BIODIVERSITY IN THE FIRST RELEASE OF SBTS FOR NATURE AND AN APPROACH FOR FUTURE METHODS

BIODIVERSITY SHORT PAPER

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SCIENCE BASED TARGETS NETWORK
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Executive summary

Businesses have a key role to play in the conservation, sustainable use, and restoration of biodiversity due to the impacts and dependencies they have on nature. This paper explains, at a high level, the inclusion of biodiversity within the first release of science-based targets for nature and outlines the more detailed biodiversity coverage analysis approach to be completed by the Biodiversity Hub. The forthcoming biodiversity analysis will focus on the first release of science-based targets for nature and define pathways for more comprehensive inclusion of biodiversity in the target-setting methods.

Purpose of this document: SBTN and biodiversity

This paper is aimed at the Science Based Targets Network (SBTN) stakeholder community. This includes the technical development community (comprising SBTN technical experts, academics, and practitioner experts), the corporate sector (comprising organizations interested and involved in reviewing and piloting tools and methods), civil society, and governmental organizations interested in corporate sustainability guidance on biodiversity.

This paper describes SBTN's emerging approach for developing methods that companies can use to set targets to reduce negative and increase positive impacts on biodiversity. It introduces a forthcoming detailed analysis of biodiversity coverage in the first release of science-based targets for nature, which will inform the development of further SBTN methods.

This paper focuses specifically on biodiversity within the SBTN methods, primarily the first release of methods for science-based targets for nature. This includes Step 1 (v1), Step 2 (v1) and Step 3 for Land (v0.3) and Freshwater (v1). Throughout the rest of this paper, a working familiarity with biodiversity and the general approach of SBTN is assumed.

The importance of business interactions with biodiversity

Biodiversity is a measure of the biotic, or living, components of nature that interact with and are impacted by different dimensions of the abiotic, or nonliving, components, including natural resources and climate. It is commonly understood at the ecosystem, species, and genetic level. Biodiversity has both intrinsic value and value to people across all cultures (IPBES, 2022). It is integral to the provision of ecosystem services (or Nature's Contributions to People (NCPs)), which are critical for human survival, wellbeing, and the global economy. Regulating services, like pollination, are important for agriculture, whereas provisioning services deliver fisheries and forestry products, and specific biological materials are necessary for cosmetics and pharmaceuticals.

Business activities contribute to the five IPBES direct drivers of biodiversity loss, or SBTN "pressures": land/freshwater/sea use change, overexploitation, pollution, climate change and invasive alien species. If unabated, these collective pressures could lead to a sixth mass extinction of life on Earth (Barnosky et al., 2011; Díaz et al., 2019; IPBES, 2019; Williams et al., 2020). Given the impacts, and dependencies, that business activities have on biodiversity and ecosystem services, it is essential that companies act to mitigate biodiversity loss and support its recovery. SBTN's core aim is to enable companies to mitigate negative impacts on biodiversity and to contribute to positive biodiversity outcomes. This is approached through the initial dimensions of species and ecosystems, for which biodiversity data and tools are currently more accessible to companies than biodiversity data at the genetic level.

Connections between SBTN and other relevant global frameworks

Setting science-based targets for nature can help companies work toward targets within the Kunming-Montreal Global Biodiversity Framework (GBF), the Sustainable Development Goals (SDGs), and the UN Conventions on Climate Change (UNFCCC). Additionally, science-based targets for nature can help combat desertification (UNCCD) and to sustainably manage the international trade in threatened and listed species (IUCN, CITES).

The forthcoming analysis of biodiversity coverage in the first release of science-based targets for nature (outlined below) will map out how the interrelations between existing and planned SBTN methods contribute to the global goals outlined in international agreements, including the GBF and SDGs.

Biodiversity in existing SBTN methodologies

SBTN provides a framework enabling companies to mitigate[1] biodiversity loss associated with their business activities, and to make verified contributions to the conservation and restoration of biodiversity.

The SBTN framework comprises five steps: Step 1: Assess; Step 2: Interpret & Prioritize; Step 3: Measure, Set, & Disclose; Step 4: Act; Step 5: Track. The first release of science-based targets for nature includes methods for Steps 1 and 2 that account for pressures on land and freshwater, biodiversity, and marine systems, helping companies prioritize initial target setting. Targets can currently be set using the Step 3 methods for Freshwater Quantity and Quality (v1) and Land Use Change (v0.3).

Step 1: Assess and Step 2: Interpret & Prioritize

Step 1 of the SBTN framework requires companies to complete an environmental and societal materiality screening for their value chain, linked to the five pressures (or direct drivers within the IPBES framework) driving biodiversity loss (IPBES, 2019). This is followed by an initial quantitative environmental assessment of those material business activities and pressures. For example, companies sourcing IUCN-threatened or CITES-listed species must ensure adequate coverage of overexploitation in their value chain assessment (Step 1b) by submitting species names, status, quantities, and sourcing location.

Companies are also required to use biodiversity data to contextualize pressures, along with other state of nature data. In addition, SBTN recommends that companies use complementary biodiversity datasets at the species and ecosystem levels during this assessment for a more complete understanding of biodiversity importance in each location. Companies completing this analysis may draw from a list of recommended biodiversity metrics, selected for their appropriateness within the SBTN methods, accessibility, and ease of

[1]SBTN follows the mitigation hierarchy AR3T (avoidance, reduction, regeneration, restoration, and transformation) to address environmental impacts.

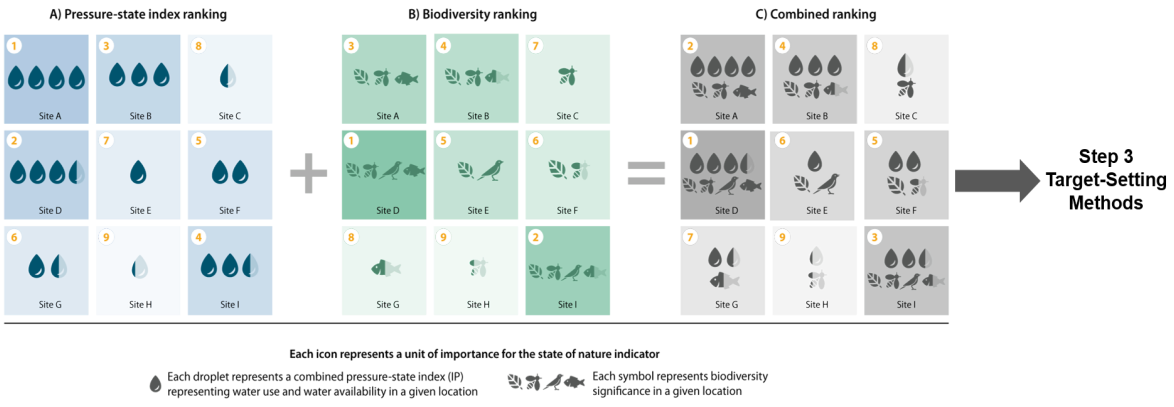
interpretation. They broadly fall into categories of species extinction risk (e.g., Species Threat Abatement and Restoration (STAR) (Mair et al., 2021), species richness and endemism (e.g., range rarity), ecosystem condition/integrity (e.g., Ecosystem Integrity Index (EII)), areas of biodiversity importance (e.g., Key Biodiversity Areas and Protected Areas), and Nature's Contributions to People (NCPs) (Chaplin-Kramer et al., 2023).

This list is not intended to be exhaustive; companies may use data describing other appropriate dimensions of biodiversity (e.g., other datasets describing ecosystem condition) with interpretation and justification. For example, companies may require different datasets to ensure appropriate taxonomic coverage for their targets. The Step 1 method will be updated as new datasets and approaches become available, such as the release of STAR for freshwater and marine species extinction risk, and further freshwater and marine ecosystem condition metrics.

In Step 2, companies use the biodiversity data collected and analyzed in Step 1, along with pressure and additional state of nature data, to inform where and for which business activities to set science-based targets (Figure 1). Within the first release of science-based targets for nature, this information is used to inform where companies must set science-based targets for Freshwater Quantity and Quality, and Land Use and Change. This set of locations is called the target boundary (see SBTN Glossary for further details).

While business activities contribute to biodiversity pressures throughout the target boundary, biodiversity importance and conservation needs vary across locations. Therefore, companies must incorporate biodiversity data within their target-setting strategy[2] to reflect where pressures have a disproportionate impact on biodiversity loss; these must be addressed with greater urgency through science-based targets for nature. As a prioritization process outcome, companies will learn which initial targets will effectively mitigate their most significant negative impacts on biodiversity and increase their potential for positive impacts.

See Appendix A for a case study highlighting the use of biodiversity data in Steps 1 and 2 for two fictitious companies.



[2] the sequencing of target-setting within a target boundary

Figure 1: Combining location rankings using pressure-state index and biodiversity data in Steps 1 and 2. The three figures show the calculation and introduction of new information, moving from the pressure index ranking to the biodiversity ranking, and then to the combined ranking. Each of the nine boxes within each figure represents a different site. Each site is associated with both a value for that variable (the icons) and the ranking (the yellow number). The combined ranking is used to inform the priority of a given site for setting and validating (Step 3), implementing (Step 4), and achieving (Step 5) science-based targets for nature.

Step 3: Measure, Set, and Disclose

Prioritization of biodiversity importance in Steps 1 and 2 is intended to ensure that realm-based targets (e.g., v1 science-based targets for Freshwater and v0.3 for Land) are set in places where company actions—taken in line with the SBTN mitigation hierarchy—will have the greatest impact on "bending the curve" of biodiversity loss (Leclere et al., 2020). Over time, companies must address the entirety of their target boundaries (consistent with the Step 3 methods guidance) to make claims about the achievement of science-based targets for nature.

The initial Land science-based targets (Step 3, v0.3) aim to mitigate land use change: the dominant direct driver of terrestrial biodiversity loss (IPBES, 2019; Jaureguiberry et al., 2022). The targets currently include 1) no conversion of natural ecosystems; 2) land footprint reduction; 3) engaging with multi-stakeholder landscape initiatives for conservation, restoration, and sustainable land use in line with locally determined goals.

The initial Freshwater science-based targets (Step 3, v1) enable company action on natural resource exploitation of abiotic resources (water use) and water pollution (eutrophication from nutrient pollution). Water pollution is the second most dominant driver of biodiversity loss in freshwater ecosystems (Jaureguiberry et al., 2022). The targets align with the latest hydrological science on local thresholds for 1) freshwater quantity: maintaining environmental flows (an action aligned with maintaining habitat requirements for freshwater biota), and 2) freshwater quality: keeping nitrogen and phosphorus loads within water quality limits for aquatic ecosystem health. The presence of threatened or highly sensitive species is also used to determine the need for a local model.

However, while the current target-setting methods make an important step forward for corporate sustainability actions, they do not comprehensively address all important pressures on biodiversity, such as invasive species and species overexploitation. Nor does the first launch of science-based targets for nature address interactions between pressures and targets and their impacts on biodiversity: a complex topic dependent on learning from method implementation.

SBTN is committed to more complete biodiversity coverage in the next release of target-setting methods, with two approaches for biodiversity currently being explored. The first involves using pressure-based targets (including invasive species and overexploitation) to account for the major pressures on biodiversity, and the second includes species and ecosystem target indicators. SBTN will also develop methodologies for oceans, coasts, and marine/aquatic food systems building on the latest marine biodiversity science.

A research process for a full analysis of biodiversity coverage

The forthcoming research paper will document these opportunities for more comprehensive biodiversity coverage, building upon the first SBT release. Areas where better coverage is needed have already been identified, including incorporating species-level indicators, freshwater and marine ecosystem level indicators, greater consideration of connectivity, and pressures such as overexploitation and invasive species. As an example, reduction of species extinction risk is a high-profile outcome of the GBF (Goal A, Target 4) that resonates strongly with the general public, including consumers. Species-level targets and indicators, currently absent from SBTN Step 3 methods, may therefore be valuable for companies looking to take action.

The main objective of the paper will, therefore, be the identification of consistent methodologies for measuring biodiversity impacts and creating positive biodiversity outcomes from science-based targets for nature. These methodologies will include biodiversity metrics which are (as stated above): appropriate for use in the SBTN methods, accessible (without primary data collection), interpretable, and actionable (when used as a target indicator) for companies.

The components of the paper will include:
1: Opportunities to improve biodiversity coverage within pressure-based target-setting methods through realm-based approaches.
2: Opportunities for the development of targets with biodiversity indicators linked to the state of biodiversity.
3: Complementary actions companies can take, alongside science-based targets for nature, to better address the pressures on biodiversity (e.g., interim targets).

The forthcoming analysis will identify both the strengths of the current methods (i.e., the potential biodiversity benefits of targets), any remaining biodiversity gaps in SBTN methodology (i.e., dimensions of biodiversity and pressures on biodiversity loss), and examples of where achievement of existing realm-based targets may not result in sufficiently positive outcomes for biodiversity and nature's contributions to people (i.e., the need for new targets and mechanisms for action).

Timelines

Work on the detailed biodiversity coverage analysis will commence after final approval of all methods included in the first release. This work will be released and open to the public following either peer review or an equivalent external review.

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Appendix A. Illustrative example

The following content depicts two fictitious companies: Company A and Company B. The examples demonstrate the use of biodiversity data and analyses within the methods for Step 1: Assess and Step 2: Interpret & Prioritize.

Use and analysis of biodiversity threats and significance within the Step 1 methods for an example company

When Company A, a food and agriculture company, is assessing its pressures, in addition to quantifying other pressures on biodiversity in line with SBTN guidance, they must also review sourcing and report on any IUCN threatened or CITES listed species within its upstream supply chain. If the company finds such a species, they must report the species' scientific name, threat status (IUCN and CITES), sourcing quantity, and location, as part of the Steps 1 and 2 checks. Finding none, they may move through the value chain assessment for environmental material pressures and business activities.

To complete the Step 1b value chain assessment, the company must contextualize its company-specific pressures with both a state indicator that is responsive to that pressure (i.e., a pressure-sensitive state indicator—SoN_P in the methods), and at least one state indicator for biodiversity (SoN_B in the methods).

In the example of the company's water pollution pressures, for its pressure-sensitive state indicator, the company uses the unified water pollution data layer provided by SBTN. For its biodiversity indicators for the water pollution pressure, Company A chooses to evaluate both rarity-weighted richness, capturing richness of endemic or range-restricted freshwater species (in the absence of STAR for freshwater species), and a metric of water quality regulation, a critical NCP in the region. To enable analysis using the SBTN Step 2 method, the company will need to harmonize the spatial scale of these data and normalize the datasets in order combine them into a single dataset for prioritization. Company A uses the normalization approach recommended by SBTN for state indicators (The same approach would be used for normalizing the pressure-sensitive indicator of water pollution) by using the maximum global value (for rarity-weighted richness and regulation of water quality). To combine these biodiversity datasets, the company takes the maximum value in each location and records which dataset that maximum value is attributed to.

Use and analysis of biodiversity threats and significance within the Step 2 methods

Company B, a furniture company, applies the prioritization methodology within its spatial target boundary (upstream target boundary A) for upstream land use change (conversion). It finds that its timber sourcing area spans Northern Europe and Brazil. The company calculates the pressure and state index score (I_P), combining the normalized habitat loss values within concessions and estimates of remaining habitat areas within the relevant ecoregion. In this process, the company finds that operations in Denmark have lower recent levels of habitat loss (measured as area converted) than their operation in Brazil. This means that

timber sourcing in Denmark has a lower pressure score than in Brazil, but that Denmark has lower levels of remaining habitat than Brazil, meaning that Denmark has a higher pressure-sensitive state of nature (SoN_P) score than Brazil. When combined into a pressure state index (I_P), following the Step 2 guidance, the site ranking between the two is similar. However, using the $STAR_{(T)}$ score to assess species extinction risk reveals that the site in Brazil is of very high biodiversity significance compared to Denmark. This Brazilian site is within the Atlantic Forest Coastal Rainforest Ecoregion; a biodiversity hotspot known for high species richness and endemism, as well as anthropogenic pressures contributing to biodiversity loss reflected in the $STAR_{(T)}$ score.

Although Company B will need to set science-based targets for No Conversion of Natural Ecosystems for each landscape in its direct operations and upstream target boundary A, the company uses the information derived during the ranking step to prioritize locations within the target boundary. Given the biodiversity significance of the Brazilian Atlantic Forest, the company knows that it should prioritize halting natural ecosystem conversion in this region as soon as possible, recognizing that this ambition should exceed even the target date. Companies should, if possible, define target dates that are more ambitious than those required to meet the requirements in less time and if a regional, place or commodity-based initiative has a more ambitious target date.