

## GS SUSTAIN

# Biodiversity: TNFD releases recommended disclosure metrics

**On March 28, the Taskforce on Nature-Related Financial Disclosures (TNFD) released its fourth beta framework to help improve nature-related information in corporate and investor reporting. This latest release, for the first time, proposes specific nature-related metrics for disclosure in order to establish reporting on biodiversity dependencies and potential impacts on nature from business activities, increase transparency related to risks and opportunities, and provide more granular detail for additional metrics that may apply to specific industries and types of ecosystems with high potential impacts.** In this report we break down changes to the overall framework and the new metric disclosure recommendations, discuss data availability and potential implications for corporate reporting, and highlight takeaways on how this development may influence the regulatory environment and investing in Biodiversity moving forward.

**We believe that while recommended metrics mark a turning point for corporate and investor transparency around biodiversity, they remain a first step. We think investors may increasingly adopt the TNFD's framework after the final version is released in September this year, which could lead to greater pressure on companies to enhance biodiversity-related reporting starting in 2024. In addition, we may see countries that participated in COP 15 looking to the TNFD to help implement Target 15 of the Global Biodiversity Framework on corporate disclosure of nature-related risks and impacts. Where companies have exposure to biodiversity-related risks, we expect increased disclosures will likely have implications for ESG flows, cost of capital and brand reputation in the next few years.**

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## PM's Summary

**The Taskforce on Nature-Related Financial Disclosures — a non-governmental organization supported by government and philanthropic funding — was announced in July 2020 to improve information on evolving nature-related risks through a comprehensive reporting framework and to ultimately encourage a shift in global financial flows towards nature-positive outcomes,** following the lead of the Taskforce on Climate-Related Financial Disclosures (TCFD). The recommendations of the TCFD have become the market- and regulator-preferred framework for assessing and disclosing climate-related financial risks, addressing Governance, Strategy, Risk Management, and Metrics & Targets.

**This fourth draft version of the framework for nature-related financial disclosures, released on March 28, proposes specific nature-related metrics for disclosure** in order to establish reporting on biodiversity dependencies and potential impacts on nature from business activities, increase transparency related to risks and opportunities, and provide more granular detail for four industries and biomes with high potential impacts, releasing metric-level detail for the Agriculture and Food sector and Tropical Forest biome as a first example. The beta framework is open for public commentary until June 1, 2023, at which point next steps include incorporating feedback into the existing framework, expanding sector- and biome-specific guidance, developing case studies and use cases to assist implementation efforts and considering guidance on transition plans for nature-positive goals and targets before the final framework is published in September 2023.

**Net nature positive** refers to strategies and activities where humans positively impact nature and allow for an increase in biodiversity headed towards full recovery of thriving nature (to levels before human-inflicted destruction).

**We believe that while metric-level recommendations from the TNFD mark a turning point for corporate and investor transparency around biodiversity, they remain a first step.** The Global Biodiversity Framework (GBF), agreed upon at the COP 15 conference on Biodiversity, established a set of global targets to conserve nature. The TNFD's recommended disclosures address some (but not all) of these goals, and additional work is required to establish baseline levels and performance required on these metrics in order to make positive contributions to nature. In order to understand how performance against these metrics impacts global performance towards both the Global Biodiversity Framework and works towards net nature positivity, each of the GBF's targets requires in depth analysis on where we stand today, what sectors and regions contribute most to damage and/or have the most potential for positive impact, and what performance thresholds on individual metrics need to be met at a company-level in order to reach the global targets.

**Voluntary reporting in line with the TNFD can begin later this year after the final version of the framework is released (expected September 2023). We think investors may increasingly adopt the TNFD's framework, which could lead to greater pressure on companies to enhance biodiversity reporting starting in 2024.** *Climate*-focused investors are already engaging corporates to request disclosures aligned to the Taskforce on *Climate*-related Financial Disclosures (TCFD), which we see reflected in corporate adoption rates of climate reporting. The CAGR between 2016 and

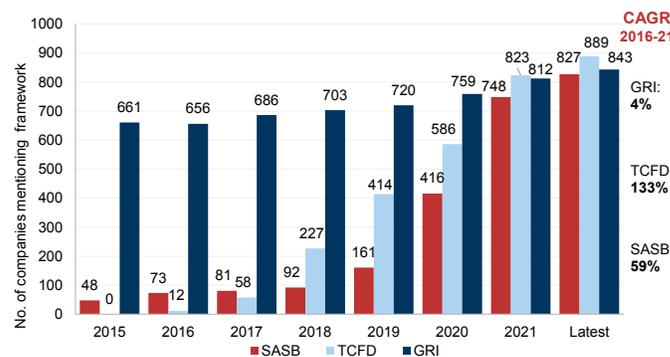
2021 for companies mentioning TCFD in annual reports and company filings was 133% (Exhibit 1). While TCFD reporting took around five years to become widely adopted, we expect the timeline for nature-related disclosures could be accelerated, given sustainability infrastructure already in place.

Regulatory support for the **TCFD** reporting framework also continues to accelerate, with G7 nations agreeing to introduce climate reporting mandates in line with the TCFD, the UK mandating climate reporting in line with TCFD recommendations, and the US proposing TCFD-aligned mandatory reporting for corporates in March of last year. We expect the SEC to prioritize moving forward on this climate reporting proposal this year, though they face potentially high hurdles. While the **TNFD**'s framework is not included in regulations and legislation today, we expect the path forward could follow a similar trend to the **TCFD**. Biodiversity disclosure mandates are recommended for large and transnational companies and financial institutions as part of the Global Biodiversity Framework's Target 15 (Exhibit 10), which upon publication of country-level national action plans for biodiversity could expand the impact of the framework and ultimately of investment implications.

**Where companies have exposure to biodiversity-related risks, we expect increased disclosures will likely have implications for ESG flows, cost of capital and brand reputation in the next few years.**

**Exhibit 1: Corporate adoption of TCFD and SASB matches mounting demand for investor-relevant ESG information**

Number of unique companies mentioning SASB, TCFD, GRI in annual reports and company filings within the S&P 1200



Source: Bloomberg , Data compiled by Goldman Sachs Global Investment Research

## TNFD Nature-Related Disclosure Recommendations

**The TNFD's beta framework seeks to assess risk against the same four pillars as the TCFD: (1) Governance; (2) Strategy; (3) Risk Management; and (4) Metrics and Targets.** The fourth beta was released last week for public commentary until June 1, 2023. Draft disclosure recommendations are outlined under each of the four pillars, with qualitative descriptions recommended under Governance, Strategy and Risk Management.

**The TNFD, in addition to its four-pillared approach to disclosures, has released a Nature Risk Assessment framework, LEAP, to help companies understand and respond to nature-related risks and opportunities.** This assessment process can support the disclosure recommendations and help inform decisions and strategies under the four pillars. The LEAP approach is defined as follows:

- **Locate** your interface with nature;
- **Evaluate** your dependencies and impacts;
- **Assess** your risks and opportunities; and
- **Prepare** to respond to nature-related risks and opportunities and report.

**Exhibit 2: TNFD draft disclosure recommendations and accompanying LEAP approach for corporates and financial institutions to assess nature-related risks and opportunities**

Governance	Risk & Impact Management
Disclose governance around nature-related dependencies, impacts, risks & opportunities.	Disclose how organization identifies, assesses and manages nature-related dependencies, impacts, risks and opportunities.
a) Describe <b>board's oversight</b> of nature-related dependencies, impacts, risks & opportunities.	a) (i) Describe processes for <b>identifying and assessing</b> nature-related dependencies, impacts, risks and opportunities <b>in direct operations</b> .
b) Describe <b>management's role in assessing and managing</b> nature-related dependencies, impacts, risks and opportunities	a) (ii) Describe approach to <b>identify</b> nature-related dependencies, impacts, risks & opportunities <b>in value chain and financed activities/assets</b> .
	b) Describe processes for <b>managing</b> nature-related dependencies, impacts, risks and opportunities, and <b>actions taken as a result</b> .
	c) Describe how identifying, assessing, and managing nature-related risks are <b>integrated into overall risk management</b> .
	d) Describe how <b>stakeholders are engaged</b> by organization in assessment of and response to nature-related dependencies, impacts, risks & opportunities.
Strategy	Metrics and Targets
Disclose actual and potential impacts of nature-related risks and opportunities on business, strategy and financial planning.	Disclose the metrics and targets used to assess and manage relevant nature-related dependencies, impacts, risks & opportunities.
a) <b>Describe nature-related dependencies, impacts, risks and opportunities</b> identified over the short, medium, and long term.	a) Disclose <b>metrics used to assess and manage nature-related risks and opportunities</b> in line with strategy and risk management process.
b) Describe nature-related risks and opportunities' <b>effects on businesses, strategy, and financial planning</b> .	b) Disclose <b>metrics used to assess and manage dependencies and impacts</b> on nature.
c) Describe the <b>resilience of the organization's strategy</b> , taking into consideration different scenarios.	c) Describe the <b>targets</b> used to manage nature-related dependencies, impacts, risks and opportunities and performance against targets.
d) Disclose <b>locations where there are assets/activities in value chain and/or financed</b> , in priority areas.	

**LEAP: for nature-related risks and opportunities assessment**

Locate	Evaluate	Assess	Prepare
<b>Business footprint:</b> Where are direct assets and operations and related value chain?	<b>ID of relevant environmental assets and ecosystem services:</b> What environmental assets and ecosystem services does company depend on or impact at each priority location?	<b>Risk and Opportunity ID:</b> What are corresponding risks & opportunities for business?	<b>Strategy &amp; resource allocation:</b> What strategy and resource allocation decisions should be made as a result of analysis?
<b>Nature interface:</b> With which biomes and ecosystems do activities interface? What is integrity and importance of ecosystems at each location?	<b>ID of dependencies and impacts:</b> What nature-related dependencies and impacts exist at each priority location?	<b>Existing risks mitigation &amp; management:</b> What existing risk mitigation and risk & opportunity mgmt approaches are already being applied?	<b>Performance measurement:</b> How will company set targets and define / measure progress?
<b>Priority location identification:</b> At which locations are ecosystems assessed as high integrity, rapidly declining integrity, high biodiversity importance, areas of water stress or areas with potential for significant dependencies/impacts?	<b>Dependency analysis:</b> What is the size and scale of dependencies on nature in each priority location?	<b>Additional risks mitigation &amp; management:</b> What additional risk mitigation and risk & opportunity mgmt actions should be considered?	<b>Reporting:</b> What will company disclose in line with TNFD disclosure recommendations?
<b>Sector identification:</b> What sectors, business units, value chains or asset classes are interfacing with nature at priority locations?	<b>Impact analysis:</b> What is size and scale of nature impacts in each priority location?	<b>Materiality assessment:</b> Which risks and opportunities are material & should be disclosed in line with TNFD disclosure recommendations?	<b>Presentation:</b> Where and how will company present their nature-related disclosures?

Source: TNFD

**Nature-related disclosures are in early days relative to Metrics and Targets related to climate change with likely years of fine-tuning in the search for consensus.** In earlier versions, the Metrics and Targets pillar asked companies to decide which metrics the organization uses to assess material nature-related risks and opportunities and the thought process behind those decisions, *without guidance to help understand what metrics are material to businesses and to accomplishing nature-related goals*. Further guidance on the Metrics and Targets pillar was published last week, providing for the first time, a mapping of core biodiversity-related metrics that the TNFD views as being likely material to all businesses.

**In this latest version, a few notable changes have been made to the main framework.** A ‘scoping phase’ is now included with updated guidance on how to identify initial areas of focus and initial scope for assessment, by identifying the type of organization, entry points, and type of analysis through guiding questions. These questions help determine the nature of the organization, primary functional units, products, activities and assets, location of direct operation and supply chains, understanding sectors and biomes covered through the value chain, and determining whether analysis should be by product, process, input, business unit or site. Understanding scope feeds into the Locate and Evaluate aspects of the LEAP framework.

**Exhibit 3: Non-exhaustive list of changes made in beta 4 release of TNFD**  
TNFD proposal as of March 2023 compared to November 2022

Additions	Removals
<b><u>Risk &amp; Impact Management</u></b>	<b><u>Risk &amp; Impact Management</u></b>
A) Description of the process for identifying and assessing nature-related dependencies, impacts, risks and opportunities now separated by direct operations and upstream / downstream value chain	REMOVED: Describing the approach to locate sources of inputs used to create value that may generate nature-related dependencies, impacts, risks and opportunities
B) Guidance broadened to include actions taken in light of risk management process	
<b><u>Metrics &amp; Targets</u></b>	<b><u>Metrics &amp; Targets</u></b>
A) Guidance broadened to include indicators and metrics at an individual risk and opportunity level	REMOVED: Describing how targets on nature and climate are aligned, contribute to each other, and any trade-offs
B) Guidance expanded to list categories of metrics to be disclosed, against historical baselines, reference industry averages, etc.	
C) Guidance expanded to include types of targets an organization might set, a request for methodology used to set a target, performance against targets, and how these align with global goals for nature	
<b><u>Strategy</u></b>	<b><u>Strategy</u></b>
C) Guidance broadened to include an increased rate of change of nature-related risks; additional recommendation to report resources available to adapt strategy to address future risks and opportunities	Information on processes for identifying risks and opportunities has been moved to Risk & Impact Mgmt
D) New priority locations added: high integrity ecosystems; areas of rapid decline in ecosystem integrity; areas with potential significant dependencies and/or impacts	REMOVED: B) List of areas for consideration
<b><u>Governance</u></b>	<b><u>Governance</u></b>
B) Additional request to disclose how organization assigns nature-related responsibilities to management, in addition to 'whether'	

Source: TNFD, Data compiled by Goldman Sachs Global Investment Research

The current draft release of the TNFD’s framework is open for market consultation, with this being the last draft version before the final version is completed. **The final release of the framework is expected in September 2023. We expect some companies to begin preliminary exploration of the TNFD framework this year, and we will likely see companies discuss their engagement with the framework this year. Full voluntary reporting against the framework and including the specific metrics outlined below will likely follow beginning next year with potential for mandated reporting in the years following.**

## Breaking Down Core and Supplementary Disclosure Metrics in TNFD

**The latest TNFD beta framework released 10 core metrics for corporate disclosures that can help indicate alignment with the Global Biodiversity Framework and demonstrate impacts against the drivers of nature change: Land/Sea Use Change; Climate Change; Direct Exploitation; Pollution; and Invasive/Alien Species.** The

TNFD recommends that organizations report against all 10 of these global core indicators or provide explanations as to why they have not reported. Of these core indicators, one is related to climate change, two are related to land or sea use change, four are related to pollution, and three are related to resource exploitation. These metrics were established using seven design features:

1. Distinguishing between assessment metrics and disclosure metrics
2. Distinguishing between cross-sector metrics and sector- and biome-specific metrics
3. Creating core disclosure metrics to help comparability within and across sectors
4. Including both positive and negative impacts on nature
5. Aligning with the LEAP approach
6. Including a review mechanism to ensure adjustments can be made as knowledge and tools evolve
7. Aligning to global and national policy priorities, standards and target-setting frameworks, including the Global Biodiversity Framework, ISSB and GRI's standards under development, the European Sustainability Reporting Standards (ESRS), and the Science Based Targets Network.

The 10 core metrics identified are not all available from ESG data providers or reported by companies today. We believe four of the core indicators have data available today: GHG emissions (81% disclosure in the MSCI ACWI), total extent of land, freshwater and/or ocean-use change (2% disclosure), total amount of hazardous waste generated (49% disclosure), and total non-GHG air pollutants (38% disclosure). An additional three have data available today that partially meets the criteria included in the TNFD but is either missing scope or location specificity: pollutants released to soil, wastewater discharged and concentrations of pollutants in wastewater, water withdrawal from areas of water stress. Other metrics include land use change in priority ecosystems, quantity of high-risk natural commodities sourced from the environment and quantity of commodities sourced from priority ecosystems are currently unavailable from third party ESG data providers, and are generally not disclosed or reported by companies quantitatively. We would expect an uptick in voluntary reporting on these metrics beginning in the 2024 reporting cycle covering FY23. While the TNFD has not entered regulatory or legislative drafts, we may see additional engagement between regulatory requirements and TNFD when countries begin submitting national action plans to the Global Biodiversity Framework.<sup>1</sup>

<sup>1</sup> While the agreement to create national action plans from parties of the Convention on Biological Diversity do not have a deadline yet, 25 action plans have been submitted in the last four years.

## Exhibit 4: 10 Core Indicators for Nature Exposure for all companies

Driver of Nature Change	Indicator	Metric	Connection to GBF targets	Metric Available Today	Disclosure Rate, MSCI ACWI
Climate Change	GHG emissions	Scope 1, 2 and 3 GHG emissions	Target 7	Total scope 1 & 2 emissions	80.6%
Land, freshwater, ocean-use change	Total extent of land, freshwater, and/or ocean-use change	Extent of change, in sq km, by type of ecosystem and business activity (absolute and change from previous year)	Targets 1, 2, 5, 11	Land disturbed	2.0%
Land, freshwater, ocean-use change	Land, freshwater, ocean-use change in prioritized ecosystems	Extent of change, in sq km, by type of ecosystem and business activity, for prioritised ecosystems	Targets 1, 2, 5, 11	-	-
Pollution & pollution removal	Total pollutants released to soil split by type	Total pollutants released to soil split by type, in tonnes	Targets 7, 11	Drilling Waste and/or Hazardous Spills	8.3%
Pollution & pollution removal	Volume of wastewater discharged, concentrations of key pollutants in wastewater discharged	Volume of water discharged (total, freshwater, other), in cubic metres, and concentrations of key pollutants in the wastewater discharged by type	Targets 7, 11	Volume of wastewater treated	2.7%
Pollution & pollution removal	Total amount of hazardous waste generated	Total amount of hazardous waste generated by type, in tonnes	Targets 7, 11	Hazardous waste	48.7%
Pollution & pollution removal	Total non-GHG air pollutants	Total non-GHG air pollutants by type, including: particulate matter, nitrogen oxides, volatile organic compounds, sulphur oxides, ammonia	Targets 7, 11	VOC and/or SOx and NOx emissions	37.8%
Resource use & replenishment	Water withdrawal and consumption from areas of water stress	Total water withdrawal and consumption from areas of water stress, in cubic metres	Target 11	Total water withdrawal	69.7%
Resource use & replenishment	Quantity of high-risk natural commodities sourced from land, ocean and/or freshwater	Quantity of high-risk natural commodities sourced from land, ocean or freshwater split into types, by tonnes, and proportion of total, along with change from previous year	Targets 5, 11	Commodity Sourcing ESG Risks Discussed Y/N	3.5%
Resource use & replenishment	Quantity of natural commodities sourced from priority ecosystems	Quantity and share of natural commodities sourced from priority ecosystems split into types, in tonnes, proportion of total, and change from previous year	Targets 5, 11	-	-

Global Biodiversity Framework targets are provided in more detail in the Appendix

Source: TNFD, Bloomberg, Refinitiv Eikon, Goldman Sachs Global Investment Research

The TNFD is also considering adding an 11th core metric which would address plastic production and consumption and is seeking feedback from stakeholders on whether this metric should be included in the list of core indicators and what exactly it should recommend disclosing. This draft proposal is open for feedback between now and June 1, 2023.

**Outside of the core indicators, the TNFD proposes 14 “additional disclosure metrics” that would address dependencies and impacts on nature which should be disclosed only in relevant sectors and/or biomes.** Compared to the core metrics, these have fewer indicators that are currently reported by companies and available data points to consume. Of the 14, only one has a direct comparable metric (total water withdrawal (70% disclosure in the MSCI ACWI)) while five others have metrics available today that cover parts of the metric while either missing a quantitative aspect or a key part of the metric (Biodiversity policies and materials sourcing policies are missing quantitative measurement of sustainably managed ecosystems; Land with protected conservation status does not separate out voluntary conservation; sustainable packaging addresses part of consumption and production but misses all other use cases; and Noise reduction products do not address light pollution).

#### Exhibit 7: 14 Additional Dependencies & Impact Metrics

Driver of Nature Change	Does metric measure positive or negative impacts / dependencies?	Metric	Connection to GBF targets (GS SUSTAIN view)	Metric Available Today	Disclosure Rate, MSCI ACWI
Land, freshwater, ocean-use change	Positive	Extent of land, freshwater and/or ocean-use change that is sustainable managed by ecosystem type and business activity (proportion of total, change from previous year)	1, 2, 3, 5, 10, 11	Biodiversity Policy	39.0%
Land, freshwater, ocean-use change	Positive	Extent of land, freshwater and/or ocean voluntarily conserved or restored by ecosystem type (absolute, change from previous year)	1, 2, 3, 5, 10, 12	Land Owned, Leased or Managed with Protected Conservation Status	0.29%
Pollution & pollution removal	Positive	Volume of pollutants removed from land, atmosphere, ocean and freshwater	7	-	-
Pollution & pollution removal	Negative	Volume of plastic produced and/or consumed	7	Sustainable Packaging	36.3%
Resource use & replenishment	Negative	Total water withdrawal and consumption (absolute, change from previous year)	11	Water Withdrawal	69.7%
Resource use & replenishment	Negative	Extent of area that the organization controls and/or manages used for the production of natural commodities (split into types, change from previous year)	1, 2, 5, 10, 11	-	-
Resource use & replenishment	Positive	Quantity of high-risk commodities sourced under a management or certification programme	1, 2, 5, 10, 12	Materials Sourcing Policy	52.9%
Resource use & replenishment	Positive	Volume of water loss mitigated and produced	11	-	-
Resource use & replenishment	Negative	Quantity of wild species extracted from natural habitats for commercial purposes	4, 5, 6, 9	-	-
Invasive Species	Negative	Number and extent of non-purposefully introduced species, varieties or strains in areas owned, operated, used or financed in priority areas (absolute, present/absence or number removed, change year on year)	5, 6	-	-
Invasive Species	Negative	Light and noise pollution	4, 6	Noise Reduction Products?	6.48%
Other: Ecosystem condition and extent	Negative	Quantitative measurement of change to ecosystem condition and extent in priority locations the organization depends or impacts on	1, 2, 4, 5, 7, 11	-	-
Other: Ecosystem services	Negative	For ecosystem services impacted, measurement on the change in the provision of the service	1, 2, 4, 5, 7, 12	-	-
Other: Ecosystem services	Negative	For ecosystem services depended on, measurement on the change in the provision of the service	1, 2, 4, 5, 7, 13	-	-

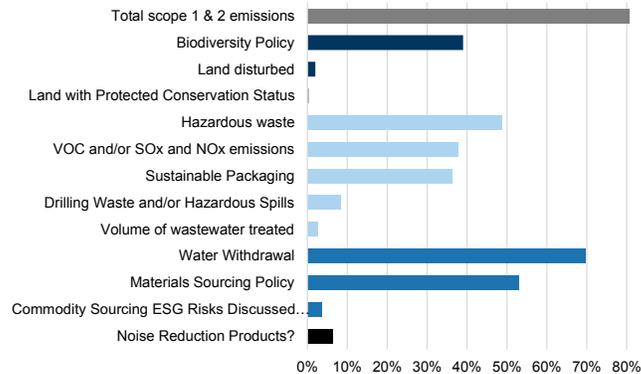
Global Biodiversity Framework targets are provided in more detail in the Appendix

Source: TNFD, Bloomberg, Refinitiv Eikon, Goldman Sachs Global Investment Research

**All of these metrics that are available today have a wide variety of disclosure metrics, but we can see from the below that, of the five drivers of nature change, the climate change driver has the highest disclosure, while land, freshwater and ocean-use change and invasive species have extremely low corporate reporting levels today.**

**Exhibit 8: Emissions and water withdrawal have high disclosure rates, while land disturbed, land conserved, wastewater treated, and commodity sourcing disclosures are rare**

Disclosure rates for metrics GS SUSTAIN has identified as aligned with TNFD recommended metrics for disclosures, across both core and additional metrics, MSCI ACWI



Source: Bloomberg, Refinitiv Eikon, Goldman Sachs Global Investment Research

## Putting Biodiversity Metrics into Context

**While these indicators by the TNFD mark a turning point for corporate and investor transparency around biodiversity impacts (and dependencies), they remain a first step.** Global limits and associated metric thresholds aligned to global limits remain without global proposals. Investors and companies are now working with a set of 23 global targets from the Global Biodiversity Framework agreed upon at COP 15 towards which they can potentially contribute and 24 potential metrics from the TNFD that each relate to some combination of GBF's targets. In our view, neither of these tools provides a singular or succinct indicator to track whether a company is "on track" towards being net nature positive (like emissions targets required to be "on track" to meet net zero decarbonization goals). Further work is needed to assess what constitutes positive performance on these metrics and how different metrics work together to impact nature. In order to understand how performance against these metrics impacts global performance towards both the Global Biodiversity Framework and work towards net nature positivity, each of the GBF's targets requires in-depth analysis on where we stand today, what sectors and regions contribute most to damage and/or have the most potential for positive impact, and what performance thresholds on individual metrics need to be met at a company-level in order to reach the global targets.

The TNFD has initiated work on sectors and regions that contribute most to damage and have potential for positive impact, based on their assessment by offering additional

sector-specific metrics for the agriculture sector and biome-specific metrics for sectors and biomes with the most significant dependencies and impacts on nature, in their view. This includes four sectors (Financial Institutions, Mining & Metals, Agriculture & Food, and Energy (including Oil & Gas and Electric Utilities)) and four biomes (Tropical forests, Rivers and streams, Intensive land use systems, and Marine shelf) in the current version, along with extended disclosure metric recommendations for the agriculture and food sector, and organizations operating in or interfacing with tropical rainforests as examples. These are accessible using the dashboard filtering function that filters cross-sector LEAP guidance and any additional relevant guidance.

**The TNFD has also created a Tools Catalogue which outlines third-party resources that can help organizations apply different phases of the LEAP framework. These include, but are not limited to:**

- [Science-Based Targets for Nature](#)
- [Global Forest Watch](#)
- [IBAT](#)
- [Trase](#)
- [natcap Map](#)
- [Quantis Accounting for Natural Climate Solutions](#)
- [GloBio](#)
- [LIFE Impact Index](#)
- [Global Biodiversity Score](#)

### **Next Steps**

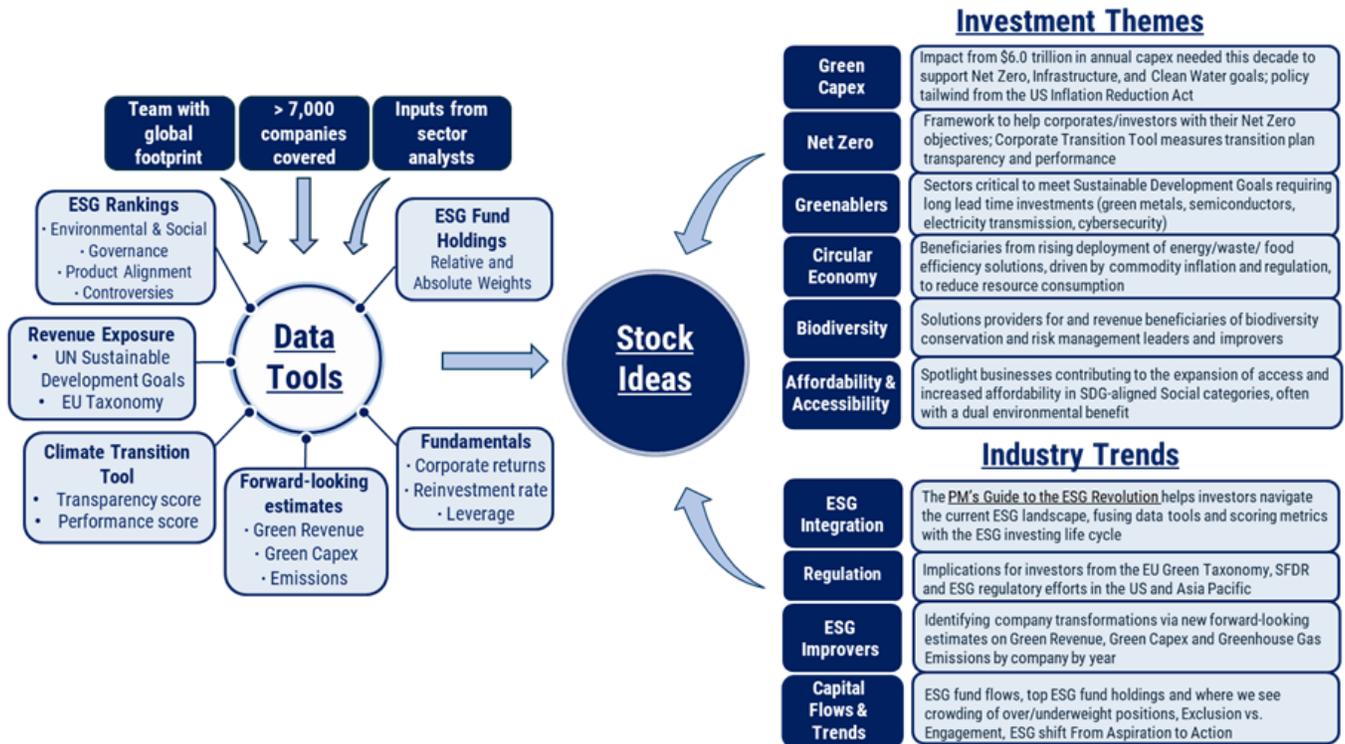
**The Taskforce on Nature-Related Financial Disclosures provides priorities for additions and changes to be made for the final publication in September 2023. These include:**

1. Further development of sector- and biome-specific guidance, including core sector disclosure indicators and metrics (already underway for Aquaculture, Chemicals and Pharmaceuticals, Forestry, Infrastructure and Real Estate; and Textiles and Apparel), which will be released as they are developed by the Taskforce;
2. Incorporating feedback on the beta framework, including nearly 200 pilot tests;
3. Developing case studies and use cases for interpretation and application assistance;
4. Refining the beta framework based on audit and assurance considerations;
5. Further developing scenarios guidance and toolkit to include financial institutions;
6. Considering guidance on transition plans for nature positive goals and targets; and
7. Developing guidance on links between climate and nature.

Adjustments will also be made based on feedback received from the feedback survey, feedback focus groups, and formal comment letters received before June 1, 2023. This will inform the final framework released in September, 2023.

# GS SUSTAIN - How we can help

Exhibit 9: How GS SUSTAIN can help: Data tools, themes, trends and ideas



Source: Goldman Sachs Global Investment Research

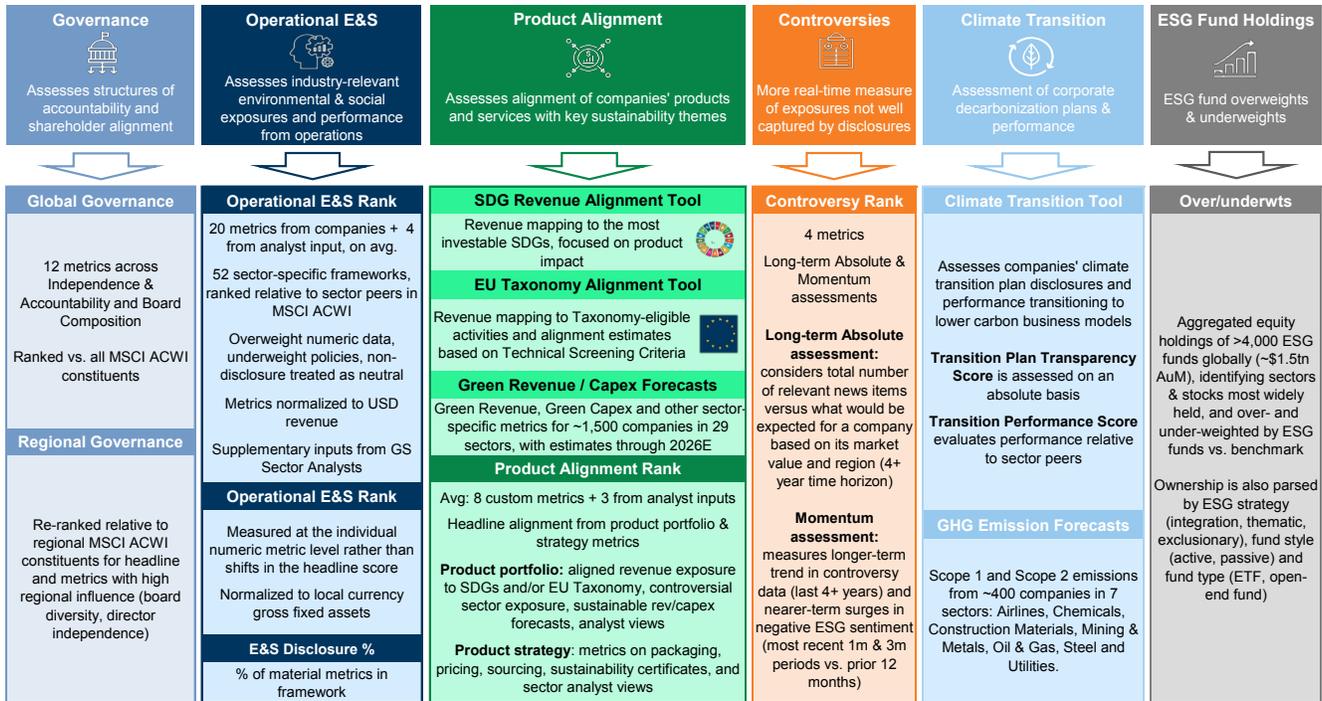
# Appendix

## Exhibit 10: 23 Targets outlined in the Global Biodiversity Framework, agreed upon at COP 15 on Biodiversity in December 2022

1	Ensure that all areas are under participatory integrated biodiversity inclusive spatial planning and/or effective management processes to bring the loss of areas of high biodiversity importance, including ecosystems of high ecological integrity, close to zero by 2030, while respecting the rights of indigenous peoples and local communities.
2	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.
3	Ensure and enable that by 2030 at least 30% of terrestrial and marine areas, especially areas of particular importance for biodiversity, are effectively conserved and managed through systems of protected areas and other effective area-based conservation measures.
4	Ensure urgent management actions, to halt human induced extinction of known threatened species and for the recovery and conservation of species, in particular threatened species, to significantly reduce extinction risk, as well as to maintain and restore the genetic diversity within and between populations of native, wild and domesticated species.
5	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, while respecting and protecting customary sustainable use by indigenous peoples and local communities.
6	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, reducing the rates of introduction and establishment by at least 50 percent, by 2030, and eradicating or controlling invasive alien species especially in priority sites.
7	Reduce pollution risks and the negative impact of pollution from all sources, by 2030, to levels not harmful to biodiversity and ecosystem functions and services, considering cumulative effects
8	Minimize the impact of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation, and disaster risk reduction actions, while minimizing negative and fostering positive impacts of climate action on biodiversity.
9	Ensure that the management and use of wild species are sustainable, thereby providing social, economic and environmental benefits for people, especially those in vulnerable situations and those most dependent on biodiversity
10	Ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably, conserving and restoring biodiversity and maintaining nature's contributions to people, including ecosystem functions and services.
11	Restore, maintain and enhance nature's contributions to people, including ecosystem functions and services, such as regulation of air, water, and climate, soil health, pollination and reduction of disease risk, as well as protection from natural hazards and disasters, through nature-based solutions and ecosystem-based approaches
12	Significantly increase the area and quality and connectivity of, access to, and benefits from green and blue spaces in urban and densely populated areas sustainably, by mainstreaming the conservation and sustainable use of biodiversity, and ensure biodiversity-inclusive urban planning
13	Take effective legal, policy, administrative and capacity-building measures at all levels to ensure the fair and equitable sharing of benefits that arise from the utilization of genetic resources and from digital sequence information on genetic resources, as well as traditional knowledge associated with genetic resources.
14	Ensure the full integration of biodiversity and its multiple values into policies, regulations, planning and development processes, poverty eradication strategies, strategic environmental assessments, environmental impact assessments and, as appropriate, national accounting, within and across all levels of government and across all sectors
15	Take legal, administrative or policy measures to encourage and enable business, and ensure large companies and financial institutions: (a) Regularly monitor, assess, and transparently disclose their risks, dependencies and impacts on biodiversity; (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;
16	Ensure people are encouraged and enabled to make sustainable consumption choices and by 2030, reduce the global footprint of consumption in an equitable manner, halve global food waste, reduce overconsumption and substantially reduce waste generation.
17	Establish, strengthen capacity for, and implement in all countries in biosafety measures as set out in Article 8(g) of the Convention on Biological Diversity and measures for the handling of biotechnology and distribution of its benefits as set out in Article 19 of the Convention.
18	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 United States dollars per year by 2030
19	Substantially and progressively increase the level of financial resources, including domestic, international, public and private resources to implement national biodiversity strategies and action plans, by 2030 mobilizing at least US \$200 billion per year, including by increasing biodiversity related international financial resources from developed countries to developing countries to at least US\$ 20 billion per year by 2025, and to at least US\$ 30 billion per year by 2030; among other strategies to mobilize capital.
20	Strengthen capacity-building and development, access to and transfer of technology, and promote development of and access to innovation and scientific cooperation, to meet the needs for effective implementation, particularly in developing countries, fostering joint technology development and joint scientific research programmes.
21	Ensure that the best available data, information and knowledge, are accessible to decision makers, practitioners and the public to guide effective and equitable governance, integrated and participatory management of biodiversity, and to strengthen communication, awareness-raising, education, monitoring, research and knowledge management
22	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
23	Ensure gender equality in the implementation of the framework through a gender-responsive approach where all women and girls have equal opportunity and capacity to contribute to the three objectives of the Convention

Source: Convention on Biological Diversity

Exhibit 11: The GS SUSTAIN ESG Toolkit



A growing number of metrics from our toolkit are available via Marquee Data Services. Metrics not available via Marquee are made available upon request.

Source: Goldman Sachs Global Investment Research

# Disclosure Appendix

## Reg AC

We, Madeline Meyer, Evan Tylenda, CFA, Brian Singer, CFA, Derek R. Bingham, Brendan Corbett, Emma Jones, Rachit Aggarwal, Enrico Chinello, Ph.D., Keebum Kim and Grace Chen, hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

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