et al., Payments for forest ecosystem services: a look at neglected existence values, the free-rider problem and beneficiaries' willingness to pay, International Forestry Review, 2018.

244. Cost internalization is the incorporation of negative external effects, notably environmental depletion and degradation, into the budgets of enterprises and households by means of economic instruments, including fiscal measures and other (dis)incentives. Source: Organization for Economic Cooperation and Development (OECD), Glossary of Statistical Terms, 25 September 2001.

245. Taskforce on Nature-related Financial Disclosures (TNFD), The TNFD Nature-related Risk & Opportunity Management and Disclosure Framework Beta v0.1 Release, March 2022.

246. Note: New estimates are continuously being developed based on new evidence and analyses, for example a 2020 study (Griscolm et al., National Mitigation Potential from Natural Climate Solutions in the Tropics, 2020) focused only on tropical forests and a 2019 study (Bastin et. al., The Global Tree Restoration Potential, 2019) examined the potential for forest restoration across the globe. The global estimates in the chart (from Griscolm et al., Natural Climate Solutions, 2017) are considered to be useful middle-ground estimates to understand the size of the global opportunity. Source: AlphaBeta, Identifying Biodiversity Threats and Sizing Business Opportunities: Methodological Note to the New Nature Economy Report II: The Future of Nature and Business, 15 July 2020, p.16.

WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

The World Economic Forum, committed to improving the state of the world, is the International Organization for Public-Private Cooperation.

The Forum engages the foremost political, business and other leaders of society to shape global, regional and industry agendas.

World Economic Forum
91–93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland

Tel.: +41 (0) 22 869 1212
Fax: +41 (0) 22 786 2744
contact@weforum.org
www.weforum.org