The TNFD Nature-Related Risk and Opportunity Management and Disclosure Framework
Beta v0.2
June 2022
Summary

An introduction to TNFD

The Taskforce on Nature-related Financial Disclosures (TNFD) was established in 2021 in response to the growing appreciation of the need to factor nature in financial and business decisions. The TNFD is a global, market-led initiative with the mission to develop and deliver a risk management and disclosure framework for organisations to report and act on evolving nature-related risks and opportunities, with the ultimate aim of supporting a shift in global financial flows away from nature-negative outcomes and toward nature-positive outcomes.

The TNFD is adopting an open innovation approach, centered around the release of several beta versions of the framework for feedback and pilot testing with market participants and other stakeholders, and expert input from a wide range of knowledge and implementation partners.

Following the release of beta v0.1 in March 2022 and this beta v0.2 in June 2022, the Taskforce will release v0.3 and v0.4 of the beta framework in November 2022 and February 2023, before the launch of the Taskforce’s final recommendations in September 2023.

The TNFD framework – an overview

TNFD framework beta v0.1

The first beta version of the TNFD framework included three core components:

- An outline of fundamental concepts and definitions for understanding nature that the TNFD recommends market participants use when assessing and disclosing their nature-related risks and opportunities;
- Guidance for corporates and financial institutions to incorporate nature-related risk and opportunity assessment into their enterprise strategy and risk management processes to inform a range of corporate and capital allocation decisions, including those related to reporting and disclosure; and
- The TNFD’s draft disclosure recommendations for nature-related risks and opportunities.

TNFD framework beta v0.2

This v0.2 beta release of the TNFD framework builds on v0.1 (Figure 1). The three core components of the framework have not changed in v0.2. Based on feedback from a range of market participants and other stakeholders, beta v0.2 makes several enhancements based on market feedback and three significant additions:

- A first draft architecture for metrics and targets, and draft guidance on, and an illustrative set of, dependency and impact metrics;
- A proposed approach to specific guidance; and
- An update to LEAP-FI.

These additions are reflected in the TNFD’s interactive online platform, which now represents beta v0.2 of the TNFD framework in its entirety.

Alongside the updated framework itself, the Taskforce are also releasing complementary guidance and case studies:

- Additional piloting guidance to support pilot testing that will run from July 2022 to 1 June 2023.
- Additional draft guidance on the ‘Evaluate’ phase of the TNFD’s LEAP approach for Dependency and Impact Analysis for corporates (E3 and E4).
- Additional draft guidance on the TNFD LEAP Approach Locate Phase for Nature Interface and Priority Location Identification (L2 and L3).
- An updated case study on a hypothetical forestry company application of LEAP and related metrics and data sources. This builds on the case study included in the TNFD Data Discussion Paper, first released alongside the TNFD beta v0.1.

Figure 1: Overview of beta v0.1 and v0.2
Feedback on beta v0.1 released in March 2022

Since the v0.1 beta release, the Taskforce has received significant feedback from a range of market participants (see box). In general, market participants welcomed the TNFD’s open innovation process and reported finding each component of the first beta version of the framework useful (see figure 2).

- The beta framework has been viewed over 30,000 times online from viewers in over 70 countries. Over 500 pieces of topical feedback were received through the TNFD online portal (framework.tnfd.global) or sent directly, from 138 organisations or individuals, in 37 countries.
- Responses were received from financial institutions and corporates from a variety of sectors including the consumer goods, industrial, utility and material sectors, as well as public sector institutions, academic and research organisations, business associations, and intergovernmental, civil society and conservation organisations.
- 70 of those who responded provided detailed, qualitative feedback.
- The remaining 68 provided quantitative feedback on the utility of different elements of the TNFD framework.
- Based on those respondents who identified their country, feedback was provided from 37 countries across Africa, Asia, Europe, the Middle East, North America, Oceania and South America.
- The 10 countries with the most respondents providing feedback (in order of feedback received) were the United Kingdom, Japan, Australia, France, the United States, Canada, Singapore, Brazil, Germany and Norway.
- The TNFD Secretariat has also convened outreach and feedback meetings with market participants across sectors and jurisdictions.

Figure 2: Feedback on usefulness of components of v0.1 release

<table>
<thead>
<tr>
<th>Component</th>
<th>Very useful</th>
<th>Fairly useful</th>
<th>Not that useful</th>
</tr>
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<tbody>
<tr>
<td>Fundamentals for understanding nature</td>
<td>59%</td>
<td>33%</td>
<td>7%</td>
</tr>
<tr>
<td>TNFD Draft Disclosures Recommendations</td>
<td>56%</td>
<td>32%</td>
<td>12%</td>
</tr>
<tr>
<td>LEAP approach</td>
<td>59%</td>
<td>39%</td>
<td>3%</td>
</tr>
<tr>
<td>Priority areas for further development</td>
<td>73%</td>
<td>27%</td>
<td></td>
</tr>
<tr>
<td>Piloting the Framework</td>
<td>25%</td>
<td>50%</td>
<td>25%</td>
</tr>
<tr>
<td>Engage</td>
<td>56%</td>
<td>44%</td>
<td></td>
</tr>
</tbody>
</table>

A number of areas for improvement emerged from the feedback with three overall themes:

- More specific guidance would be helpful, particularly ‘how to’ guidance related to the LEAP approach, with more case studies and illustrative examples;
- Some specific technical aspects of the core components of the v0.1 framework (definitions, disclosure recommendations and the LEAP approach) need further development and clarification; and,
- The TNFD should continue to expand its outreach and engagement across stakeholders and geographies to bring in a mix of perspectives and market experience, and ensure the framework is both science-based and practical to implement.

Where appropriate, feedback has been incorporated into this v0.2 update release and its accompanying documents. A number of other important issues raised by feedback providers remain under consideration by the Taskforce and will be incorporated into future releases.

TNFD’s approach to metrics and targets

The TNFD’s approach in the v0.2 release to nature-related measurement and target setting includes:

- An integrated, overarching architecture for nature-related indicators, metrics and targets, including cross-industry metrics categories;
- Draft guidance and an illustrative set of indicators and metrics for the assessment of nature-related dependencies and impacts, to support pilot testing;
- Initial considerations for target-setting.

The TNFD’s approach to metrics and targets is built around six key design features:

1. Distinguishes between ‘Assessment Metrics’ used internally by report preparers for assessment purposes to inform management decisions (including what to disclose) and ‘Disclosure Metrics’ to be used in external disclosures for report users;
2. Focuses on cross-sector metrics to begin with, aligned with the approach of the Task Force on Climate-related Financial Disclosures (TCFD) and builds on the work of standard-setting bodies;
3. Configures to support end-to-end nature-related risk management and disclosure, following the LEAP approach introduced in the v0.1 release of the TNFD framework;
4. Provides a common global set of ‘core’ disclosure metrics (specifics to be provided in future releases) to enable comparability within and across sectors, while also recognising the need to accommodate ‘additional’ disclosures based on the specific needs of each sector and different regulatory requirements across jurisdictions;
5. Enables periodic reviews of the measurement architecture to ensure it continues to be fit for purpose, based on further development of scientific knowledge, data and measurement innovation and reporting requirements; and
6. Aligns with emerging global and national policy target setting frameworks, such as the Global Biodiversity Framework (GBF) and corporate target-setting approaches such as those being developed by the Science Based Targets Network (SBTN).
At the global level, the TNFD seeks to align with the environment-related Sustainable Development Goals and the post-2020 GFB currently being negotiated through the UN CBD COP15 process. At the organisational level, the TNFD also seeks to align with the corporate target-setting approach being developed by the SDTN.

TNFD’s approach to specific guidance

Many market participants have been clear that nature-related risk and opportunity assessment is new and unfamiliar. The TNFD has received feedback from market participants that they need additional guidance, including sector-specific guidance, but also by realm, biome and nature-related issue. The TNFD will therefore approach the development of specific recommendations and guidance using the following structure (Figure 4):

1. **Sector specific**: Guidance tailored to the economic sector in which organisations conduct business. (The TNFD’s proposed sector classification and priority sectors for the development of additional guidance are set out in v0.2. In forthcoming v0.3 and v0.4 releases, the TNFD will develop additional guidance).

2. **Nature-related issue specific**: Guidance tailored to specific nature-related issues – dependencies, impacts, risks and opportunities – that are relevant for a particular organisation and across sectors. (Not yet developed for v0.2 – to be added in future releases).

3. **Realm specific**: Guidance linked to the nature realms defined by the TNFD (ocean, freshwater, land and atmosphere), and possibly also by biome. (Not yet developed for v0.2 – to be added in future releases).

Towards sector-specific guidance: TNFD sector classification & sector prioritisation

The draft disclosure recommendations in the beta v0.1 of the TNFD framework are sector agnostic and apply both to financial institutions and corporates. The TNFD’s first attempt at providing specific guidance based on the distinct characteristics of an organisation was the development of two versions of LEAP: the LEAP approach for corporates (including financial institutions as corporates) and LEAP FI, a version of LEAP specifically tailored towards financial institutions as providers or managers of capital, which has been updated in the v0.2 release (see below).

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**Figure 3: Types of metrics in the context of the LEAP approach**

The approach to nature-related metrics and target-setting will increase in specificity over subsequent releases of the beta framework through collaborative, staged development of guidance on metrics and targets.

In the v0.3 and v0.4 beta releases in November 2022 and February 2023, the TNFD will provide further draft guidance on risk, opportunity and response Assessment Metrics, Disclosure Metrics and target-setting. The Taskforce will not make final decisions on ‘core’ and ‘additional’ Disclosure Metrics until the final release v1.0 in September 2023.

The Taskforce will not make final decisions on ‘core’ and ‘additional’ Disclosure Metrics until the final release v1.0 in September 2023.

**Initial considerations for TNFD target-setting**

Conceptually, metrics and targets (and data) need to line up at three different levels – global (the level of coordinated international policy), national (the level of national regulation and law) and local (the ecosystem level where business interfaces with nature).

With respect to global action on climate change, this ‘architecture for action’ is fully developed. But for coordinated global action to tackle nature loss and achieve global targets that address nature loss, the architecture for action is largely incomplete. The TNFD is engaging international actors developing nature-related targets at the global, national and local level to encourage coordinated action.

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**Figure 4: Structure for the TNFD specific guidance**
TNFDs Proposed Approach to Sector Classification

The TNFD’s proposed non-financial sector classification is based on the Sustainable Industry Classification System® (SICS®), developed by SASB to group companies based on shared sustainability risks and opportunities. This has been adopted by the ISSB for the global baseline they are developing for sustainability disclosure. The TNFD has adopted SICS® to align as closely as possible to this emerging global baseline under development by the ISSB.

The specific guidance the TNFD develops will be designed to be interoperable with different sector and industry classification schemes.

For the financial sector, the TNFD will organise guidance into the four major financial services industries identified and defined by the TCFD (banks, insurance companies, asset managers, asset owners), with the addition of Development Finance Institutions, given their important role in nature-related financing in emerging markets, including in many nature hotspots.

TNFDs proposed priority sectors

The TNFD has developed an initial list of non-financial priority sectors and finance sector priority industries. For non-financial sectors, The TNFD will prioritise eight thematic sectors, 13 sub-sectors and 18 industries for development of the TNFD sector-specific guidance/recommendations moving forward. While the TNFD recognises that every non-financial sector is affected by nature-related risks and opportunities, the TNFD’s initial priority list includes sectors and industries that are more likely to be financially impacted than others due to their exposure to dependencies and impacts on nature. It also considers the sector’s potential opportunities – activities that create positive outcomes for organisations and nature by avoiding or reducing impact on nature, or contributing to its restoration. The eight thematic sectors are:

- Food and beverage;
- Renewable resource and alternative energy;
- Infrastructure;
- Resource transformation;
- Health care;
- Extractives and mineral processing;
- Finance and asset management;
- Food and beverage; infrastructure; or reducing impact on nature, or contributing to its restoration. The eight thematic sectors are:

All five of the financial industry sectors identified above are also considered to be priorities for the development of additional guidance.

LEAP-Fi update

In the v0.1 release of the beta framework, the TNFD proposed an internal risk and opportunity assessment approach, called LEAP, for use by both corporates and financial institutions. This prescriptive ‘how to’ guidance was developed and proposed based on extensive feedback during the preparatory phase for establishing the TNFD. A wide cross-section of market participants indicated that they would value guidance not only on what to report and disclose; but also how to embed nature considerations into enterprise and portfolio risk management processes.

Recognising the unique needs of the financial services sector, the TNFD v0.1 beta framework released in March included a LEAP approach for financial institutions (LEAP-FI) as providers or managers of capital. This v0.2 update contains an enhanced version of LEAP-FI that supersedes the 0.1 beta version in the March release (Figure 5).

In addition to the four phases of the LEAP approach for corporates (Locate, Evaluate, Assess and Prepare) presented in beta, LEAP-Fi v0.2 sets out a preceding set of scoping questions to help financial institutions assess their financial portfolios. LEAP-Fi is designed to enable financial institutions to progress to the ‘Locate’ or ‘Evaluate’ phase of LEAP, as appropriate for their specific business activities, the type of asset classes/financial products and the appropriate level of aggregation in their portfolio. The key enhancement made to LEAP-Fi is clearer recognition that as providers of capital, financial institutions will likely have different entry points into the assessment of nature-related risks, including based on the level of aggregation and scale of their capital portfolios.

Figure 5a: Scoping questions for LEAP-Fi v0.2

Figure 5b: LEAP-Fi v0.2 - Overview

A revised approach for LEAP-Fi will be included in the v0.4 release in February for additional review and comment.
Priority areas for further framework development

The near-term highest priorities for the Taskforce’s work in the next phase of framework development before the v0.3 release in November 2023 are:

• Developing the initial approach to scenarios;
• Continuing to build the approach to metrics and targets, with guidance on risk, opportunity and response Assessment Metrics and initial guidance on targets;
• Developing specific guidance for priority sectors/realms/biomes/nature-related issues, including guidance for financial institutions; and
• Launching and running a Data Catalyst, to crowd-in market knowledge and experience developing solutions to nature-related assessment needs and data gaps.

The Taskforce will continue to work with knowledge partners and seek feedback from a wide range of market participants and other stakeholders through multiple consultation channels, including the TNFD Forum, consultation meetings and pilot testing of the beta framework.

Engage – Co-create the TNFD framework

The TNFD’s open consultation period will continue until 1 June 2023. The TNFD invites market participants and other stakeholders to:

• Review and comment on the beta framework: Organisations can review the draft framework and provide feedback via the TNFD online platform.
• Pilot test the framework: Corporates and financial institutions keen to explore how the TNFD framework would apply in their specific organisational context can pilot test the framework independently and, in some cases, through collaborative industry efforts. The TNFD piloting guide, released alongside beta v0.2, provides detailed information for organisations interested in piloting the framework.
• Participate in consultation discussions: Based on the feedback provided by market participants, the TNFD will convene focus group discussions about key emerging themes, technical areas of the framework or by geography or sector – to engage feedback providers in further detail.

While the TNFD will accept feedback on a rolling basis, feedback for each iterative release of the beta framework will be evaluated according to the schedule outlined below (Table 1).

All feedback, irrespective of when it is provided, will be reviewed and evaluated before the final recommendations are published in September 2023.

<table>
<thead>
<tr>
<th>Beta release</th>
<th>Release date</th>
<th>Deadline for feedback on this release</th>
</tr>
</thead>
<tbody>
<tr>
<td>v0.1</td>
<td>15 March 2022</td>
<td>25 May 2022</td>
</tr>
<tr>
<td>v0.2</td>
<td>28 June 2022</td>
<td>23 September 2022</td>
</tr>
<tr>
<td>v0.3</td>
<td>November 2022</td>
<td>24 January 2023</td>
</tr>
<tr>
<td>v0.4</td>
<td>February 2023</td>
<td>1 June 2023</td>
</tr>
<tr>
<td>v1.0 (final)</td>
<td>September 2023</td>
<td></td>
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</tbody>
</table>
1. Introducing the TNFD framework

The Taskforce on Nature-related Financial Disclosures (TNFD) was established in 2021 in response to the growing appreciation of the need to factor nature in financial and business decisions. The TNFD is a global, market-led initiative with the mission to develop and deliver a risk management and disclosure framework for organisations to report and act on evolving nature-related risks and opportunities, with the ultimate aim of supporting a shift in global financial flows away from nature-negative outcomes and toward nature-positive outcomes.

The TNFD framework is intended for use globally by corporates and financial institutions of all sizes. The TNFD follows in the footsteps of the work of the Task Force on Climate-related Financial Disclosures (TCFD) on climate risk management and disclosures, but focuses on ensuring that nature-related dependencies, impacts, risks and opportunities are effectively understood and communicated by corporates to the financial community. The TNFD’s work is a part of the wider system of activities that are shaping markets and economies to be sustainable. The Taskforce is committed to ensure that its process and the TNFD framework are complementary to these wider developments.

The TNFD framework is being developed by the Taskforce, which sits at the heart of the TNFD initiative. The Taskforce is made up of 34 senior executives drawn from corporates, financial institutions and market intermediaries around the world and led by the TNFD Co-Chairs, Elizabeth Mrema and David Craig. Collectively, the Taskforce Members represent institutions with over US$19.4 trillion in assets under management and a footprint in over 180 countries. A global network of 16 core knowledge partners, including leading global scientific, conservation and standards development bodies, have also contributed to the development of specific aspects of the framework.

1.1 Developing the TNFD framework

The TNFD has set out to accelerate action by developing and promoting the adoption of an integrated risk management and disclosure framework. The framework will be directly usable and valuable to financial report preparers and users, build on the best metrics, data and tools already existing or under development in the market, and follow a science-based approach. To achieve this, the TNFD is adopting an open innovation approach, centered around feedback and pilot testing with market participants, and supported by expert input from a wide range of knowledge and implementation partners.

The first beta version of the TNFD framework, released in March 2022, was designed to start a dialogue with a broad cross-section of market participants about how best to assess and manage nature-related risks and opportunities in a manner that is both science-based and practical to implement.

Following this release of beta v0.1, the Taskforce will release v0.2 and v0.3 of the beta framework in November 2022 and February 2023, before the launch of the Taskforce’s final recommendations in September 2023 (see Figure 6). The TNFD invites market participants and other stakeholders, including policymakers, regulators, scientists, conservation organisations and local and indigenous peoples’ organisations, to provide feedback on the beta versions of the TNFD framework through the TNFD’s interactive online platform.

1.2. The TNFD framework – An overview

The TNFD framework seeks to provide recommendations and guidance of relevance to a wide range of market participants, including investors and credit providers, analysts, corporate executives and boards, regulators, stock exchanges and accounting firms. It has been developed following the TNFD principles of being market usable, science-based, purpose driven, integrated and adaptive, and globally inclusive, while embracing a broad approach to nature-related risks and employing an integrated approach to sustainability risk management and reporting.

TNFD framework beta v0.1

The first beta version of the TNFD framework included three core components:

• An outline of fundamental concepts and definitions for understanding nature that the TNFD recommends market participants use when assessing and disclosing their nature-related risks and opportunities;
• The TNFD’s draft disclosure recommendations for nature-related risks and opportunities; and
• Guidance for corporates and financial institutions to incorporate nature-related risk and opportunity assessment into their enterprise strategy and risk management processes to inform a range of corporate and capital allocation decisions, including those related to reporting and disclosure.
2. Summary of feedback on TNFD framework beta v0.1

2.1 Overview

The TNFD invited market participants and other stakeholders, including policy makers, regulators and scientific and conservation organisations, to provide feedback on the first beta version of the TNFD framework. An interim deadline was set of 25 May 2022 for initial feedback on the v0.1 release, in advance of the v0.2 release. The Taskforce’s initial responses to that feedback are provided here.

Further feedback on beta versions of the TNFD framework is welcome throughout the open innovation process until 1 June 2023, with subsequent releases during 2022 and 2023. The timeline for subsequent beta releases and the interim deadline for further feedback are outlined at the end of the report summary.

In summary:

• The beta framework has been viewed over 30,000 times online from viewers in over 70 countries.
• Over 500 pieces of topical feedback were received through the TNFD online portal (framework.tnfd.global) or sent directly, from 138 organisations or individuals, in 37 countries.
• Responses were received from financial institutions and corporates from a variety of sectors including the consumer goods, industrial, utility and material sectors, as well as public sector institutions, academic and research organisations, business associations, and intergovernmental, civil society and conservation organisations.
• 70 of those who responded provided detailed, qualitative feedback. The remaining 68 provided quantitative feedback on the utility of different elements of the TNFD framework.
• Based on those respondents who identified their country, feedback was provided from 37 countries across Africa, Asia, Europe, the Middle East, North America, Oceania and South America.
• The 10 countries with the most respondents providing feedback (in order of feedback received) were the United Kingdom, Japan, Australia, France, the United States, Canada, Singapore, Brazil, Germany and Norway.
• The TNFD Secretariat has also convened over 20 outreach and feedback meetings with market participants across sectors and jurisdictions.

One-hundred and twenty users provided responses via the online platform on the overall usefulness of different parts of the v0.1 beta release (very useful/fairly useful/not that useful), as summarised in Figure 8. The figure demonstrates the overwhelmingly positive feedback from the market on the usefulness of different parts of the TNFD framework.
2.2 Key themes of feedback

The Taskforce has reviewed all of the feedback received on v0.1 of the beta framework. On the basis that providers of feedback did so directly to the Taskforce and on a confidential basis, the Taskforce is providing an aggregated summary of the feedback provided. Three broad themes of feedback were received:

- The need for further guidance
- Technical aspects of core components of the beta v0.1 framework
- Approach to developing the TNFD framework, including communications and engagement.

2.2.1 The need for further guidance

Feedback on the need for further guidance for specific users and topics was requested, including:

- Additional specific guidance for all users;
- Guidance for financial institutions;
- Guidance on – and work to address – data and analytic gaps and challenges;
- Guidance on scenarios; and
- Guidance on metrics and targets.

Further detail is provided in the table below on the guidance needs that were identified, what the Taskforce has included to meet these needs in the v0.2 release, and the Taskforce's plans for further work to meet these guidance needs in subsequent releases, building towards the final framework publication in September 2023.
Further guidance on metrics and targets in subsequent releases will include related guidance on data, including sources and methodologies. Additionally, the TNFD Data and Analytics Discussion Paper will be updated to reflect developments in the nature-related data landscape.

Feedback theme
1.3 Guidance on scenarios

Provide guidance on scenarios and a set of standard nature-related scenarios as a reference source.

Although no new material on scenarios has been published in the v0.2 release, the Taskforce has already begun to scope its approach to nature-related scenarios, in collaboration with the Network of Central Banks and Supervisors for Greening the Financial System (NGFS) and other knowledge partners. The TNFD is considering the need for both guidance on scenarios and a set of standard nature-related scenarios.

Taskforce plans for subsequent releases
The TNFD proposed approach to scenarios and draft guidance on scenarios will be included in subsequent releases.

Feedback theme
1.4 Guidance on metrics and targets

Provide guidance on metrics, which should:

- be prescriptive and help standardise the types of metrics for disclosure and clarify the ‘minimum’ expectation to be compliant with the TNFD framework;
- address the lack of consensus on dependency metrics; and
- be clear on how the approach to metrics will evolve over time.

In the v0.2 beta release, the Taskforce has prepared an initial approach to metrics and targets. This includes a design concept of ‘core’ and ‘additional’ Disclosure Metrics, which will be required for disclosures, as well as Assessment Metrics for internal assessment using the LEAP approach. The v0.2 release includes draft guidance on dependency and impact Assessment Metrics, with accompanying illustrative set of metrics. These have been included to support pilot testing and feedback.

The Taskforce has proposed in the v0.2 release that the approach to metrics and targets will be updated every three to five years to keep up with data, science and metrics developments.

See Section 3 for more details.

Taskforce plans for subsequent releases
The TNFD will recommend a set of core Disclosure Metrics that should be disclosed in line with the TNFD disclosure recommendations by September 2023.

Further detail on the timeline for further development of the approach to metrics and targets is provided in Section 3.
2.2.2 Feedback on technical aspects of the core components of the v0.1 beta release

The TNFD received specific feedback on technical aspects of the v0.1 beta release of the TNFD framework, including the definitions of core concepts, the draft disclosure recommendations and the LEAP approach. The key themes in this feedback are summarised in Table 3.

Table 3: Key themes of feedback on technical aspects of the core components of the v0.1 beta release

<table>
<thead>
<tr>
<th>Feedback request</th>
<th>Taskforce response in v0.2 release, clarifying any change from v0.1</th>
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<tbody>
<tr>
<td>Definitions &amp; core concepts</td>
<td>In the v0.1 beta release, the TNFD definitions drew on credible science sources (e.g. ‘nature’ from IPBES, ‘biodiversity’ from the CBD, ‘environmental assets’ from the UN SEEA Ecosystem Accounts). With thanks to respondents that identified a number of inconsistencies and lack of references in the v0.1 release, the v0.2 release of the TNFD framework on the online interactive platform is updated accordingly. In the v0.2 release, a set of further definitions relating to the new additions have been included, which mostly relate to metrics and targets. See Appendix 3 for new additions to the TNFD glossary.</td>
</tr>
<tr>
<td>2.1 Clarity &amp; consistency of definitions</td>
<td>Taskforce plans for subsequent releases</td>
</tr>
<tr>
<td>Need greater clarity, streamlining and consistency in definitions (specific points raised on physical risks, transition risks, impact, impact drivers, indirect impact, state of nature, criteria for high-risk ecosystems, opportunities, intrinsic value, preparers of information, nature, biodiversity, natural capital, materiality, nature-based solutions, and nature-positive).</td>
<td>The Taskforce will continue to refine and streamline the definitions as the TNFD framework evolves through subsequent beta releases. The Taskforce will continue to work with knowledge partners to improve and revise the definitions, classifications and sources used in the TNFD framework in subsequent releases.</td>
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Feedback theme

2.2 Emphasis on biodiversity, the value of biodiversity and drivers of biodiversity loss

Greater emphasis needed on the importance of biodiversity, the intrinsic value of nature and the drivers of biodiversity loss. Drawing on the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)

Beta v0.1 of the TNFD framework:
- Provides definitions of the terms nature, biodiversity, nature loss and impact drivers, which are drawn from the definitions of the Convention on Biological Diversity and the IPBES. The TNFD framework considers the five main drivers of nature change: climate change, resource use, land and sea use change, pollution and invasive alien species, as identified by IPBES.
- Recognises that biodiversity is an essential characteristic of nature that enables ecosystem assets to be productive, resilient and able to adapt to change. Biodiversity operates at a genetic, species, habitat and ecosystem level and is critical to maintaining the quality, resilience and quantity of ecosystem assets and the provision of ecosystem services on which business and society rely.
- Recognises that wider society depends on ecosystems for their livelihoods and a variety of ecosystem services. It also recognises that, like education and health, nature is more than an economic good: many people value its existence and recognise its intrinsic value, irrespective of any direct or indirect use by people.

These approaches have not been changed in the v0.2 release. However, the v0.2 release considers the importance of biodiversity and the drivers of nature change in the draft approach to metrics and targets. This proposes categories of metrics for dependencies and impacts and includes state of nature metrics (including ecosystems, species and their diversity).

This reflects the recognition in the TNFD framework of the importance of maintaining the quality and quantity of the stock of environmental assets including ecosystem assets, the quality and reliability of ecosystem service flows, and biodiversity (as defined by the CBD, the variability among living organisms, including diversity within species, between species and of ecosystems).

See Section 3 for more details.

Taskforce plans for subsequent releases

The TNFD acknowledges comments on the value, including intrinsic value, of biodiversity. The Taskforce will be expanding its consideration of value as it develops the approach to measurement of nature-related dependencies, impacts, risks and opportunities.

Feedback theme

2.3 Focus on impacts on – and risks to – nature and society, acknowledging nature's intrinsic value.

Require companies and financial institutions to report on impacts on, and adverse risks to, nature and human rights, not only if impacts create significant financial impact on business enterprise value. In the beta v0.1 framework, impacts on nature are included following the TNFD's definitions of dependencies and impacts. One of the four general requirements outlined in the draft disclosure recommendations in the beta v0.1 framework is that 'identification of material nature-related risks and opportunities should be based on an assessment of nature-related dependencies and impacts.' The TNFD draft Disclosure Recommendations Strategy D includes considerations of business impacts on nature.

The beta v0.1 framework recognises that wider society depends on ecosystems for their livelihoods and a variety of ecosystem services. It also recognises that, like education and health, nature is more than an economic good: many people value its existence and recognise its intrinsic value, irrespective of any direct or indirect use by people.

In beta v0.1, the TNFD also outlined its current approach to materiality in its priority areas for further development. This sets out that in line with the gradual convergence in the perspective on materiality in the market, the TNFD framework recognises that consideration of both nature-related dependencies and impacts is required for a comprehensive assessment of risks and opportunities, and that impacts on nature become relevant to enterprise value when assessed over a future time horizon (e.g. through scenario analysis).

In the beta v0.2 release, the TNFD has included guidance on - and a set of illustrative indicators and metrics for - assessing impacts on nature.

TheTNFD framework is being developed to be applicable to meet both the emerging global baseline being developed by the ISSB and the approaches of specific jurisdictions and the ambitions of individual preparers, which may go beyond these requirements.

The v0.2 beta release includes guidance and a set of illustrative metrics on the impact of business on nature.

Taskforce plans for subsequent releases

The Taskforce will continue to reflect and work on how impacts and risks to nature and society fit within the overall framework, including through ongoing consultation with conservation and scientific knowledge partners and dialogue with indigenous peoples and local communities (IPCL) group representatives and civil society organisations over the course of the next 12 months.

The TNFD recognises the importance of this and the desire of many institutions providing feedback to make this more prominent.
2.4 Consideration of opportunities

In the beta v0.1 framework, opportunities are defined as ‘activities that create positive outcomes for organisations and nature by avoiding or reducing impact on nature, or contributing to its restoration’. This has not been changed in v0.2 of the framework.

Need to ensure framework does not reward basic actions that companies and financial institutions should be taking anyway as part of the expected baseline (e.g., Good International Industry Practices).

Organisations should be encouraged to look at opportunities in a wider context than risk mitigation for society and nature.

Taskforce plans for subsequent releases

The Taskforce will continue to follow the progress among organisations defining nature positive to inform its work, including the Global Biodiversity Framework of the CBD.

The Taskforce appreciates the feedback on opportunities, and as it moves into developing sector-specific guidance, it will further strengthen its definition and guidance on opportunities and continue to evaluate how the mitigation hierarchy fits into the framework and the need for transformative business models.

2.5 Inclusion of systemic risk

Systemic risks are difficult to address directly for companies or financial institutions and are the responsibility of policy makers and regulators.

There is no change to the approach to systemic risks in beta v0.2. Companies and financial institutions are exposed to the systemic risk of ecosystem collapse. This risk of the collapse of ecosystems could present the greatest risk to companies and financial institutions.

Taskforce plans for subsequent releases

The Taskforce will continue to assess the best way to consider systemic risks in the TNFD framework.

The Taskforce will focus on scenarios in its next phase, as one important route for further building the TNFD’s thinking on systemic risks.

2.6 Inclusion of dependencies and impacts in draft disclosure recommendations

Respondents queried whether the TNFD disclosure recommendations will require disclosure of dependencies and impacts, or only risks and opportunities.

The draft disclosure recommendations in the v0.1 beta release were aligned with those of the TCFD as a starting point, including the TCFD’s focus on disclosure of risks and opportunities. Nevertheless, the general requirements introduced by the Taskforce in the v0.1 beta make clear that the assessment of risks and opportunities ‘should be based on assessment of nature-related dependencies and nature impacts’. This has not changed in the v0.2 release. However, the guidance and illustrative metrics outlined in the v0.2 release make clear that impact and dependency analysis is the critical starting point, aligned with the LEAP approach, for assessing nature-related risks and opportunities.

This is not changed in the v0.2 release. However, the new content on metrics in the v0.2 release sets out Assessment Metrics for dependencies and impacts. Assessment Metrics are distinguished from Disclosure Metrics.

Taskforce plans for subsequent releases

The Taskforce will consider this feedback and evaluate the inclusion of dependencies and impacts on nature in the disclosure recommendations, based on ongoing feedback from market participants, including pilot testing, for updates in subsequent releases.

Disclosure Metrics for dependencies, impacts, risks and opportunities will be designated into ‘core’ and ‘additional’ metrics and these will be set out in subsequent releases.
### Feedback theme

#### 2.7 Timeframes in the draft disclosure recommendations

The Taskforce recognises that this timeframe set out in the TNFD disclosure recommendations is ambitious given current data availability. But the TNFD landscape assessment of data & analytics availability suggests that the data landscape is evolving rapidly and the TNFD aims to further stimulate innovation through the TNFD Data Catalyst (launching July 2022). The TNFD remains optimistic about new data and analytics solutions coming online in the next two to three years that could address a number of data gaps and analytical challenges. The Taskforce therefore has not changed the timeframe included in the v0.2 beta release.

### Taskforce plans for subsequent releases

The Taskforce will continue to evaluate timeframes set out in the draft disclosure recommendations for subsequent releases, based on ongoing feedback, discussions with data providers and pilot testing.

### Feedback theme

#### 2.8 Adaptation of ‘scopes’ from climate reporting

In the beta v0.1 framework, the TNFD used direct, upstream and downstream as a simplified construct. This aligns with the approach of the Science Based Targets Network (SBTN) and the draft European Sustainability Reporting Standards (ESRS) being developed by EFRAG. In v0.2, the Taskforce continues to propose this as a simplified and appropriate approach to ‘scopes’ in climate reporting.

### Taskforce plans for subsequent releases

The TNFD will continue to evaluate the use of direct, upstream and downstream as a simplified construct for nature, equivalent to scopes in climate reporting, based on ongoing feedback and pilot testing. The Taskforce will be elaborating further on this adaptation of ‘scopes’ in the November 2022 v0.3 release.

### LEAP approach

#### 2.9 Criteria for defining high importance and low integrity ecosystems.

The v0.2 beta release of the TNFD framework provides new guidance for the Locate phase of the LEAP approach, including signposting reference sources that can be used to evaluate the integrity and importance of ecosystems. (Note - this is also relevant for Strategy D draft disclosure recommendation).

### Taskforce plans for subsequent releases

The Taskforce will consider the inclusion of valuation in future releases of the framework, as the Taskforce progresses its work on risk and opportunity metrics.
### Feedback theme

#### 2.12 LEAP approach in relation to disclosure recommendations

<table>
<thead>
<tr>
<th>Need to be clearer how the LEAP approach and disclosure recommendations relate to each other.</th>
</tr>
</thead>
<tbody>
<tr>
<td>As set out in the v0.1 release, LEAP is not, in itself, a disclosure recommendation or a mandated process to adhere to the disclosure recommendations put forward by the TNFD. As such, not everything that is identified, assessed and evaluated using the LEAP approach needs to be disclosed. LEAP is intended to serve as voluntary guidance to assist market participants with their internal analysis and discussions in order to make a number of corporate and investment decisions and apply the TNFD disclosure recommendations. Report preparers may want to note their use of the LEAP approach to increase confidence among report users about the methodology being used to prepare their disclosures. Critically, the TNFD believes that all aspects of the LEAP approach should be incorporated into any robust nature-related risk and opportunity assessment process. The v0.2 beta release has not changed this approach.</td>
</tr>
</tbody>
</table>

### Taskforce plans for subsequent releases

The Taskforce will set out how the LEAP approach relates to the evolving TNFD draft disclosure recommendations and explain the linkages in subsequent releases.
### Feedback on framework development process, communications and engagement

The TNFD also received general feedback on the overall framework, how it is being developed, communication of its work and its engagement with stakeholders and other initiatives, as summarised in Table 4.

<table>
<thead>
<tr>
<th>Feedback detail</th>
<th>Taskforce response in v0.2 release, clarifying any change from v0.1</th>
</tr>
</thead>
</table>

#### Feedback theme

<table>
<thead>
<tr>
<th>3.1 Alignment with other initiatives, including relevant standards and frameworks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continue to build on the TCFD framework and work of the SBTN. The TNFD framework should align with other initiatives and frameworks, in particular the ISSB exposure drafts, as well as the work of the Capitals Coalition including the Natural Capital Protocol, OECD guidelines, European Sustainability Reporting Standards (ESRS) and the Environmental Sustainability Gap framework (ESGAP).</td>
</tr>
</tbody>
</table>

The beta v0.1 and v0.2 framework releases have been developed in close collaboration with knowledge partners, which include standards bodies ISSB (SASB), EFRAG, OECD, Capitals Coalition and SBTN, as well as partners involved in the development of ESGAP (Agence Francaise de development). See the full list of knowledge partners [here](#) and the TNFD’s relationships with other initiatives is set out in the FAQs on the TNFD website.

Both v0.1 and v0.2 use definitions and concepts that draw on existing standards and a strong scientific basis, including the Intergovernmental Platform on Biodiversity and Ecosystem services (IPBES).

<table>
<thead>
<tr>
<th>Taskforce plans for subsequent releases</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Taskforce will continue to share, collaborate and work to further align the TNFD framework with these other related initiatives and emerging standards, including the emerging global baseline through the ISSB.</td>
</tr>
</tbody>
</table>

#### 3.2 Clarity on what the TNFD Framework is (and is not)

<table>
<thead>
<tr>
<th>Feedback theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need clearer communication of the TNFD’s overall objectives and practical uses of the framework.</td>
</tr>
</tbody>
</table>

The TNFD’s objectives and proposed users of the framework are laid out in the FAQs on the TNFD website. The TNFD framework is not a standard, a certification scheme or a detailed taxonomy for nature-related investments. As a framework, akin to that developed by the TCFD, rather than a disclosure standard, it complements rather than replaces existing standards. It is an integrative framework that sits above these and can be used by related standards, including voluntary standards, such as those developed by GRI and CDP, and mandatory standards, such as the European Sustainability Reporting Standards and the emerging global baseline being developed by the ISSB.

The Taskforce recognises that report preparers will have jurisdiction and investor-specific needs that go beyond the TNFD framework. The framework is seeking to align with the emerging global baseline and provide flexibility for those who need or want to report to other standards beyond that global baseline.

<table>
<thead>
<tr>
<th>Taskforce plans for subsequent releases</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Taskforce will continue to offer clear communication about the framework as it develops. The TNFD will also continue to align with the emerging global baseline, and jurisdictional requirements that go beyond the global baseline, as it develops the framework.</td>
</tr>
</tbody>
</table>
### Feedback theme

#### 3.3 Engagement with Indigenous Peoples and reference to human rights and impacts and risks to human rights.

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engage further with Indigenous Peoples and co-develop solutions that recognise their inherent rights and title, as well as their deep, intergenerational knowledge in the protection of nature. The TNFD disclosure requirements should include human rights, integrating reporting requirements already outlined under international human rights standards.</td>
</tr>
</tbody>
</table>

The TNFD is expanding its consultation efforts with a dedicated plan for engaging Indigenous Peoples and Local Communities, via a partnership with the IUCN, to start in July 2022. This aims to ensure the voices and perspectives of Indigenous Peoples and Local Communities are incorporated into the design and development phase of the framework. Indigenous and local communities are stewards of much of the world's natural resources and play a particularly critical role in safeguarding nature. Their communities are also highly dependent on nature for their livelihoods and Indigenous-led enterprises are often pioneers in sustainable business models.

### Taskforce plans for subsequent releases

A priority area for further development in the framework in subsequent releases is consideration of social dimensions, including consideration of human rights. This will be developed in close engagement with Indigenous Peoples and Local Communities through this new engagement channel led by IUCN.
3. The TNFD’s Draft Approach to Metrics and Targets

3.1 Context

Market demand for a standardised approach to measurement

While the measurement of natural capital and ecosystem services has progressed, there is not yet consensus in the market – in principle or in practice – on a comprehensive approach to measuring nature-related dependencies, impacts, risks and opportunities. A landscape assessment undertaken by the TNFD found that there are more than 3,000 different nature-related metrics in use already today by standards bodies, policy making and regulatory bodies and in major scientific reference reports. The lack of standardisation of nature-related metrics limits corporate and financial institution measurement, management and reporting of nature-related risks and opportunities and poses challenges for providing comparability in a practical way across and within sectors, one of the key requirements emphasised by market participants.¹

State of play: Measurement of impacts on nature

The progress made on nature-related corporate reporting standards has focused on the measurement of business impacts on nature, including direct drivers, such as business activities leading to ecosystem degradation and biodiversity loss, as well as indirect drivers, such as water usage, water and land pollution, air pollution and waste generation. Impact drivers are most often considered only in terms of negative impacts on nature, even though they can also have a positive impact on nature, for example, through business activities for nature restoration, conservation, regenerative agriculture and invasive species removal.

State of play: Measurement of dependencies on nature, risk and opportunity

Nature-related dependencies and related risks are included in existing reporting standards to varying degrees, but measures of business dependencies on nature remain less well developed, with science and conservation organisations acknowledging that further work needs to be done. Where dependencies are covered, they vary in coverage by realm and ecosystem service. For example, water provision and risks from water scarcity have been addressed in some disclosure schemes, while exposure to loss of pollination services is rarely included. Addressing this underdeveloped aspect of the natural capital measurement is a critical priority.

State of play: Measurement of financial risk and opportunity

The translation of impacts and dependencies into measures of risks and opportunities related to financial outcomes such as revenues, cashflows and enterprise value are less developed. This is particularly true for opportunities that have been underrepresented across all disclosure requirements. Guidance on how these measures can and should be used by financial institutions to inform their investments and decision-making is even more in its infancy.

Measurement for corporate reporting today is heavily focused on measuring business impacts on nature. Metrics for assessing dependencies, risks and opportunities are significantly less developed.

3.2 Objectives and timeline for development of TNFD’s approach to measurement

Consultations by the Taskforce with a wide range of market participants have signalled clearly that, as a response to these challenges, there is high demand for a standardised and integrated approach to measurement that:

- Is scientifically robust and sensitive to changes in the location-specific state of nature, where business processes interface with natural ecosystems;
- Levels up the uneven landscape for nature-related metrics by improving metrics for assessing dependencies, risks and opportunities as well as impacts;
- Provides comparable, high-quality data and insights to inform corporate and financial institution decision making, including at aggregated loan and investment portfolio levels for financial institutions;
- Is practical to implement and can be used at scale and at different levels (site, product, corporate) by organisations in a time and cost-effective manner; and
- Can be used for risk and opportunity management, transition planning and corporate target setting, aligned with broader national and global public policy goals for reversing nature loss, as is now the case with the global climate ‘architecture for action’ used by government, business and finance.

Achieving all of these requirements in a unified approach to nature-related risk management and disclosure is a complex undertaking, requiring difficult trade-offs between comprehensiveness and clarity; and specificity and flexibility.

The TNFD’s iterative, open innovation approach to metrics and targets outlined in this v0.2 release is designed to balance the complexity of science with the practical needs of the market. The approach outlined below is intended to facilitate feedback from a wide range of stakeholders and assist with pilot testing, leading up to the finalisation of the Taskforce’s recommendations in September 2023.

In this beta v0.2 release, the TNFD:

- Outlines an integrated, overarching architecture for nature-related indicators, metrics and targets, including cross-industry metrics categories;
- Provides proposed criteria for the selection of assessment indicators an illustrative set of indicators and metrics for the assessment of nature-related dependencies and impacts to support pilot testing (see annexes 1 and 2); and
- Sets out initial considerations for target-setting (see annex 3).

In future releases, the TNFD will expand and increase the specificity of guidance on indicators and metrics. The development of the TNFD approach to indicators, metrics and targets is as follows:

- For release in November 2022 (v0.3) – initial guidance on measuring nature-related risks and opportunities, initial guidance on targets (recognising that the timing will not allow the outcomes of the CBD process to be reflected) and initial guidance on disclosure metrics. The release may also include guidance on how the approach to indicators, metrics and targets can be adopted and used by financial institutions.
- For release in February 2023 (v0.4) – revised guidance on disclosure metrics, including proposed core and additional disclosure metrics. Revised guidance on target-setting based on work by SBTN and CBD, sector-specific guidance for prioritised sectors and case studies.

• For release in September 2023 (v1.0) – final set of indicators and metrics, including assessment and disclosure metrics (both ‘core’ and ‘additional’), categorised by realm. Finalised target-setting guidance.

Through this staged approach, the TNFD hopes to:

• Stimulate initial feedback from the market and other key stakeholders to inform the further development of the approach to measurement at the heart of the TNFD Framework;

• Equip market participants with a scalable approach to measurement based on the current direction of global and national policy developments (including the CBD COP15 Global Biodiversity Framework), and related, existing measurement and target-setting approaches, which can be updated as these evolve;

• Support pilot testing by providing an illustrative set of metrics that can be used. These metrics will draw on those already included by industry standards bodies and disclosure frameworks in their existing standards guidance, based on a landscape assessment undertaken by TNFD;

• Encourage innovation and alignment by supporting all market participants to assist in building out the architecture for nature-related metrics and targets with integrity and speed;

• Be cognisant of current data limitations, but not constrained by them. The Taskforce recognises the speed of innovation in data collection and analysis happening today and believes that this will rapidly improve what is possible. As such, the TNFD’s proposed approach to metrics and targets includes review mechanisms to update the approach to nature-related metrics and targets over time; and

• Accommodate the use of metrics and targets that are currently less commonly used and reported on, but that are critical to assessing and managing nature-related risks and opportunities. These include metrics for assessing changes in the state of nature and nature-related financial risks and opportunities.

Link to pilot testing

Given the evolving landscape outlined above, this enables the TNFD to use the open innovation framework development period to 1 June 2023 to learn more from market experience, feedback and pilot testing and work with knowledge partners to determine which metrics are most robust, useful and important as Disclosure Metrics (both ‘core’ and ‘additional’).

Pilot testers are requested to provide feedback on the illustrative indicators and metrics provided in the v0.2 release. Pilot testers may also use – and provide feedback on – the overall metrics architecture and categorisation to help the Taskforce make progress on its approach toward the final framework publication in September 2023

3.3 Outline of the TNFD’s approach to metrics

Metrics are defined as a system or standard of measurement (Biodiversity Indicators Partnership. 2011. Guidance for national biodiversity indicator development and use.) An indicator is defined as a quantitative or qualitative factor or variable that provides a simple and reliable means to measure performance (OECD/DAC. 2002. Glossary of Key Terms in Evaluation and Results Based Management Development Assistance Committee Available from: http://www.oecd.org/dac/evaluation/2754804.pdf)

3.3.1 Key elements of the proposed metrics and targets architecture

Reflecting these challenges and constraints, the TNFD’s approach to metrics and targets is built around six design features:

1. Distinguishes between ‘Assessment Metrics’ used internally by report preparers for assessment purposes to inform management decisions (including what to disclose) and ‘Disclosure Metrics’ to be used in external disclosures for report users;

2. Aligns with the Task Force on Climate-related Financial Disclosures (TCFD) approach of focusing first on cross-sector metrics and builds on the work of standard-setting bodies, in recognition that considerable research, scientific expertise and feedback from market participants is embodied in these various measurement, standards and disclosure frameworks developed by organisations such as the UN Statistics Division, CDP, GRI, SASB and IIRC (now the VRF) and CDSB (the last three now incorporated into the new International Sustainability Standards Board);

3. Configures to support end-to-end nature-related risk management and disclosure, following the LEAP approach introduced in the v0.1 release of the TNFD framework;

4. Provides a common global set of core disclosure metrics (specifics to be provided in future releases) to provide a baseline for comparability within and across sectors, while also recognising the need to accommodate additional disclosures based on the specific needs of each sector and different regulatory requirements across jurisdictions;

5. Enables periodic reviews of the measurement architecture to ensure it continues to be fit for purpose, based on further development of scientific knowledge, data and measurement innovation and reporting requirements; and

6. Aligns with emerging global and national policy target-setting frameworks, such as the Global Biodiversity Framework (GBF), and corporate target-setting approaches such as those being developed by the Science Based Targets Network (SBTN).
1. Two types of metrics: Assessment and Disclosure

The TNFD’s approach to measurement includes two types of metrics:

- **Assessment Metrics** – metrics used within an integrated internal assessment process for nature-related risk and opportunity management (the TNFD’s recommended LEAP approach). These Assessment Metrics help to inform internal decision making and would not be required to be disclosed (i.e. not part of TNFD-aligned disclosure against Metrics & Targets disclosure recommendation A) unless specified in the Disclosure Metrics. Assessment Metrics are relevant to the Locate, Evaluate and Assess phases of LEAP as well as the ‘Strategy and resource allocation’ components of the P phase (P1 and P2). Assessment Metrics for only the impact and dependency metrics categories have been identified in this v0.2 update release. Assessment Metrics for risk and opportunity analysis and strategy and resource allocation considerations will be included in the v0.3 release in November 2023.

- **Disclosure Metrics** – metrics required to be disclosed to market participants in line with the TNFD’s disclosure recommendations (i.e. Metrics & Targets disclosure recommendation A). Some, but not all, Assessment Metrics may also be Disclosure Metrics. Disclosure Metrics are not detailed in this v0.2 release and will be released for discussion and market feedback in a future release.

2. Configuring the LEAP approach for risk and opportunity assessment

In the v0.1 beta framework release in March 2022, the TNFD introduced an integrated assessment process for nature-related risk and opportunity management called LEAP.

The phased approach of LEAP makes clear the different types of assessment metrics required as report preparers assess nature-related risks and opportunities and identify a set of disclosures aligned with the TNFD’s draft disclosure recommendations (Table 5):

<table>
<thead>
<tr>
<th>LEAP phase</th>
<th>Metric type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L Locate phase</td>
<td>Assessment</td>
<td>Measuring the integrity/importance of ecosystems at each location where a business, or the financing activities supporting the business, interface with nature in order to define priority locations</td>
</tr>
<tr>
<td>E Evaluate phase</td>
<td>Assessment</td>
<td>Measuring business dependencies and impacts at each priority location where a business, or the financing activities supporting the business, interface with nature. This includes impact driver, state of nature and ecosystem service metrics</td>
</tr>
<tr>
<td>A Assess phase</td>
<td>Assessment</td>
<td>Measuring the resulting nature-related risks and opportunities, including the impact on the financial health and resilience of a company, and the risks to nature</td>
</tr>
</tbody>
</table>

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*The draft disclosure recommendation for Metrics and Targets A in the v0.1 beta release of the TNFD framework states that organisations should: ‘Disclose the metrics used by the organisation to assess material nature related risks and opportunities in line with its strategy and risk management process.*
This v0.2 beta release focuses on the Assessment Metrics for dependencies and impacts on nature under the ‘E’ phase of the LEAP process. Further work will be undertaken by the Taskforce on the Assessment Metrics for the ‘L’, ‘A’ and ‘P’ phases of LEAP.

3. Cross-industry metrics categories

Aligned with the approach taken by the Task Force on Climate-Related Financial Disclosures (TCFD) and based on existing frameworks and standards in the market place, the proposed TNFD approach to metrics and targets starts by identifying categories of nature-related cross-industry metrics. The proposed TNFD cross-industry metrics categories are provided in Table 6 and are supplemented with guidance in Annex 1 and an illustrative set of metrics in Annex 2.
Indicators and Metrics

Metrics are defined as a system or standard of measurement (Biodiversity Indicators Partnership. 2011. Guidance for national biodiversity indicator development and use.) An indicator is defined as a quantitative or qualitative factor or variable that provides a simple and reliable means to measure performance (OECD/DAC. 2002. Glossary of Key Terms in Evaluation and Results Based Management Development Assistance Committee Available from: www.oecd.org/dac/evaluation/2754804.pdf)

Figure 10: Connection between indicators and metrics

- **Indicators**
  - Ocean
    - Example: Extent of marine area used for business activity
  - Freshwater
    - Example: Volume of water discharged
  - Land
    - Example: Area of land converted

- **Metrics**
  - Metric 1.1
    - Area of natural marine ecosystems owned, leased and/or operated in by ecosystem type and business activity
  - Metric 1.2
    - Volume of total water discharged (m³)
    - Volume of freshwater discharged (m³)
    - Volume of other water discharged (m³)
  - Metric 1.3
    - Area of land (km²) converted/degraded by ecosystem type and business activity

A number of different levels of measurement will be relevant for Assessment and Disclosure Metrics. Indicators and metrics may be at the level of:
- Direct operations (site, project or corporate level);
- Upstream; and
- Downstream (including portfolio level).

Metrics levels should be hierarchical (i.e. corporate level metrics would be the aggregation of site or project-level metrics). Ecosystems and biomes intersect with the different levels of metrics.

The illustrative metrics in Annex 2 focus on Direct Operations as a starting point.

4. Providing comparability yet flexibility for different disclosure regimes – Core and Additional Disclosure Metrics

As outlined above, one of the biggest challenges the TNFD faces in designing a nature-related risk management and disclosure framework is striking the right balance between simplicity and comprehensiveness. Ultimately, investors, creditors and regulators across markets and jurisdictions will make this judgement in different ways. As such, the TNFD will provide some flexibility in approach, while also recommending a common global set of ‘core’ metrics that allows comparability within and across sectors. This will help to ensure that the approach taken in the TNFD framework fits into a broader global baseline for integrated sustainability reporting and is manageable and cost effective for report preparers.

To ensure the analytic and reporting process is manageable and achievable, Disclosure Metrics recommended by the TNFD as part of the final framework in September 2023 would be delineated into ‘core’ and ‘additional’ metrics:

- **Core Disclosure Metrics** are metrics that all organisations should disclose in line with the TNFD’s disclosure recommendations (Metrics & Targets disclosure recommendation A). These metrics would provide the market with consistent, decision-useful information, including for financial institutions. The TNFD recommends that organisations should consider Core Disclosure Metrics within the context of the regulatory disclosure requirements for the applicable jurisdiction they are operating in.

- **Additional Disclosure Metrics** are metrics that a company or financial institution may choose to include in their disclosures, based on their specific industry, location and/or regulatory requirements, depending on their jurisdiction. As the name suggests, these would be additional to, not a substitute for, reporting on the core TNFD Disclosure Metrics, irrespective of whether all the core TNFD Disclosure Metrics are required by the relevant jurisdiction.

5. Ensuring flexibility and fitness for purpose – A periodic review process

The TNFD proposes that the specific metrics it recommends in the v1.0 framework in September 2023 be subject to periodic review initially every three to five years. This would help to ensure that advances in science, data, policy and investor expectations can be reflected and incorporated, while providing medium-term consistency and certainty of approach for report preparers and users.

Examples of advances to consider in the periodic updates include:
- Reviews of the monitoring framework for the post-2020 Global Biodiversity Framework (GBF);
- Major assessment reports undertaken by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES); and
- Changes in regulatory arrangements and/or the information needs of financial institutions, including in the global baseline of reporting standards by the ISSB and/or elsewhere.

The TNFD welcomes feedback from market participants whether they would prefer a 3-year or 5-year review cycle, balancing consideration for medium-term reporting consistency on the one hand, with the need to incorporate technology and reporting advances on the other.

6. Aligning with emerging target-setting frameworks and approaches

The TNFD approach to measurement and target-setting will align with the emerging global and national policy target-setting frameworks, such as the Global Biodiversity Framework (GBF), and corporate target-setting approaches such as those being developed by the Science Based Targets Network (SBTN). As the GBF and SBTN approaches are still in development, the TNFD will work closely with the CBD, SBTN, ISSB and others to maximise alignment and work towards a joined-up approach to guidance for market participants.

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3.4 Illustrative assessment metrics and criteria for user selection

As part of the LEAP approach, the TNFD proposes that organisations consider the following criteria to select indicators and metrics, noting that they should be sensitised to the specific sector and location of business operations:

1. **Select a range of relevant indicators:** select indicators for each element of sub-category 2 in Table 7 on an 'assess or explain basis’. Have a clear, justifiable rationale for the reasons why a category is not relevant for the assessment;

2. **Consider materiality:** Choose indicators based on the results of the location prioritisation (LEAP component L3) and materiality assessment (LEAP component A4). Indicators should be selected based on their ability to measure the most material dependencies, impacts, risks and opportunities for the entity;

3. **Cover all the TNFD’s four realms of nature, where relevant:** The range of indicators selected should assess ecosystem assets across the four realms of nature, (land, freshwater, ocean, atmosphere) where relevant to the organisation’s direct, upstream and downstream interface with nature;

4. **Consider interconnectedness:** Indicators selected should reflect the relationships between impact drivers, state of nature and ecosystem services. Indicators should cover an interconnected suite across the assessment categories, taking into account measurability and frequency of inclusion in existing standards and frameworks;

5. **Use a set of metrics:** Indicators should be measured using a set of metrics, including where possible an absolute metric; the rate of change, intensity/efficiency and prevalence; and level (direct operations at the product, site and corporate level and upstream and downstream);

6. **Consider scalability:** Metrics selected should be scalable and able to be applied at different levels across sectors and locations and for targets; and

7. **Baselines and reference states:** State of nature metrics should compare the current ecosystem condition to a baseline and reference state. Rate of change metrics should be compared to a starting baseline. Guidance on reference condition is provided in Annex 1A.

**Figure 11:** Sets of metrics for each indicator (where possible)

**Table 7:** TNFD Cross-industry assessment metrics categories with illustrative indicators

<table>
<thead>
<tr>
<th>Dependency &amp; Impact Metrics Category</th>
<th>Sub-category 1</th>
<th>Sub-category 2</th>
<th>Indicator - illustrative Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrestrial ecosystem use</td>
<td>Extent of land converted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshwater ecosystem use</td>
<td>Extent of freshwater area converted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marine ecosystem use</td>
<td>Extent of marine area converted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-GHG air pollutants</td>
<td>Volume of non-GHG air pollutants released</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil pollutants</td>
<td>Volume of soil pollutants released</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water pollutants</td>
<td>Volume of water discharged</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid waste</td>
<td>Hazardous waste generated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water use/replenishment</td>
<td>Volume of water consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of natural resources</td>
<td>Use of natural resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greenhouse gas emissions/carbon storage, sequestration and removal</td>
<td>Scope 1, 2 and 3 emissions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological alterations</td>
<td>Level of invasive species in area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disturbances</td>
<td>Level of noise pollution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habitat/land cover</td>
<td>Species richness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition - minimum of compositional state</td>
<td>Species abundance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Species threat abatement restoration</td>
<td>Species threat abatement restoration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight of provisioned assets</td>
<td>Weight of provisioned assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume of water withdrawn</td>
<td>Volume of water withdrawn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tonnes of soil retained</td>
<td>Tonnes of soil retained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area of habitat providing services</td>
<td>Area of habitat providing services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of properties in low risk categories</td>
<td>Number of properties in low risk categories</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tonnes of GHG retained</td>
<td>Tonnes of GHG retained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recreation, visual amenity, scientific and education or spiritual/artistic/symbolic</td>
<td>Number of visits for cultural purposes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Further guidance on the measurement of dependencies and impacts, and illustrative sets of indicators and metrics for each category are provided in Annexes 1 and 2.
3.5 Initial considerations for TNFD target-setting

Conceptually, metrics and targets (and data) need to line up at three different levels – global (the level of coordinated international policy), national (the level of national regulation and law) and local (the ecosystem level where business interfaces with nature), as outlined in Figure 12.

**Figure 12: Global metrics and targets policy architecture needed for action**

<table>
<thead>
<tr>
<th>Metrics</th>
<th>Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Accountability</td>
<td>National Accountability</td>
</tr>
<tr>
<td>Local Assessment</td>
<td>Local Assessment</td>
</tr>
</tbody>
</table>

With respect to global action on climate change, this ‘architecture for action’ is fully developed and enabling action by governments, business, finance and civil society. But for coordinated global action to tackle nature loss and achieve global targets that address nature loss, the architecture for action is largely incomplete (Figure 13). No comparable global architecture for measurement and target-setting for nature – covering land, freshwater, oceans and atmosphere (including dimensions beyond climate change such as air quality) – yet exists.

**Figure 13: The global metrics and targets architecture for action – climate vs. nature**

<table>
<thead>
<tr>
<th>Climate Architecture for Action</th>
<th>Nature Architecture for Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metrics</td>
<td>Targets</td>
</tr>
<tr>
<td>National Accountability</td>
<td>National Accountability</td>
</tr>
<tr>
<td>Local Assessment</td>
<td>Local Assessment</td>
</tr>
</tbody>
</table>

- In place
- In registration
- No agreed approach
At the global level, the TNFD seeks to align with the environment-related Sustainable Development Goals and the post-2020 GBF currently being negotiated through the UN CBD COP15 process. These global targets would then cascade down to the national level through the established mechanism of National Biodiversity Strategy and Action Plans (NBSAPs).

Local ecosystem targets can then inform measurement and target setting by companies and financial institutions. Following this approach, the TNFD also seeks to align with the corporate target-setting approach being developed by the SBTN.6

Numerous institutions are working to provide guidance for science-based target setting for nature by companies and cities, in parallel with the ongoing intergovernmental negotiations for a CBD post-2020 Global Biodiversity Framework (GBF). This includes progress by the Science Based Targets Network (SBTN) on science-based target setting methodologies for corporates and cities. These institutional and global targets connect through the draft targets of the GBF including, but not limited to, the proposed Target 15. These targets may change in their relevance as a result of the ongoing negotiations within the CBD process.7

While the TNFD can help to address some of these challenges, others are primarily the responsibility of other international actors, such as policy makers, regulators and scientific bodies. The TNFD is engaging these other international actors to encourage coordinated action. Development of all aspects of this metric, targets and data architecture will also ensure the TNFD’s own recommendations are fully enabled to achieve the desired outcome of informing better corporate and financial institution decision making that ultimately shifts the flow of global capital to nature-positive outcomes.

Further detail on TNFD’s initial considerations for targets are contained in Annex 3.

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7 The draft Global Biodiversity Framework Target 15 states that: “All businesses (public and private, large, medium and small) assess and report on their dependencies and impacts on biodiversity, from local to global, and progressively reduce negative impacts, by at least half and increase positive impacts, reducing biodiversity-related risks to businesses and moving towards the full sustainability of extraction and production practices, sourcing and supply chains, and use and disposal.” (CBD, First Draft of the Post-2020 Global Biodiversity Framework)

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4. TNFD’s approach to specific guidance

4.1 Structure and design considerations for the development of specific guidance

Many market participants have been clear that nature-related risk and opportunity assessment is new and unfamiliar. The TNFD has received feedback from market participants that they want additional guidance, including sector-specific guidance, but also by realm, biome and nature-related issues.

The TNFD will therefore approach the development of specific recommendations and guidance using the following structure (see Figure 14):

1. **Sector specific**: Recommendations/guidance tailored to the economic sector in which organisations conduct business.
2. **Nature-related issue specific**: Recommendations/guidance tailored to specific nature-related issues – dependencies, impacts, risks and opportunities – that are relevant for a particular organisation and across sectors.
3. **Realm specific**: Specific guidance/recommendations linked to the nature realms defined by the TNFD (ocean, freshwater, land and atmosphere).

**Figure 14: Structure for TNFD-specific guidance**

Nature-related issues are relevant across various sectors. For example, the impact driver freshwater use is relevant to a variety of sectors, including agriculture, apparel and textiles, mining, and oil and gas. A multi-dimensional approach to guidance will allow organisations from different sectors to access guidance on these nature-related issues that are relevant across industries.

The guidance will build on the following further design considerations:

- Provide further detail on sector-specific metrics and targets, building on the approach to metrics and targets in v0.2, which covers cross-industry metrics only;
4.2 Towards sector-specific guidance: TNFD sector classification and sector prioritisation

The draft disclosure recommendations in the beta v0.1 of the TNFD framework are sector agnostic and apply both to financial institutions and corporates. The TNFD’s first attempt at providing specific guidance based on the distinct characteristics of an organisation has been the development of two versions of LEAP: the LEAP approach for corporates (including financial institutions as corporates) and LEAP Fi, a version of LEAP specifically tailored towards financial institutions as providers or managers of capital, which has been updated in the v0.2 release (see Section 5).

Since the launch of the Taskforce, the TNFD has received significant interest from market participants in the development of additional guidance, including by sector. The TNFD therefore aims to enhance the specificity of its recommendations moving forward and develop guidance that is relevant, customised and aligned to the needs of different market participants.

4.2.1 TNFD’s Proposed Approach to Sector Classification

The TNFD’s non-financial sector classification is based on the Sustainable Industry Classification System® (SICS®), developed by SASB to group companies based on shared sustainability risks and opportunities. This has been adopted by the ISSB for the global baseline they are developing for sustainability disclosure. The TNFD has adopted SICS® to align as closely as possible to this emerging global baseline under development by the ISSB.

The TNFD will organise financial sector guidance into the four major financial services industries identified and defined by the TCFD: banks, insurance companies, asset managers and asset owners. Development Finance Institutions have been added, given their important role in nature-related financing in emerging markets, including in many nature hotspots.

The specific guidance developed by the TNFD will be designed to be interoperable with different sector and industry classification schemes and a mapping to different classification schemes will be provided in future releases.

4.2.2 TNFD’s proposed priority sectors

Non-financial TNFD priority sectors

While the TNFD recognises that every non-financial sector has an impact on nature and is affected by nature-related risks and opportunities, the TNFD has developed an initial list of its priority sectors, identifying the sectors and industries that are more likely to be financially impacted than others due to their exposure to dependencies and impacts on nature. It also considers the sector’s potential opportunities – activities that create positive outcomes for organisations and nature by avoiding or reducing impact on nature, or contributing to its restoration. This first list of priorities has been identified to ensure a manageable scope of work for the Taskforce in developing its first set of specific guidance. Further sectors, sub-sectors and industries may be added in subsequent releases.

To inform its prioritisation of sectors for developing sector specific guidance, the TNFD has conducted a review and consolidation of existing sector-specific research and assessments focused on nature-related dependencies, impacts, risks, and opportunities. Based on this review and evaluation, and aligned with the SICS classification scheme, eight thematic sectors, 13 sub-sectors and 19 industries have been prioritised for the TNFD’s initial development of sector-specific guidance recommendations moving forward:

Table I: Non-financial TNFD priority sectors and industries for development of sector specific guidance

<table>
<thead>
<tr>
<th>Sub-sectors</th>
<th>Industries</th>
<th>SASB definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food and Beverage</td>
<td>1 Food</td>
<td>Meat, Poultry and Dairy (1)</td>
</tr>
<tr>
<td></td>
<td>2 Agricultural Products</td>
<td>The Agricultural Products industry is engaged in processing, trading and distributing vegetables and fruits, and producing and milling agricultural commodities such as grains, sugar, consumable oils, maize, soybeans and animal feed.</td>
</tr>
<tr>
<td></td>
<td>2 Food and Beverage Retail</td>
<td>3 Alcoholic Beverages</td>
</tr>
<tr>
<td></td>
<td>4 Non-Alcoholic Beverages</td>
<td>The Non-Alcoholic Beverages industry produces a broad range of beverage products, including various carbonated soft drinks, syrup concentrates, juices, energy and sport drinks, teas, coffee and water products.</td>
</tr>
<tr>
<td></td>
<td>5 Processed foods</td>
<td>The Processed Foods industry includes companies that process and package foods such as bread, frozen foods, snack foods, pet foods, and condiments for retail consumer consumption. Typically, these products are made ready to consume, are marketed for retail consumers, and can be found on food retailers’ shelves.</td>
</tr>
</tbody>
</table>

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### Thematic sector

#### Renewable Resources and Alternative Energy

<table>
<thead>
<tr>
<th>No.</th>
<th>Thematic sector</th>
<th>Industry Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Forestry and Paper</td>
<td>The Forestry Management industry consists of companies that own and/or manage natural and planted forestry lands and timber tracts, or operate non-retail tree nurseries and rubber plantations.</td>
</tr>
<tr>
<td>4</td>
<td>Alternative Energy</td>
<td>The Biofuels industry consists of companies that produce biofuels and process raw materials for production. Biofuels are manufactured using organic feedstocks and are used primarily as transportation fuels. Companies typically source feedstocks, which include food, oil crops and animal products, from agricultural product distributors. Ethanol and biodiesel are the most widely produced biofuels, while other types include biogas, biohydrogen and synthetic biofuels, produced from a variety of organic feedstocks.</td>
</tr>
<tr>
<td>5</td>
<td>Infrastructure</td>
<td>The Engineering and Construction Services industry provides engineering, construction, design, consulting, contracting and other related services that support various building and infrastructure projects. The industry is primarily made up of four major segments: engineering services, infrastructure construction, non-residential building construction and building sub-contractors and construction-related professional services.</td>
</tr>
<tr>
<td>6</td>
<td>Utilities and Distributors</td>
<td>Companies in the Water Utilities and Services industry own and operate water supply and wastewater treatment systems (generally structured as regulated utility businesses) or provide operational and other specialised water services to system owners (usually market-based operations). Water supply systems include the sourcing, treatment and distribution of water to residences, businesses and other entities such as governments. Wastewater systems collect and treat wastewater, including sewage, graywater, industrial waste fluids and stormwater runoff, before discharging the resulting effluent back into the environment.</td>
</tr>
</tbody>
</table>

#### Extractive and Minerals Processing

<table>
<thead>
<tr>
<th>No.</th>
<th>Thematic sector</th>
<th>Industry Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Construction Materials</td>
<td>Construction materials companies have global operations and produce construction materials for sale to construction firms or wholesale distributors. These primarily include cement and aggregates, but also glass, plastic materials, insulation, bricks and roofing material. Materials producers operate their own quarries, mining crushed stone or sand and gravel. They may also purchase raw materials from the mining and petroleum industries.</td>
</tr>
<tr>
<td>8</td>
<td>Metals and Mining</td>
<td>The Metals and Mining industry is involved in extracting metals and minerals, producing ores, quarrying stones, smelting and manufacturing metals, refining metals and providing mining support activities. It also produces iron ores, rare earth metals and precious metals and stones.</td>
</tr>
<tr>
<td>9</td>
<td>Oil &amp; Gas Exploration and Production</td>
<td>Oil and gas (E&amp;P) companies explore for, extract or produce energy products such as crude oil and natural gas, which comprise the upstream operations of the oil and gas value chain. Companies in the industry develop conventional and unconventional oil and gas reserves, which include, but are not limited to, shale oil and/or gas reserves, oil sands and gas hydrates.</td>
</tr>
</tbody>
</table>

#### Health Care

<table>
<thead>
<tr>
<th>No.</th>
<th>Thematic sector</th>
<th>Industry Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Biotechnology and Pharmaceuticals</td>
<td>The Biotechnology and Pharmaceuticals industry develops, manufactures and markets a range of brand-name and generic medications. A significant portion of the industry is driven by research and development, a high risk of product failure during clinical trials and the need to obtain regulatory approval. Concerns over pricing practices and consolidation within the sector have created downward pricing pressures. Demand for the industry's products is largely driven by population demographics, rates of insurance coverage, disease profiles and economic conditions.</td>
</tr>
</tbody>
</table>
The TNFD’s sector equivalency tool will allow these industries to be mapped to equivalent national/ regional classification systems (e.g. NACE, Taxonomies) or other commonly used classification systems (e.g. GICS as used in ENCORE, ICS).

4.3 Next steps: Content to be developed for specific guidance

4.3.1 Sector specific guidance

In forthcoming v0.3 and v0.4 releases, the TNFD will develop additional guidance for market participants relevant to specific sectors, including the following content:

a. Sector basics:
   • Sector definition and brief description of the key economic activities and production processes included under the sector.
   • A table providing equivalencies to the most commonly used sector classification systems (e.g. ISIC – NACE in European Union, SIC codes in the UK, SIC/NAICS Code in the USA, ISIC and ICB).
   • A general business case for taking nature into account, with reference to the management and disclosure of nature-related risks and opportunities most relevant to the sector.
   • An overview of sector-specific data requirements to conduct an assessment of nature-related risks and opportunities (e.g. data on the economic activities performed, data on management practices across the supply chain and contextual data on nature).
   • A compilation of nuanced definitions and terms relevant to the sector used throughout the specific guidance/recommendations.

b. Linkages to relevant nature-related issues
   • An overview of relevant dependencies on nature associated with the sector.
   • An overview of relevant impacts on nature associated with the sector, as they relate to direct and indirect activities (upstream and downstream).
   • An overview of relevant nature-related risks associated with the sector.
   • An overview of relevant nature-related opportunities associated with the sector.

c. Use cases (Figure 15)
   • Industry-specific use cases showing why and how organisations apply the TNFD framework, integrating relevant nature-related issues. Use case design will enhance understanding and drive action and exemplify what the process looks like for that sector.
   • The use cases will illustrate and guide users on how nature-related risks and opportunities have been assessed, managed and disclosed by different organisations in the sector.
   • Use cases will follow the structure of the LEAP approach and highlight specifics relevant to the sector.

4.2.3 Financial industries prioritised by TNFD

The TNFD will organise financial sector guidance into the four major financial services industries identified and defined by the TCFD, with the addition of Development Finance Institutions, given their important role in nature-related financing in emerging markets, including in many nature hotspots.

Table 9: TNFD priority financial industries for development of specific guidance

<table>
<thead>
<tr>
<th>Industry</th>
<th>Financial service provided/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Banks</td>
<td>Lending</td>
</tr>
<tr>
<td>2 Insurance companies</td>
<td>Underwriting</td>
</tr>
<tr>
<td>3 Asset managers</td>
<td>Asset management</td>
</tr>
<tr>
<td>4 Asset owners</td>
<td>Investing, Public and private-sector pension plans, endowments and foundations</td>
</tr>
<tr>
<td>5 Development finance institutions</td>
<td>Lending, grants, hybrid financing, pay-for-success models and catalytic funding</td>
</tr>
</tbody>
</table>
d. Signposts to existing sector-specific guidance materials, building on those already in the online portal

- Signposts to selected relevant sector-specific disclosure guidance provided by TNFD knowledge partners (e.g. SASB standards and disclosure topics, GRI sector standards).
- Signposts to relevant sector-specific research and tools developed by TNFD knowledge partners and piloting partners (e.g. UNEP-WCMC, UNEP FI and Global Canopy (ENCORE), SBTN – Sector materiality tool; SASB Materiality Finder, GRI Sector Standards) and industry associations.
- Signposts to relevant regulatory requirements for disclosure and management performance (e.g. mandatory disclosure requirements, green taxonomies defining technical screening criteria) for the sector.

4.3.2 Nature-related issue specific guidance

Nature-specific guidance is not yet developed for beta v0.2. Over the next year, the TNFD envisages developing additional guidance for market participants related to each of the four nature realms (ocean, freshwater, land and atmosphere) and by biome (introduced in the v0.1 beta framework). This guidance will assist report preparers in understanding dependencies and opportunities in an integrated fashion across realms and biomes.

Realms and biome specific guidance would include:

- Links to relevant disclosure tools (e.g. CDP forest and water questionnaires);
- References to relevant data and analytics tools and platforms covering specific realms (e.g. Aqueduct for freshwater); and,
- Definitions of ecosystem integrity or high-risk ecosystems and state of nature metrics, related to specific biomes.

Figure 16 - Drivers of nature change and measurable impact drivers

<table>
<thead>
<tr>
<th>Dependencies</th>
<th>f. Metrics and targets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Linkages to specific dependency metrics, building on guidance in the v0.2 release.</td>
</tr>
<tr>
<td></td>
<td>• Linkages to specific targets related to dependencies on nature, building on guidance in the v0.2 release.</td>
</tr>
</tbody>
</table>

Guidance on nature-related risks and opportunities will be considered as the approach to metrics and targets for risks and opportunities is developed by the Taskforce.

4.3.3 Realm-specific guidance

Realm-specific guidance is not yet developed for beta v0.2. Over the next year, the TNFD envisages developing additional guidance for market participants related to each of the four nature realms (ocean, freshwater, land and atmosphere) and by biome (introduced in the v0.1 beta framework). This guidance will assist report preparers in understanding dependencies and opportunities in an integrated fashion across realms and biomes.

Realms and biome specific guidance would include:

- Links to relevant disclosure tools (e.g. CDP forest and water questionnaires);
- References to relevant data and analytics tools and platforms covering specific realms (e.g. Aqueduct for freshwater); and,
- Definitions of ecosystem integrity or high-risk ecosystems and state of nature metrics, related to specific biomes.

Figure 16 - Drivers of nature change and measurable impact drivers
5. LEAP for Financial Institutions (LEAP-FI) – v0.2 Update

5.1 Overview of LEAP-FI

The TNFD believes that all aspects of the TNFD LEAP approach should be incorporated by all types of organisations into any robust nature-related risk and opportunity assessment process. However, for the financial services sector as providers of financial capital, different entry points into the LEAP approach and a greater or lesser emphasis on different components of LEAP may be appropriate.

Recognising the unique needs of the financial services sector, TNFD beta v0.1 presented the beginnings of a LEAP approach for financial institutions (LEAP-FI). The beta v0.2 of the framework contains an updated version of LEAP-FI that supersedes v0.1.

LEAP and LEAP-FI aim to meet the needs of five types of financial institutions as both users and beneficiaries of the approach:

1. Banks;
2. Insurance companies;
3. Asset managers;
4. Asset owners; and
5. Development finance institutions.

In developing the LEAP approach, including LEAP-FI, the Taskforce has built on and integrated existing, high-quality nature-related frameworks, tools, data sources and other guidance developed by a range of other organisations that are aligned with the TNFD’s principles and approach. The source frameworks and tools used are signposted throughout the phases of the LEAP approach and LEAP-FI, with descriptions of how they may be used by organisations. As new frameworks, tools, data sources and guidance are developed, the TNFD will add additional signposts into the LEAP and LEAP-FI approaches, where relevant.

The LEAP-FI process is based on the following considerations:

- Financial institutions operating as a corporate entity can apply the LEAP approach for corporates as it pertains to their own operations and supply chain. However, these impacts will be limited compared to those of financed activities.
- Financial institutions can encourage their clients (recipients of financial capital) to use the LEAP approach for corporates and report information in line with the TNFD disclosure recommendations. Data provided to financial institutions by clients can be used to complement other sources of data, such as proxy data available from public and/or private providers.
- Financial institutions will need to apply the LEAP-FI approach flexibly to accommodate variations in the nature and structure of the business, the type of asset classes/financial products and level of aggregation of financial products/services.
- Tools and data already exist to help financial institutions get started with the assessment of their portfolios. These include matrices of high impact and high dependency sectors, such as the SBTN Sector Materiality Tool,10 and data and metrics on ecosystem integrity and importance. Examples and case studies are referenced in the framework online platform ‘Additional guidance to support LEAP for financial institutions (LEAP-FI).’

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Some asset classes and financial institutions may initially find it challenging to secure a comprehensive view of nature-related risks and opportunities. However, developments in data and analytics and greater transparency will support a more comprehensive understanding of risks and opportunities over time. As with corporates, financial institutions can start with a narrow scope for their assessment and build a more comprehensive assessment over time.

The beta v0.2 of the framework contains an updated version of LEAP-FI that supersedes v0.1.

5.2 LEAP-FI v0.2

In addition to the four phases of the LEAP approach for corporates (Locate, Evaluate, Assess and Prepare) presented in beta, LEAP-FI v0.2 sets out a preceding set of scoping questions to help financial institutions prioritise and focus effort as they assess their financial portfolios.

Figure 17a: Scoping questions LEAP-FI v0.2

<table>
<thead>
<tr>
<th>Scope the Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F1</strong> Type of business</td>
</tr>
<tr>
<td><strong>F2</strong> Entry points</td>
</tr>
<tr>
<td><strong>F3</strong> Type of analysis</td>
</tr>
</tbody>
</table>

Type of business (F1)

- What is the nature of our business as a financial institution?
- What are the main functional units within our business?

Entry points (F2)

- F1 Pointer - FIs may choose to initially assess one area of their business. Over time, they should work to assess all areas of their business.
- F2 Pointer - FIs should use best judgement to determine the most appropriate entry point for their business.
- F3 Pointer - FIs should determine the most appropriate level of assessment for their products/asset class, given the level of aggregation.

Type of analysis (F3)

- What sectors/geographies do we allocate capital?
- What asset classes/financial products do we have and what are their potential interactions with nature?
- What biomes/ecosystems do our financial activities interact with and how?

Figure 17 b: LEAP-FI v0.2 – Overview

Type of business (F1)

**What is the nature of our business as a financial institution?**

The nature of a financial institution’s business will shape its approach to using LEAP. Financial institutions can be highly diversified or more specialised. For example, a financial institution may have asset management, lending and/or insurance activities.

**What are the main functional units within our business?**

Consideration of different functional units within the business will also be important and may be a desired unit of analysis for assessment. For example, a financial institution may have retail, commercial and investment banking divisions. In practice, financial institutions may choose to start their assessment by focusing on one functional unit within their business. Over time, financial institutions should assess all areas of their business.

Entry points (F2)

The TNFD has identified three core entry points for financial institutions: 1) sector/geography, 2) type of product/asset class and 3) biome/ecosystem, outlined in further detail below. Financial institutions should use their best judgement to identify the most appropriate entry point(s) for their business.
Some financial institutions may initially focus their efforts on identifying the key biomes/ecosystems with which they interface. For example, a financial institution may interact with coastal biomes through the financing of tourism, impact tropical forests through agri-food lending or consider the dependence on freshwater ecosystems and related ecosystem services of its pharmaceutical and construction clients.

This analysis could then be supplemented with an assessment of the maturity of the regulatory environments in the jurisdictions for the relevant locations of specific ecosystems.

### Table 10: Entry points for financial institutions

<table>
<thead>
<tr>
<th>Entry point</th>
<th>Description</th>
<th>Example(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Sector/ geography</td>
<td>The nature-related risk and opportunity assessment is initially focused on key sectors/geographies where geographies are set at a scale that is meaningful to a financial institution’s internal organisation, e.g. cereals in USA or Latin America. This is followed by a deep dive into sectors/biomes/companies.</td>
<td>An asset manager would like to understand its most material sectoral exposures and any portfolio hotspots by sector/geography. A commercial lender would like to understand sector concentrations and any hotspots within its lending portfolio.</td>
</tr>
<tr>
<td>#2 Type of product/asset class</td>
<td>The nature-related risk and opportunity assessment is initially focused on the type of product/asset classes. This is followed by a deep dive into sectors/biomes/companies.</td>
<td>A retail bank would like to assess its most material exposure across its financial products services (e.g. mortgages, motor financing, personal loans).</td>
</tr>
<tr>
<td>#3 Biome/ecosystem</td>
<td>The nature-related risk and opportunity assessment is initially focused on the biomes/ecosystems with which the financed activities of the business interface. This is supplemented with an assessment of the maturity of the regulatory environments in these areas.</td>
<td>A specialty insurer/reinsurer focused on the energy and marine sectors would like to assess its most material exposure across key biomes. A universal owner is interested in deforestation and would like to assess its most material exposure for tropical forest biomes across key sectors and geographies.</td>
</tr>
</tbody>
</table>

**In which sectors/geographies do we allocate capital?**

Financial institutions may initially assess the exposure of their portfolios across sectors and geographies. For example, a financial institution may finance agriculture in the USA or fisheries in South East Asia. Following this initial prioritisation exercise, financial institutions could then undertake a deep dive into key sectors, biomes and/or companies.

**What asset classes/financial products do we have and what are their potential interactions with nature?**

Financial institutions may initially focus their assessment by product type/asset class. For example, a financial institution may have exposure via its commercial or retail lending portfolio, its insurance liabilities, its owned or managed assets and its capital markets or advisory activity.

This could then be followed by a deep dive into sectors, biomes and/or companies.

**What biomes/ecosystems do our financial activities interact with and how?**

Some financial institutions may initially focus their efforts on identifying the key biomes/ecosystems with which they interface. For example, a financial institution may interact with coastal biomes through the financing of tourism, impact tropical forests through agri-food lending or consider the dependence on freshwater ecosystems and related ecosystem services of its pharmaceutical and construction clients.

This analysis could then be supplemented with an assessment of the maturity of the regulatory environments in the jurisdictions for the relevant locations of specific ecosystems.

### Type of analysis (F3)

What level of assessment is feasible/appropriate given the level of aggregation of financial products and services?

Financial institutions should take into account whether an assessment is appropriate at the project/site level, company level or portfolio level. The TNFD will continue to develop uses, learning from pilot testing, to help inform choices about the appropriateness of assessments at these different levels.

### 5.3 Outputs of LEAP-FI scoping questions

The output of the scoping questions could be, for example, an initial heat map of the priority nature-related exposures and opportunities within the portfolio. After the prioritisation is complete, further deep dives can be undertaken. Financial institutions may choose to assess initially only one area of their business. The TNFD believes that over time, they should assess all areas of their business.

LEAP-FI is designed to enable financial institutions to progress to the ‘Locate’ or ‘Evaluate’ phase of LEAP, as appropriate for their specific business activities, the type of asset classes/financial products and the appropriate level of aggregation in their portfolio. For example:

- Financial institutions engaged in place-based financing, such as project finance, real estate, some insurance (e.g. hazard assessment) and some private equity firms, may already have access to location-based data and therefore can start with the ‘Locate’ phase of LEAP.
- Listed and unlisted equity and debt, sovereign risk and commercial lending institutions are more likely to take a sector-focused approach and may therefore find it more appropriate to start their LEAP assessment with the ‘Evaluate’ phase, while recognising the importance of returning to a consideration of ‘Locate’ for evaluating the place-based dependencies and impacts on nature resulting from their investment and lending activities.

The TNFD recognises that the array of products and services offered by financial institutions is complex and diverse. These scoping questions are designed to enable financial institutions to better identify material nature-related exposures and opportunities across their portfolios. As set out above, several entry points into the LEAP approach are possible for financial institutions, given their diverse needs and investing/lending objectives. Based on their individual business models, internal organisation and reporting systems, regulatory context and decision-making needs, each financial institution will need to use its best judgement to identify the most appropriate entry point(s) for their business.

The TNFD welcomes ongoing feedback from financial institutions on the modified LEAP-FI approach and will continue to evaluate and enhance its usability based on feedback from financial institutions.
6. Priority areas for further framework development

As set out in Section 2, the TNFD will continue to revise the framework based on ongoing feedback from market participants. The near-term highest priorities for the Taskforce’s work in the next phase of framework development before the v0.3 release in November 2023 are:

• Developing the initial approach to scenarios;
• Continuing to build the approach to metrics and targets, with guidance on risk and opportunity metrics, and response Assessment Metrics and initial guidance on targets;
• Developing specific guidance for priority sectors/realms/biomes/nature-related issues, including guidance for financial institutions; and
• Launching and running the data catalyst.

The Taskforce will continue to work with knowledge partners and the TNFD Forum to inform this work.
7. Engage – co-create the TNFD framework

7.1 Routes for testing & feedback

TNFD's open innovation approach allows market participants and other stakeholders to provide feedback on the beta versions of the framework through three primary routes:

- **Review and comment on the beta framework:** Organisations can review the draft framework and provide feedback via the [TNFD online platform](#).
- **Pilot test the framework:** Corporates and financial institutions keen to explore how the TNFD framework would apply in their specific organisational context can pilot test the framework independently and, in some cases, through collaborative industry efforts. The TNFD piloting guide, released alongside beta v0.2, provides detailed information for organisations interested in piloting the framework.
- **Participate in consultation discussions:** Based on the feedback provided by market participants, the TNFD will convene focus group discussions about key emerging themes, technical areas of the framework or by geography or sector – to engage feedback providers in further detail.

7.2 Key milestones & dates

The TNFD's open consultation period will continue until 1 June 2023. While the TNFD will accept feedback on a rolling basis until then, feedback for each iterative release of the beta framework will be evaluated according to the schedule outlined below. In advance of each release, TNFD will provide high-level direction on areas of framework design that are highest priorities for feedback.

All feedback, irrespective of when it is provided, will be reviewed and evaluated before the final recommendations are published in September 2023.

<table>
<thead>
<tr>
<th>Beta release</th>
<th>Release date</th>
<th>Deadline for feedback on this release</th>
</tr>
</thead>
<tbody>
<tr>
<td>v0.1</td>
<td>15 March 2022</td>
<td>25 May 2022</td>
</tr>
<tr>
<td>v0.2</td>
<td>28 June 2022</td>
<td>23 September 2022</td>
</tr>
<tr>
<td>v0.3</td>
<td>November 2022</td>
<td>24 January 2023</td>
</tr>
<tr>
<td>v0.4</td>
<td>February 2023</td>
<td>1 June 2023</td>
</tr>
<tr>
<td>v1.0 (final)</td>
<td>September 2023</td>
<td></td>
</tr>
</tbody>
</table>
8. Learn more

Explore the TNFD Knowledge Bank

The TNFD’s mission includes disseminating knowledge and best practice as the Taskforce builds momentum towards longer-term market adoption of a risk management and disclosure framework for nature-related risks and opportunities. The TNFD shares relevant articles, research and market insights through the TNFD Knowledge Bank.

Join the TNFD Forum

The TNFD Forum is a global, multi-disciplinary consultative group of institutions with over 500 Forum members. Membership of the Forum is open to a broad range of institutional types including corporates, financial institutions, public sector institutions including regulators, pension funds and sovereign wealth funds, academic and research organisations, business associations, inter-governmental organisations, as well as conservation and civil society organisations. Institutions interested in joining the Forum should express their interest by completing this form.

Contact Us

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Online portal: framework.tnfd.global
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9.1 Overview

This document provides guidance on Assessment Metrics for dependencies and impacts on nature. These are relevant to the Evaluate (E) phase of the LEAP approach. In developing the TNFD approach to dependency and impact measurement, the Taskforce has drawn on a wide range of existing research and included the input and advice of our knowledge partners, including through two workshops convened in May 2022. Through that process, the Taskforce is particularly grateful for the input and advice of:

- Accounting for Nature;
- Agence Française de Développement;
- The Biodiversity Consultancy;
- Cambridge Institute for Sustainability Leadership (CISL);
- the Capitals Coalition;
- CDP;
- Climate Works Centre;
- European Financial Reporting Advisory Group (EFRAG);
- GIST Impact Advisory;
- GRI;
- IUCN;
- the Natural Capital Project;
- the Network for Greening the Financial System (NGFS);
- Organisation for Economic Co-operation and Development (OECD);
- Pollination;
- Science Based Targets Network (SBTN);
- Stockholm Resilience Centre at Stockholm University, with partners Beijer Institute and Global Economic Dynamics and the Biosphere (GEDB) Academy Program of the Royal Swedish Academy of Sciences;
- UNEP World Conservation Monitoring Centre (UNEP-WCMC);
- UN Statistics Division (UNSD);
- World Business Council for Sustainable Development (WBCSD) and WWF.

Box 1: TNFD’s definitions of dependencies and impacts

The TNFD has defined **dependencies** as aspects of ecosystem services that an organisation or other actor relies on to function. Dependencies include ecosystems’ ability to regulate water flow, water quality and hazards like fires and floods; provide a suitable habitat for pollinators (who, in turn, provide a service directly to economies); and sequester carbon (in terrestrial, freshwater and ocean realms).

The TNFD has defined **impacts** as changes in the state of nature, which may result in changes to the capacity of nature to provide social and economic functions. Impacts can be positive or negative. They can be the result of an organisation’s - or another party’s - actions and can be direct, indirect or cumulative.

Nature-related dependencies and impacts are closely interrelated. For example, for a beverage company or farming business withdrawing water from a watershed, today’s water consumption (measured by m³ withdrawn) is both an impact on nature (the water is not available for other potential uses by nature itself, or by other users) and a dependency (it is a critical input into business processes and, ultimately, cashflow generation for the business). The relationship between dependencies and impacts is dynamic over time. In this example, unsustainably high withdrawal of water today from the watershed (an impact on nature), can accentuate business dependencies in the future because the watershed may not have the capacity and resilience to continue to sustain the same level of withdrawal in the future. It may also affect other aspects of nature that the business relies on, such as the existence of wild pollinators that pollinate the crops of the farming business.

As a result, the TNFD recommends a comprehensive assessment of dependencies and impacts on nature requires assessment of:

- Impact drivers;
- Changes to the state of nature; and
- State of, and changes in, ecosystem services.
Measuring impact drivers is relevant for both dependency and impact analysis:

- From a dependency perspective, impact drivers cause changes to the state of nature, which in turn affect the provision of ecosystem services with consequences for business and society. Impact driver metrics can be used as inputs to models to estimate changes to the state of nature and ecosystem service provision, as well as to interpret or anticipate trends in state indicators at a corporate, national or regional level. From an impact perspective, the TNFD defines an impact driver as ‘a measurable quantity of a natural resource that is used as a natural input to production or a measurable non-product output of a business activity’. Examples include the volume of sand used in construction, litres of fish oil used in pharmaceuticals or application of pesticides/tonnes of carbon dioxide emissions. Impact drivers can be associated with both positive and negative changes to the state of nature. Impact driver metrics are used by organisations to assess the aspects of their business activities that result in an impact on nature (positive or negative, direct or indirect).

Measuring changes to the state of nature is relevant for both dependency and impact analysis:

- From a dependency perspective, changes to the state of nature (resulting from both business impact drivers and external factors) also change the capacity of nature to provide the ecosystem services businesses depend on, which drive revenues, cashflow and enterprise value creation. Measuring change in the state of nature is essential to understand the ability of the ecosystem to continue providing these services into the future, which is needed to assess the associated risks and opportunities.
- From an impact perspective, measuring changes to the state of nature is fundamental. It involves assessing how business impact drivers lead to impacts in terms of changes in the state of nature (positive or negative, direct or indirect).

Measuring ecosystem services, and changes in them, is relevant for both dependency and impact analysis:

- From a dependency perspective, changes in the flow of ecosystem services available to the business can arise from changes in the extent and condition of the ecosystem assets that underpin them. This can be caused by both business impact drivers and external drivers of change and can create risks and opportunities for the business where it has a significant dependency on that ecosystem service. It can also be useful for organisations to measure the current state of ecosystem services they rely on.
- From an impact perspective, changes to the flow of ecosystem services available to society (resulting from changes to the extent and condition of the underpinning ecosystem assets caused by business impact drivers) can create risks and opportunities, such as reputational risks.
- In some cases, an organisation’s dependence on a particular ecosystem service can also be an impact driver (e.g., water consumption), so there is some overlap between the impact driver and dependency indicators.

The TNFD has defined impact and dependency pathways that show the links between these three categories of assessment and measurement (impact drivers, changes to the state of nature and changes to ecosystem services) (see box 2).

**Box 2: Impact and dependency pathways**

**An impact pathway** describes how, as a result of a specific business activity, a particular impact driver results in changes in the state of nature, which result in changes in the provision of ecosystem services. It also shows how these changes affect different stakeholders.

**A dependency pathway** shows how a particular business activity depends upon specific features of natural capital. It identifies how changes in the state of nature affect the costs and/or benefits of doing business by changing the provision of ecosystem services.

For further detailed step-by-step guidance on dependency and impact analysis (Components E3 & E4 in LEAP) the TNFD has prepared a separate guidance note on with the Capitals Coalition, which can be found here.

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11 The TNFD will work further with knowledge partners for future releases to further refine the thinking on impact drivers to reflect that these can drive both positive as well as negative impacts on nature.
13 GRI, UNEP-WCMC and CREM (2011) Approach for reporting on ecosystem services.
14 Impact drivers can be mapped to the pressures referred to in SBTN and the Driver-Pressure-State-Impact-Response (DPSIR) Framework, and the direct drivers of change referred to by IPBES, the CBD and Millennium Ecosystem Assessment.
16 GRI, UNEP-WCMC and CREM (2011) Approach for reporting on ecosystem services.
9.2 Measuring impact drivers

Annex 2 provides an illustrative set of cross-industry Assessment Metrics for impact drivers across the four realms to support pilot testing and stimulate feedback, focusing on direct operations in the first instance. This illustrative set of Assessment Metrics for impact drivers will be revised, based on feedback from pilot testing, and further supplemented with industry-specific metrics that will be developed in the TNFD’s complementary specific guidance.

9.2.1 Introduction

Impact driver indicators can be useful for various stages of an organisation’s assessment and management of nature-related risks and opportunities, including:

- Understanding the changes to the state of nature and ecosystem services (dependencies) caused by impact drivers;
- Measuring performance against targets for impact drivers; and
- Determining and monitoring the effectiveness of management responses to impact drivers to reduce their negative impact on nature and increase the positive impact.

As part of the dependency and impact analysis in the E phase of LEAP, the TNFD asks that organisations identify material impact drivers that should be measured. The TNFD recommends that organisations consider the impact drivers set out in Figure 20 below. The impact drivers map to the TNFD’s definitions of drivers of nature change: land, water and ocean use change, resource use, climate change, pollution, and invasive species (based on IPBES).18

Impact drivers can result in both negative and positive impacts on nature. The current characterisation of impact drivers, taken from IPBES and SBTN, tends to focus more attention on consideration of impact drivers with a negative impact (e.g. pollution, disturbances, emissions). The Taskforce intends to continue to work with its knowledge partners to arrive at a characterisation of impact drivers that considers both negative and positive impacts of business on nature to ensure the metrics architecture can represent this. For example, while a forestry company may have a negative impact on nature by removing trees from an ecosystem, it can also have a positive impact through restoration of native species and maintenance of corridors for animal movement. A robust measurement framework would comprise metrics capable of measuring both negative and positive variance over time across the four realms and across impact drivers. For the purposes of this v0.2 beta, the Taskforce has adopted the current definition of impact drivers established by IPBES.18

Impact driver indicators should be measured using both absolute metrics and the associated rate impact drivers.

9.2.2 Scoping measurement of impact drivers

Determining level of assessment

Organisations should assess impact drivers across:

- Direct operations (site or project level and corporate level);
- Upstream; and
- Downstream (including portfolio level).20

Impacts on nature are significantly related to land / freshwater / ocean use change and therefore supply chain, product level and corporate level impacts should be traceable back to the entity location. Companies with significant direct impacts (e.g. extractives, fisheries, aquaculture, agriculture and forestry) will approach the identification of impact driver metrics differently to those whose

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9.2.3 Guidance on methodologies and data for impact drivers

The TNFD recommends organisations use the following sources of guidance when identifying and measuring material impact drivers:

- Environmental or natural capital accounting frameworks, such as the Natural Capital Protocol\(^2\), the draft Transparent methodology\(^2\) and UN SEEA Ecosystem Accounts\(^2\) that have been applied at a corporate entity level\(^2\);
- Existing corporate disclosure requirements such as GRI\(^2\), CSDB guidance on water and biodiversity\(^2\), which will be incorporated in IFRS ISSB standards, and CSR\(^2\) provide useful guidance on the measurement of impact drivers, particularly around resource exploitation, climate change and pollution;
- Target and measurement setting initiatives including the Align project recommendations;
- Lifecycle analysis approaches, such as the EU Corporate Environmental Footprint (CEF) and Product Environmental Footprint (PEF)\(^2\); and
- Environmental Extended Input-Output models such as Exiobase may be useful for value chain analysis.

The TNFD Data Discussion Paper, released by the TNFD alongside the beta v0.1 framework, notes a number of additional tools to support identification and measurement of impact drivers.

9.2.4 Data availability and quality for impact drivers

Organisations can source impact driver data through primary and secondary sources using proxies where data is unavailable. The type of data used and its limitations need to be communicated with transparency, including the implications for how to interpret the conclusions appropriately. Where data is lacking in quality, how companies have managed the risk is important.

<p>| Table 12: Types of nature-related data relevant to impact drivers |
|---------------------|-------------------------------------------------------------|</p>
<table>
<thead>
<tr>
<th>Data type</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary data</td>
<td>Data collected for the assessment being undertaken</td>
</tr>
<tr>
<td></td>
<td>and collected to measure a specific impact driver</td>
</tr>
<tr>
<td></td>
<td>Internal business data e.g. measured raw material consumption, revenue/site level data collected through surveys or sampling</td>
</tr>
<tr>
<td></td>
<td>Data collected from suppliers or customers</td>
</tr>
<tr>
<td>Secondary data</td>
<td>Data generated by an entity other than the data users</td>
</tr>
<tr>
<td></td>
<td>and may include modelled or third party data</td>
</tr>
<tr>
<td></td>
<td>Published, peer-reviewed and grey literature (for example, life-cycle impact assessment (LCIA) databases, industry, government or internal reports)</td>
</tr>
<tr>
<td>Proxy data</td>
<td>Data collected for an alternative purpose to its specific use case</td>
</tr>
<tr>
<td></td>
<td>An entity could use the volume of manufactured product output and the estimated machinery water efficiency to estimate proxy water consumption</td>
</tr>
</tbody>
</table>

Third party data providers are increasingly offering these types of data. It is convenient to use where it is expensive or challenging to collect primary data. However, preparers undertaking assessments based on these data sources should exercise caution and adopt conservative interpretations, while constantly striving to improve accuracy and being transparent on the approach and assumptions made. Third party data should not be assumed to be accurate for individual companies or projects and the data should be considered representative of individual assets and the methodology behind the third party data gathering.
calculation and modelling processes should be well understood by the user. The highest quality, location-specific primary data should be a company’s ultimate priority.

Proxy data can be particularly useful in the absence of primary data that is measured at site level. Where proxy data is used to estimate or inform conclusions, the preparer should be fully transparent by making this explicit, along with the sources of supporting data and methodology.

The primary risk with proxy data is that it can be inadvertently misleading. It is possible that by using proxy data, a company can incorrectly flag high/low materiality and not reflect the reality of activity impact, consequences for dependencies and related risk. This could, in turn, drive action that is undesirable or inappropriate.

### 9.3 Evaluating changes to the state of nature

Annex 2 provides an illustrative set of cross-industry Assessment Metrics for the state of nature to support pilot testing and stimulate feedback. This illustrative set of Assessment Metrics for the state of nature will be revised based on feedback from pilot testing and further supplemented with biome metrics that will be developed in the TNFD’s complementary specific guidance.

#### 9.3.1 Scoping

Evaluating changes to the state of nature, both historic and future, is important to understand the risks and opportunities associated with dependencies and impacts on nature. Organisations should seek to draw on authoritative assessments of changes in the state of nature produced by government or scientific organisations for local ecosystems they have prioritised through the ‘Locate’ phase of the LEAP approach.

Where such independent authoritative assessments do not exist, organisations may need or wish to conduct their own measurement activities (or partner with others to do so) although this will obviously be subject to the capacity and financial resources to do so.

It is the view of the Taskforce that no single metric will adequately represent the state of nature in a given location. A set or dashboard of metrics will be required to make an informed evaluation of dependencies and impacts, as laid out in the LEAP approach.

Analysts should be able to draw on state of nature assessments produced by public authorities or reputable scientific organisations. There is still currently no globally standardised approach to measuring the state of nature. The TNFD is working with knowledge partners and others to highlight this issue and seek to address it, drawing on the most established methods, in particular UN SEEA Ecosystem Accounting.

In developing its approach to metrics on the state of nature, the TNFD has drawn on the work of knowledge partners, including EFRAG, UN SEEA Ecosystem Accounting, the Transparent and Align Project, as well as pre-existing guidance such as the GRI, CDSB Biodiversity Application guidance, and Biological Diversity Protocol. The TNFD is closely contributing to and monitoring progress by knowledge partners in this area.

On this basis, to measure changes to the state of nature, the TNFD recommends organisations focus on measuring the condition and extent of ecosystem assets, a sub-set of environmental assets. Ecosystem assets are important for the provision of ecosystem services, which organisations depend on.

The TNFD state of nature metrics in Annex 2 therefore focus on the measurement of ecosystem assets. These can be organised around aspects of natural capital, such as soil and water, if that is useful to inform decision-making and corporate natural capital accounts. In future releases, the TNFD may provide state of nature metrics for all environmental assets.

#### 9.3.2 Scoping measurement of the state of nature

There is no globally standardised approach to the measurement of the state of nature and no single metric can represent a comprehensive assessment of changes to the state of nature.

The TNFD recommends a set or dashboard of metrics that measure:

32 Project Task Force on European Reporting Standards, EFRAG (2022) Exposure draft ESRS E4: Biodiversity and Ecosystems; UNEP-WCMC, Capitals Coalition, Arcadis and ICF (2022) Recommendations for a standard on biodiversity measurement and valuation. Consultation
• The status of ecosystems
  • The extent – the area coverage of a particular ecosystem, usually measured in terms of spatial area.
  • Condition (health) – measures of the quality of ecosystems relative to a pre-determined reference state. Biodiversity is integral to measuring ecosystem condition, contributing to the composition, structure and function of ecosystems.
  • The status of species\(^{34}\) that have been identified to be a priority
    • Population size
    • Extinction risk

Box 4

A reference condition is the condition against which past, present and future ecosystem condition is compared in order to measure relative change over time. One reference condition\(^ {31}\) could be a previous or desired state of nature that can be used for comparison.\(^ {36}\) The choice of reference condition will depend on the business and environmental context. In some cases, it will be a pristine/undisturbed condition, while in others it will be a functional/resilient ‘managed’ ecosystem.

Further guidance on defining reference conditions is provided in Annex 1a.

Figure 21: State of nature metrics – ecosystem assets and species

9.3.2.1 Evaluation of changes to the state of ecosystem assets

Measurement of changes in the state of ecosystem assets should be based on metrics for the extent and condition of priority ecosystems that the organisation has identified in the Locate phase of LEAP. These give insight into the overall health of an ecosystem.\(^ {37}\) The appropriate metrics will depend on the ecosystem asset and its location. Entities will need to determine the extent to which their operations have the potential to change the current and future state of that ecosystem.

Evaluating ecosystem condition

Assessment Metrics can be classified into six classes of ecosystem characteristics. The TNFD defines the characteristics of ecosystem assets in line with the IUCN’s Global Ecosystem Typology\(^ {38}\) and the UN SEEA Ecosystem Accounting (see Box 3). While ideally organisations should have a metric for each of the six classes of ecosystem characteristic, at a minimum, organisations should have at least one metric per priority ecosystem that measures the compositional state combined with an extent metric.

Organisations should evaluate aspects of ecosystem condition that have been identified as most material to the organisation based on its impacts and dependencies. For example:

• An organisation that has identified an impact driver of soil pollution should evaluate the soil health in the relevant priority ecosystems;

• An organisation that has identified a material dependency on water supply (an ecosystem service) should evaluate the quality and availability of water resources in relevant priority ecosystems.


Many different approaches to assessing ecosystem condition exist. The TNFD recommends selecting these approaches based on the following criteria: 40

• For each ecosystem, using the most generally accepted or recognised method applicable within the jurisdiction.
• Using the same method for each ecosystem type (biome).

The TNFD recognises that direct measurement of such metrics may not be feasible, so proxy or modelled approaches may be required. Metrics that capture multiple aspects of ecosystem condition exist that give entities insight into the state of nature. An example of this is the upcoming Ecosystem Integrity Index, which captures ecosystem structural, compositional and functional state, and the IUCN Red List of Ecosystems. 41 Techniques such as eDNA or remote sensing can allow cost efficient means of gaining insight into ecosystem extent and condition.

Box 3: Classes of measurable ecosystem characteristics 42

• Physical state characteristics: physical descriptors of the abiotic components of the ecosystem (e.g., soil structure, water availability);
• Chemical state characteristics: chemical composition of abiotic ecosystem elements (e.g., water quality, soil nutrient levels, air pollutant concentrations);
• Compositional state characteristics: the composition/diversity of ecological communities at a given time/location (e.g., species abundance, species richness). Best practice ecosystem metrics should consider changes in the composition of species, regardless of their rarity or threat status or value, compared to an intact reference state;
• Structural state characteristics: aggregate properties (e.g., mass, density) of the whole ecosystem or its main biotic components (e.g., total biomass, canopy coverage);
• Functional state characteristics: summarise the biological, chemical and physical interactions between ecosystem compartments (e.g. primary productivity, disturbance frequency); and
• Landscape and seascape characteristics: describe the spatial scales of ecosystems (e.g., landscape diversity, connectivity, fragmentation).

9.3.2.2 Evaluation of changes to the state of species

The TNFD recommends that organisations supplement ecosystem metrics with species-level indicators where the species or species group is identified to be material. 43 The rationale is to identify potential transition risks linked to regulatory requirements for species protection, consumer concern/reputational risks and physical and transition risks linked to dependence on species for raw materials.

The following criteria could be considered by organisations when determining the prioritisation of species to evaluate: 44

• The species is sensitive to company-induced impact drivers and therefore changes in state are likely to be attributed to business activities, as opposed to external factors;
• The management of the species generates significant financial risks and/or opportunities;
• Species are important for business continuity, for example, pollinators that support the production of crops a business depends upon;
• The species are legally protected, according to local, national and/or international laws and conventions;
• The species is recognised to be a priority/threatened species at a local, national and/or international level (e.g. listed on the IUCN Red List) – recognising that perceptions of materiality may be different depending on local versus global considerations. For example, a locally abundant species may be perceived as material by some if it is globally rare;
• Species that are unique to (i.e. restricted to) or dependent on the ecosystems the company operates in;
• Business impacts on the species are likely to result in a significant change in its local and/or overall population (positive or negative);
• The species plays a critical role in the ecosystem e.g. linked to tipping points; and
• The species plays a significant cultural or economic role for stakeholders (e.g. pollinating, educational and recreational services, sense of belonging).

Measurements of changes in species population size and extinction risk provide insight to the health of a single species’ population and its relative resilience to change and can be used as a starting point for defining species metrics. 45

The species indicators are defined as:

• Population size: Measures changes in the number of individuals of a species within an area.
• Extinction risk: Measures the threat status of a species and how activities/pressures may affect the threat status. The indicator may also measure change in the available habitat for a species as a proxy for impact on local or global extinction risk.

Metrics should provide insight into the extinction risk facing the species in question, the relative importance of the site for the species in question and the impact drivers facing the species at the site. Species metrics should be measured against a suitable baseline/reference state, which involves

41 IUCN (accessed 2022) International Union for Conservation of Nature’s Red List of Threatened Species
determining the target population size of species and/or establishing the target habitat size as a proxy. Where it is not possible to secure species data, habitat extent and condition can be used as a proxy for species health and the guidance on ecosystems should be followed.

Annex 2 contains illustrative example sets of state of nature metrics for species for pilot testing, which will be expanded and revised in future releases.

9.3.3 Guidance on methodologies and data for state of nature

The TNFD recommends that companies work towards primary rather than modelled data for the state of nature, but recognises that proxies and modelled data are a valuable starting point, particularly for companies with complex corporate structures e.g., companies with significant upstream impacts or financial institutions.

Further references on methods and data for state of nature are provided in the TNFD Data Discussion Paper.

9.3.4 Data availability and quality for state of nature

The availability and quality of state of nature data will depend on geography, realm, ecosystem type and the selected metrics. While analysis of satellite imagery and geospatial datasets can help assess the state of terrestrial ecosystems, they are insufficient to assess the state of ocean ecosystems, nor able to describe the state of a species-at-risk. Companies may therefore have to adopt, in these cases, a best-available data approach to evaluating the state of priority ecosystem assets.

In areas where data is out of date or at an inappropriate spatial scale, or where ecosystem interactions are complex and/or uncertain, the building of environmental accounts may be required to assess potential areas of nature-risk. Environmental accounting standards, such as, but not limited to, those provided by Accounting for Nature, generally require the measurement of the actual condition of an environmental asset through the use of earth observation, sensors, field observations, eDNA and other data gathering options and technologies.

A list of potential data sources for state of nature data can be found in the WG2 Data Discussion Paper.

Managing data gaps

Given the varying availability of state of nature data, it is likely that companies will experience some data gaps. These data gaps can include lack of business asset location data (or spatial extent of an asset’s operating area), ecosystem data (e.g., physical, chemical, compositional, structural, functional and landscape data relating to the state of nature), and data related to the interaction between nature and company assets. How these data gaps can be addressed is outlined below:

- **Business asset location data:** accurate location data is essential to the state of nature assessment process, both to identify a baseline and to determine changes in nature’s state over time. However, an understanding of the location of business assets by biome, region, nation or realm can still provide useful insights.

- **Ecosystem data:** if location data is available but ecosystem data for the metrics of interest are not, companies may use proxies, peer reviewed research and qualitative sources to fill in their understanding of the state of nature. For example, if species abundance information is not available, a company can monitor the area of appropriate habitat or indicator species as a proxy.

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47 CDSB (2021) Biodiversity Application Guidance
49 https://www.accountingformature.org/
Guidance on Dependency & Impact Metrics

8.8.1 Introduction

Metrics on ecosystem services should:

• Provide insight into the extent of organisational dependency on ecosystem services e.g. the proportion of raw materials potentially exposed to risk as a result of dependence on an ecosystem service or level of productivity directly dependent on an ecosystem service;
• Assess the current and future health of the ecosystem, i.e. the extent and condition of the ecosystem assets that underpin the ecosystem services currently and under different scenarios;
• Indicate current and projected trends in those ecosystem services under different scenarios; and
• Consider the value – now and over multiple future timescales – of these services to the organisation and society.

9.4 Measuring ecosystem services

Annex 2 provides an illustrative set of cross-industry Assessment Metrics for ecosystem services to support pilot testing and stimulate feedback. This illustrative set of Assessment Metrics for ecosystem services will be revised based on feedback from pilot testing.

9.4.1 Introduction

For example, an organisation with a dependency on flood risk mitigation services provided by a woodland water catchment in a particular area could measure:

• The number of flooding incidents avoided (the ecosystem service of flood risk mitigation); and
• The condition of the woodland water catchment (the state of the ecosystem asset), indicating its resilience to continue providing these services into the future, based on a measure of the expected future state of the catchment under a business-as-usual scenario.

Box 5: Ecosystem services

Ecosystem services are defined as the contributions of ecosystems to the benefits that are used in economic and other human activity.53

The TNFD defines ecosystem services as falling into one of the following categories:

• Provisioning services represent the contributions to benefits that are extracted or harvested from ecosystems (e.g. timber and fuel wood in a forest, freshwater from a river).
• Regulating and maintenance services result from the ability of ecosystems to regulate biological processes and to influence climate, hydrological and biochemical cycles, and thereby maintain environmental conditions beneficial to individuals and society.
• Cultural services are the experiential and intangible services related to the perceived or actual qualities of ecosystems whose existence and functioning contributes to a range of cultural benefits (e.g. the recreational value of a forest or a coral reef for tourism).

Focusing on final ecosystem services for corporate assessment purposes can reduce the number of metrics required and increase the accuracy of measurements.11

9.4.2 Scoping – Ecosystem service metrics

In line with the Evaluate phase of LEAP, organisations should identify which ecosystem services are significant for the business from both a dependency and impact perspective and which ecosystem assets are supporting these services across direct, downstream and upstream operations as appropriate.12

The TNFD has set out the ecosystem service categories and ecosystem assets listed in Figure 24 below based on UN SEEA-Ecosystem Accounting. This should be used as a starting point for indicator/metric selection.53

The TNFD recommends that organisations measure changes to the flow of ecosystem services on which the organisation has significant dependencies and impacts. The prioritisation of ecosystem services to understand their significance to the organisation should take into account:

50 UN-SEEA (2021) System of Environmental-Economic Accounting Ecosystem Accounting
53 Adapted from: United Nations (2021) System of Environmental-Economic Accounting
Further guidance on how changes in ecosystem services (dependencies) affect financial risks and opportunities will be included in future beta releases.

Impact driver metrics may be used as proxies for provisioning ecosystem service metrics (e.g. water usage) where such metrics are unavailable, although this is only possible for provisioning services and is not recommended unless accessing data for the metrics above is problematic.

### Guidance on methodologies and data for ecosystem service metrics

Frameworks such as UN-SEEA, the Measure and Value stage of the Natural Capital Protocol\(^5\) and associated biodiversity guidance\(^6\) and the BSI standard on natural capital accounting\(^7\) provide guidance on the measurement of ecosystem services, including linking final ecosystem services to the beneficiaries that depend on those services, which can be used to inform the priority list of services. These frameworks also provide guidance on ecosystem assets that support the provision of different ecosystem services.

Ecosystem service indicators should be selected based on the decision they inform and/or question that they answer and in accordance with the following criteria: relevance to user needs, understandable, usable for measuring progress or identifying issues, scientifically sound, sensitive to change, practical and affordable, availability of data and data use policy, trustworthy data sources that are peer reviewed, frequency of update of data, use of metrics for other frameworks and reporting. Further guidance on how to assess data quality and communicate quality of data to inform decision making will be included in future beta releases.

Further guidance is available in the NFSD Data discussion paper.

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\(^{54}\) Adapted from UNEP-WCMC, Capitals Coalition, Arcadis and ICF (2022) Recommendations for a standard on biodiversity measurement and valuation, Consultation Draft. Aligning Accounting Approaches for Nature (AlgA) and ENCORE

\(^{55}\) Natural Capital Coalition (2016) Natural Capital Protocol

\(^{56}\) Capitals Coalition and Cambridge Conservation Initiative (2020) Integrating biodiversity into natural capital assessments


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9.4.4 Data availability and quality for ecosystem service metrics

Data relevant for developing ecosystem service indicators can be found in many different forms and at different scales, including downloadable databases, statistical compendia, spatially mapped data, academic research and books. The most common sources of data for ecosystem service indicators can be divided into four categories: national statistics, on site observations, remote sensing or numerical simulation models. 59

Undertaking measurement at the appropriate scale will be important. In order to connect them to ecosystem assets, the TNFD recommends that ecosystem service metrics be measured linked to location. However, like impact drivers, where linking ecosystem services to location is not yet possible due to capacity/data issues, they could be measured in aggregate for a company and not contextualised to a specific location and still provide some useful insights.

The Taskforce recognises that evaluation of nature-related dependencies and impacts is complex, particularly currently given the lack of a globally agreed, standardised approach for state of nature and ecosystem service assessment. The Taskforce is working with knowledge partners and others to address this important gap. Recognising that many organisations are involved in this and it will take time, the Taskforce will continue to assess with its knowledge partners ways and means to make the ‘Evaluate’ phase of the LEAP process easier for companies and financial institutions while ensuring it remains science-based.

The Taskforce will further refine the approach to measuring dependencies and impacts outlined in this v0.2 beta release. This will include further consideration of technical aspects such as adjustments to the characterisation of impact drivers, considerations of value, and the use and definition of thresholds, baselines and reference conditions. The TNFD will also continue to assess various initiatives by to develop aggregated indices for ecosystem condition assessment which may help to simplify the evaluation process for companies and financial institutions.

The Taskforce welcomes feedback from market participants on this draft approach to measuring nature-related dependencies and nature impacts, including from those pilot testing the approach laid out here in the v0.2 beta release.

We are particularly interested in feedback from pilot testers on the following questions:

1. Were you able to evaluate your organisation’s impact drivers (using the guidance provided in this v0.2 beta release) once you identified your priority locations as outlined in the ‘Locate’ phase of LEAP? What was the most difficult aspect of evaluating your impact drivers?
2. Did you find the illustrative indicators and metrics for impact drivers provided in Annex 2 adequate in representing your organisation’s dependencies and impacts on nature? Which indicators and metrics were most useful? Which were least useful? Why?
3. Based on your selection of priority locations, were you able to source authoritative state of nature assessments from reputable government or scientific sources as a basis for your evaluation? If not, did you attempt to undertake your own measurement activities using other primary data sources or by commissioning external experts? What were the most difficult aspects or obvious gaps in your state of nature evaluation?
4. Were you able to source reliable data or assessments on ecosystem services and the change in the flow of ecosystem services that your organisation impacts or depend on, at each priority location?
5. Did you limit your analysis to your organisation’s direct dependencies and impacts only? Or did you include (or attempt to evaluate) upstream and/or downstream dependencies and impacts as well? If you did attempt to look upstream and downstream as well, was the guidance provided in the v0.2 release sufficient to enable you to assemble the data and information required? What else would be useful?

For entities wishing to evaluate ecosystem condition through direct measurement, the TNFD provides guidance drawn from the UN-SEEA Ecosystem Accounting (Table 14). For those entities using proxies/modelled data, reference conditions are usually set within those models.

Table 14: Potential reference conditions for assessing change in nature

<table>
<thead>
<tr>
<th>Ecosystem</th>
<th>Possible reference conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural ecosystems: Ecosystems predominantly influenced by natural ecological processes characterised by a stable ecological state maintaining ecosystem integrity: ecosystem condition ranges within its natural variability. Examples: primary and old growth forests (T1, T2), natural grasslands and savannahs (T4), natural lakes (F2) and wetlands (TF1)</td>
<td>Undisturbed or minimally-disturbed condition of an intact ecosystem: The condition of an ecosystem with maximal ecosystem integrity with no or minimal disturbance</td>
</tr>
<tr>
<td></td>
<td>Historical condition: The condition of an ecosystem at some point or period in its history that is considered to represent the stable natural state (e.g., the pre-industrial period or pre-intensive agriculture)</td>
</tr>
<tr>
<td></td>
<td>Least-disturbed condition: The currently best available condition of an ecosystem</td>
</tr>
<tr>
<td>Anthropogenic ecosystems: Ecosystems predominantly influenced by human activities, where a stable natural ecological state is unobtainable and future socio-economic interventions are required to maintain a new stable state. Examples: urban green spaces and croplands (T4), artificial waterbodies (F3), anthropogenic marine systems (M4)</td>
<td>Historical condition: The condition of an ecosystem at some point or period in its history that is considered to represent the stable socioecological state (e.g., the pre-industrial period or pre-intensive agriculture)</td>
</tr>
<tr>
<td></td>
<td>Least-disturbed condition: The currently best available condition of an ecosystem</td>
</tr>
<tr>
<td></td>
<td>Contemporary condition: The condition of an ecosystem at a certain point or period in its recent history for which comparable data are available</td>
</tr>
<tr>
<td></td>
<td>Best-attainable condition: The expected condition of an ecosystem under best possible management practices and attaining a stable socio-ecological state</td>
</tr>
</tbody>
</table>

Reference conditions and levels can be estimated using one or a combination of the following methods:

- **Reference sites:** If pristine or minimally-disturbed sites are available, they can be used to determine a reliable measure of the mean and statistical distribution of condition variables.

- **Modelled reference conditions:** These can be used to infer conditions in the absence of historical monitoring, where representative reference sites are not available.

- **Statistical approaches based on ambient distributions:** Least-disturbed conditions or best attainable conditions can be estimated by observing the range of values from current ecosystem monitoring and by selecting a reference condition.

- **Historical observations and paleo-environmental data:** This method uses historical observations or paleontological data to describe a historical reference condition, typically before 1970 when routine environmental monitoring programmes started.

- **Contemporary data:** This method uses contemporary data to describe a contemporary reference condition, typically after 1970 when routine environmental monitoring programmes started. For instance, The Living Planet Index uses species data collected in 1970 as a reference to assess changes.

- **Prescribed levels of a set of ecosystem condition variables:** These can be used to construct a bottom-up reference condition. Examples of these reference levels include zero values for emissions or pollutants, a specific number of species, established sustainability or threshold levels such as critical loads for eutrophication and acidification, and target levels in terms of legislated quality measures (air and water quality).

- **Expert opinion**

Data representing reference conditions for the ideal or target state of nature will depend on sector and on metric, but also whether an organisation is considering the materiality of impacts from a business perspective or a societal perspective. This may include a pristine natural state or may refer to some healthy stable or resilient state. In either case, reference conditions should be established by a credible third party, and/or be subject to peer review or third party verification, and be transparent. The precautionary principle should be applied throughout.

**Setting a reference condition (and metric selection)**

Data to construct and support the selection of a reference condition can include all ecosystem characteristics included in Box 2 (Annex 1). For these indicators, preference should be for primary observational data and/or context-specific modelled data from secondary sources. Where a pristine or otherwise appropriate reference condition does not exist, or cannot be established, modelled data may be required. For example, fisheries will model the maximum allowable biomass harvest yield to maintain target fish populations, but may also require measures to protect areas of high conservation value with an established reference condition, such as target benthic seascape topography. The appropriate reference condition metrics and datasets will need to be established by sector, and potentially by company, depending on their identified potential impacts and operating geographies.

### Annex 2: Illustrative Dependency and Impact Assessment Metrics for Pilot Testing

To support the Taskforce’s efforts to identify and refine a set of Assessment and Disclosure Metrics for the September 2023 recommendations, the Taskforce is releasing in draft form a set of illustrative metrics for market participants to test, listed below. This set of illustrative metrics for pilot testing is based on a landscape assessment completed by the TNFD, which identified over 3,000 metrics in use today across a wide range of frameworks and disclosure standards, including but not limited to CDSB, CDP, GRI, Accountability Framework (AF), International Capital Market Association (ICMA) and SASB.

To inform the TNFD framework design and development process to September 2023, the Taskforce is particularly interested in feedback on the following key issues and questions:

1. **Are these illustrative metrics practical to use, given current organisational capabilities and access to data sources?**

2. **Does the use of these illustrative metrics adequately support completion of the Dependency and Impact analysis components in the E Phase of the LEAP approach (E3 and E4), or equivalent activities the organisation may undertake using its own proprietary approach? If not, what metrics do you believe are missing that have broad relevance across sectors, or in your specific sector, and could usefully be considered by the Taskforce for inclusion in the final recommended set of Assessment Metrics for Dependency and Impact Analysis?**

3. **Did the use of these metrics, in conjunction with the TNFD's LEAP approach and related guidance, help to inform better organisational awareness of, and decision making around, nature-related dependencies and impacts, and specific corporate decisions around strategy, governance, risk management and capital allocation?**

4. **For financial institutions, did the use of these metrics, in conjunction with the TNFD’s LEAP-FI approach, help to inform better decision making around exposures in, and risk management approaches for, investment and credit portfolios?**

For further detailed step-by-step guidance on dependency and impact analysis (Components E3 & E4 in LEAP) the TNFD has prepared a separate guidance note on with the Capitals Coalition, which can be found here.
### E1: Identify relevant environmental assets & ecosystem services

#### Impact drivers
- Land/water/sea use change
- Resource use
- Climate change
- Pollution
- Invasive species and other

- Terrestrial ecosystem use
- Water use
- Greenhouse gas emissions
- Non-GHG air pollution
- Biological alterations
- Water pollution
- Soil pollution
- Soil waste

#### Ecosystems
- Physical state characteristics:
  - physical descriptors of key abiotic components of the ecosystem (e.g., soil structure, water availability); Chemical state characteristics:
  - chemical composition of abiotic ecosystem elements (e.g., water quality, soil nutrient levels, air pollutant concentrations).

- Compositional state characteristics:
  - composition/diversity of ecological communities at a given time/location (e.g., species abundance, species richness). Best practice ecosystem metrics should consider changes in the composition of species, regardless of their rarity or threat status or value, compared to an intact reference state.

- Structural state characteristics:
  - aggregate properties of the whole ecosystem or its main biotic components (e.g., total biomass, canopy coverage).

- Functional state characteristics:
  - summarise the biological, chemical and physical interactions between ecosystem compartments (e.g., primary productivity, disturbance frequency), and describe the spatial scales of ecosystems (e.g., landscape diversity, connectivity, fragmentation).

- Landscape and seascape characteristics:
  - changes in the spatial configuration of species, regardless of their rarity or threat status or value, compared to an intact reference state.

#### Condition
- Extent

#### E2: Identify dependencies and impacts

#### E3: Dependency analysis

#### E4: Impact analysis

### State of nature

#### Species
- Population size
- Extinction risk

### Ecosystem services

#### Provisioning services
- Water supply
- Genetic material
- Bioenergy
- Other provisioning services

#### Regulating & maintenance services
- Pollination
- Soil and sediment retention
- Water flow regulation
- Solid waste remediation
- Water purification
- Flood mitigation
- Air filtration
- Soil quality regulation
- Nursery population and habitat maintenance
- Local (micro and meso) climate regulation
- Biological control
- Global climate regulation
- Floodplain regulation
- Storm mitigation
- Noise attenuation
- Other regulating and maintenance services

#### Cultural services
- Recreation related services
- Aesthetic services
- Education, scientific & research services
- Other cultural services
- Spiritual, artistic and symbolic services
## Impact driver metrics

The following table contains an illustrative set of metrics for each impact driver (focusing on direct operations only).

**Table 15: Illustrative indicators and metrics for impact drivers**

<table>
<thead>
<tr>
<th>Impact driver</th>
<th>Realm</th>
<th>Indicator</th>
<th>Metric</th>
<th>Unit of measure</th>
<th>Framework reference</th>
<th>Level of metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land/water/sea use change</td>
<td>Terrestrial ecosystem use</td>
<td>Extent of land converted</td>
<td>Area of land converted/degraded by ecosystem type (before and after) and business activity</td>
<td>Km2 or equivalent</td>
<td>CDP Forests</td>
<td>x x x x</td>
</tr>
<tr>
<td>Land/water/sea use change</td>
<td>Terrestrial ecosystem use</td>
<td>Terrestrial ecosystem use overlap with legally protected and internationally recognised areas</td>
<td>Area of land owned, leased and/or operated in that is within or in close proximity to legally protected and internationally recognised areas (e.g. legally protected areas, UNESCO World Heritage sites, UNESCO Biosphere Reserves, Ramsar sites, Key Biodiversity Areas)</td>
<td>Km2 or equivalent</td>
<td>CDP Forests; WBA; SASB Ecological Impacts</td>
<td>x x x x</td>
</tr>
<tr>
<td>Land/water/sea use change</td>
<td>Terrestrial ecosystem use</td>
<td>Extent of land used for business activity</td>
<td>Area of natural terrestrial ecosystems owned, leased and/or operated in by ecosystem type and business activity</td>
<td>Km2 or equivalent</td>
<td>CDP Forests; WBA; SASB Ecological Impacts</td>
<td>x x x x</td>
</tr>
<tr>
<td>Land/water/sea use change</td>
<td>Terrestrial ecosystem use</td>
<td>Terrestrial ecosystem use overlap with legally protected and internationally recognised areas</td>
<td>Percentage of land owned, leased and/or operated within legally protected and internationally recognised areas (e.g. UNESCO World Heritage sites, UNESCO Biosphere Reserves, Ramsar sites, Key Biodiversity Areas)</td>
<td>Percentage</td>
<td>SASB Ecological Impacts</td>
<td>x</td>
</tr>
<tr>
<td>Land/water/sea use change</td>
<td>Marine ecosystem use</td>
<td>Extent of marine area converted</td>
<td>Area of marine area converted/degraded by ecosystem type (before and after) and business activity</td>
<td>Km2 or equivalent</td>
<td>CDSB Biodiversity</td>
<td>x x x x</td>
</tr>
<tr>
<td>Land/water/sea use change</td>
<td>Terrestrial ecosystem use</td>
<td>Marine ecosystem use overlap with legally protected and internationally recognised areas</td>
<td>Area of marine ecosystems owned, leased and/or operated in that is within or in close proximity to legally protected and internationally recognised areas (e.g. legally protected areas, UNESCO World Heritage sites, UNESCO Biosphere Reserves, Ramsar sites, Key Biodiversity Areas)</td>
<td>Km2 or equivalent</td>
<td>CDP Forests; WBA; SASB Ecological Impacts</td>
<td>x x x x</td>
</tr>
<tr>
<td>Land/water/sea use change</td>
<td>Terrestrial ecosystem use</td>
<td>Extent of marine area used for business activity</td>
<td>Area of natural marine ecosystems owned, leased and/or operated in by ecosystem type and business activity</td>
<td>Km2 or equivalent</td>
<td>CDSB Biodiversity</td>
<td>x x x x</td>
</tr>
<tr>
<td>Land/water/sea use change</td>
<td>Terrestrial ecosystem use</td>
<td>Marine ecosystem use overlap with legally protected and internationally recognised areas</td>
<td>Percentage of marine area owned, leased, and/or operated within legally protected or internationally recognised areas (e.g. UNESCO World Heritage sites, UNESCO Biosphere Reserves, Ramsar sites, Key Biodiversity Areas)</td>
<td>Percentage</td>
<td>SASB Ecological Impacts</td>
<td>x</td>
</tr>
<tr>
<td>Land/water/sea use change</td>
<td>Freshwater ecosystem use</td>
<td>Freshwater ecosystem use overlap with legally protected and internationally recognised areas</td>
<td>Area of freshwater ecosystems owned, leased and/or operated in within or in close proximity to legally protected and internationally recognised areas (e.g. legally protected areas, UNESCO World Heritage sites, UNESCO Biosphere Reserves, Ramsar sites, Key Biodiversity Areas)</td>
<td>Km2 or equivalent</td>
<td>CDP Forests, WBA; SASB Ecological Impacts</td>
<td>x x x x</td>
</tr>
<tr>
<td>Land/water/sea use change</td>
<td>Freshwater ecosystem use</td>
<td>Extent of freshwater area converted</td>
<td>Area of freshwater area converted/degraded by ecosystem type (before and after) and business activity</td>
<td>Km2 or equivalent</td>
<td>CDSB Biodiversity</td>
<td>x x x x</td>
</tr>
<tr>
<td>Land/water/sea use change</td>
<td>Freshwater ecosystem use</td>
<td>Freshwater ecosystem use overlap with legally protected and internationally recognised areas</td>
<td>Percentage of freshwater area owned, leased and/or operated in within legally protected or internationally recognised areas (e.g. UNESCO World Heritage sites, UNESCO Biosphere Reserves, Ramsar sites, Key Biodiversity Areas)</td>
<td>Percentage</td>
<td>SASB Ecological Impacts</td>
<td>x x x x</td>
</tr>
<tr>
<td>Land/water/sea use change</td>
<td>Freshwater ecosystem use</td>
<td>Freshwater area restored</td>
<td>Area of freshwater habitat restored split into ecosystem types</td>
<td>Km2 or equivalent</td>
<td>WBA</td>
<td>x x x x</td>
</tr>
<tr>
<td>Land/water/sea use change</td>
<td>Terrestrial ecosystem use</td>
<td>Land restored</td>
<td>Area of terrestrial habitat restored split into ecosystem types</td>
<td>Km2 or equivalent</td>
<td>WBA</td>
<td>x x x x</td>
</tr>
<tr>
<td>Land/water/sea use change</td>
<td>Freshwater ecosystem use</td>
<td>Marine area restored</td>
<td>Area of marine habitat restored split into ecosystem types</td>
<td>Km2 or equivalent</td>
<td>WBA</td>
<td>x x x x</td>
</tr>
<tr>
<td>Impact driver</td>
<td>Realm</td>
<td>Indicator</td>
<td>Metric</td>
<td>Unit of measure</td>
<td>Framework reference</td>
<td>Level of metric</td>
</tr>
<tr>
<td>---------------</td>
<td>-------</td>
<td>-----------</td>
<td>--------</td>
<td>-----------------</td>
<td>---------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Pollution</td>
<td>Land</td>
<td>Non-GHG air pollutants</td>
<td>Volume of non-GHG pollutants released to air</td>
<td>Tonnes</td>
<td>ICMIA HFIR – Transport, SFDR PAI, WBA-B8</td>
<td>x x x x</td>
</tr>
<tr>
<td></td>
<td>Water</td>
<td>Pollutants released to soil</td>
<td>Total pollutants released to soil split into types (e.g. pesticides)</td>
<td>Tonnes</td>
<td>CDSB Biodiversity</td>
<td>x x</td>
</tr>
<tr>
<td></td>
<td>Ocean</td>
<td></td>
<td>Number of soil-related detrimental impact incidents experienced by organisation by location</td>
<td>Count</td>
<td></td>
<td>x x x x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pollutants released to soil within or in close proximity to legally protected or internationally recognised areas</td>
<td>Total pollutants released to soil in or in close proximity to legally protected and internationally recognised areas (e.g. legally protected areas, UNESCO World Heritage sites, UNESCO Biosphere Reserves, Ramsar sites, Key Biodiversity Areas)</td>
<td>Tonnes</td>
<td>CDSB Biodiversity</td>
<td>x x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water pollutants</td>
<td>Volume of water discharged (total, freshwater, other)</td>
<td>Cubic metre or equivalent</td>
<td>CDSB Biodiversity; GRI 11.6.5 Oil &amp; Gas /GRI 303-4; CDP Water</td>
<td>x x x x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water pollutants</td>
<td>Volume of water discharged to legally protected, internationally recognised or water-stressed areas</td>
<td>Cubic metre or equivalent</td>
<td>CDSB Biodiversity; GRI 11.6.5 Oil &amp; Gas /GRI 303-4; CDP Water</td>
<td>x x x x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water pollutants</td>
<td>Concentration of key pollutants in the wastewater discharged (e.g. hydrocarbons or nitrogen)</td>
<td>Concentration (e.g. mg/cubic meter)</td>
<td>GRI 11.6.5 Oil &amp; Gas /GRI 303-4; CDSB Water</td>
<td>x x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water pollutants</td>
<td>Volume of water discharged to destinations (e.g. fresh surface water, brackish surface water, groundwater, seawater, third party destinations)</td>
<td>Concentration (e.g. mg/cubic meter)</td>
<td>GRI 11.6.5 Oil &amp; Gas /GRI 303-4; CDP Water – W5 Facility-level water accounting</td>
<td>x x x x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water pollutants</td>
<td>Water-related detrimental incidents experienced by organisation by location</td>
<td>Count</td>
<td>CDP Water</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water pollutants</td>
<td>Volume of wastewater treated, reused, or avoided</td>
<td>Cubic metre or equivalent</td>
<td>ICMA Water – B – Wastewater Treatment</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>Solid</td>
<td>Hazardous waste generated</td>
<td>Total amount of hazardous waste generated by type</td>
<td>Tonnes</td>
<td>CDSB Biodiversity; GRI 303 Waste: ERSR-5</td>
<td>x x</td>
</tr>
<tr>
<td></td>
<td>waste</td>
<td>Non-hazardous waste generated</td>
<td>Total amount of non-hazardous waste generated by type</td>
<td>Tonnes</td>
<td>CDSB Biodiversity; GRI 303 Waste: ERSR-5</td>
<td>x x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waste disposal</td>
<td>Total amount of hazardous and non-hazardous waste by type disposed of by type of disposal (incineration with energy recovery, incineration without energy recovery, landfilling, other)</td>
<td>Tonnes</td>
<td>CDSB Biodiversity; ESRSR-5</td>
<td>x x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waste minimised, reused or recycled</td>
<td>Total amount of waste by type minimised, reused or recycled</td>
<td>Tonnes</td>
<td>ICMIA HFR – Buildings</td>
<td>x x x x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waste minimised, reused or recycled</td>
<td>Share of total waste minimised, reused or recycled</td>
<td>Percentage</td>
<td>ICMIA HFR – Buildings</td>
<td>x x x x</td>
</tr>
<tr>
<td>Resource use</td>
<td>Water</td>
<td>Total water consumption</td>
<td>Volume of water consumption (total, freshwater, other)</td>
<td>Cubic metre or equivalent</td>
<td>CDSB Biodiversity, GRI; CDP Water</td>
<td>x x x x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water consumption by source</td>
<td>Volume of water consumption (total, freshwater, other) by other (e.g. surface water, groundwater, seawater, produced water, third-party water)</td>
<td>Cubic metre or equivalent</td>
<td>CDSB Biodiversity, GRI; CDP Water</td>
<td>x x x x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water consumption from water stressed areas</td>
<td>Volume of water consumption (total, freshwater, other) from areas of water stress</td>
<td>Cubic metre or equivalent</td>
<td>CDSB Biodiversity, GRI; CDP Water</td>
<td>x x x x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total water withdrawal</td>
<td>Volume of water withdrawals from all areas (total, freshwater, other)</td>
<td>Cubic metre or equivalent</td>
<td>CDSB Biodiversity, GRI; CDP Water</td>
<td>x x x x</td>
</tr>
<tr>
<td>Impact driver</td>
<td>Realm</td>
<td>Indicator</td>
<td>Metric</td>
<td>Unit of measure</td>
<td>Framework reference</td>
<td>Level of metric</td>
</tr>
<tr>
<td>---------------</td>
<td>-------</td>
<td>-----------</td>
<td>--------</td>
<td>----------------</td>
<td>---------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>X X</td>
<td>Water</td>
<td>Water use</td>
<td>Water withdrawal by source</td>
<td>Volume of water withdrawals (total, freshwater, other) by source (e.g. surface water, groundwater, seawater, produced water, third-party water)</td>
<td>Cubic metre or equivalent</td>
<td>CDSB, Biodiversity, GRI; CDP Water</td>
</tr>
<tr>
<td>X X</td>
<td>Water</td>
<td>Water use</td>
<td>Water withdrawal from water stressed areas</td>
<td>Volume of water withdrawal (total, freshwater, other) from areas of water stress</td>
<td>Cubic metre or equivalent</td>
<td>CDSB, Biodiversity, GRI; CDP Water</td>
</tr>
<tr>
<td>X X</td>
<td>Water</td>
<td>Water use</td>
<td>Water reused or recycled</td>
<td>Volume of water (total, freshwater, other) reused or recycled</td>
<td>Cubic metre or equivalent</td>
<td>SFDR, PAI; CDP Water</td>
</tr>
<tr>
<td>X X</td>
<td>Water</td>
<td>Water use</td>
<td>Water reused or recycled</td>
<td>Share of water reused or recycled</td>
<td>Percentage</td>
<td>SFDR, PAI; CDP Water</td>
</tr>
<tr>
<td>X X</td>
<td>Water</td>
<td>Water use</td>
<td>Water loss mitigation</td>
<td>Volume of water loss mitigated (e.g. evaporation mitigation, leakage mitigation)</td>
<td>Cubic metre or equivalent</td>
<td></td>
</tr>
<tr>
<td>X X</td>
<td>Water</td>
<td>Water use</td>
<td>Produced water</td>
<td>Volume of water produced</td>
<td>Cubic metre or equivalent</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>Other resource use</td>
<td>Use of natural resources sourced from land</td>
<td>Extent of area that the organisation controls and/or manages that is used for the production of natural commodities sourced from land, split into types</td>
<td>Tonnes</td>
<td>CDP</td>
<td>x x</td>
</tr>
<tr>
<td>X</td>
<td>Other resource use</td>
<td>Use of natural resources sourced from land</td>
<td>Quantity of high-risk commodities sourced from land split into types (such as leather, soil, palm oil, crops, timber)</td>
<td>Tonnes</td>
<td>ESRS-3, CDSB Biodiversity</td>
<td>x x</td>
</tr>
<tr>
<td>X</td>
<td>Other resource use</td>
<td>Use of natural resources sourced from marine areas</td>
<td>Extent of area that the organisation controls and/or manages that is used for the production of natural commodities sourced from marine areas, split into types</td>
<td>Tonnes</td>
<td>CDP</td>
<td>x x</td>
</tr>
<tr>
<td>X</td>
<td>Other resource use</td>
<td>Use of natural resources sourced from marine areas</td>
<td>Quantity of high-risk commodities sourced from marine areas split into types (such as gravel, oil, seafood, energy)</td>
<td>Tonnes</td>
<td>ESRS-3, CDSB Biodiversity</td>
<td>x x</td>
</tr>
<tr>
<td>X</td>
<td>Other resource use</td>
<td>Use of natural resources sourced from freshwater areas</td>
<td>Extent of area that the organisation controls and/or manages that is used for the production of natural commodities sourced from freshwater areas, split into types</td>
<td>Tonnes</td>
<td>CDP</td>
<td>x x</td>
</tr>
<tr>
<td>X X X</td>
<td>Other resource use</td>
<td>Use of natural resources sourced from priority areas</td>
<td>Quantity of high-risk commodities sourced from legally protected, internationally recognised areas (e.g. legally protected areas, UNESCO World Heritage sites, UNESCO Biosphere Reserves, Ramsar sites, Key Biodiversity Areas) split into types</td>
<td>Tonnes</td>
<td>CDP</td>
<td>x x</td>
</tr>
<tr>
<td>X X X</td>
<td>Other resource use</td>
<td>Use of natural resources sourced from priority areas</td>
<td>Share (i.e. proportion) of natural commodities sourced from legally protected, internationally recognised areas (e.g. legally protected areas, UNESCO World Heritage sites, UNESCO Biosphere Reserves, Ramsar sites, Key Biodiversity Areas) or other priority areas, split into types</td>
<td>Percentage</td>
<td>CDP</td>
<td>x x</td>
</tr>
<tr>
<td>X X X</td>
<td>Other resource use</td>
<td>Use of wild species</td>
<td>Quantity of wild species extracted from natural habitats for commercial purposes, split into species types and realms</td>
<td>Count</td>
<td>CDSB Biodiversity</td>
<td>x x</td>
</tr>
<tr>
<td>X X X</td>
<td>Other resource use</td>
<td>Use of wild species</td>
<td>Share of wild species extracted from legally protected and internationally recognised areas (e.g. legally protected areas, UNESCO World Heritage sites, UNESCO Biosphere Reserves, Ramsar sites, Key Biodiversity Areas)</td>
<td>Count</td>
<td>CDSB Biodiversity</td>
<td>x x</td>
</tr>
<tr>
<td>X X X</td>
<td>Other resource use</td>
<td>Plastic production</td>
<td>Volume of plastic produced</td>
<td>Tonnes</td>
<td>ESRS-3 Requirement 13; WBA-15</td>
<td>x x</td>
</tr>
<tr>
<td>X</td>
<td>Greenhouse gas emissions</td>
<td>Scope 1, 2 and 3 emissions</td>
<td>Refer to TCFD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X X X</td>
<td>Biological alterations</td>
<td>Level of invasive species in area</td>
<td>Presence/absence of invasive species in area</td>
<td>Qualitative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X X X</td>
<td>Biological alterations</td>
<td>Level of invasive species in area</td>
<td>Absolute number of invasive species</td>
<td>Count</td>
<td>ICMA Biodiversity – A – Protected areas and OECM</td>
<td>x x</td>
</tr>
<tr>
<td>X X X</td>
<td>Disturbances</td>
<td>Level of noise pollution</td>
<td>Decibels of noise above normal level</td>
<td>Decibels</td>
<td>CDSB Biodiversity</td>
<td>x</td>
</tr>
</tbody>
</table>
Example state of nature indicators

Example cross-sector indicators for ecosystems and species are given below. Some use direct measurement techniques, while others use impact driver data as proxies. Recognising the variability in the availability of data, examples of indicators are provided, together with existing measurement tools and techniques. The indicators set out below are illustrative only. In later beta releases, the TNFD will develop a more comprehensive guidance list with suggested proxies and data sources with an indication of strengths, weaknesses and limitations.

### Table 16: Example indicators and measurement tools and techniques – state of nature

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Example indicator</th>
<th>Description</th>
<th>Example means of measurement</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What to measure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecosystem extent</td>
<td>Habitat/land cover (e.g. forest, coral reef)</td>
<td>Measures the extent of a particular ecosystem type without factoring in the condition of the ecosystem</td>
<td>Direct measurement • Habitat surveys Secondary data • Change in extent of tree cover over time Proxies • Certification status where certification scheme addresses avoidance of habitat loss</td>
<td>EFRAG, The Align Project Hansen et al1</td>
</tr>
<tr>
<td>Compositional state</td>
<td>Species abundance (e.g. mean species abundance or MSA)</td>
<td>Measures the (average) change in population size of native species in an area from a reference intact state, thus providing a proxy of ecosystem condition.</td>
<td>Direct measurement • Species counts, eDNA Secondary/modelled data: • Biodiversity footprinting, e.g. Global Biodiversity Score, Biodiversity Footprint, Financials Corporate Biodiversity Footprint Estimated state, e.g. based on land use • Biodiversity Impact Metric Existing analysis on state of ecosystems: 1 • Hotspots of natural capital depletion • Critical habitat map</td>
<td>The Align Project EU B@B Platform1, EFRAG, Finance for Biodiversity Foundation4, UNEP-WCMC</td>
</tr>
<tr>
<td>Compositional state</td>
<td>Species abundance (e.g. mean species abundance or MSA)</td>
<td>Measures the (average) change in population size of native species in an area from a reference intact state, thus providing a proxy of ecosystem condition.</td>
<td>Direct measurement • Species counts, eDNA Secondary/modelled data: • Biodiversity footprinting, e.g. Global Biodiversity Score, Biodiversity Footprint Estimated state, e.g. based on land use • Biodiversity Impact Metric Existing analysis on state of ecosystems: 1 • Hotspots of natural capital depletion • Critical habitat map</td>
<td>The Align Project EU B@B Platform1, EFRAG, Finance for Biodiversity Foundation4, UNEP-WCMC</td>
</tr>
<tr>
<td>Landscape and seascapes</td>
<td>Potentially disappeared fraction of species (PDF)</td>
<td>Measures Intactness, fragmentation and connectivity – the average change in local species richness in an area from a reference intact state.</td>
<td>Secondary/modelled • Terrrestrial Biodiversity Intactness Index5</td>
<td>The Align Project EFRAG UNEP-WCMC Natural History Museum</td>
</tr>
<tr>
<td>Functional state</td>
<td>Net primary productivity</td>
<td>Measures the rate that energy is stored by plants and made available to other species in the ecosystem, thus measuring the productivity by measuring the core process that occurs for ecosystems to function.</td>
<td>Modelled • Vegetation index5</td>
<td>CISL1, EFRAG The Align Project</td>
</tr>
<tr>
<td>Functional state</td>
<td>Keystone species</td>
<td>Measures changes to the population of scientifically identified species of the assessment area to indicate changes to ecosystem function, i.e. those that have an impact on an ecosystem disproportionate to their abundance.</td>
<td>Primary data based on surveys • Biodiversity Indicator and Reporting System (BIRS)</td>
<td>EFRAG</td>
</tr>
</tbody>
</table>

---


3. EU Business @ Biodiversity Platform (2019) Assessment of biodiversity measurement approaches for businesses and financial institutions.


6. Helen Phillips; Adriana De Palma; Ricardo E Gonzalez; Sara Contu et al. (2021). Dataset: The Biodiversity Intactness Index – country, region and global-level summaries for the year 1970 to 2050 under various scenarios. Natural History Museum Data Portal (data.nhm.ac.uk). https://doi.org/10.5519/he1eqmg1

### What to measure

#### Species population size

<table>
<thead>
<tr>
<th>N/A</th>
<th>Number of individuals of priority species</th>
<th>Indicator measures changes in the number of individuals of priority species in a specific area</th>
<th>Direct measurement</th>
<th>RSPB</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Number of breeding pairs of priority species</td>
<td>Measures the local population size and may provide information on changes in suitability of an area as a breeding ground.</td>
<td>Direct measurement Proxies</td>
<td>EFRAG The Align Project</td>
</tr>
</tbody>
</table>

#### What to measure

#### Species extinction risk

<table>
<thead>
<tr>
<th>N/A</th>
<th>Contribution to extinction risk</th>
<th>Estimates how different activities at a location may drive species extinctions globally.</th>
<th>Direct measurement</th>
<th>EFRAG The Align Project IUCN</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Change in species area of habitat (ha)</td>
<td>Measures change in habitat size as a proxy of a change to a species population size</td>
<td>Primary data based on surveys • Species Threat Abatement and Restoration metric using survey data</td>
<td>EFRAG The Align Project IUCN SDG target 15.1</td>
</tr>
</tbody>
</table>

Species richness and composition is assumed to be covered within the ecosystem condition and extent indicators, so it is not explicitly referenced within the species indicators above.

The following table provides examples of biome-specific metrics, split into the six classes of ecosystem characteristics, defined by UN-SEEA: 8 The Taskforce is evaluating the benefits of providing biome-level guidance. The definition and taxonomy of biomes, following the UN-SEEA Ecosystem Accounting, was outlined in the v0.1 beta framework. In the v0.2 beta release, TNFD provides example assessment metrics for a small set of biomes across ocean, land and freshwater realms, to illustrate how state of nature metrics can be organized by biome. The Taskforce may develop a full set of metrics of the state of nature by biome in subsequent releases.

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8 [https://www.bipindicators.net/indicators/wild-bird-index](https://www.bipindicators.net/indicators/wild-bird-index)


11 UN-SEEA (2021) System of Environmental-Economic Accounting-Ecosystem Accounting.
Table 17: Example biome-specific metrics

<table>
<thead>
<tr>
<th>Ecosystem type</th>
<th>Realm</th>
<th>Physical state</th>
<th>Chemical state</th>
<th>Compositional state</th>
<th>Structural state</th>
<th>Functional state</th>
<th>Landscape / seascape</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2 Temperate-boreal forests and woodlands biome</td>
<td>Land</td>
<td>Vegetation water content</td>
<td>Soil organic carbon content; Air pollutant concentration</td>
<td>Tree species richness; Lichen species richness; Bird species richness</td>
<td>Soil layer thickness; Tree cover density; Forest age class distribution</td>
<td>Density of trees with hollows for nesting; Vegetation index; Water stress index</td>
<td>Forest area density; Landscape diversity; Forest connectivity</td>
</tr>
<tr>
<td>F1 Rivers and streams</td>
<td>Freshwater</td>
<td>River flow; Permanence of water flow; Sediment load</td>
<td>Nitrogen concentration; Phosphorus concentration</td>
<td>Macro-invertebrate species richness</td>
<td>Area of riverbanks vegetated</td>
<td>Biological oxygen demand</td>
<td>Share of river flow controlled by barriers; River system fragmentation</td>
</tr>
<tr>
<td>M1 Marine shelf</td>
<td>Ocean</td>
<td>Water clarity; (Micro)plastic concentration</td>
<td>Chlorophyll a concentration; Oxygen concentration; pH (or dissolved CO2)</td>
<td>Coral species richness; Fish species richness</td>
<td>Reef bleachedness; Kelp/seagrass height, Density or cover; Live coral cover</td>
<td>Ratio between fishing mortality and fishing at maximum sustainable yield; Biological oxygen demand</td>
<td>Seagrass meadow cover</td>
</tr>
<tr>
<td>T7.4 Urban and industrial ecosystems</td>
<td>Land</td>
<td>Imperviousness</td>
<td>NO2 concentration</td>
<td>Bird species richness</td>
<td>Share of urban green space; Vegetation or tree cover</td>
<td>Average distance of residents to urban green space; Landscape diversity</td>
<td></td>
</tr>
<tr>
<td>T4 Savannas and grasslands</td>
<td>Land</td>
<td>% Bare ground</td>
<td>Soil organic carbon content; Soil pH</td>
<td>Bird species richness; Butterfly species richness; Proportion of non-native species</td>
<td>The presence/density of treesshrubs</td>
<td>Dry matter productivity</td>
<td>Connectivity of trees; Grassland connectivity</td>
</tr>
</tbody>
</table>

Ecosystem service metrics

Examples of ecosystem service metrics for select categories of ecosystem services considered to be broadly applicable across all sectors are contained below:

Table 18: Example ecosystem service metrics

<table>
<thead>
<tr>
<th>Ecosystem service</th>
<th>Ecosystem service sub-category</th>
<th>Realm</th>
<th>Potential indicator</th>
<th>Potential physical metric(s)</th>
<th>Potential unit</th>
<th>Framework reference(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulating and maintenance services</td>
<td>Water flow regulation services (baseline flow maintenance; peak flow mitigation)</td>
<td>X</td>
<td>Amount of water flow regulated</td>
<td>Capacity of reservoirs or alternative forms of storage (cubic metres) otherwise needed to provide same service</td>
<td>Cubic metre or equivalent</td>
<td>UN SEEA – EA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X</td>
<td>Amount of water flow regulated</td>
<td>Volume of diverted water flow otherwise needed to provide same service</td>
<td>Cubic metre or equivalent</td>
<td>TNFD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X</td>
<td>Amount of secure water supply</td>
<td>Altered level of number of people/businesses/areas with secure water supply</td>
<td>Count</td>
<td>ICMA CC A&amp;R</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X</td>
<td>Amount of water flow regulated</td>
<td>Altered level of livestock and or crops (e.g. reduced/avoided loss of livestock and/or crops)</td>
<td>Count</td>
<td>ICMA CC A&amp;R</td>
</tr>
<tr>
<td>Regulating and maintenance services</td>
<td>River flood mitigation services</td>
<td>X</td>
<td>Altered risk level by incident size or damage cost</td>
<td>Altered risk level of incident (e.g., flood frequency)</td>
<td>Count</td>
<td>GRI, UNEP-WCMC and CREM (2011) Approach for reporting on ecosystem services.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X</td>
<td>Altered risk level by incident size or damage cost</td>
<td>Number of people and buildings in a lower risk category</td>
<td>Count</td>
<td>UN SEEA – EA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X</td>
<td>Altered risk level by incident size or damage cost</td>
<td>Change in flood damage costs</td>
<td>Dollar value or equivalent</td>
<td>ICMA CC A&amp;R</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X</td>
<td>Altered risk level by incident size or damage cost</td>
<td>Altered level of land-loss from inundation and/or coastal erosion in km² (e.g. reduction of land-loss)</td>
<td>Km² or equivalent</td>
<td>ICMA CC A&amp;R</td>
</tr>
<tr>
<td>Ecosystem service sub-category</td>
<td>Realm</td>
<td>Potential indicator</td>
<td>Potential physical metric(s)</td>
<td>Potential unit</td>
<td>Framework reference(s)</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
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<td>---------------------</td>
<td>-----------------------------</td>
<td>----------------</td>
<td>-----------------------</td>
<td></td>
</tr>
<tr>
<td>Global climate regulation services</td>
<td>Land X</td>
<td>Tonnes of greenhouse gas (GHG) retained</td>
<td>Tonnes of carbon and other greenhouse gases retained (sequestered and stored) within company operations or supply chain</td>
<td>Tonnes of CO2e</td>
<td>UN SEEA – EA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Altered risk level by incident size or damage cost</td>
<td>Altered level in the number of wildfires and/or in the area damaged by wildfires in km² (e.g. reduction in the number of wildfires)</td>
<td>Km² or equivalent</td>
<td>ICMA CC A&amp;R</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Tonnes of greenhouse gas (GHG) retained</td>
<td>Amount of carbon absorbed by vegetation (tons)</td>
<td>Tonnes of CO2e</td>
<td>CDSB Biodiversity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Number of people affected due to climate-related hazards</td>
<td>Number of people evacuated/injured/displaced/economically unproductive due to climate-related hazards (e.g. reduced number of people injured)</td>
<td>Count</td>
<td>ICMA CC A&amp;R – E – Other sustainability indicators</td>
<td></td>
</tr>
<tr>
<td>Local (micro and meso) climate regulation services</td>
<td>X</td>
<td>Number of people affected due to climate-related hazards</td>
<td>Number of households with air temperature reduced by more than 5 °C on hot days</td>
<td>Count</td>
<td>UN SEEA – EA</td>
<td></td>
</tr>
<tr>
<td>Air filtration services</td>
<td>X</td>
<td>Weight or volume of pollutant filtered/remediated</td>
<td>Tonnes of pollutants absorbed by type of pollutant (e.g., PM10; PM2.5)</td>
<td>Tonnes</td>
<td>UN SEEA – EA</td>
<td></td>
</tr>
<tr>
<td>Soil and sediment retention services (Soil erosion control services and landslide mitigation services)</td>
<td>X</td>
<td>Tonnes of ecosystem asset retained</td>
<td>Tonnes of soil retained; number of properties with reduced risk of landslide</td>
<td>Tonnes</td>
<td>UN SEEA – EA</td>
<td></td>
</tr>
<tr>
<td>Solid waste remediation</td>
<td>X</td>
<td>Weight or volume of pollutant filtered/remediated</td>
<td>Tonnes of solid waste remediated</td>
<td>Tonnes</td>
<td>UN SEEA – EA</td>
<td></td>
</tr>
<tr>
<td>Water purification services</td>
<td>X</td>
<td>Tonnes of ecosystem asset retained</td>
<td>Tonnes of pollutants remediated by type of pollutant (nutrients and other pollutants)</td>
<td>Tonnes</td>
<td>UN SEEA – EA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Area of habitat providing services</td>
<td>Hectares of habitat providing water filtration; cubic meters /day of water filtered by vegetation</td>
<td>Hectare or equivalent</td>
<td>Capital Coalitions (2016)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Weight or volume of pollutant filtered/remediated</td>
<td>Grams of pollutant assimilated per kilometre of river</td>
<td>Gram or equivalent</td>
<td>Capital Coalitions (2016)</td>
<td></td>
</tr>
<tr>
<td>Pollination services</td>
<td>X</td>
<td>Area of habitat providing services</td>
<td>Area of crops pollinated, by type of crop</td>
<td>Km² or equivalent</td>
<td>UN SEEA – EA</td>
<td></td>
</tr>
<tr>
<td>Coastal protection services</td>
<td>X</td>
<td>Number of properties in a lower risk category</td>
<td>Number of properties in a lower risk category</td>
<td>Count</td>
<td>UN SEEA – EA</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>Coastal protection capacity</td>
<td>Coastal protection capacity</td>
<td></td>
<td>Km or equivalent</td>
<td>Maes (2016)</td>
<td></td>
</tr>
<tr>
<td>Ecosystem service sub-category</td>
<td>Land</td>
<td>Water</td>
<td>Ocean</td>
<td>Air</td>
<td>Realm</td>
<td>Potential indicator</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>-----</td>
<td>-------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Crop provisioning services</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Weight or volume of provisioned assets</td>
</tr>
<tr>
<td>Grazed biomass provisioning services</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>Weight or volume of provisioned assets</td>
</tr>
<tr>
<td>Wood provisioning services</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Weight or volume of provisioned assets</td>
</tr>
<tr>
<td>Wild fish and other natural aquatic biomass provisioning services</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>Weight or volume of provisioned assets</td>
</tr>
<tr>
<td>Wild animals, plants and other biomass provisioning services (excludes aquatic and wood products)</td>
<td>X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Weight or volume of provisioned assets</td>
</tr>
<tr>
<td>Water supply</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>Weight or volume of provisioned assets</td>
</tr>
<tr>
<td>Nursery population and habitat maintenance services</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Size of biomass stocks dependent upon nursery and habitat services</td>
<td>Size of biomass stocks dependent upon nursery and habitat services</td>
</tr>
<tr>
<td>Number of people affected due to habitat hazards</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Altered level in workforce absenteeism due to climate-related health impacts (e.g. reduced workforce absenteeism)</td>
<td>Count</td>
</tr>
<tr>
<td>Number of people affected due to habitat hazards</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Altered level of number of people suffering from flood-related infections (e.g. reduced number of people)</td>
<td>Count</td>
</tr>
<tr>
<td>Number of visits for cultural purposes</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Number and length (hours) of visits</td>
<td>Count</td>
</tr>
<tr>
<td>Amount of properties with cultural benefits</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Number of properties with views of natural landscapes/located near green/blue areas</td>
<td>Count</td>
</tr>
<tr>
<td>Number of visits for cultural purposes</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Number of visits for educational, scientific and research purposes</td>
<td>Count</td>
</tr>
</tbody>
</table>
Annex 3: Initial considerations for setting nature-related targets

Targets are referenced in two areas of beta v0.1 of the TNFD framework:

1. The draft disclosure recommendations include, under the Metrics and Targets pillar, a draft recommended disclosure to ‘Describe the targets used by the organisation to manage nature-related risks and opportunities and performance against targets’.

2. Component P2 of the LEAP approach for nature-related risk and opportunity assessment focuses on target setting and performance management, to help market participants address the question of ‘How will we set targets and define and measure progress?’

There is demand from market participants for the TNFD framework to help with transition planning, target setting and with achieving corporate targets aligned with broader national and global public policy goals. These include the post 2020 Global Biodiversity Framework, which will set global biodiversity targets. The TNFD’s approach to target setting will need to ensure that its architecture for metrics and targets can be used in this broader context, both for internal risk and opportunity management, as well as for reporting and disclosure.

Figure 23: The ‘Architecture for Action’ for Nature

The TNFD propose that organisations set nature-related targets in line with the Science Based Targets Network’s (SBTN) interim targets, which adhere to the best available science. This will be updated based on the emerging SBTN target-setting methods in development. Freshwater methods are currently the most advanced in SBTN’s work programme and are out for internal consultation among SBTN partners.

SBTN’s action framework emphasises the importance of avoiding and managing negative impacts first, as a precursor to achieving targets for nature-positive outcomes.

The TNFD also acknowledges that other forms of science-based target setting may be adopted by companies. In such cases, transparency is recommended on the methodology used for target setting.

The approach to targets will be updated in future TNFD framework releases, based on progress with the SBTN, or other science-based target-setting methods, lessons learned from pilot testing and the global targets agreed in the CBD post-2020 Global Biodiversity Framework. In subsequent releases, the TNFD will also explore targets and transition planning to reflect the climate-nature nexus, building on the TCFD framework approach to the Science Based Targets initiative’s (SBTi) climate-related targets.
Annex 4: Glossary – new terms for TNFD v0.2 release

See TNFD’s full glossary, including terms from v0.1 release, on the online platform.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
<th>Source</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abiotic services</td>
<td>Abiotic flows are contributions to benefits from the environment that are not underpinned by, or reliant on, ecological characteristics and processes</td>
<td>United Nations et al. (2021) System of Environmental Economic Accounting – Ecosystem Accounting (SEE EA)</td>
<td>Multilateral Development Finance Institution Working Group and the Cross Sector Biodiversity Initiative (2015)</td>
</tr>
<tr>
<td>Area of influence</td>
<td>The area in which an entity location may potentially directly, indirectly and cumulatively cause impacts on biodiversity</td>
<td>Natural Capital Coalition (2016) Natural Capital Protocol</td>
<td>IPBES (2019)</td>
</tr>
<tr>
<td>Assessment metrics</td>
<td>Metrics used within an integrated internal assessment process for nature-related risk and opportunity management, such as the LEAP approach. These would not be required for disclosure</td>
<td>TCFD</td>
<td>IPBES (2019)</td>
</tr>
<tr>
<td>Baseline</td>
<td>Starting point or benchmark against which changes in the state of nature attributed to your business activities can be compared</td>
<td>Natural Capital Coalition (2016) Natural Capital Protocol</td>
<td>IPBES (2019)</td>
</tr>
<tr>
<td>Critical habitat</td>
<td>Any area of the planet with high biodiversity conservation significance, based on the existence of habitat of significant importance to critically endangered or endangered species, restricted range or endemic species, globally significant concentrations of migratory and/or congregatory species, highly threatened and/or unique ecosystems and key evolutionary processes</td>
<td>IFC (2012) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. International Finance Corporation, Washington DC, U.S.A</td>
<td>IUCN (2012): <a href="https://portals.iucn.org/library/node/9243">https://portals.iucn.org/library/node/9243</a></td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
<td>Source</td>
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</tr>
<tr>
<td>Reference condition</td>
<td>The condition against which past, present and future ecosystem conditions are compared in order to measure relative change over time</td>
<td>United Nations et al. (2021) System of Environmental-Economic Accounting—Ecosystem Accounting (SEEA EA). White cover publication, pre-edited text subject to official editing. Available at: <a href="https://seea.un.org/ecosystem-accounting">https://seea.un.org/ecosystem-accounting</a>.</td>
<td></td>
</tr>
<tr>
<td>Resilience</td>
<td>The level of disturbance that an ecosystem or society can undergo without crossing a threshold that creates different structures or outputs. Resilience depends on factors such as ecological dynamics and the organisational and institutional capacity to understand, manage and respond to these dynamics</td>
<td>IPBES (2019)</td>
<td></td>
</tr>
<tr>
<td>Species composition</td>
<td>The array of species in a specific sample, community, or area</td>
<td>IPBES (2019) The global assessment report on biodiversity and ecosystem services.</td>
<td></td>
</tr>
<tr>
<td>Stressed watersheds</td>
<td>Watersheds, where the demand for water exceeds the available amount during a certain period, or when poor quality restricts its use. Water stress causes freshwater resources to deteriorate in quantity (aquifer over-exploitation, dry rivers, etc.) and quality (eutrophication, organic matter pollution, saline intrusion, etc.)</td>
<td>Adapted from EEA. 1999. Environment in the European Union at the turn of the century. Page 155. Environmental assessment report No 2</td>
<td></td>
</tr>
<tr>
<td>State of nature</td>
<td>The condition and extent of ecosystem assets, including positive or negative changes</td>
<td>TNFD, adapted from UN SEEA. 2021. System of Environmental-Economic Accounting – Ecosystem Accounting: Final Draft</td>
<td></td>
</tr>
<tr>
<td>Threatened species</td>
<td>Species assessed as facing a high risk of extinction in the wild in the medium-term</td>
<td>IUCN 2012: <a href="https://portals.iucn.org/library/node/10315">https://portals.iucn.org/library/node/10315</a>.</td>
<td></td>
</tr>
</tbody>
</table>