

An evaluation of tools being promoted to help the private sector disclose its impacts on biodiversity

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Few tools advertised to support companies to disclose their impacts on biodiversity can do so at a scale that informs the KMGBF.

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Author contributions

AJP, EM and HN conceived of the study and oversaw the implementation and analyses. CC, RMHP, NON, and SR collated the data and made the analyses as part of their Masters in Conservation Leadership at Cambridge University. LB contributed to writing of the manuscript with all other authors.

Abstract

Target 15 of the Global Biodiversity Framework (KMGBF) encourages the private sector to measure their risks, dependencies, and impacts on biodiversity. Various disclosure and action frameworks are

being developed to help companies do this, two of which (TNFD & SBTN) publish lists of tools that can help make these assessments. Here we provide an analysis of 129 tools listed on one or both sites classifying tool type and assessing the ways in which they measure biodiversity. Many of the tools included methods/approaches, single GIS layers or consultancy companies offering bespoke analyses. Only 58 tools (45% of all tools) were classified as a database or software tool that would allow standardised outputs to queries. Only 37 (29%) of the listed tools contained ecosystem (32) or species data (22) with global coverage, and only 13 (10%) tools used data on individual species to enable risk to be assessed at a species level. Most of the 13 tools that could provide information on species used data from either the Integrated Biodiversity Assessment Tool (IBAT) or the Global Biodiversity Information Facility (GBIF). The utility of tools in supporting disclosure and action frameworks, and achievement of KMGBF goals, would be improved with an independent classification of applicability, transparency about underlying datasets, improved integration of global ecosystems and species data, sustainable financing to generate and maintain high-quality biodiversity data, and corporate follow-through from disclosure to robust action.

Introduction

Among the 23 Targets in the Kunming-Montreal Global Biodiversity Framework (KMGBF), agreed by 196 countries in December 2022, Target 15 focuses on the private sector, recognising the extensive impacts they have on biodiversity (CBD, 2022a). The Target requires state parties to: *Take legal, administrative or policy measures to encourage and enable business, and in particular to ensure that large and transnational companies and financial institutions: (a) Regularly monitor, assess, and transparently disclose their risks, dependencies and impacts on biodiversity, including with requirements for all large as well as transnational companies and financial institutions along their operations, supply and value chains and portfolios; (b) Provide information needed to consumers to promote sustainable consumption patterns; (c) Report on compliance with access and benefit-sharing regulations and measures, as applicable; in order to progressively reduce negative impacts on biodiversity, increase positive impacts, reduce biodiversity-related risks to business and financial institutions, and promote actions to ensure sustainable patterns of production.* A headline indicator identified for Target 15 is the number of companies reporting on disclosures of risks, dependencies, and impacts on biodiversity (CBD 2022b). This indicator is important to track because the mission and goals of the KMGBF cannot be achieved without support from the private sector and we need to move to a position where all companies are aiming to minimise their impacts on biodiversity.

There has been an increasing interest in the private sector measuring its corporate sustainability ([Pranugrahaning et al. 2021](#)) and increasing calls to measure impacts on biodiversity (UN Environment Programme, 2023). With an increasing focus on the private sector's impacts and dependencies on nature, partly driven by the adoption of the KMGBF, a range of nature-related regulations, frameworks, and standards have been and are being developed (Lammerant et al. 2024, Tin et al. 2024). These include the Task Force for Nature-related Financial Disclosures (TNFD – TNFD 2023a), Science Based Targets for Nature (SBTN – SBTN 2024a), and Global Reporting Initiative (GRI 2025). the EU Taxonomy for Sustainable Activities (EU Technical Expert Group on Sustainable Finance 2020) and the related European Sustainability Reporting Standards (ESRS). The focus of these frameworks varies, but all ultimately aim to provide direction to the private sector regarding assessing and prioritising their impacts and dependencies on nature, setting and committing to science-based targets, transforming their business practices to sustainable models, and disclosing performance. This high-level process has been termed the ACT-D high-level business actions on nature (Assess, Commit, Transform, Disclose) and summarises the journey most nature-related regulations, frameworks, and standards are encouraging organisations in the private sector to adopt (Capitals Coalitions, 2022).

The TNFD framework and the SBTN guidance are two leading frameworks developed to guide the private sector through the ACT-D process (Linsley et al. 2023). These two frameworks also publish a list of tools that may be useful to business to help them disclose their risks, dependencies and impacts on biodiversity. The SBTN guidance shows how organisations can set science-based targets on land use, oceans, climate, and freshwater. In contrast, the TNFD shows how organisations can disclose their dependencies, impacts, risks, and opportunities on nature using the TNFD's LEAP (Locate, Evaluate, Assess, Prepare) approach and the TNFD recommended disclosures (TNFD, 2023a). Despite different focuses, there is significant alignment between the TNFD's LEAP approach and the SBTN's 5-step approach (Assess, Prioritise, Set targets, Act, Track). Both require companies to locate where their operations are (both direct operations and value chains) and assess their impact and dependencies in these locations to prioritise locations for target setting and action. Both frameworks require the use of spatially explicit biodiversity data. Katic et al. (2023) reviewed several tools' for measuring biodiversity performance and its alignment to the international targets for biodiversity. Barth et al. (2025), on the other hand, assessed biodiversity impact measurement among other characteristics for SBTN tools. Both papers recommended better clarity on what aspects of biodiversity are being measured by the tools.

This paper aims to provide more clarity within a rapidly evolving landscape of tools that claim to meet the needs of disclosure frameworks. It provides a summary analysis of a classification and evaluation of the tools listed as relevant on both TNFD's and SBTN's websites, particularly assessing the methods used and extent to which they might help a company measure its risks, dependencies and impacts on biodiversity. It differs from the earlier assessments (Katic et al. 2023; Barth et al. 2025) in that it includes a much larger set of tools (129 vs 33 (14 for in depth analysis) & 41 respectively) and in particular aims to identify the underlying biodiversity data being used by the tools. In order to measure impacts on biodiversity the underlying biodiversity data are critical but often hidden from the potential user on these tools websites.

Methods

Tools listed

Both TNFD and SBTN list tools in Online Catalogues that may be useful for measuring risks and impacts on their websites. A brief summary is provided together with a link to where the tool is available online. We focused on these two disclosure frameworks because they provided such lists. We collated all available tools provided which totalled 96 for TNFD and 38 for SBTN tools listed in their online Tools Catalogues in February 2024 (TNFD, 2024; SBTN, 2024b), removing five duplicates of tools that were common to both lists resulting in a total of 129 unique tools.

We categorised the tools into seven classes based on information on the tool's website and where necessary by e-mails to the publisher of the tool requesting additional information. We did not receive responses to all requests and in those cases based the classification on what we could discern from the website. These classes captured the main variation that existed among the tools. In some cases a tool might be classified in more than one class but we opted to select the class which seemed most appropriate for that tool rather than classify a tool in multiple classes.

1. Guidance document: a document providing guidance to companies relevant to undertaking one or more steps in the TNFD and/or SBTN process;
2. Method/approach: published methods (as a paper or report) that could be applied to measure some aspect of nature, risk, dependency or impact;
3. Satellite/GIS layer: a spatially explicit data set mapped and provided as a raster or vector shapefile;
4. Online software: available to provide an analysis output from a company's input of data such as sites of interest;

5. Downloadable software: software that a user downloads and operates themselves, potentially needing training to use;
6. Database: a dataset available to a company to use in its own analyses;
7. Consultancy company: a company offering bespoke analyses for a client on a commercial basis.

We excluded the 39 consultancy companies in category (7) since bespoke analyses are not comparable across users and we did not consider them to be a tool per se (Supplementary Materials Annex 1). We also did not believe that all available consultancy companies that could provide bespoke analyses were listed on the two sites. Some tools may be developed by a consultancy company and offered as part of their package but in this case if it met one of the first six classes then we classified it there. Therefore, we evaluated 90 unique tools from the TNFD and SBTN online catalogues, of which 58 came from the TNFD site and 37 from SBTN, with five common to both sites.

Classification of tools

We created a disclosure tools matrix in Microsoft Excel (Supplementary Materials Table S1) for the evaluated tools using three overarching classifications:

1. Tool attributes and accessibility – Whether a TNFD or SBTN tool, type of class of tool, and whether it is applicable globally, regionally or nationally, whether it is freely available and whether training may be needed to use the tool (as described on the tool’s website);
2. Industry application – how the tool has been classified by the publisher to meet TNFD or SBTN steps and which industries could apply the tool;
3. Approach to biodiversity measurement – what underlying biodiversity datasets are used in the tool.

In completing the disclosure tools matrix, we used information provided by the TNFD and SBTN Online Catalogues, and resources available on the tools’ websites. Each tool was self classified by the tool’s publisher as relevant for specific industries. The list of industries differed between the TNFD and SBTN sites. We therefore re-classified all industries to follow the Sustainability Accounting Standards Board’s Sustainable Industry Classification System® ([SASB, 2024](#)) and we used these to summarise the relevance of the tools for different industries (TNFD, 2023b). The SASB Standards guide organisations in providing industry-based disclosures about sustainability-related risks and opportunities to understand possible financial impact.

For the LEAP/SBTN Steps 1-3, we used the Guidance for Corporates on Science-based Targets for Nature document co-authored by TNFD and SBTN that describes how LEAP and the 5-Step SBTN approaches align (TNFD & SBTN, 2023). We analysed tools based on their self-declared classification in the Online Catalogues.

Given that these disclosure frameworks are designed to help measure and disclose a company's risks, dependencies, and impacts on biodiversity, we evaluated how biodiversity was measured by the tool to assess how it aims to disclose impacts on species or ecosystems. We made these analyses on tools (database, downloadable software, or online software) that claimed to be applicable at a global scale and to measure some aspect of biodiversity. Only 37 (41% of the 90 initially evaluated tools) met these criteria. We used the tool's website to initially identify what underlying biodiversity data were used by the tool. Where this was not discernible, we then contacted the publisher of the tool. Not all people contacted responded to our requests and in these cases we classified the tool based only on what was available on their website. In particular we aimed to evaluate whether ecosystem type data and species data were used in some way in the tool:

1. Ecosystem/landcover data: Where the tool used an ecosystem, ecoregion or landcover layer we labelled it as having some form of ecosystem-based analytical capabilities
2. Species: Where data on species were used in the tool we labelled it as having species-based analytical capabilities. We also classified the species data as to whether it focused on one species, many species, and how many taxonomic groups it included. For Instance, some tools provided data on marine mammals while others used data from the IUCN Red List of Threatened species.

Results

Classification of tool attributes and accessibility

Of the six classes of tools, the most common disclosure tools in the final 90 tools were online software (31%) and databases (28%), followed by methods/approach (18%) and Guidance Documents (11%) (Figure 1).

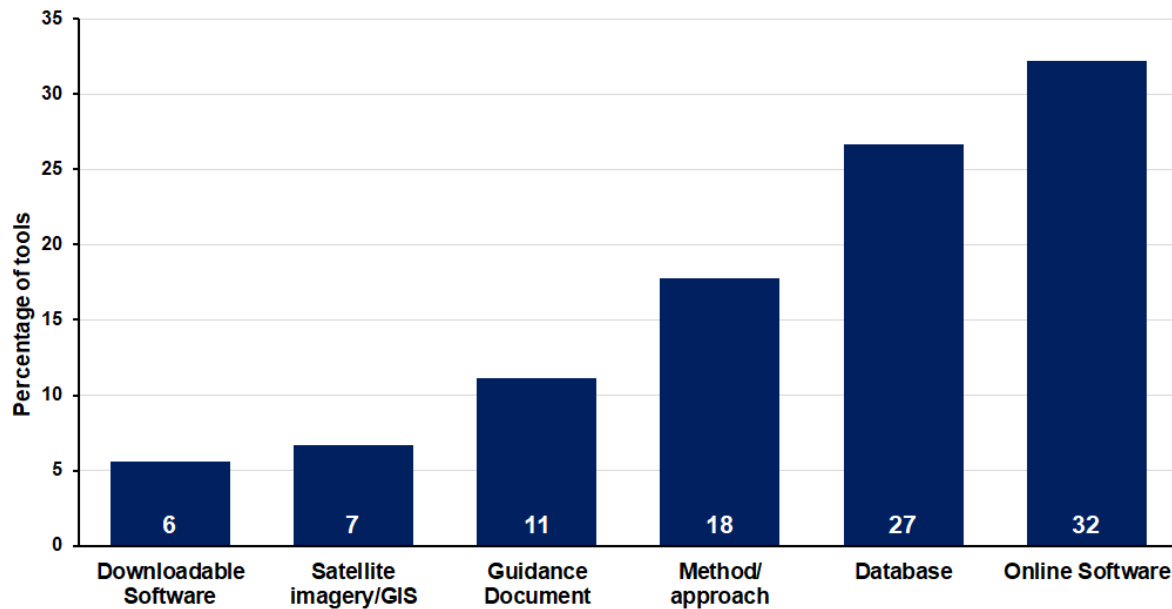


Figure 1. Classification of the 90 tools on TNFD and SBTN's websites into six categories.

Fifty-nine (66%) of the 90 tools offered free access to some aspect of the tool or a trial version with 46 (51%) charging for full use. Sixty-seven tools (74%) made their methods about the tool, underlying database, and usage publicly available. From website descriptions (training courses offered) we considered that 78 tools (87%) required some training in their use for a company to be able to generate results.

Industry application

Seventy-four (82%) of the tools have a spatial component, allowing a company to produce spatially explicit results depending on the geographic location of sites of interest. Eighty-four (94%) of the tools could be used to make analyses at a global scale as their underlying data covered the whole world, with the remaining five designed for specific countries (Brazil, Japan, United Kingdom (2 tools), and USA).

Many of the tools were self-classified as applicable across many industries (Figure 2), with 68 (76%) claiming they were applicable to all classes of industry. Results showed a high number of tools appropriate for renewable energy (96%), food and beverage (92%), extractive and minerals processing (88%), and infrastructure (87%). The financial (74%), services (69%), and technology and communications (68%) sectors had the fewest applicable tools for nature-related disclosures.

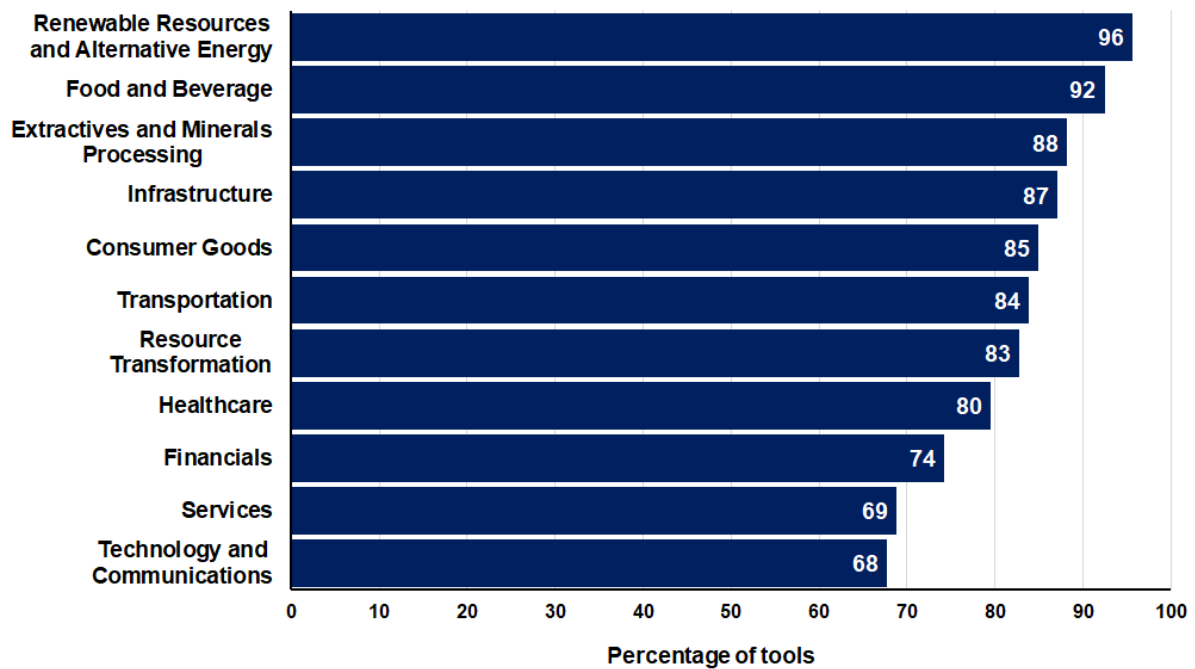


Figure 2. Percentage of tools classified according to a self-identified sector application.

Fifty-eight tools from the TNFD site had self-classified their alignment to the TNFD recommended disclosure pillars: Metrics & Targets, Strategy, Risk & Impact and Governance. Most tools addressed the first three of these with fewer being relevant for Governance (Table 1).

Given that many of the tools are methods, guidance or single GIS layers, while they may usefully inform or be incorporated in a company's analysis, they cannot produce analyses by themselves. We considered that databases, online software and downloadable software could potentially be used directly to provide information or produce analyses supporting disclosures and analysed this subset of the tools separately. Considering these 39 tools, each of the first three recommended disclosure pillars is addressed by 79% of these tools, with 50% addressing all three (Table 1a).

Table 1a. The number of tools in the TNFD catalogue out of the 58 tools listed by TNFD that self identified their applicability to the recommended TNFD disclosure pillars. Only 29 of the 58 tools self classified.

	All TNFD Tools (excluding consultancies)	Databases and Software
<i>TNFD Disclosure Pillar</i>	<i>29 tools</i>	<i>24 tools</i>
Metrics & Targets	24 (83%)	19 (79%)
Strategy	24 (83%)	19 (79%)

Risk & Impact management	24 (83%)	19 (79%)
Governance	6 (21%)	6 (25%)
Total relating to one or more pillars	29 (100%)	24 (100%)

Table 1b. The number of tools in the TNFD and SBTN catalogues that self classified their applicability for the recommended steps of the LEAP approach in the TNFD framework

	All TNFD and SBTN Tools (excluding consultancies)	Databases and Software
<i>TNFD LEAP Steps</i>	<i>89 Tools</i>	<i>57 Tools</i>
Locate	81 (91%)	52 (91%)
Evaluate	80 (90%)	50 (88%)
Assess	71 (80%)	45 (79%)
Prepare	70 (79%)	42 (74%)
Total relating to one or more steps	87 (98%)	56 (98%)

Of the combined TNFD and SBTN tools, 91% addressed the Locate step, with the number of applicable tools decreasing for subsequent steps (Table 1b). Only 67% claimed to address the entire LEAP process. Considering the subset of tools that were databases and software we found that between 91% to 74% claim to address each aspect of the LEAP process (Table 1b), and 67% the entire LEAP process. The LEAP approach aligns with the first three steps (Assess, Prioritize, Set targets) of the SBTN 5-step approach, and the evaluated tools did not cover the remaining steps in the SBTN approach (Act, Track).

How biodiversity is measured by the tool

Results showed that 70 of the tools (78%) claimed to address some aspect of biodiversity. This might be through using a land cover or ecosystem map to identify habitats or may additionally include species point or range data. However, many of these were GIS layers, methods, or guidance documents. Limiting the analysis to databases and software (downloadable or online) that can be

applied globally, because these tools will be more applicable and of interest for companies worldwide, we identified 36 tools (40%) that addressed some aspects of biodiversity. Of these 36 tools, 18 (50%) provided data on species and 31 on ecosystems (86%) while 26 (72%) included ecosystem services such as carbon sequestration and water quality. Of the 90 tools evaluated, 22% did not contain species or ecosystem data. These tools tend to measure some aspect of ecosystem services instead such as water availability (Aqueduct Water Risk Atlas) or climate change transition plans (Responsible Impact).

Of the 19 tools with species data, only 14 (38% of 37 biodiversity tools) of these had data for more than 1 taxonomic group of species, and only 13 (35%) tools used data on individual species as opposed to generic species richness/range-rarity layers. Of the 13, ten were online software tools and 3 were databases. Table 2 describes the ten online software tools that companies could use to assess impacts at a species level.

Seven of the 19 tools derived their species data from the same source, the Integrated Biodiversity Assessment Tool (IBAT) which contains species data from the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species and the Key Biodiversity Areas (KBA) databases, and one stated it could incorporate IBAT data if the company had access to it. IBAT was one of the tools on both SBTN and TNFD's websites. Three of the tools were databases that could help identify species from various monitoring protocols (sound, camera trap images and e-DNA) and three tools used Global Biodiversity Information Facility (GBIF) point location data to identify species found at sites (GBIF being one of these database tools). IUCN Red Listed species ranges are reviewed and validated by biodiversity experts and updated every 5 years ideally. The IUCN Red List is updated every 3-5 months. GBIF point data are provided by a whole range of data providers more frequently (at least monthly) and have a classification of an estimated level of accuracy, but the data are known to need cleaning before they can be used. The other three datasets identify species with certain characteristics (e.g. they make a sound that can be identified to the species) that are at a site but the databases do not yet cover the whole globe even though that is the intent.

Table 2. The 10 online tools that use individual species data for multiple taxonomic groups and which could be used to measure impacts at a species level

Tool name	Type of species data	Tool use	Company uses
Arbimon	Bio-acoustic monitoring – call and soundscape library	Identification of species from calls at a site by uploading calls	Conducting a risk assessment by assessing which species are at risk from developments at a site using ground truthed data.

			Conducting an opportunity assessment to see which species could benefit from conservation action. Baselining and monitoring sites to track the impact of actions on species richness and the presence/absence of species.
<u>Ecosystem Intelligence Platform</u>	Ecological requirements of species groups, applied to interpret user-provided data (landscape and design features) from a site	Estimating impacts of interventions at a site, by inferring how far landscape and design features can support life-cycle requirements for species groups	Assessing and monitoring the costs and benefits of land use change at the site level on climate, air quality, water, biodiversity, soil, and social factors. Users can assess trade offs of interventions using a systems-based model.
<u>EY NAT</u>	GBIF point data with IUCN Red List threat status	Identifying potential priority sites for biodiversity, and potential presence of species of concern	Identifying risks and impacts by identifying 'nature sensitive areas' using different nature-related maps.
<u>FLINTpro</u>	GBIF point data with IUCN Red List status	Identifying potential priority sites for biodiversity, and potential presence of species of concern	Scenario modelling to understand the present and future risk of different land management choices including the biodiversity implications of land and commodity supply chain choices.
<u>IBAT</u>	IUCN Red List of Threatened Species, World Database of Protected Areas, KBA trigger elements and derived species datasets (Species Threat Abatement and	Identifying priority sites for biodiversity, expected/potential presence of species of concern, and potential for interventions to	Conducting a risk assessment through the identification of priority areas for biodiversity. Identifying areas with the greatest potential for the

	Restoration metric, Range-weighted Rarity)	contribute to reduction in species extinction risk	reduction of species extinction risk.
<u>Natcap prioritise & measure</u>	IBAT data on threatened species and KBA trigger elements	Identifying priority sites for biodiversity and expected/potential presence of species of concern	Evaluating and assessing nature-related impacts, dependencies risks and opportunities and analysing supply chain biodiversity risks.
<u>NatureAlpha (Nature Accounting platform)</u>	IBAT data on threatened species and KBA trigger elements	Identifying priority sites for biodiversity and expected/potential presence of species of concern	Identifying material ESG topics for portfolio companies. Quantifying nature-related risk at asset, company and portfolio levels.
<u>NatureMetrics</u>	e-DNA libraries for species	e-DNA provided by user is identified to species or higher taxonomic level	Conducting a risk assessment by assessing which species are at risk from developments at a site using ground truthed data. Conducting an opportunity assessment to see which species could benefit from conservation action. Baselining and monitoring sites to track the impact of actions on species richness and the presence/absence of priority species.
<u>Stream Ocean Dashboard</u>	Marine species data	Identify species from imagery from underwater cameras	Marine biodiversity monitoring.
<u>Xylo Systems</u>	IBAT data on threatened species and KBA trigger elements	Identifying priority sites for biodiversity and expected/potential presence of species of concern	Baselining and identifying risks and opportunities. Identifying areas with the greatest potential for the reduction of species extinction risk.

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278 Of the 32 tools with ecosystem data, 22 (59% of the 37 biodiversity tools) contained data for
279 terrestrial, freshwater, and marine ecosystems, three (8%) focused only on terrestrial ecosystems, one
280 (3%) focused on marine, and four (11%) were focused on terrestrial & freshwater or terrestrial &
281 marine. Ecosystem data were primarily provided as maps of land cover, ecoregions, forest cover or
282 integrity, therefore not providing information on specific ecosystem types (e.g. as in the IUCN
283 ecosystem typology, Keith et al. 2020).

284 **Discussion**

285 *A focus on biodiversity.*

286 The 23 targets of the KMGBF aim to contribute to four overall goals as well as a 2050 vision and 2020
287 mission. The mission aims to ‘halt and reverse biodiversity loss’ while Goal A aims to ‘maintain the
288 integrity, connectivity and resilience of ecosystems...’ and ‘halt human-induced extinctions of species
289 by 2030 and reduce extinction rates tenfold by 2050’. Goal B aims to ‘sustainably use and manage
290 biodiversity’. Mair et al. (2024) argued that Goals A and B should be the ultimate motivations for
291 action implemented in response to the KMGBF targets and that Target 15 should contribute directly
292 and in a quantified manner to these outcome goals. For Target 15 to contribute effectively to the
293 KMGBF mission and these two goals measurement of risks, dependencies and impacts needs to be at
294 a species and ecosystem level. Without this level of resolution we cannot know if the actions of
295 companies are substantively contributing to the targets and goals, particularly to halting extinctions
296 and reversing biodiversity loss. For example, if results of impacts are only reported at an ecosystem
297 or landcover level, we cannot track whether threatened species are being impacted or not.
298 Ecosystems are not homogenous and species can be distributed within them in very patchy ways. It is
299 therefore important to monitor impacts at a species level as well as an ecosystem scale (Stephenson
300 & Carbone, 2021). Of the numerous tools on the lists provided by SBTN and TNFD, our analysis shows
301 that only a few can support companies’ disclosures and decisions at this level of resolution.

302 Katic et al. (2023) pointed out that biodiversity indicators in the tools they reviewed were mostly
303 focused on ecosystem functioning and landscape metrics rather than impacts on species and the
304 structure and composition of particular ecosystems. Barth et al. (2025) also reported that tools were
305 unclear about how they measured biodiversity. Examining a much wider range of tools than these two
306 studies, we found that many of the tools advertised by TNFD and SBTN do not measure biodiversity
307 at the species level. Only 19 tools aimed to measure impacts to species and of these only 13 had data
308 on individual species as opposed to generic species richness, biodiversity intactness and species range-

rarity layers. Thirty-two tools claimed to assess ecosystems but in several cases these were landcover maps rather than ecosystem maps. Such generic layers can provide basic information about potential impacts but do not help a company identify which ecosystems or species need to be prioritised for monitoring or mitigation actions. Of the 13 tools that used species data, seven used data from the IUCN Red List of Threatened Species through IBAT (including IBAT itself). Three tools used Global Biodiversity Information Facility (GBIF) point location data to identify species found at sites. It is clear that the two main sources of species data being used in these tools come from IBAT and GBIF. This is because there are few sources of global species data available that are also considered authoritative. While other platforms exist, the lack of regular review, updating and validation of their data makes it difficult to be certain that they are accurate and show the latest distribution of species. Even the IUCN Red List of Threatened Species (used by IBAT) and GBIF have flaws in their species data despite expert review and this is why there is a need for regular updates and validation as data continue to be collected on species.

Recommendations

Third party classification of tools

Many of the tools were self-classified as being applicable across multiple sectors and addressing multiple stages of the TNFD's LEAP approach. However, given that many tools were method documents, GIS layers and similar, they would need to be built into other tools to be useful to a company. While they may contribute to the LEAP approach it is unlikely many of them can help a company meet all the recommendations for LEAP.

More generally, self-classification of tools on both sites did not appear to be consistent and often claimed that tools could contribute more to the disclosure process than they can in reality. For many tools it was also difficult to assess how they contributed to a company's ability to make disclosures and additional information was needed to clarify the tool's purpose and use. In part this was due to minimal information being provided about a tool on its website, particularly on how they make their calculations. There is a strong element of competition between the various tools which are all targeting private sector clients and their websites are somewhat opaque about what they actually do. It is possible that for those tools that require subscription that more detail about the data used in the tool is made available to the user but companies would ideally know this before they select to use a tool. An independent classification of the tools, including indication of whether they can be used alone or only support the application of other tools, would enable more reliable assessments for private sector disclosures and increase confidence in their ability to measure risks, dependencies and impacts

on biodiversity. In order to achieve this more detail would need to be known about the underlying data being used by the tool.

Transparency about the underlying datasets in the tools

It was difficult to identify the actual data underlying many tools, and in some cases we could not determine this despite making requests to the tool owner. More clarity is needed on what aspect of nature (e.g., biotic or abiotic) a tool is addressing and using when making its analytics. Tools' scientific robustness should be assessed to avoid inaccurate assessments and disclosures, with datasets and methodologies made available to improve transparency and comparability of disclosures. It isn't helpful to companies to have so many tools listed, with a need to check each of their websites to try to evaluate which might work best for them. TNFD and SBTN should really take some responsibility in checking the quality of the tools they advertise. At present anyone can upload a tool on TNFDs website and there is no consistent classification of their tools, while SBTN used an internal selection process when they published their list of tools and do provide some basic classification of what the tools may be useful for. We would recommend that both TNFD and SBTN develop a common method of review that is applied to all tools as they are added to their Online Catalogues, possibly made by a third party. Ideally there would be a description of where and how the tool could be applied in the disclosure process. This review should include listing the key datasets used by the tool so that these are clear to a company when they are considering what tools to use.

Biodiversity data

A mix of ecosystem and species data were provided across the tools. The 13 tools that used species data mostly drew these from the IUCN Red List of Threatened Species or GBIF. Those that use IUCN Red List data apply the polygon ranges of species and intersect these with sites to identify potential species of conservation concern present at a site. Those that use GBIF data do the same type of analysis but use point locations of species that have been recorded with GPS coordinates. There are constraints and benefits from either approach: IUCN ranges extrapolate to where the species likely occurs but may not have been recorded, while GBIF data only records where data on a species have been collected by someone visiting a site. Conversely, a species range may predict a species to be present where it is not. Ecosystem data came mainly from global land cover or forest cover maps and these provide a very high level of mapping, and have recently been shown not to be very useful for measuring impacts (Sonter et al. 2025). Global ecosystem maps at lower levels (levels 4 or 5) in the ecosystem typology (Keith et al. 2020) as well as species data need to be better integrated in tools but in many countries these do not exist yet. For ecosystems, it would be valuable to draw on the work of

the Red List of Ecosystems (Keith et al. 2013), making information on the assessed ecosystems more easily available for the private sector.

Long term financing of biodiversity data to support disclosures

Most tools (66%) offered some sort of free access. This could be appealing to the private sector, but free access to nature data raises significant issues. Generating and maintaining high quality, up-to-date, scientific and authoritative data on nature is costly and needs to be sustainably financed (McKenzie et al. 2025). Freely available datasets are often not updated because there are no resources to do so. Juffe-Bignoli et al. (2016) discussed the need for financing support to keep tools both affordable and scientifically robust, important attributes for any useful disclosure tool. The KMGBF envisaged that the private sector would play a key role in reversing biodiversity loss and contributing towards the implementation of the framework. Part of the private sector's role should also be to support the costs of maintaining and improving the underlying biodiversity data in these tools.

Implementing actions to avoid and minimise impacts

Disclosures of company risks, dependencies and impacts on biodiversity, the focus of Target 15 of the KMGBF, should only be a first step. Several recently published papers highlight the risk of only measuring and disclosing impact without implementing actions to avoid and minimise current impacts and compensate for residual impacts (Irvine-Broque & Dempsey, 2023; Mair et al. 2024; Zhu et al. 2024). The last step in the TNFD LEAP approach, 'Prepare', entails a company planning how to respond to their nature-related risks and opportunities. TNFD recommends that disclosure involves setting clear targets and reporting on progress to achieving these to minimise impacts, risks and dependencies on biodiversity. It is only if this happens that the private sector will contribute to achieving Target 15 and the mission and goals of the KMGBF.

The 96 tools listed in the TNFD website in February 2024 had expanded to 212 tools by February 2025, indicating the rapid and dynamic nature of tool development. SBTN updated their list in July 2024 but label their list of tools as dated in 2023 on their website. With this clear appetite for innovation in the nature tool space, we encourage not further proliferation but rather consolidation to produce robust tools, based on sound data, that can help organisations reliably measure, disclose and positively change their impact on both species and ecosystems.

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490 **Supplementary Materials**

491 Table S1. An Excel file with the tools we examined and our classifications is provided as
492 supplementary material.