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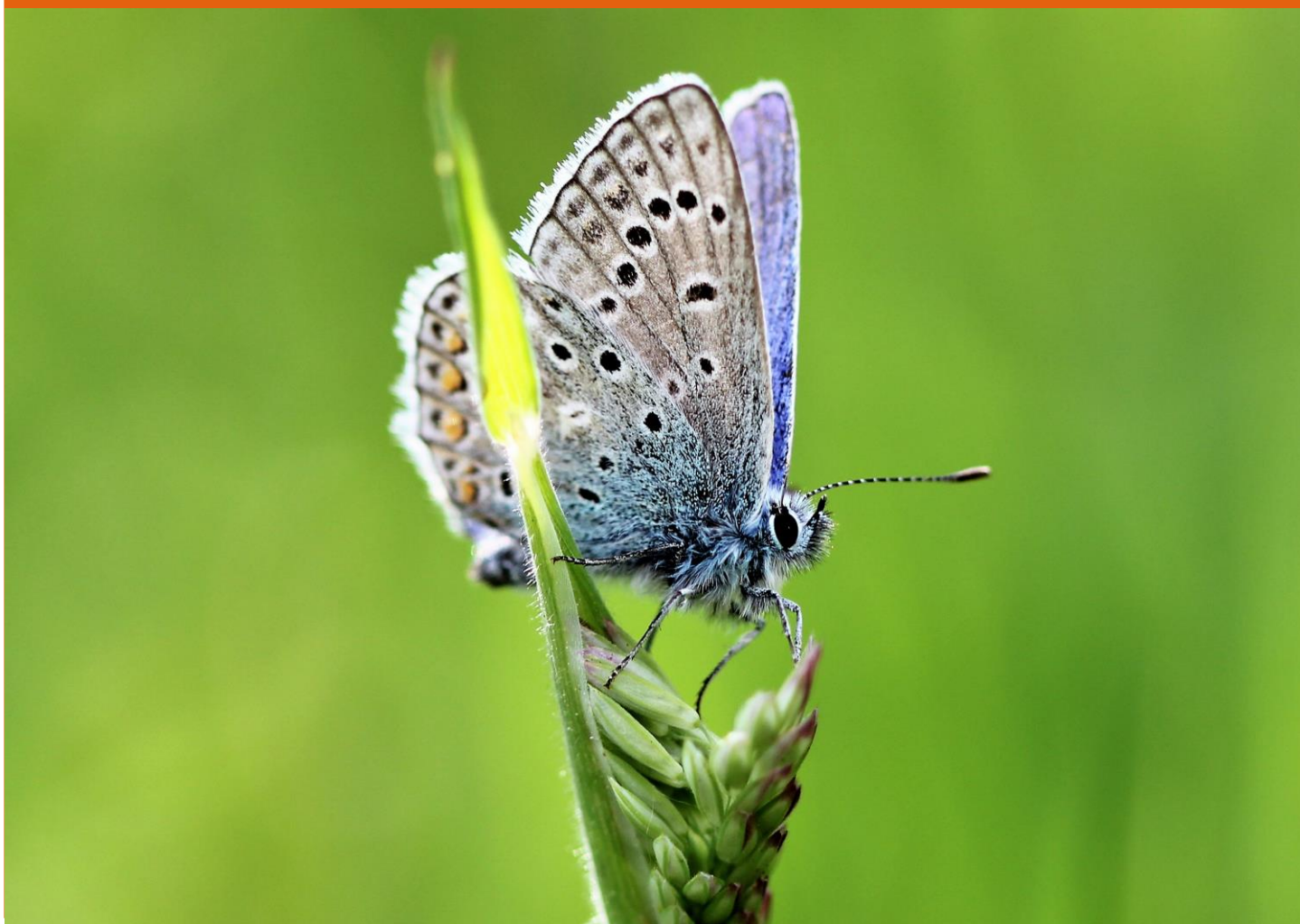


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ASSESSMENT OF BIODIVERSITY MEASUREMENT APPROACHES FOR BUSINESSES AND FINANCIAL INSTITUTIONS

EU Business @ Biodiversity Platform

UPDATE REPORT 2
6 DECEMBER 2019



ASSESSMENT OF BIODIVERSITY MEASUREMENT APPROACHES FOR BUSINESSES AND FINANCIAL INSTITUTIONS



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READER'S GUIDE

This Update 2 report is a follow up to the 2018 Update 1 report “Assessment of biodiversity accounting approaches for businesses and financial institutions”.

These annual updates reflect evolutions in the development of biodiversity assessment approaches for businesses and financial institutions and therefore the content might change from year to year.

For this year, the content is largely inspired by the joint work of the EU B@B Platform and the UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) under the Aligning Biodiversity Measures for Business (ABMB) Initiative, which aims to achieve common ground between biodiversity tools for business. This is further explained under Sections 1 and 2.

Another important change is the title. To avoid any misunderstandings in interpretation we replaced ‘accounting approaches’ by ‘measurement approaches’ as accounting refers to the process of compiling consistent, comparable and regularly produced data using an accounting approach for natural capital, while measurement has a purely technical dimension. The focus of these assessment reports currently is on the technical issues of biodiversity measurement approaches by businesses.

Annex 2 has been updated based on a review by tool developers in summer 2019. While two approaches were not updated, four additional approaches and frameworks were included in the assessment. Furthermore, the assessment template for the technical description of the biodiversity measurement approaches has been refined to better reflect the key topics for convergence as identified under the Aligning Biodiversity Measures for Business initiative.

The comparative tables under Annex 3 in the Update 2018 Report have been replaced by more detailed thematic tables comparing the different approaches, which are now included under the thematic chapters 3 to 6.

Finally, this update report also includes additional explanatory sections on Globio and ReCiPe as these appear to be common underpinning datasets and tools for several biodiversity assessment approaches.

This second update report has the following structure:

Main report

- Executive summary of key findings 2019
- Section 1: Context and objectives
- Section 2: Methodological approach
- Section 3: Business applications, biodiversity targets for business and proposed decision tree for selecting the biodiversity tools and metrics which are fit for your business applications
- Section 4: Boundaries and baselines
- Section 5: Metrics and data
- Section 6: Disclosure

Annexes (separate document)

- Annex 1: Description of GLOBIO and ReCiPe
- Annex 2: Technical details of the assessed ‘biodiversity metrics for business’ approaches;
- Annex 3: Matrix with detailed mapping of biodiversity measurement approaches against business applications and organisational focus areas

EXECUTIVE SUMMARY

Measurement of biodiversity performance by businesses and financial institutions is rapidly gaining attention. We are facing a global biodiversity crisis which requires urgent action from all players in society, including the private sector. Awareness is growing rapidly and many initiatives promoting the role of businesses and investors in halting the loss of biodiversity and even in restoration are developing, which is extremely hopeful. In parallel, there is a growing demand for more transparency in business performance with regard to biodiversity. This, in turn, drives standardisation of reporting and disclosure. In the light of these developments, it is essential that companies have access to credible biodiversity measurement methods and metrics.

Given the sudden explosion of many different biodiversity measurement approaches and metrics, the EU Business & Biodiversity Platform in 2018 started with a systematic independent assessment of these approaches. It immediately became clear that there was a huge interest from many sides. For the first time a comparative analysis was made, resulting in a much better overview of similarities and differences. One of the key findings was that different types of business applications and different organisational focus areas require different biodiversity measurement approaches. This year, the sample of investigated methods and frameworks was increased from 10 to 14 and forces were joined with the Aligning Biodiversity Measures for Business (ABMB) initiative, led by UNEP WCMC and funded by the Boticário Group Foundation. By means of several technical workshops and technical subgroup discussions, a major step forward has been made.

The main conclusions of the 2019 assessment of biodiversity measurement approaches are structured according to the following 4 themes:

- Selecting a suitable biodiversity measurement approach
- Boundaries and baselines
- Data and metrics
- Disclosure.

Selecting a suitable biodiversity measurement approach

Significant progress has been made in the mapping of measurement approaches in terms of the business applications/uses (including specific biodiversity targets) and organizational focus areas they support. A **typology of business applications and targets** relevant for selecting an appropriate biodiversity measurement approach has been agreed against which measurement approaches can be mapped.

An initial mapping of the assessed biodiversity measurement approaches and frameworks against 8 business applications and 6 organisational focus areas showed the following:

- Measurement approaches exist that can serve all the identified business applications at all areas of organizational focus (project/ site, corporate, country etc);
- Although approaches are primarily designed with a certain business application in mind, it may be possible to adapt them for different applications;
- Significant progress has been made in testing and refining the measurement approaches with manage having now completed pilots or in the process of piloting and refinement.

The mapping overview, although to be further refined, provides a first rough guidance for companies looking for a suitable biodiversity measurement approach. However, more criteria are important to facilitate this decision process. A simple **decision tree** for businesses will be built linked to this mapping to aid companies in identifying appropriate measurement approaches. This will be integrated into the broader decision tree to guide businesses through the integration of biodiversity into natural capital assessments which will be produced by the Natural Capital Coalition and Cambridge Conservation Initiative (CCI) as part of supplementary guidance on biodiversity to the Natural Capital Protocol. Key questions that could be posed in such a decision tree include:

- What is the business decision that you are trying to inform i.e. what is the business application?
- What is the organisational focus area (from product level to sector level)?
- What are the objectives of your assessment?
- What data is available for your assessment?

Assessment of concrete case studies from now on will be very useful to further refine guidance on biodiversity measurement approaches for business.

Boundaries and baselines

Definitions and the terminology used to describe transparent value chain boundaries, site level impact boundaries and baselines vary between different measurement approaches and in some cases are not clear. Considerations relating to these include:

- **Value chain boundaries:** Some corporate or portfolio level measurement approaches are using guidance from the Natural Capital Protocol (which considers upstream – raw materials, direct operations and downstream (products) impacts and dependence and the Greenhouse Gas Protocol ‘scopes’ concept to set value chain boundaries. This has the advantage of resonating with companies already using these Protocols.
- **Site level impact boundaries:** Site-based methodologies will give different results depending on how the boundaries around the assessment are drawn. Currently there is no agreement on how to define these boundaries across different sites. Clarity and common ground are required across site based methodologies on definitions of area of influence or impact, how to address indirect or cumulative impacts and how to separate company related threats to biodiversity from background threats. On the other hand, standardization and common ground has its limits and there should always be enough room for flexibility based on local context. Environmental impact assessment approaches might provide a necessary complementary approach.
- **Baseline/ reference:** Measurement approaches use a **baseline** against which progress is tracked and may also use a **reference state** e.g. the “undisturbed system/pristine state” against which a metric such as the mean species abundance metric (MSA) is defined¹². Few of the different measurement approaches clearly set out reference state or baseline considerations.

Data and metrics

A **database mapping the external data sets used by approaches** followed by the ABMB initiative has been refined based on work by UNEP-WCMC and others. It distinguishes between the use of data in the approaches: externally collected **input data for assessment** and **inputs used to build characterisation factors**. The database is still a work in progress and can be accessed [here](#).

A first proposal of **data accuracy scale** distinguishes between five level of accuracy of characterisation factors, helping to assess the accuracy of assessments. The accuracy of the measurement of input data also needs to be considered.

Progress has been made on the **identification of potential common input indicators and data formats**. Such convergence among tool developers in the format and content of data inputs would facilitate data collection by businesses. An example of such common indicator which is identified as very promising for convergence is ‘yearly land occupation’. Two broad types of approaches are used to assess impacts on biodiversity:

- **Directly (and only) based on measures of biodiversity state;**
- **Using characterisation factors (i.e. models) linking pressures and economic activities to biodiversity state** and thus impacts on biodiversity.
- There are also **hybrids** using both approaches.

Five main aggregate "metrics" are currently used to quantitatively aggregate impacts or dependencies: **mean species abundance (MSA)**, **potentially disappeared fraction (PDF)**, **risk of extinction**, **aggregate index** such as the biodiversity impact index (used by LIFE Key) and **monetary value** (e.g. euros). A sixth option, used by some measurement approaches, relies on **qualitative aggregations of assessments**.

Metrics differ by their aggregation (or lack of aggregation) approach, state of biodiversity covered (terrestrial, aquatic or marine), to assess biodiversity state based on ecological surveys, availability of characterisation

¹ Alkemade R, van Oorschot M, Miles L, Nellemann C, Bakkenes M and ten Brink B. (2009). GLOBIO3: A Framework to Investigate Options for Reducing Global Terrestrial Biodiversity Loss. *Ecosystems* 12: pp. 374-390.

² Schipper, A. M., Meijer, J. R., Alkemade, R., & Huijbregts, M. A. J. (2016). The GLOBIO model: a technical description of version 3.5. The Hague: Netherlands Environmental Agency (PBL). Retrieved from http://www.pbl.nl/sites/default/files/cms/publicaties/pbl_publication_2369.pdf

factors and associated capacity to assess the biodiversity impact of pressures (three sources of characterisation factors are common to most tools: GLOBIO, ReCiPe and the IUCN Red List). **These characteristics of the metrics are associated to a number of limitations**, which are common to all the tools using the same metric. A significant difference between approaches lies in **how they deal with long-lasting impacts** such as the impact of GHG emissions on climate change. Tools using the PDF unit [BFFI, PBF] deal with this question by integrating impacts over time. Other tools like the GBS do not integrate over time but nonetheless take into account the persistence of impacts through the distinction of a dynamic and a static footprint.

Metrics focused on elementary components of biodiversity (taxa and habitats) and aggregated, pressure (or economic activity)-based metrics can be linked through three ways:

- Aggregation of (comprehensive enough) data on the abundance and richness of species into aggregated metrics;
- Collection of site-level direct measurements by aggregated metric approaches;
- Collection of land use, etc. data by approaches focusing on taxa and habitats.

Disclosure

Current corporate biodiversity disclosures do not provide a picture of corporate risk exposure and performance³. Momentum is increasing for greater business transparency on biodiversity performance driven by, for example, calls to develop a 'task force for nature impacts disclosure', the integration of biodiversity and ecosystem services into the EU Sustainable Finance Action Plan, the call for a revision of the EU Non Financial Reporting Directive making it much more demanding in terms of disclosure requirements and a requirement for mandatory biodiversity disclosures in some European countries. Not all measurement approaches are designed for disclosure.

At the same time there is a strong tendency for more harmonisation and standardisation of reporting allowing investors and other stakeholders to compare biodiversity performance of companies. There is rapidly increasing interest in the development of a more standardised environmental accounting system (E-GAAP), not at least within the European Commission. Placing disclosure focused biodiversity measurement approaches in the context of an accounting framework such as the Biological Diversity Protocol could assist in demonstrating a comprehensive picture of performance consistent with financial accounting. This in turn could assist companies in monitoring and communicating their contributions to the Sustainable Development Goals and the future Post-2020 Global Biodiversity Framework under the Convention on Biological Diversity.

³ Addison, P.F.E., Bull, J.W. and Milner-Gulland, E.J. (2018a). 'Using conservation science to advance corporate biodiversity accountability'. Conservation Biology. <https://doi.org/10.1111/cobi.13190>.

Recommendations for developers and users of measurement approaches

Table 1 A series of recommendations for developers and users of measurement approaches

Issue	For developers	For users
Business applications	<ul style="list-style-type: none"> Review and critique the mapping of approaches and decision tree and work with companies to pilot approaches. Communicate the results of piloting and integrate into approaches. 	<ul style="list-style-type: none"> Engage in piloting of the measurement approaches. Communicate case studies and lessons learned Test the decision tree as part of proposed piloting of the Natural Capital Protocol supplementary guidance on biodiversity
Boundaries & baselines	<ul style="list-style-type: none"> Be transparent on boundaries (value chain and site), baselines and references to enable clarity on how well the approaches meet the needs of the business application under investigation. 	<ul style="list-style-type: none"> Be aware that the boundary and baselines defined by the different measurement approaches may vary and understand the implications of this for decision making.
Data & metrics	<ul style="list-style-type: none"> Contribute to the refinement of the data accuracy scale outlined above. Identify and disclose key data inputs into the assessment and ensure that data gaps, uncertainties and limitations are clearly communicated. Support the development of common input indicators across measurement approaches Be transparent about the strengths and weaknesses of the metric 	<ul style="list-style-type: none"> Identify your material biodiversity issues (risks and opportunities): and decide how to measure them Collect the data inputs necessary to produce accurate and relevant assessments. Be aware of the pressures and types of biodiversity covered each measurement approach and the implications for decision making. Understand the metrics being employed by different measurement approaches, the questions they are designed to address and how this reflects the objectives of your own assessment.
Disclosure	<ul style="list-style-type: none"> Consider setting out a roadmap for public disclosure that starts with a more restricted level of disclosure and aspires to complete, rigorous and accurate disclosure over time. 	<ul style="list-style-type: none"> Users of measurement approaches wishing to use them for public disclosure should ensure that the approach has been designed with public disclosure in mind (transparent in assumptions, methods, data & limitations)

The way forward

Going forward, the focus of this work will be on the assessment of case studies, i.e. concrete applications of the biodiversity measurement approaches by companies to:

- Give increased insights in the strengths and weaknesses of the different approaches and to refine the decision tree on how to select a suitable measurement approach;
- Determine the differing treatment of concepts such as boundaries, baselines and reference states and their benefits and limitations of different approaches and their implications for decision making and consider how indirect and cumulative impacts and shared responsibilities for pressures are addressed;
- Engage in the refinement of data mapping, a data accuracy scale and identification of common input indicators; and
- Continue to explore how emerging measurement approaches and disclosure frameworks can enhance the quality and uptake of corporate biodiversity disclosure and reporting against national/global policy target.

As such, the EU B@B Platform aims to provide the business community with a continuously improved practical guidance to support decision making in terms of biodiversity measurement.

1 CONTEXT AND OBJECTIVES

Fuelled by a growing demand from investors, environmental groups and other key stakeholders for greater transparency and disclosure on both current and future impacts of business activities, natural capital assessment and accounting are rapidly gaining interest.

The traditional unidimensional perspective of financial performance (GDP for nations, financial reports for companies) is being replaced by a more multidimensional perspective covering also natural and social capital performances. There is a growing interest in non-financial reporting amongst public authorities, financial institutions (FIs) and the business community.

As a consequence, businesses are looking for credible and comparable accounting and reporting approaches. This tendency is reflected by the growing number of initiatives aimed at identifying common ground between assessment and accounting approaches or even standardization, both between the 'capitals' (e.g. integrated reporting) and between thematic approaches (e.g. in the field of biodiversity metrics).

Credible assessment approaches require natural capital metrics and robust methodologies. For some environmental issues, such as greenhouse gas (GHG) emissions and water consumption, these metrics are relatively straightforward and already familiar to businesses. However, the situation is different for biodiversity as a key component of comprehensive natural capital assessments.

Sustainable Development Goals (SDGs) 14 ('life under water') and 15 ('life on land') are the least well reported of the SDGs by companies, in part because of a perceived lack of materiality, but also because of a lack of indicators to enable that reporting⁴. The latest 'Reporting Matters' report by the World Business Council on Sustainable Development (WBCSD)⁵ confirms this alarming position for SDG 14 (only referenced by 32% of companies) but indicates that 51% of investigated companies refer to SDG 15.

Businesses are struggling to identify approaches to measure their biodiversity performance that are on the one hand practical and pragmatic and on the other hand meaningful and relevant. This also applies to financial institutions who are looking for suitable ways to assess biodiversity performance (in terms of impacts and risks) of their portfolio of investments.

Multiple methodologies on how businesses and FIs can measure and value their impacts and dependencies on ecosystem services (ES) and biodiversity are developing. Which of these will emerge as generally accepted and applied methodologies is yet to be seen.

Why is it so difficult to develop a generally accepted approach to measure and value the biodiversity performance of a company or investment?

Multiple reasons exist, for example: the extent to which business models and supply chains of commodities are directly or rather indirectly linked to and depending on nature differs from sector to sector; the complexity of biodiversity itself (i.e. multitude of species and habitats, each with their specific sensitivity to different pressures); and the often complicated cause/impact relationships between a company's activities and biodiversity receptors are some of these reasons.

In the light of the growing interest in natural capital accounting (NCA) and a clear demand for methodologies for including ecosystems and biodiversity into NCA, a wide range of initiatives have been launched to develop pragmatic biodiversity metrics for businesses and FIs. Faced with these multiple approaches and based on requests from its members, the EU Business @ Biodiversity Platform (EU B@B Platform)⁶ started a critical and constructive assessment of a sample of biodiversity measurement approaches developed for or by businesses and FIs in 2018.

Originally the main objectives were to provide an overview of different methodological approaches, compare their key features and identify the key obstacles faced by these approaches. Now, the focus is moving towards identifying common ground amongst these approaches in order to converge them rather than further diverge

⁴ <https://home.kpmg/uk/en/home/insights/2018/04/analysis-sdg-reporting-in-top-250-global-companies.html> and <https://www.unglobalcompact.org/library/5361>

⁵ Reporting Matters 2019, WBCSD, released on 14 Oct 2019 (<https://www.wbcsd.org/Programs/Redefining-Value/External-Disclosure/Reporting-matters/Resources/Reporting-matters-2019>)

⁶ in particular Workstream 1 on Natural Capital Accounting and Workstream 3 on Financial Institutions and Biodiversity

This might ultimately result in a decision tree allowing users to select the most suitable biodiversity tools and metrics for their specific needs and management decisions they wish to inform.

That is why we have joined forces with the Aligning Biodiversity Measures for Business⁷ initiative (ABMB). This initiative is led by UNEP-WCMC with support from the Boticário Group Foundation. ABMB is a collaboration of over twenty organisations with expertise in corporate biodiversity measurement approaches. It aims to form a common view amongst key stakeholders on the measurement, monitoring and disclosure of corporate biodiversity impact and dependencies and to build on this to help integrate more credible and comprehensive indicators of corporate contribution to global biodiversity goals into corporate reporting and global policy frameworks. The EU B@B Platform co-hosted an initial technical workshop in Brussels in March 2019 with ABMB and delivered support in the preparation of a second workshop in October 2019 in Rio de Janeiro, Brazil. The findings of this assessment report is important to inform the future activities of the EU B@B Platform and potential partners (including developers and users of these metrics). This work is also a contribution to the preparation of a Biodiversity Supplement to the Natural Capital Protocol.

This assessment exercise is updated annually. It is the second of a series of reports prepared on behalf of the EU B@B Platform. Updates might consist of the inclusion of additional approaches in the assessment, adaptations of the assessment methodology to reflect new developments, descriptions of case studies, etc. We invite further constructive contributions by other members of the EU B@B Platform and beyond with a view to progress the development of biodiversity measurement approaches for business.

Important: This paper is only an intermediary step and is neither meant to be definitive nor exhaustive. Through it we hope to facilitate a broader application of the assessed methodologies and a discussion based on enhanced transparency with a view to facilitate the further development and enhancement of these measurement approaches.

⁷ https://www.unep-wcmc.org/system/comfy/cms/files/files/000/001/556/original/20190614_AligningMeasuresFlyer_Communications_FINAL_210619.pdf

2 METHODOLOGICAL APPROACH

2.1 Scope

The focus of this assessment is on biodiversity measurement approaches and frameworks for businesses and FIs which rely on quantitative indicators that provide information on the significance of impacts on biodiversity, and which are not case-specific. The latter is important, as businesses and FIs need approaches that can be applied by several companies and preferably for different types of business applications, different levels of application (e.g. project, site) and in different locations.

For this reason and without any prejudice to their value and usefulness, certain types of biodiversity assessment approaches are not included in this assessment, such as:

- Purely process based approaches which rely on 'yes/no' questions and only provide qualitative insights on the level of actions undertaken by a company in the field of biodiversity. They rely on 'process indicators' (e.g. 'Do you have a biodiversity action plan?') rather than 'impact indicators'. Examples of such approaches include the European Biodiversity Standard⁸, the Biodiversity Benchmark⁹, and the Biodiversity Check¹⁰. A number of the approaches in this assessment report also include process indicators but only to complement the information collected on the basis of quantitative indicators.
- Approaches applied in Environmental Impact Assessment and similar types of specialized studies, which focus on a specific development in a specific area.
- Approaches which are company specific and which rely on a methodology which is not open source¹¹.
- Approaches which only focus on ecosystem services identification and valuation (e.g. InVest, Aries). A number of the approaches in this assessment report also include ecosystem services but only as an add on to the impacts measurement.
- Biodiversity metrics approaches which can be used for calculating biodiversity offsets. Examples are the BBOP biodiversity metrics¹², the UK DEFRA biodiversity metrics¹³, the Dutch 'Natuurpunten' method¹⁴, etc. These latter approaches could also fit under the given scope but were not included to date.

There is one exception to the above set of rules. We have also included in the assessment a biodiversity accounting approach, i.e. the Biological Diversity (BD) Protocol (BD Protocol). The BD Protocol is a good example of how biodiversity data collected by means of whatever biodiversity measurement approach can be presented according to accounting principles. As such, the BD Protocol makes the link to disclosure.

2.2 Assessment approach

The assessment approach applied in this Update Report is to a large extent informed by the approach applied by the ABMB initiative and builds further on the outcomes of the Technical Workshop in Brussels

⁸ <http://www.europeanbiodiversitystandard.eu/en>

⁹ <https://www.wildlifetrusts.org/sites/default/files/2018-06/BBOM4%20Biodiversity%20Benchmark%20Requirements.pdf>

¹⁰ https://www.business-biodiversity.eu/docs/ebbc_index01.aspx?id=36799&basehrefrequ=true&isalias=true

¹¹ The Environmental Profit & Loss approach as developed and applied by Kering is an open source approach

¹² <http://bbop.forest-trends.org/pages/guidelines>

¹³ <https://www.gov.uk/government/publications/technical-paper-the-metric-for-the-biodiversity-offsetting-pilot-in-england>

¹⁴ <https://www.pbl.nl/publicaties/2009/natuureffecten-in-de-mkba-s-van-projecten-voor-integrale-gebiedsontwikkeling>

in March 2019. The workshop was the first of three that are planned by the Initiative to bring developers and users of biodiversity measurement approaches together to create a unified foundation for the development and use of corporate biodiversity performance measures.

The key outcome of the March 2019 workshop was the establishment of five broad topics for further investigation:

- 1. Business applications and targets
- 2. Scope, boundaries and baselines
- 3a) Corporate data inputs
- 3b) Metrics and midpoint characterisation factors
- 4. Mainstreaming (disclosure)

The work by these subgroups has influenced this 2019 assessment. Additional requests for information were included in the assessment template that was circulated to the tool developers (see section 2.3) and the subsequent subgroup discussions were to a large extent informed by the assessment findings. This assessment report presents the preliminary findings which informed a second Technical Workshop in Rio de Janeiro, Brazil (29 – 31 Oct 2019) (see chapters 3, **Error! Reference source not found.**, 5 and 6).

The development of common ground principles for biodiversity measurement approaches were explored in the subgroups and Brazil meeting. However, it was felt that the Natural Capital Protocol principles of relevance, rigor, replicability and consistency (which underpinned the 2018 report) should be the starting point for measurement approaches. These principles were reviewed against areas of common ground for biodiversity footprinting identified by CDC Biodiversity et al (2018)¹⁵ to create a checklist that could be used by developers and users of measurement approaches to ensure they are fit for purpose (see Table 2).

Table 2: A checklist of considerations for biodiversity measurement for business that implement the Natural Capital Protocol principles.

Natural Capital Protocol Principles	Considerations for biodiversity measurement
Relevance: consider most relevant, material issues.	<p>Approaches, data and metrics should be:</p> <ul style="list-style-type: none"> • appropriate for the type of application they aim to support; • relevant to the businesses' scope and boundaries; • designed to address all issues, impacts and performance relevant to the business application.
Rigor: use technically robust, data, methods and information	<p>Approaches should:</p> <ul style="list-style-type: none"> • achieve suitable accuracy to enable users to make decisions with reasonable assurance on the quality of information; • be based on best available data selected against established criteria; • be based on technically robust metrics for which key gaps and uncertainties and their implications for decision making are clear.
Replicability: assumptions, data, methods, caveats are transparent, documented and repeatable	<p>Approaches and methodologies should:</p> <ul style="list-style-type: none"> • be transparent on limitations and how the approach works; • be transparent on boundaries and references/baselines; • disclose any relevant assumptions, limitations, uncertainties and references to data collection methodologies.

¹⁵ Berger, J.; Goedkoop, M.J.; Broer, W; Nozeman, R; Grosscurt, C.D.; Bertram, M., Cachia, F.; Common ground in biodiversity footprint methodologies for the financial sector, Paris, 3 October, 2018

Consistency: data and methods are compatible with each other and scope of analysis

Approaches and data should:

- apply similar boundaries and reference/ baselines definitions to similar business applications;
- select metrics that allow for meaningful comparisons over time and between products/sites etc.

However, since the Protocol was designed for internal decision making, there is a gap in relation to disclosure. As the Biological Diversity Protocol develops, it will provide guidance in this area, drawing from the Greenhouse Gas Protocol and International Financial and Reporting Standards and set out relevant principles.

2.3 Uniform assessment template

To review the approaches and initiatives selected for this assessment in a uniform and objective way, their developers were invited to complete a common template adjusted to include technical characteristics that could also inform the ABMB initiative's work to identify areas of common ground.

In addition to the assessment exercise method developers were also asked to position their methods in a matrix listing the different categories of business applications (see section 3.2) on the vertical axis and the different organisational focus areas (see section 3.4) on the horizontal axis. This matrix is a key result of the 2019 assessment report as it provides an overview of all the approaches in a single figure (see Annex 3).

The completed templates are included in alphabetical order (i.e. name of measurement approach – see section 2.4) under Annex 2.

2.4 Assessed approaches

Within the scope of the 2019 assessment, updated information was provided by tool developers for eight out of 10 approaches which were assessed in 2018¹⁶. In addition, four new biodiversity or measurement approaches were integrated in the assessment, i.e. the Biological Diversity Protocol, the the Biodiversity Performance Tool for the food sector and the related Biodiversity Monitoring Tool, and Kering's Environmental Profit and Loss (EP&L) approach on biodiversity. Most of the assessed approaches are still under development and at piloting stage. Table 3 provides an overview. A detailed description of each approach is included in Annex 2 contained in a separate document.

The information sheets in Annex 2 with a detailed description of the characteristics of each biodiversity measurement approach and the overview matrix in Annex 3 which provides an insight in the level of coverage of business applications and organizational focus areas by the respective measurement approaches offer a huge amount of very useful information. A large part of this information – collected by the EU Business & Biodiversity Platform – has been carefully digested in the different subgroups of the ABMB initiative. The outcomes are presented in Chapters 3 to 6 and will feed further discussions within the ABMB initiative as well as in the EU B&B Platform over the next months. We are however aware that – due to time constraints – not all information included in Annex 2 and 3 has been harvested and analysed yet. Also, both in-depth descriptions of Globio and ReCiPe in Annex 1 offer a treasure of very relevant information which is not fully exploited yet but will definitely be investigated in the coming months and year.

¹⁶ No updated information was provided for the Biodiversity Footprint Calculator. As the Bioscope tool is not updated anymore, we haven't included it in the assessment. More information on both tools can be found in the Update 1 Report (see https://ec.europa.eu/environment/biodiversity/business/news-and-events/news/news-106_en.htm)

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APPROACHES FOR BUSINESSES AND FINANCIAL
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ASSESSMENT OF BIODIVERSITY MEASUREMENT APPROACHES FOR BUSINESSES AND FINANCIAL INSTITUTIONS



Table 3: Overview of assessed biodiversity measurement approaches and disclosure frameworks

	Name of tool/ framework	Developer	Description	Status	Private sector engagement
1	Agrobiodiversity Index (ABD)	Biodiversity International (Int)	ABD assesses risks in food and agriculture related to low agrobiodiversity. Index based on 33 indicators. Assesses: dietary diversity, crop diversity, seed genetic diversity, level of safeguarding for the future, and benefit to local livelihoods.	Ongoing development	Clarmondial AG
2	Biological Diversity Protocol (BD Protocol)	Endangered Wildlife Trust (South Africa)	This protocol is aligned to the Natural Capital Protocol. It helps provide biodiversity-specific guidance to measuring changes in the state of natural capital (step 6 of the Natural Capital Protocol), by providing guidance on how to measure change(s) in biodiversity components affected by business. It differs from the other measurement approaches in that it offers an accounting framework.	Under development	Nedbank
3	Biodiversity Footprint Financial Institutions (BFFI)	ASN Bank (NL)	The BFFI is designed to provide an overall biodiversity footprint of the economic activities a financial institution (FI) invests in. The methodology allows calculation of the environmental impact and the environmental footprint of investments within an investment portfolio.	Operational	ASN Bank
4	Biodiversity Indicators for extractives (BIE)	UNEP-WCMC, Conservation International, and Fauna & Flora International (Int)	It is a joint initiative with Conservation International and Fauna & Flora International, with support from IPIECA and the Proteus Partnership. The project has developed and it is testing a methodology that meets the needs of extractive companies in understanding their performance in mitigating their impacts on biodiversity. The methodology is being piloted by extractives companies throughout 2019 and will be refined following feedback from the pilots then published for broader uptake.	Piloting with extractive companies	Proteus Partners, IPIECA and ICMM members

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Business @
Biodiversity

5	Biodiversity Impact Metric (BIM)	Cambridge Institute for Sustainable Leadership (CISL) (UK)	BIM has been design to assess the impacts of a company's activities from raw material sourcing. It provides information of how and where the company can reduce their impact. BIM has been developed to assess impact in soil and water that, combined with biodiversity, will be called 'Healthy Ecosystems Metrics' but will be released late 2019 and are designed to assess a company's contribution to maintenance of an ecologically functional landscape.	Piloting with members of CISL's Natural Capital Impact Group	Members include Kering, ASDA, Mondi, Volac; Mars; The Crown Estate; Anglian Water; Yorkshire Water; Primark.
6	Biodiversity Performance Tool for Food sector (BPT)	Solagro (France)	The Biodiversity Performance Tool (BPT) is being elaborated in the frame of the EU LIFE Project "Biodiversity in standards and labels for the food sector" aims at proposing a methodology to quite easily assess the integration of functional biodiversity at farm level for food sector actors (product quality or sourcing managers) as well as for certification companies (certifiers and auditors). The BPT should help farmers and farm advisors to elaborate and implement sound Biodiversity Action Plans, which contribute substantially to a better biodiversity performance on farm level. The tool will support auditors and certifiers of standards as well as product, quality and sourcing managers of food companies to better assess the preservation and improvement of integration of biodiversity at farm level.	Online tool tested in Oct – Dec 2019. Available from Jan 2020	Pilot farms
7	Biodiversity Monitoring Tool for the Food sector (BMT)	Lake Constance Foundation, Germany	The tool (also elaborated in the frame of the EU LIFE Project "Biodiversity in standards and labels for the food sector") has been created to offer food standards and food companies the possibility to monitor certain aspects with relevance for biodiversity of their certified farms / their producers. The monitoring is divided into two levels. Level 1 monitoring is a system wide approach with indicators to evaluate the potential created for biodiversity (ecological structures, biotope-corridors, buffer zones, etc.) and the reduction of negative impacts on biodiversity (use of chemical pesticides and fertilizers, erosion, water use, etc.). Level 2 is an In-depth sampling beyond the	Pilots in Oct – Dec 2019. Available from Jan 2020	Pilot farms

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scope of certification. It monitors mid- and long-term effects of certification on wild biodiversity on the farm and its direct surroundings by selected key indicator species.

8	Global Biodiversity Score (GBS)	CDC Biodiversité (France)	It provides an overall and synthetic vision of the biodiversity footprint of economic activities. It is measured by the mean species abundance. Mean Species Abundance (ratio between the observed biodiversity and the biodiversity in its pristine state) based on PBL Netherlands Environmental Assessment Agency's model of five terrestrial pressures (land use, nitrogen deposition, climate change, fragmentation, infrastructure/encroachment) and 5 aquatic pressures, and their impacts on biodiversity.	Developing (until May 2020)	B4B+ Club of about 35 large businesses in most industries
9	Environmental Profit & Loss (EPL)	Kering (France)	The EP&L measures carbon emissions, water consumption, air and water pollution, land use, and waste production along the entire supply chain, thereby making the various environmental impacts of the company's activities visible, quantifiable, and comparable. These impacts are then converted into monetary values to quantify the use of natural resources.	Operational	Kering
10	LIFE Key (LIFE)	LIFE Institute (Brazil)	LIFE Methodology helps organizations in identifying their impacts and designing a strategic plan to reduce, mitigate and compensate for them, including a specific approach to reduce impacts in the supply chain. By using the LIFE Biodiversity Estimated Impact Value (BEIV) an organization calculates and evaluates an organization's impact based on five environmental aspects taking into account quantity and severity criteria.	Operational in Brazil and Paraguay, with an expansion plan in execution in Latin America and Europe	28 companies/ organisations. Five companies in Brazil and one company in Paraguay are already LIFE certified.
11	Product Biodiversity Footprint (PBF)	I CARE – Sayari (France)	Combines biodiversity studies and companies' data to quantify the impacts of a product on biodiversity all along the product's life cycle stages in order to provide recommendations for changes	Tested with the agriculture sector, further testing for	Kering, Avril and L'Oréal

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other sectors is
ongoing

12	Species Threat Abatement and Restoration metric (STAR)	IUCN (Int)	The STAR* measures the contribution that investments can make to reducing species extinction risk. It can help the finance industry and investors target their investments to achieve conservation outcomes, and can measure the contributions these investments make to global targets such as the Sustainable Development Goals.	Piloting is complete and reports are being finalized	Smallholder agriculture
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Source: EU B@B Platform, 2019 and UNEP-WCMC (on behalf of the Aligning Biodiversity Measures for Business initiative). 2019. Discussion Paper 1 for the Technical Workshop on Aligning Biodiversity Measures for Business: Identifying common ground between corporate biodiversity measurement approaches.

3 HOW TO SELECT A BIODIVERSITY MEASUREMENT APPROACH?

This chapter focuses on **business applications**, **biodiversity targets** and on **ways to select a suitable biodiversity measurement approach**. It is based on the findings and outputs so far of Subgroup 1 of the ABMB initiative¹⁷.

3.1 Issues to be addressed in selecting a measurement approach

With a range of measurement approaches developing, it will be important for their uptake that potential business users are clear on:

- how each approach could be used to meet the information needs of different business applications/ uses;
- which organizational focus a measurement approach is best suited to i.e. product/ site/ corporate/ supply chain;
- the strengths and limitations of each approach in providing information that can inform the decision the company wishes to make.

To achieve this, an agreed **typology of business applications and targets** relevant for selecting an appropriate biodiversity measurement approach is required against which measurement approaches can be mapped. If complemented with a **navigator/ decision tree**, this can support users to select the right tools, i.e. those that fit best to their specific needs.

3.2 Business applications (BA)

The concept of 'business applications' in a natural capital context is introduced in the Natural Capital Protocol (2016). It is defined as "the intended use of the results of your natural capital assessment, to help inform decision making". The Protocol¹⁸ presents a list of possible business applications with examples of the types of strategic or operational decisions that could be informed. These applications are neither mutually exclusive nor exhaustive but should provide an idea of the potential scope of applications. The following applications are mentioned:

- Assessing risks and opportunities
- Comparing options
- Assessing impacts on stakeholders
- Estimating total value and/or net impact
- Communicating internally or externally

Many businesses are seeking one indicator for biodiversity performance to be used across a variety of business applications. The diversity of measurement approaches that are developing with business suggests that assessing biodiversity performance for different BA may require different approaches. It is important to link biodiversity measurement approaches and related biodiversity indicators to the type of applications businesses and FIs are interested in. Therefore, it is important to have a clear picture of

¹⁷ See also UNEP-WCMC (on behalf of the Aligning Biodiversity Measures for Business initiative). 2019. Discussion Paper 1 for the Technical Workshop on Aligning Biodiversity Measures for Business: Identifying common ground between corporate biodiversity measurement approaches

¹⁸ More specifically, see Table 1.2 in the Natural Capital Protocol

these BA and how the range of measurement approaches that are developing fit within them. Without this there is a risk that businesses become confused by the range of approaches that are developing.

At this moment, 8 **different BA** are distinguished (see Table 4). BA 3 'tracking progress to targets' was further split into 9 more specific BA according to the type of biodiversity targets (see Table 5).

The list of BA is based on work by IUCN and Oxford University (Addison et al., 2018), CDC Biodiversité (Berger et al., 2018), the Natural Capital Protocol (NCC, 2016), the outcomes of the Technical Workshop on 26 and 27 March 2019 in Brussels and the subsequent discussions in Sub group 1 on 6 Sept 2019 (organised as part of the ABMB initiative, and supported by the EU Business & Biodiversity Platform) and the Technical Workshop in Brazil in Oct 2019.

It is important to note that the Biological Diversity Protocol (BD Protocol) is not a measurement approach *per se*. It aims to enable impact measurement approaches to consolidate data for corporate level accounting, internal reporting and external disclosure. This is a unique "approach" in the landscape of impact measurement approaches analysed as part of this report. This is why "accounting for internal reporting and/or external disclosure" has been added as a BA¹⁹. Not all biodiversity impact measurement approaches generate the same type of outputs and are able to satisfy accounting and reporting principles / requirements, notably those set out by the BD Protocol. While the BD Protocol, in its draft format, has data requirements and accounting/reporting principles which can be key differentiation factors for impact measurement approaches, not enough information is yet available to undertake this work effectively. It is understood that the BD Protocol team is actively engaging with a number of impact measurement approaches to ensure alignment.

The broader BA 'internal reporting and external disclosure' – so, not limited to accounting – is not included in the list as it is not a differentiating element for the selection of the most appropriate biodiversity measurement approach for a company's or investor's specific purposes.

Please also note that overlaps are possible between different business applications.

Table 4: List of BA, based on consent by SG1 during discussion 6 Sept 2019

Business applications (Bas)	Explanation
BA 1: Assessment of current biodiversity performance	<i>This is a very common BA. A company might do this just to demonstrate that it's doing well in terms of biodiversity performance, or simply to know its current level of performance. It could be part of BA 3 (tracking progress to targets), 4 (comparing options) or 7 (assessing risks and/or opportunities).</i>
BA 2: Assessment of future biodiversity performance	<i>A company might be interested in assessing future biodiversity performance as a result of, for instance positive impact actions (e.g. restoration actions and/or actions that reduce pressures on biodiversity) or changes in its activities.</i>
BA 3: Tracking progress to targets	<i>Companies that have set targets on biodiversity performance will need to track progress periodically. There are many categories of targets and the current list (see Table 5) covers the main categories.</i>
BA 4: Comparing options	<i>A company might want to compare the impact of different options on biodiversity. Although the focus of the biodiversity measurement tools is on measuring biodiversity impacts, any decisions will also rely on economic considerations.</i>

¹⁹ This BA was only added in the list after recent discussions in SG1 (Sept – Oct 2019). Therefore, it was not included in the matrix which was circulated to tool developers over the summer (See Annex 4)

While some tools have explicitly integrated an economic indicator other tools provide useful input for an internal cost benefit analysis.

This BA can inform different levels of decision. Some examples of this BA:

- *Which site offers least harm to biodiversity values?*
- *Which mitigation measures offer best result in terms of both ecological and economic terms?*
- *Which product scores best considering both biodiversity performance and economic return?*
- *Which investments in biodiversity conservation or restoration score offer the best value for money?*
- *Which supply chains are riskier from a biodiversity point of view?*
- *Which companies within a sector are performing best (according to rating agencies)?*
- *Which sectors are performing best in terms of biodiversity (for investment decisions by Fis)?*

BA 5: Assessment / rating of biodiversity performance by third parties, using external data

Third party assessment based on biodiversity criteria and fed with external data (into the absence of company data). This can be applied to compare company biodiversity performance across a sector.

BA 6: Certification by third parties

Third party certification based on auditing of a clearly established methodological approach.

BA 7: Screening and assessment of biodiversity risks and opportunities

Biodiversity measurement approaches can be used, for instance in case of due diligence assessments as part of mergers and acquisitions, or assessment undertaken by investors to differentiate between investment options, either based on the biodiversity performance or return on investment of different companies. This might also be undertaken by FI to assess biodiversity risk and inform pricing credit.

This application often, but not always, overlaps with BA 4.

BA 8: Biodiversity accounting for internal reporting and/or external disclosure

Accounting refers to the process of compiling consistent, comparable and regularly produced data using an accounting approach. Companies may assess biodiversity impacts in the context of a specific accounting framework, such as management accounting (e.g., budget forecast), financial accounting (e.g., biodiversity offset liability) or national accounting (e.g., applying the System of Environmental-Economic Accounting – Experimental Ecosystem Accounting - SEEA EEA). An emerging biodiversity-specific accounting framework, the BD Protocol, which is based on adaptations of double-entry bookkeeping, helps companies produce Statements of Biodiversity Position and Performance using quantitative, non-monetary metrics.

3.3 Targets

A key step after defining the business application that indicators would support is to 'set clear objectives relating to what the business wants to achieve in relation to the management of biodiversity and how

that can be measured²⁰. Such commitments could be voluntary, regulatory or could relate to international biodiversity goals such as the Aichi targets, Sustainable Development Goals, or Science-Based Targets for biodiversity, similar to the 2°C target for climate, for which work is currently underway.

Relevant targets are listed under BA 3 (tracking progress to targets) in Table 4. Differentiating between these different types of targets is likely to be relevant for the selection of the appropriate biodiversity measurement approach.

Table 5 sets out a range of targets and goals, as referred to under BA 3. Differentiating between these targets might be relevant for the selection of the appropriate biodiversity measurement tool.

Table 5: Influential targets and goals relevant to establishing robust corporate biodiversity indicators

Target/ Goal	Implication for biodiversity measurement
Aichi targets and post 2020 biodiversity targets	<i>Aichi targets will be subject to review and potential update if adopted in the post 2020 biodiversity policy framework. Indications are that private sector uptake has been limited to date. Given the Convention on Biological Diversity focus on mainstreaming and industry in recent years, it is likely that these targets will be adjusted in a manner that either more closely reflects a need to engage the private sector in their delivery or that translates them for application by the private sector²¹.</i>
Sustainable Development Goals	<i>Corporate disclosure of progress against the SDGs is increasing. However, indications are that the biodiversity focused targets (SDG 14, 15) are not currently well addressed by companies²². It should be noted that these goals are well aligned with Aichi Targets and so approaches aiming to support one should also support the other. Measurement approaches that can demonstrate contribution to these targets are likely to resonate with the private sector.</i>
Planetary Boundaries	<i>The Stockholm Resilience Centre developed a model – planetary boundaries – that provides the parameters for the planet to maintain a stable state, fundamental to supporting contemporary society. A number of companies are beginning to explore how this model might be applied within corporate decision making and disclosure²³.</i>
No net loss/ net gain	<i>No net loss or net gain commitments placed within the context of the biodiversity mitigation hierarchy are increasingly being adopted by business. The UK government, for example, have mandated a net gain commitment for all new developments²⁴.</i>
ISO 14001, EMAS	<i>Environmental management system requirements (e.g., ISO 14001, EMAS) are more process level oriented targets, describing how an organisation should be organized in order to continuously improve in environmental performance.</i>
Voluntary standards at sector level or product level	<i>Compliance to voluntary standards at sector or product level that aim to preserve biodiversity as its main focus (e.g. Roundtable on Sustainable Palm Oil RSPO) or secondary focus (e.g. EU Ecolabel) is another type of target.</i>
Voluntary biodiversity assessment and reporting frameworks	<i>Many companies want to demonstrate to stakeholders that they manage biodiversity in a good way. Adopting the Global Reporting Initiative biodiversity indicators is a possible way. Working in line with the steps and principles of the Natural Capital Protocol is</i>

²⁰ <https://portals.iucn.org/library/node/47919>.

²¹ Smith, T., Smith, M., Beagley, L. and Addison, P. 2018. Mainstreaming biodiversity targets for the private sector: Main Report & Case Studies. Final Report available from: <http://jncc.defra.gov.uk/page-7678>.

²² KPMG (2018) How to report on the SDGs. What good looks like and why it matters.

²³ CISL (2019) Linking planetary boundaries to business. Part of Kering's series on Planetary Boundaries for Business.

²⁴ <https://deframedia.blog.gov.uk/2019/03/13/government-to-mandate-biodiversity-net-gain/>

another possibility, in particular with the supplementary guidance on biodiversity which will be launched in 2020.

Voluntary biodiversity agreements	<i>Companies can also undersign so-called 'green deals' with public agencies or can establish cooperation with conservation NGOs, all of them entailing specific requirements to be compliant with.</i>
Regulatory and permitting requirements	<i>Evidently, also in the field of biodiversity there is plenty of legislation that companies need to be compliant with, such as the obligations of the Birds and Habitats Directives in the EU.</i>
Financial institutions requirements	<i>International financial institutions do increasingly request guarantees that projects are implemented with full respect to biodiversity (e.g. International Finance Corporation Performance Standard 6)</i>
Site to landscape level commitments	<i>These are location specific commitments in the field of biodiversity conservation. These commitments can be underwritten towards a local government agency or an NGO in charge of a river catchment area or a protected area. Very often a landscape level multi stakeholder approach is applied, with the company as one of the stakeholders.</i>
Specific corporate-level biodiversity commitments or engagements	<i>Many companies commit e.g. to avoid operating in high biodiversity value areas, to exclude purchasing of non-certified palm oil, wood, etc. These are detailed in the corporate biodiversity policy/strategy and apply to all activities of the company.</i>

3.4 Organisational focus area

A second filter that could be used to select appropriate biodiversity measures, is the **organizational focus area** of the approach. For businesses and FIs, the following organizational focus areas are distinguished:

- Product or service level
- Site and project level
- Supply chain level, i.e. upstream part of the value chain
- Corporate level, i.e. covering all activities (value chain, all locations)
- Sector or portfolio level.

These **organisational focus areas** do not completely align with the Protocol. It is a simplified combination of the focus areas distinguished in the Protocol: organizational focus (corporate, site/project, product) and value chain focus (upstream, direct operations, downstream). It avoids complicating overlaps. Value chain focus is completely covered: 'supply chain' is 'upstream', 'site/project' is 'direct operations' and 'product/service' covers the whole value chain as biodiversity measurement tools for products are LCA (Life Cycle Analysis) based. Portfolio and sector are added as this is a specific focus area for financial institutions.

We have added 'country / region' as an additional organizational focus area in recognition of the trend towards alignment between approaches developed for public authorities and approaches for businesses. Some measurement approaches are designed to support this level of decision making. Specific tools that have been developed with a primary focus on national or subnational geographical areas (e.g. GLOBIO) are not included in the assessment.

3.5 Mapping of biodiversity measurement approaches along business applications and organizational focus areas

As part of the 2019 assessment, the EU B@B Platform asked 11 developers of biodiversity measurement approaches to indicate which BA are covered by their approach and to what extent they have been tested by companies. Developers were invited to score the extent to which the BA is covered (i.e. very well (XX), to some extent (X) or not at all (0)) for each of the 'organizational focus areas' which are relevant from the perspective of a company or an investor. Developers were requested to provide explanatory text if relevant. Secondly, developers were invited to add the number of completed case studies for each of the grid cells where they have marked 'XX' or 'X'. For instance, if the tool is strongly supporting the BA 'Assessment of current biodiversity performance' at product level and it has been applied on 6 cases, the indication will be XX (6).

8 developers have completed the matrix. The main findings and conclusions are presented below, including the feedback from SG1 discussions on 6th September 2019 and discussions in the Brazil workshop end of October 2019. Annex 3 provides the consolidated feedback.

Consistency of feedback

- Not all tool developers have completed the matrix in the same way (e.g. scoring of coverage of BA for organisational focus areas), although this has improved a lot after a second request.
- Some tool developers tend to be more flexible in indicating which BA and/or focus areas are covered by their tool than others. As a consequence, there is a risk of 'over-claiming'. Therefore, it is very important to have evidence (case studies).
- Some tool developers provided more extensive information to justify their self-assessment than others.

Typology of business applications

- Overall, the proposed typology has proved to work. No tool developer has commented on it.
- SG1 acknowledged that the Biological Diversity Protocol (BD Protocol) has a particular position between the set of tools that are included in the assessment:
 - It is more an accounting approach or framework than a biodiversity measurement approach. The BD Protocol's first objective is to demonstrate biodiversity performance to external stakeholders in a way which aligns with annual financial accounting. As such, the BD Protocol can be fed with data from any biodiversity measurement tool.
 - Therefore, it was decided to add 'accounting for internal reporting and/or external disclosure' as an additional BA.
 - To avoid any further confusion with regard to the interpretation and understanding of 'natural capital assessment' and 'natural capital accounting' definitions will be added (both derived from definitions of natural accounting/assessment in Natural Capital Protocol, 2016):
 - **biodiversity accounting** is the process of compiling consistent, comparable and regularly produced data using an accounting approach on biodiversity and the flow of services generated in physical and monetary terms. The majority of applications are done at a national level and by the public sector. Natural capital accounts are a possible output from a natural capital assessment, and this also applies to biodiversity.
 - **biodiversity assessment** is the process of identifying, measuring and valuing relevant ("material") biodiversity impacts and/ or dependencies, using appropriate methods

- All BA are covered by one or more tools, although BA 5, 6 and 7 are covered by less tools than other BA. Also, within BA 3 'tracking progress to targets' there is quite some difference in the extent to which different targets are covered by the assessed approaches (see topic 'targets' below)

Impacts or dependencies coverage

- The focus of the assessment of biodiversity measurement approaches to date has been mainly on impacts and to a far lesser extent on dependencies. This is reflected by the selection of biodiversity measurement approaches which are all of them in the first place developed to identify and measure impacts. There are many tools which specifically address dependencies (ecosystem services perspective) such as InVest, Aries, etc. but these are not explored yet. As investors want to have an insight in the risk profiles of companies, they are much more interested in dependencies than impacts. Something to be reflected for the future steps to take.

Organisational focus

- The 6 different organisational focus areas are well understood by tool developers, although it has been decided to make more explicit that the first 5 organisational focus areas are those which are relevant from a corporate lens and that the sixth one ('country/region') has only been added for informative reasons (see also section 3.4).
- Site/project, supply chain and corporate are most covered by tools throughout the different BA

Targets

- All targets under BA 3 are covered by one or more biodiversity tools, although Planetary Boundaries, environmental management systems, regulatory requirements, landscape level commitments are covered to a lesser extent
- Some tools only cover targets in a qualitative way. This has for instance been indicated as such for the LIFE methodology but this is probably true of a number of the other tools as well (e.g. ABD Index). This is the case for tools which are partly based on checklists.

Case studies

- There are an increasing number of case studies reflecting that many of the measurement approaches are currently being piloted. The LIFE methodology by far has the largest number of concrete applications by businesses. GBS, PBF, STAR and BIM have a growing number of case studies. BFFI has been applied for 4 years on one case. BIE, the ABD Index and the BD Protocol are developing first test cases.
- Case studies cover product (PBF), site/project (PBF, BD Protocol, GBS, BIE and mainly LIFE), supply chain (PBF, GBS, LIFE and mainly BIM), corporate (GBS, LIFE), portfolio (GBS, BFFI). No case studies are reported for public policy.
- Case studies mainly cover BA 1 and BA 2.

Annex 3 has been condensed into the matrix in *Figure 1*. It includes only those business applications developers considered to be well covered by their approach. Many approaches can be adapted for different applications and organisational foci.

Figure 1: Categorisation of biodiversity measurement approaches updated from a report by CDC Biodiversite²⁵ based on the 2019 assessment of measurement approaches conducted by the European B@B Platform.

²⁵ <http://www.mission-economie-biodiversite.com/publication/1833>

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BUSINESS APPLICATIONS SUPPORTED	ORGANISATIONAL FOCUS					
	PRODUCT/SERVICE	SITE/PROJECT	SUPPLY CHAIN	CORPORATE	PORTFOLIO/SECTOR	COUNTRY/REGION
1.Current performance	ABD PBF	ABD LIFE BIE STAR BD BMS BMT	ABD LIFE BD PBF BIM BMS EPL	BD GBS BIE LIFE BIM BMS EPL	BFFI LIFE GBS	ABD LIFE
2.Future performance	PBF	LIFE STAR BMT	LIFE PBF	GBS LIFE	BFFI LIFE GBS	LIFE
3.Tracking target progress	ABD PBF	ABD BIE BD LIFE STAR	ABD STAR BD LIFE	ABD BIE BD LIFE GBS STAR	ABD LIFE BFFI STAR GBS	ABD STAR
4.Comparing options	ABD PBF	ABD STAR BIE	ABD LIFE BIM EPL	ABD BIM BIE GBS EPL	ABD GBS BFFI LIFE	ABD LIFE
5.Third party assessments/ ratings		LIFE		GBS LIFE	GBS LIFE BFFI	LIFE
6.Third party certification		BD LIFE BMS	BD LIFE BMS	BD LIFE BMS	LIFE	LIFE
7.Risk & opportunity assessment	ABD	ABD BIE BMT	ABD EPL	ABD BIE EPL	ABD	ABD
8. Biodiversity accounting		BD	BD	BD		

Key

ABD	Agrobiodiversity index
BFFI	Biodiversity Footprint Financials
BIM	Biodiversity Impact Metric
BMS	Biodiversity Monitoring System for the Food Sector
	Addresses biodiversity

BIE	Biodiversity Indicators for extractives
BD	Biological Diversity Protocol
GBS	Global Biodiversity Score
EPL	Environment Profit & Loss
	Addresses ecosystem services

LIFE	LIFE Impact Index
PBF	Product Biodiversity Footprint
STAR	Species Threat Abatement & Recovery
BPT	Biodiversity performance tool
	Biodiversity & ecosystem services

This matrix is draft for review and discussion with developers. It should be noted that not all approaches have been tested for the stated business application or organisational focus with companies, hence, the matrix should be refined following the piloting of the measurement approaches to enable a focus on the primary business application that each approach can support.

Whilst this matrix is potentially valuable, it could be improved by the use of colour to differentiate those approaches that use modelled data or direct measurement, those that adopt a pressures based approach or biodiversity state approach. Further categorisation of the approaches according to whether they deliver a qualitative or quantitative score was also considered valuable. A critical review of this matrix against objective criteria are required to make it a more useful guidance for companies, for example, only including those approaches for which pilots or case studies exist.

3.6 First draft of a decision tree

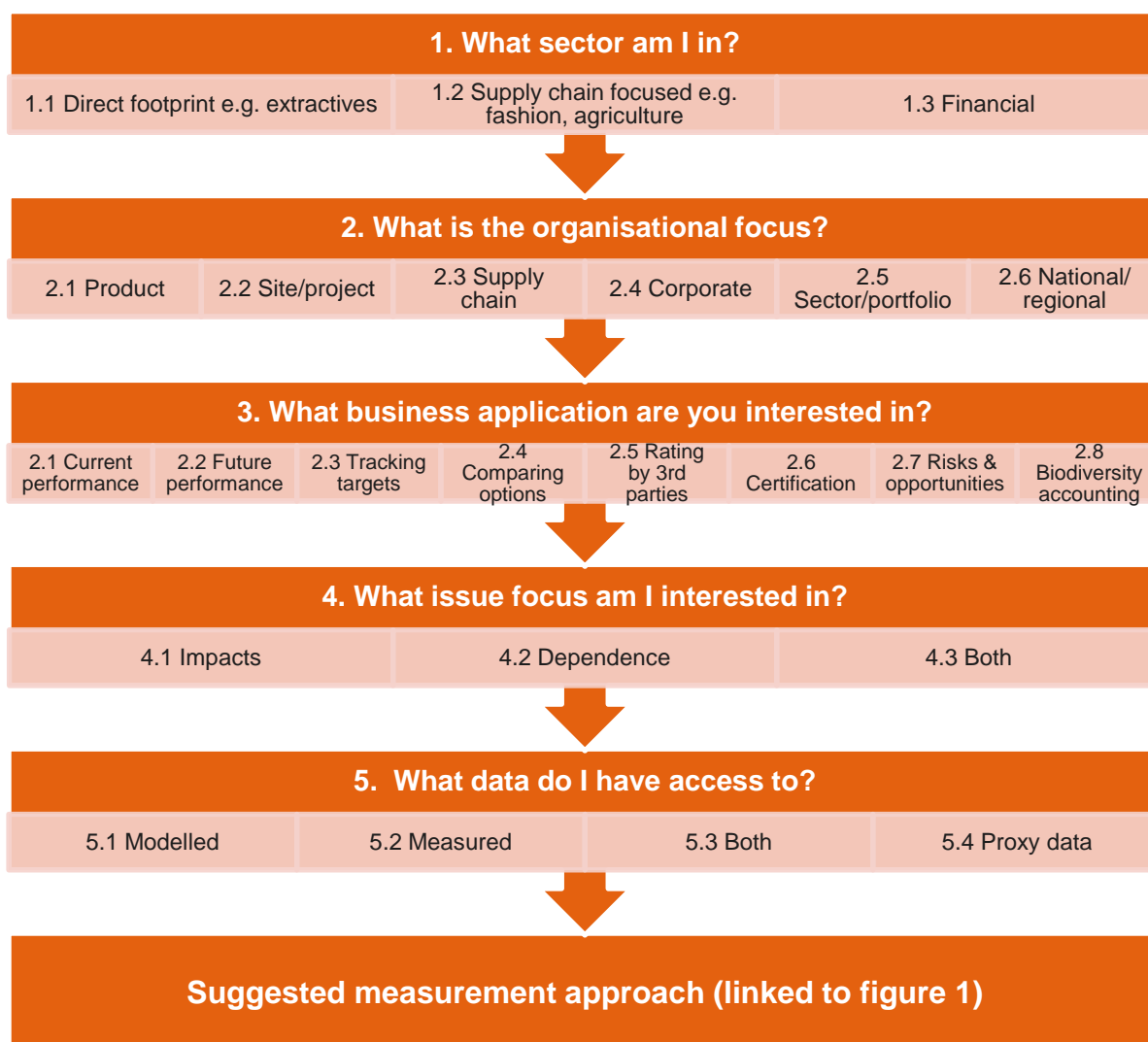
The mapping overview, although to be further refined, provides a first rough guidance for companies looking for a suitable biodiversity measurement approach. However, more criteria are important to facilitate this decision process. Therefore, a simple decision tree for businesses will be built to navigate through the complex landscape of measurement approaches. This will be built into the broader decision tree to guide businesses through the integration of biodiversity into natural capital assessments which will be produced by the Natural Capital Coalition and Cambridge Conservation Initiative (CCI) as part of supplementary guidance to the Natural Capital Protocol on biodiversity.

Key questions that could be posed in such a decision tree include:

- What is the business decision that you are trying to inform i.e. what is the business application?
- What is the organisational focus area (from product level to sector level)?
- What are the objectives of your assessment?
- What data is available for your assessment?

An initial draft of a decision tree is provided in Figure 2.

Figure 2: Initial draft of a decision tree for discussion



As there are a large number of potential combinations within the decision tree it is not possible in this document to show how each combination of responses will lead to a particular measurement approach. The final output (subject to funding) would be an interactive tool on a webpage. A couple of examples of how this interactive decision tree could work are shown below:

Q1. A3 Tracking progress to targets	Q1. A4 Comparing options
Q2. A3.3 No Net Loss or Net Gain	...
Q3. A2 Site/project	Q3. A4 Corporate
Q4. A1 User-derived, time-series data	Q4. A4 Externally collected, no time-series data
-> Biodiversity Indicators for Extractives	-> Global Biodiversity Score

Initial feedback on this decision tree suggested that it is a potentially useful tool. Additional decision or selection criteria could be:

- Does the measurement approach cover the impact groups which are relevant for my business activities? From the assessment we know that there is quite some variation between measurement approaches in terms of coverage of relevant impact groups (e.g. marine biodiversity, invasive alien species are often not factored in). Companies should try to measure all material biodiversity impacts, so if a tool only captures 50% of the material biodiversity impacts, the outcomes will not present the full picture;
- Is the measurement approach open source or not?
- Which department am I based in? Although some companies felt this would be helpful, it would make the decision tree application to larger companies, so it is not recommended to use this as a criterion?
- What level of resource is required to apply the measurement approach? Whilst helpful, it is currently difficult to include this as most approaches are being piloted for the first time.

Linking the decision tree with the matrix was also considered potentially useful to assist companies in identifying the most suitable measurement approach to meet their decision need.

3.7 Next steps

A simple set of guidance is needed to navigate potential users of measurement approaches to robust, tested approaches that meet their business decision needs. A number of steps are required to deliver this. As the measurement approaches complete the piloting of their methodologies, the results will be used to refine the matrix and decision tree further.

Recommendations for developers of biodiversity measurement approaches:

- Review and critique the matrix and decision tree above, ensuring that the matrix reflects the primary business application that it is designed to serve and building from existing decision trees such as WBCSD's in Eco4Biz
- Work with companies to pilot and communicate the results of piloting the measurement approach in the public domain

Recommendations for users of biodiversity measurement approaches:

- Engage in piloting of the measurement approaches in order to strengthen them and build capacity to apply them
- Test the decision tree as part of proposed piloting of the Natural Capital Protocol supplementary guidance on biodiversity
- Communicate lessons learned in piloting to enable identification of common issues and areas where guidance is required and into broader sustainability reporting initiatives e.g. the Global Reporting Initiatives
- Develop case studies of the application of measurement approaches to demonstrate how they can be practically used

Assessment of concrete case studies from now on will be very useful to further refine guidance on biodiversity measurement approaches for business.

4 BOUNDARIES AND BASELINES

This chapter sets out how developers are currently defining the **value chain boundaries and reference / baselines** set within their assessment methodologies. It covers the findings and outputs so far of Subgroup 2 of the ABMB initiative²⁶. Definitions of boundaries, references and baselines were reviewed for all measurement approaches to determine how they were treated (see Table 6). Areas of convergence and divergence identified and documented, and implications considered.

4.1 Issues to be addressed

A company measuring its biodiversity impacts, should aim to capture all significant biodiversity impacts, not only part of them. Understanding biodiversity impacts is often challenging, as it requires a solid insight in cause impact relationships (e.g. including first and second order impacts), influence areas and even cumulative effects. In many cases expert advice will be necessary.

Biodiversity measurement approaches often rely on assumptions, which are simplified representations of reality (e.g. 'impacts occur within a perimeter of 20 km around a site'). When applying a biodiversity measurement approach, it should be clear to all stakeholders how key issues such as boundaries (e.g. perimeter of influence), baselines and reference state are defined.

Currently definitions and the terminology used to describe value chain boundaries, reference states and baselines vary between different measurement approaches and in some cases are not clear. Understanding these differences and their implications for decision making is important if several are applied by the same business user.

4.2 Boundaries

A company's impact will differ considerably depending on the perimeter or boundaries drawn around its operations, supply chain or site. Boundary can refer to the nature of the operations included or excluded (i.e. entities under financial or operational control, or entities in which a parent company holds a stake) and the organizational value chain.

'Boundary' is not a single concept across all measurement approaches. For site based approaches assessment boundaries may be legislatively driven. For portfolio or company approaches, boundaries of assessments may be less clearly established and determined by each developer based on existing good practice.

The Natural Capital Protocol includes guidance on organisational focus, value chain boundary, baselines, spatial boundaries and whether the assessment addresses impacts or dependencies. This section focuses on value chain boundaries and spatial boundaries.

4.2.1 Value chain boundaries

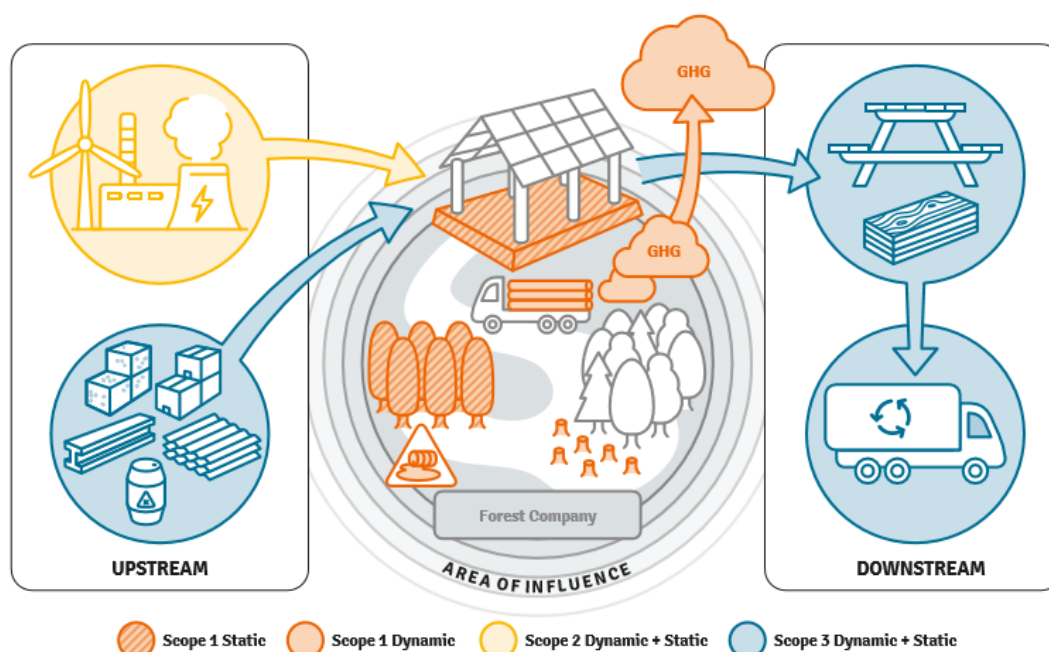
The Natural Capital Protocol identifies the following elements of the value chain to consider: upstream (raw materials), direct operations and downstream (products). The 'scopes' concept derived from Greenhouse gas emissions accounting is used by some approaches to set the boundary or perimeter of an assessment. The Global Biodiversity Score has adapted the definitions of scopes set out in the Greenhouse Gas (GHG) Protocol to address the unique attributes of biodiversity and breaks down the three scopes into:

²⁶ See also UNEP-WCMC (on behalf of the Aligning Biodiversity Measures for Business initiative). 2019. Discussion Paper 1 for the Technical Workshop on Aligning Biodiversity Measures for Business: Identifying common ground between corporate biodiversity measurement approaches

- **Scope 1:** impacts generated on the area controlled by the entity and other impacts directly caused by the entity during the period assessed.
- **Scope 2:** impacts resulting from non-fuel energy (electricity, steam, heat and cold) generation, including impacts resulting from land use changes, fragmentation, etc.
- **Scope 3:** impacts which are a consequence of the activities of the company but occur from sources not owned or controlled by the company, both upstream and downstream of its activities²⁷.

The concept matches the Protocol's scopes as illustrated by. Figure 3 below: scope 2 and scope 3 upstream are the Protocol's upstream scope, scope 1 is the NCP's direct operations scope, and scope 3 downstream is the Protocol's downstream scope.

Figure 3 Simplified representation of the scopes concept from the Global Biodiversity Score²⁸



Scope 3 impacts (impacts in the supply chain) are often the most significant – particularly for raw materials dependent companies e.g. retailers and food processors. This approach does not explicitly include indirect²⁹ e.g. inward migration of communities following the economic opportunity associated with a mine site development or cumulative³⁰ impacts (both terms that are interpreted differently across

²⁷ CDC Biodiversite (2019) Global Biodiversity Score: a tool to establish and measure corporate and financial commitments for biodiversity. 2018 technical update

²⁸ CDC Biodiversite (2019) The Global Biodiversity Score further breaks down the three scopes into 'dynamic' and 'static' footprints. The dynamic footprint is that caused by changes, consumptions or restorations i.e. by company activities. A static footprint is also calculated to reflect the fact that simply the existence of company activities prevents the land from returning to its natural state – this represents the ecological opportunity cost of the activity

²⁹ Impacts resulting from the project that may occur beyond or downstream of the boundaries of the project site and/or sometime after the project activity has ceased. From IAIA (2018) Biodiversity and Ecosystem Services in Impact Assessment.

³⁰ Includes direct and indirect impacts, past, present and future, resulting from the actions of all actors, not just the target organisation or project assessed. From Biological Diversity Protocol (2019)

different measurement approach developers). Explicit consideration of indirect and cumulative impacts will be important to factor into the measurement approaches.

This approach nonetheless has the advantage of resonating with companies already using the GHG Protocol to report and mirrors the Natural Capital Protocol value chain boundaries of upstream, direct impact and downstream. As in greenhouse gas emission accounting, ultimately all scopes should be calculated, but in the first instance a focus on the most significant areas of impact/ scope to build capacity to use the measurement approach could be beneficial to users with a clear rationale stated for that focus.

The Biological Diversity Protocol, currently in draft may offer guidance on this point. It is adopting a similar approach based on the GHG Protocol. It recognises three major parts ('scopes') of the value chain:

- Direct operations (gate-to-gate), which covers activities over which your business holds ownership or control
- Upstream (cradle-to-gate), which covers the activities of suppliers
- Downstream (gate-to-grave), which covers activities linked to the purchase, use, re-use, recovery, recycling, and final disposal of your business' products and services.

Within each scope, however, it also considers direct³¹ and indirect impact. Different measurement approaches are designed to address different aspects of the value chain e.g. Biodiversity Indicators for Extractives addresses the area of influence in Figure 3 whilst the Product Biodiversity Footprint focuses on downstream impacts.

Few of the approaches reviewed consider dependency on ecosystem services e.g. a cocoa company may be dependent on wild pollinators for yield quality and quantity. The scopes framework can also lend itself to consideration of dependencies but has not been specifically applied in this context by any of the measurement approaches to date.

4.2.2 Site level impact boundaries

Site-based methodologies will give rise to very different results depending on how the boundaries around the assessment are drawn. Inclusion of indirect and cumulative impact and attribution of pressures to those responsible for their generation are particular challenges for which clarity and common ground are required across site based methodologies. Currently interpretations of the area over which the company has influence vary significantly.

Area of Influence is defined as (from International Finance Corporation):

"The area likely to be affected by:

- (i) impacts by the project and the client's activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project; (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent.
- Associated facilities, which are facilities that are not funded as part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable.
- Cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted."

³¹ Impacts directly attributable to a defined action or project. From IAIA (2018) Biodiversity and Ecosystem Services in Impact Assessment.

An estimation of the area of influence or interest may require consideration of, for example:

- The **physical footprint** of the operating site: i.e. the area in which the company is actively working, potentially giving rise to an impact;
- **Area of direct influence**: i.e. area affected by project activities and facilities that are owned and managed by the company. A project's area of direct influence may or may not coincide with the project footprint as it reflects 'effect distances' (the distance over which particular effects, such as noise, are felt) for project activities and emissions;
- **Area of indirect influence** (sometimes called secondary or induced): i.e. the area affected by facilities that, although are not a part of the project that is being assessed by the environmental and social impact assessment, would not have been constructed in the absence of the project and the physical footprint of non-project activities in the surrounding area that are caused or stimulated by the project.

The area of direct and indirect influence may range in size from a few square kilometres, to several tens of square kilometres. A wide variety of factors (e.g. the type of operational activities conducted and the environment in which they take place) may influence the area of direct and indirect impact of an operational site. In practical terms however, companies are often faced with insufficient information to support detailed delineation of the area of influence.

The extent to which area of influence is incorporated within site-based biodiversity approaches for business and how different boundaries are reflected in portfolio-level approaches will be an important determinant of how well such different approaches can align to create an overall picture of corporate performance. Some approaches e.g. LIFE Key are using different assessment boundaries for negative and positive impact assessment. For positive impact assessment, LIFE considers operations off site, for negative only direct site operations are considered within the calculation.

The baseline determined fundamentally affects results derived from the application of a specific measurement approach. For example, for site based approaches there is evidence that the baseline set can severely alter whether targets such as No Net Loss (NNL) are met, even under identical conditions (see *Figure 4*).

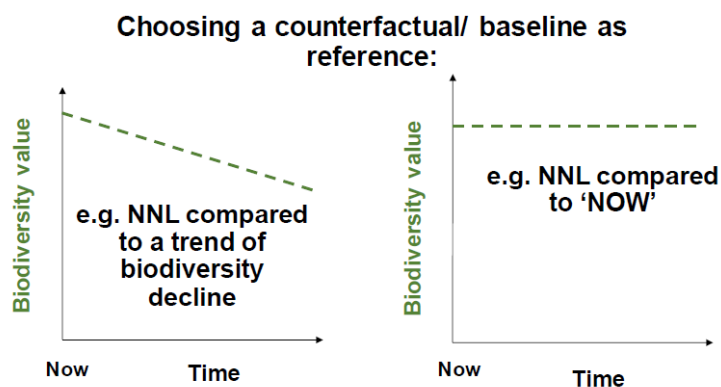


Figure 4: Differences between a baseline vs counterfactual frame of reference. NNL = no net loss biodiversity. (Amrei von Hase and Erin Parham BBOP 15 Conference, Paris 27 & 29 November 2018)

4.3 Reference and baselines

First of all, there is a need to clarify both terms. They are often used interchangeably and this is very confusing.

A correct way of thinking is to consider **reference state** as a state of ecological integrity (could be pristine, could also be a legally imposed protection regime for a species or a habitat) and **baseline** as the start of the accounting or measurement process (can be in the past, present or future). There should be no opposition. An understanding of the reference state is critical to understand the scale of loss / impacts. This is embedded in most measurement approaches. This is often reflected by condition-rating methods (e.g. MSA).

The **baseline** against which progress is tracked, i.e. the start of the accounting or measurement process, can be set by the assessing company. At least four types of baseline can be considered:

- State prior to the implementation of the project
- Current state of biodiversity
- Counterfactual scenario in which impacts are described relative to a plausible alternative state that would occur if the project did not exist
- State at an arbitrary date: for instance, a company can choose 1990 as the year to compare against its current performance. (e.g. in 1990, its impact was 100 and now it is 80 so it reduced its impact by 20% against the baseline)

The **pristine undisturbed state** is only one example of a **reference state**. The mean species abundance metric (MSA) is based on this concept ("the mean abundance of original species relative to their abundance in undisturbed ecosystems"³²³³). Such an undisturbed state is currently used by BIM, GBS, LIFE Key, BFFI and PBF, in addition to baselines which they also use.

The latter is specific to the tool concerned, the former can be selected by the company or may be set by regulatory requirements and is relevant to all measurement approaches.

Few of the different measurement approaches clearly set out reference state or baseline considerations. A transparent mechanism for selecting appropriate references or baselines is key in achieving greater consistency between approaches and careful thought should be given to identifying an appropriate baseline as the measurement approach is applied. Historically some companies have used retrospective performance references/ baselines – such approaches have proven challenging to implement in practice due to data gaps and inconsistencies. It may be that a combination of performance references/ baselines are required to give a full picture of performance.

³² Alkemade R, van Oorschot M, Miles L, Nellemann C, Bakkenes M and ten Brink B. (2009). GLOBIO3: A Framework to Investigate Options for Reducing Global Terrestrial Biodiversity Loss. Ecosystems 12: pp. 374-390.

³³ Schipper, A. M., Meijer, J. R., Alkemade, R., & Huijbregts, M. A. J. (2016). The GLOBIO model: a technical description of version 3.5. The Hague: Netherlands Environmental Agency (PBL). Retrieved from http://www.pbl.nl/sites/default/files/cms/publicaties/pbl_publication_2369.pdf

4.4 Next steps

Clarity and transparency is required on the way in which the measurement approaches are defining perimeter/ boundaries, reference states and baselines. This should be a consideration in the ongoing development of measurement approaches. In a next step – and this will largely be fed with case study assessments – the appropriateness of the way these concepts are dealt with in the biodiversity measurement approaches will be critically assessed:

- Analysing the different ways of setting boundaries and baselines and benefits and limitations of each and their implications for decision making
- Establishing an appropriate approach for establishing the perimeter/ boundaries of site level of assessments and how best to address indirect and cumulative impacts and shared responsibilities for pressures
- Determining how indirect and cumulative impacts are addressed in data models supporting measurement approaches e.g. ReCiPe and GLOBIO

Recommendations for developers of measurement approaches:

- Should be transparent, clearly stating the perimeter/ boundary of your assessment, baseline and reference state and documenting all assumptions and approaches
- For site based approaches, this transparency will require having a clear definition of area of impact/ influence or interest that reflects the nature of the operations being assessed and which represents a complete inventory of potential impacts

Recommendations for users of measurement approaches:

- Be aware that the perimeter/ boundary defined by the different measurement approaches may vary and understand the implications of this for decision making, for example, would a food processor's impact perimeter be complete if it considered direct operations only without considering the supply chain?
- Be transparent on boundaries, baseline and reference point selected.
- Consider a staged approach to assessing impact – in the same way as for climate change, the initial focus was on scope 1 (direct emissions), for biodiversity a starting point could be understanding one element of the value chain impact e.g. direct operations.

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Table 6: Comparison of scope, boundaries and baselines for 13 measurement approaches and frameworks assessing corporate impacts on biodiversity.

Measurement Approach	Aspect	Impact Boundaries at site level	Performance baseline	Reference Point
Agrobiodiversity Index	Ecosystem services	Create boundaries around the area under analysis (country or project area)	No information provided - the index can be used to develop a baseline for assessment (e.g. green bond issuers who want to determine the status of agrobiodiversity in a specific area).	No information provided.
Biodiversity Footprint Calculator	Biodiversity	Not Applicable	Progress state before the company's activities (i.e. state of biodiversity before project implementation).	Mean Species Abundance of original species, representing the intactness of nature relative to the pristine state .
Biodiversity Footprint for Financial Institutions	Biodiversity	Not Applicable	The baseline used to assess the biodiversity impact of economic activities is defined as the pristine state in the biodiversity. This is considered the state of biodiversity when there were no economic activities taking place over a longer period of time.	Use unaffected nature as a reference point. The baseline or reference in case biodiversity-positive investments are included in the footprint is the situation without the investment taking place.
Biodiversity Impact Metric	Biodiversity	Not Applicable	Not defined.	Not defined
Biodiversity Indicators for Extractives	Biodiversity	Considers impacts within physical footprint of the site referred to as the Area of Impact . Also considers impacts within the Area of Influence , which is often larger than the site's actual footprint and describes area where largest pressures are most widely spread from activities. Impacts under sole management of company. Area of Interest currently set to 50km boundary (due to max reporting buffer available in IBAT) – using to be refined using local expert knowledge	Use state prior to project implementation . Align with EIA regulation. . Required to calculate baseline to determine state for each priority biodiversity feature identified (based on expert advice) Baselines are taken from pre-project state (utilising existing documentation)	Not defined
Biological Diversity Protocol	Biodiversity	Protocol defines Value Chain Boundaries and distinguishes between direct and indirect impacts	Not defined, but requires statement of position and performance.	Expresses relative intactness of target land cover type by assessing cover type against a reference or original 'natural' state (i.e. what would the landscape look like without

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				human impacts). Requires transparency regarding assumptions and estimations made
Environmental Profit & Loss Account (EP&L)	Biodiversity	Not applicable Looks at entire value chain. Impact boundaries do not apply	Uses 2015 baseline of supply chain 'intensity' to compare results.	
Global Biodiversity Score	Biodiversity	Area under operational control	A historical baseline or counterfactual scenarios on abundance can be chosen by a company to report performance .	MSA metric compares current biodiversity levels against the "undisturbed system/pristine state" abundance level.
LIFE Key	Ecosystem services	Biodiversity Impact Index limited to direct operations within site controlled by the company. Biodiversity contribution element considers locations outside direct operations.	Not defined	Use term reference value to describe national reference value used to calculate companies' impact on the country's biodiversity at a national level. Range of sources used to define values for waste, energy, water,
Product Biodiversity Footprint	Biodiversity	Not applicable	The reference is the 'standard' product within the standard value chain using standard raw materials. Because the main application of this methodology is to compare options, determining baselines is not crucial to the assessment	Pristine state
Species Threat Abatement and Recovery (STAR) metric	Biodiversity	Considers pressures over a defined perimeter. Perimeter not stated.	Multiple baselines, including current state baseline and pre-project state baseline Ex-ante or ex-post impacts of investments at a range of scales and over a range of timeframes.	Information unavailable.
Biodiversity monitoring system for the food sector	Biodiversity	Focus on farm level. Detailed methodology not currently available publicly.	Baseline will be defined by the 25 key data and indicators. Baseline data will be established for the population of 2 – 3 key indicator species	Information unavailable.
Biodiversity performance tool in the Food Sector	Biodiversity	Focus on farm level. Detailed methodology not currently available publicly.	For each basic indicator, some threshold values are defined	Information unavailable.

5 CORPORATE DATA INPUTS, METRICS AND IMPACT FACTORS

This chapter focuses on corporate data inputs, metrics and impact factors. This chapter covers the findings and outputs so far of Subgroup 3 of the ABMB initiative³⁴.

5.1 Issues relating to data

Typical issues related to data are the following:

- **Identification of core data sets that can support multiple measurement approaches:** in order to reduce the data collection burden on companies and improve data quality it may be useful to identify core data sets that are common between different measurement approaches and encouraging companies to disclose on them. A first step to do this is to identify the input data and associated a nomenclature of data currently used by measurement approaches.
- **Addressing data quality issues:** Data is derived from many sources for use in biodiversity measurement, it may be measured or modeled, derived from within the company or externally and quality of data may vary significantly – determining how to reflect these inaccuracies and determine the sensitivity of the outcomes of the measurement approaches to variations in data used, data quality and completeness will be important to enable informed decision making.

On metrics, issues to be tackled are³⁵:

- **Different metrics (e.g. MSA, extinction risk) are aimed at answering different questions,** understanding the questions they are aiming to answer, the business applications for which they are suitable and their strengths and limitations will be important for potential users of measurement approaches.
- **Dealing with impacts over time:** some approaches explicitly take into account environmental impacts or pressures that persist over time. How can persistent environmental impacts be taken into account by measurement approaches?
- **Linkages between approaches assessing impacts on biodiversity directly (and only) based on measures of biodiversity state and approaches using characterisation factors (i.e. models) linking pressures and economic activities to biodiversity state and thus impacts on biodiversity (not addressed in this paper)**

5.2 Corporate data inputs

5.2.1 Data mapping

Data sets used as inputs for impact assessments by different measurement approaches have common elements, but also some key differences (see Table 7). The data used by the different approaches may include some or all of the following:

- spatially explicit data on the **state** of biodiversity (usually from field surveys);

³⁴ See also UNEP-WCMC (on behalf of the Aligning Biodiversity Measures for Business initiative). 2019. Discussion Paper 1 for the Technical Workshop on Aligning Biodiversity Measures for Business: Identifying common ground between corporate biodiversity measurement approaches

³⁵ Defined as "A system or standard of measurement. A combination of measures or modelled elements". See UNEP-WCMC (on behalf of the Aligning Biodiversity Measures for Business initiative). 2019. Discussion Paper 1 for the Technical Workshop on Aligning Biodiversity Measures for Business: Identifying common ground between corporate biodiversity measurement approaches.

- **pressures** on biodiversity, resources and emissions: include data relative to pressures on biodiversity (climate change, land use change, etc.), companies' contribution to these pressures (e.g. raw material consumptions, GHG emissions) and companies' efforts to reduce their impact (e.g. management strategies);
- an **economic quantification** of human activities (financial data describing company activities e.g turnover, industries and countries of operation);
- **management response**.

A mapping of the externally collected data currently used by measurement approaches was conducted by CDC Biodiversité. Whilst incomplete, this is a useful resource which can be accessed [here](#).

Different datasets will be important depending on the business application and aims. Externally collected data often requires the use of user-collected data in order to be used in assessments. For instance EXIOBASE's environmental extensions³⁶ provide data on wheat production per million Euros in different parts of the world. This data can be used only associated to turnover figures, which are usually sourced from companies themselves (user-collected data).

5.2.2 Common input indicators

It will be important to converge on a set of common input indicators, as this will guide businesses on the data which needs to be collected and which datasets can be used for which measurement approach.

The guiding principles to build such common input datasets are that most of the measurement approaches should benefit from the data collected, the impacts which can be assessed if data are collected are material (and as much as possible can be acted upon), and an existing, widely used and robust nomenclature can be linked to the datasets.

Data on pressures will likely offer the greatest potential for convergence as all the measurement approaches in the 2019 assessment rely on pressure data at some point and pressure data can feasibly be collected by businesses at reasonable costs (unlike biodiversity state data).

Based on the results of the March 2019 workshop and follow-up discussions during webinars, the following provides a preliminary list of input indicator and nomenclatures which could be agreed upon:

- Land use, distinguishing between land use categories (e.g. from GLC2000) and between different land use intensities (since the impact on biodiversity of intensive agriculture is very different from extensive agriculture);
- Yearly greenhouse gas emissions, split by e.g. yearly emissions to air, water and land, by GHG and expressed in kg;
- Yearly water withdrawals and consumptions.

³⁶ <https://www.exiobase.eu/index.php/about-exiobase>

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Table 7: Data inputs currently used in biodiversity measurement approaches in relation to biodiversity state, pressure, resources and emissions, and economic impacts of human activities, split according to the source of the data, i.e. user-derived or externally collected. Please note that management response data is not considered here as it varies significantly between sectors and measurement approaches³⁷.

Biodiversity measurement approaches	State		Pressure, resources and emissions		Economic quantification of activities	
	User-derived	External collected	User-derived	External collected	User-derived	External collected
Global Biodiversity Score (GBS)	Integration of abundance data (ecological surveys) under consideration	To be updated	Company data on land use change, greenhouse gas (GHG) emissions, water consumption, nitrogen & phosphorous concentration, consumption of commodities, services or refined products inventories	GLOBIO's scenarios as proxy of current pressures, Food & Agriculture Organisation (FAO) data on yields, Aqueduct data on water consumption by watershed, US Geological Society data on mines around the world, EXIOBASE data on material consumption	Turnover and purchases by industry and region	Public financial reports, private database on turnover (e.g. ISS-oekom)
Biodiversity Impact Metric (BIM)	NA	To be updated	Company data on land use change	FAO data on yields if company data not available	NA	NA
Biodiversity Indicators for Extractives (BIE)	Company data on species or habitats identified as priority biodiversity features	IUCN Red List data, Global Critical Habitat Screening Layer and protected areas data all from the Integrated	Company data on pressures on habitats and species assessed qualitatively based on timing of pressure, proportion of population/habitat affected and severity of pressure	National or global averages of the same data if company data unavailable	NA	NA

³⁷ See also UNEP-WCMC (on behalf of the Aligning Biodiversity Measures for Business initiative). 2019. Discussion Paper 1 for the Technical Workshop on Aligning Biodiversity Measures for Business: Identifying common ground between corporate biodiversity measurement approaches

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Business @
Biodiversity

Biodiversity
Assessment Tool.

Product Biodiversity Footprint (PBF)	To be updated	To be updated	Company data on quantities & yields of agricultural products, processes and localisation data	To be updated	NA	NA
Biodiversity Footprint for Financial Institutions (BFFI)	To be updated	NA	NA	EXIOBASE data on resource (land occupation) and material consumption	Turnover and purchases by industry and region	Public financial reports, private database on turnover (e.g. ISS-oekom)
Species Threat Abatement and Recovery (STAR)	Company data on land use, landscape used for verification at the ex-ante baseline and ex-post stage	IUCN Red List and protected areas data	Company data on land use, landscape used for verification at the ex-ante baseline and ex-post stage, includes qualitative assessments of how threats would evolve due to actions implemented by the business assessed	Threat assessments from the IUCN Red List	NA	NA
Agrobiodiversity Index (ABD)	NA	NA	Company data on geospatial location of activities	NA	NA	NA
Biodiversity Footprint Calculator	NA	NA	Company data on land use change, GHG emissions	NA	NA	NA
LIFE Key (LIFE)	Ecological surveys (used in the management recommendations but	To be updated	Company data on land use change, GHG emissions, water consumed, pesticide use (not in index, used only	If real data not available, estimations can be used of the company's activities, GHG emissions, water consumption, energy source	NA	NA

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not directly in the
metric)

for management
recommendations).

and consumption, area type,
location and size and
pesticide use

5.2.3 Data quality

Accurate and precise **data** and **characterisation factors**³⁸ have to be used to limit uncertainties in assessments of biodiversity state (and thus impacts). **Accuracy** refers to how close an assessed value is to the actual (true) value. **Precision** refers to how close the assessed values are to each other (Figure 5Error! Reference source not found.). A precise assessment will for instance be able to claim that the assessed value is “15” and not just “in the range of 10 to 20”.

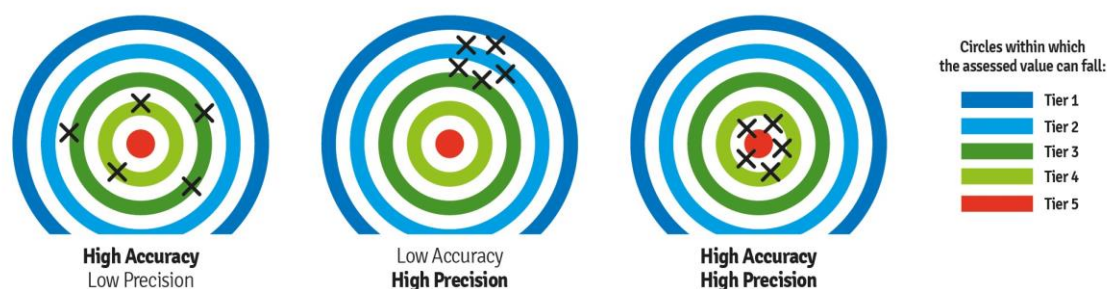


Figure 5: Use of data accuracy scale (or tier) to reflect data accuracy and precision.

Table 8 proposes a data accuracy scale, similar to and based upon the Intergovernmental Panel on Climate Change (IPCC’s) tier system, to describe the quality of characterisation factors³⁹. In order to quickly estimate the accuracy of the assessment of biodiversity state, real and modelled data are distinguished.

The data accuracy scales apply to characterisation factors, but, by extension, can be used to describe the quality of data sets and data inputs based on the quality of the best characterisation factors which can be used with these datasets or data inputs. For instance, if a data set contains changes from impervious to permeable land uses, at best, only level 3 characterisation factors can be used by approximating impervious and permeable land uses with habitats among the types used by the model. Conversely, if the data sets contained direct land use changes from the dose-response relationships⁴⁰, a level 4 characterisation factor could be used.

Another example would be a company providing a data input consisting of its wheat production and no spatial information (on the origin of the wheat): an average global yield would need to be used in order to assess the biodiversity impacts (to assess the land use for instance). Since yield is a linear factor and the yield is global (and not regional), it is associated with level 1. It should however be noted that it is the accuracy of characterisation factors and thus of the assessed (or measured) biodiversity state which is evaluated, not the accuracy of the data input itself. For instance, the level 4 (high accuracy of the assessed biodiversity state) awarded to the previous land use change example does not necessarily mean that the way these land use changes have been measured is accurate. Such data may have been

³⁸ Characterisation factors are defined here as “Values used in calculations (e.g. the Global Warming Potential of methane is a characterisation factor which allows calculation of how much kg CO₂-eq. is worth a kg of methane)”. See UNEP-WCMC (on behalf of the Aligning Biodiversity Measures for Business initiative). 2019. Discussion Paper 1 for the Technical Workshop on Aligning Biodiversity Measures for Business: Identifying common ground between corporate biodiversity measurement approaches.

³⁹ Values used in calculations (e.g. the Global Warming Potential of methane is a characterisation factor which allows calculation of how much kg CO₂-eq. is worth a kg of methane).

⁴⁰The risk of a defined outcome produced by a given amount of an agent or a level of exposure (<https://www.britannica.com/science/dose-response-relationship>)

measured through satellite monitoring or mapped through on-ground habitat mapping, which may have different accuracies.

To further improve the quality of the measurement approaches on top of such a real/modelled or data accuracy scale system, **uncertainties about the value of each measure should be quantified as much as possible**⁴¹. Uncertainties can be further broken down into different levels: inventory data, data in models, and modelled assumptions.

Table 8: Proposed data accuracy scales.

Real or modelled	Data accuracy scale	Description	Example for characterisation factors
Modelled	1	Simple linear approach. Level 1 characterisation factors are international defaults.	Average agricultural yield of wheat across the world.
	2	Region (country)-specific linear factors or more refined empirical estimation methodologies.	Average agricultural yield of wheat in Brazil.
	3	Impact factors derived from the use of relationships (equations) linking the impact source (for instance a land use change) to biodiversity impacts, with inputs requiring a translation into the appropriate typology.	Impact factors for data in formats requiring transformation to feed into dynamic bio-geophysical simulation models using multi-year time series and context-specific parameterization (such as GLOBIO).
	4	Impact factors derived from the use of direct relationships (equations) to biodiversity.	Impact factors for data that can directly feed into dynamic bio-geophysical simulation models using multi-year time series and context-specific parameterization (such as GLOBIO).
Real	5	Direct measurements of biodiversity state (no impact factor used) ⁴² .	

The data accuracy scale for 'real' data needs further refinement to reflect that data derived from direct measurement may also vary significantly in quality and accuracy. For example, directly measured data could be very old and therefore out of date. This will be further refined through the Aligning Biodiversity Measures for Business initiative.

⁴¹ Using a characterisation factor rated 5 on the data accuracy scale indeed does not mean that the impact assessment has the perfect accuracy: if the data are collected inaccurately, e.g. with insufficient line transects, then the assessment may still be inaccurate.

⁴² Direct measurements of biodiversity state are spatially explicit data. They include direct measurement conducted on-site by the company (user-collected data) and data from national or global data bases (externally-collected data). Examples of direct measurement approaches for species include observation (e.g., census, line transect, photo, video and audio), capture (e.g., traps, pitfalls), and marking (e.g., visual, collars and bands). Data on habitats are harder to classify as some approaches consider data on habitats to be proxies of the land use change pressure (it would thus be rated 4 at best). They include satellite imagery and ground-truthed data (based on site visits / on the ground sampling methods: e.g. random sampling, transect, quadrats, etc.).

5.3 Metrics and characterisation factors

5.3.1 Current issues on metrics and characterisation factors

Several initiatives seek to assess impacts on biodiversity, with two broad types of approaches used:

- The first approach assesses impacts on biodiversity directly (and only) based on measures of biodiversity state. It uses both on-site direct measurements and biodiversity data from global data sets, such as the IUCN species range maps.
- The second approach uses characterisation factors (i.e. models) linking pressures and economic activities to biodiversity state and thus impacts on biodiversity.
- Some approaches are hybrids and can use both direct biodiversity state data and pressure or economic activity data.

The measurement approaches using characterisation factors include more or less the same main pressures on biodiversity, identified by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) as land/sea use change, direct exploitation, invasive alien species, pollution, and climate change. Several steps are however needed to go from inputs (e.g. greenhouse gas or GHG emissions in kg CO₂ equivalent.) to biodiversity impacts (which could be called “endpoints” in life cycle assessment).

Some of the intermediaries (“midpoints”) are common to most biodiversity measurement approaches, for instance the global mean temperature increase is usually used to go from GHG emissions to the impact of climate on biodiversity. However, these midpoints are not always consistent between different biodiversity measurement approaches.

As Table 11 illustrates, three key sources of characterisation factors underpin a number of the methodologies: **GLOBIO**, **ReCiPe** and the **IUCN Red List**.

GLOBIO and ReCiPe are outlined in further detail in Annex 1 in the separate Annexes document.

5.3.2 Differences between metrics

Five main aggregate “metrics” are currently used to quantitatively aggregate impacts or dependencies: mean species abundance (MSA), potentially disappeared fraction of species (PDF), risk of extinction, aggregate index such as the biodiversity impact index (used by LIFE Key) and monetary value (e.g. euros). A sixth option, used by some measurement approaches, relies on qualitative aggregations of assessments. The LIFE Institute has a specific approach with the use of an index which combines measures in MSA with other indicators to calculate the biodiversity impact index which assesses whether companies meet a threshold and qualify or not for the LIFE certification.

Table 9 analyses the different approaches for aggregation and the limitations of each metric. Please note that the tables only include one natural capital assessment approach, i.e. Kering’s Environmental Profit and Loss account (EP&L). Other natural capital assessment approaches exist and involve quantitative and qualitative assessments which do not seek to conduct monetary valuations. This should be read in conjunction with Table 10 and Table 11 which provide an overview of the state and pressures covered by each measurement approach, and therefore further limitations with each approach.

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Table 9: Aggregation methods used by measurement approaches.

Metric [measurement approaches using the metric]	Aggregation method	Reasoning behind the aggregation	Limitations
Mean species abundance (MSA) [GBS, BIM, BF, LIFE]	Arithmetic mean of abundances (same weight for all species)	Equal weights are a good default and explicit weighting is also possible. Another aspect is that all species contribute to ecological functions and that redundancies provide an insurance policy against losses of ecological functions.	The use of characterisation factors instead of direct biodiversity state data increases uncertainties. The focus on ecological integrity means optimising MSA impacts can lead to the extinction of species already endangered. Lack of accepted ecosystem definitions leads to inconsistent interpretations of changes in value. Data coverage of ecosystems, and their linkages to threats, worldwide is patchy and least complete in areas of high biodiversity importance.
Potentially disappeared fraction (PDF) [BFFI, PBF]	Number of species (same weight for all species)	Similar to reasoning for MSA.	As above
Risk of extinction unit [STAR]	Sum of the risks of extinction of species weighted by their threat status	Threat status of species has been evaluated in a scientifically consistent, multi-stakeholder, global process. Presence of threatened species is an indication that the ecosystem is under pressure.	Focus on extinction risk means the optimisation (i.e. reduction) of the risk of extinction unit could lead to deterioration of previously healthy ecosystems (as they do not host any endangered species).
Biodiversity impact index [LIFE]	Arithmetic mean of 5 impact indexes considered as “pressures” on biodiversity (water; energy; emissions; waste; area)	Equal weights are a good default. Specific studies can guide different weightings.	The use of characterisation factors instead of direct biodiversity state data increases uncertainty. The use of an equal weighting for all 5 “pressures”, unrelated to their actual contribution to biodiversity loss, means optimising the biodiversity impact index could

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lead to a focus on “pressures” with a large impact on biodiversity.

Natural capital value (e.g. EUR) [Kering's EP&L]	Sum of the economic value of ecosystem services (i.e. more weight to more valuable services)	Economic valuation gives the expression of the worth of the benefits people gain from the environment. Using this assessment allows decision makers to better understand and address impacts, and prioritise actions. Valuation could be monetary or non-monetary.	The use of valuation techniques to assess monetary values increases uncertainties. The focus on the value for society of ecosystem services means optimisation of monetary value can lead to deterioration of parts of biodiversity that do not provide ecosystem services.
Qualitative/score card [BIE]	No single quantitative metric, with score cards used to identify risk areas - aggregation approach still to be determined.	State/pressure/response indicators are required to meet sites' needs and such indicators are difficult to aggregate quantitatively.	Collecting primary data on biodiversity state at a large scale is very costly, and secondary data on biodiversity state are insufficient (e.g. usually lack abundance data) to systematically and properly assess biodiversity impacts.

Table 10: State of biodiversity covered by each measurement approach

Metric [initiatives using the metric]	State of biodiversity covered	Reasons why some state of biodiversity are not covered	Capacity to assess biodiversity state based on ecological surveys (direct measurements)
Mean species abundance (MSA) [GBS, BIM, BF, LIFE]	Terrestrial and aquatic (freshwater)	No endpoint characterisation factors for marine biodiversity	Possible in theory
Potentially disappeared fraction (PDF) [BFFI, PBF]	Terrestrial, aquatic (freshwater) and marine		For PBF: not possible. For BFFI: to be determined.

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Risk of extinction unit [STAR]	Terrestrial, aquatic (freshwater) and marine		Possible
Biodiversity impact index [LIFE]	Terrestrial and marine	No endpoint characterisation factors for freshwater	Same as for MSA (since it is used in the Biodiversity impact index calculation)
Natural capital value (e.g. EUR) [Kering's EP&L]	Terrestrial only		Likely to be challenging given that values of biodiversity are known not to be well represented currently into natural capital assessments. However data on habitats (type of ecoregion) may be used to refine assessments.
Qualitative/score card [BIE]	Terrestrial, aquatic (freshwater) and marine?		Possible

Table 11. Impacts on biodiversity, and associated pressures, covered due to the impacts on biodiversity's characterisation factors available for each metric

Impacts on biodiversity's characterisation factors and associated capacity to assess the biodiversity impact of pressures							
Metric [initiatives using the metric]	Characterisation factors	Land / sea use change	Direct exploitation ⁴³	Invasive alien species	Pollution	Climate change	Other
Mean species abundance (MSA) [GBS, BIM, BF, LIFE]	GLOBIO's pressure-impact relationships	Land use, Fragmentation, Encroachment, Hydrological disturbance, Wetland conversion	Not covered directly	Not covered	Atmospheric nitrogen deposition, Nutrient emissions, Land use change in catchment	Climate change	

⁴³ In the assessment conducted within the ABMB project, "direct exploitation" was considered to include only overexploitation of biodiversity (e.g. over-fishing). The assessment will be updated in the future, since the IPBES actually also include the impacts of the exploitation of water, etc. in the "direct exploitation" pressure. Several metrics do take into account the impact on biodiversity of the over-exploitation of water, etc. and should thus not be rated as "Not covered".

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Potentially disappeared fraction (PDF) [BFFI, PBF]	ReCiPe or LC Impact's characterisation factors	Land occupation, Land transformation, (regional) Water scarcity	Not covered	Not covered	Terrestrial ecotoxicity, Terrestrial acidification, Marine ecotoxicity, Marine eutrophication, Freshwater eutrophication, Freshwater ecotoxicity	Climate change	
Risk of extinction unit [STAR]	No characterisation factor but assessment of the level of pressures through the IUCN Red List	Residential & Commercial Development, Agriculture & Aquaculture, Energy Production & Mining, Transportation & Service Corridors, Human Intrusions & Disturbance, Natural System Modifications	Biological Resource Use	Invasive & Problematic Species, Pathogens & Genes	Pollution	Climate Change	Geological Events
Biodiversity impact index [LIFE]	LIFE evaluation for waste destination impact on biodiversity. LIFE evaluation of energy matrix impact on biodiversity.	Cf. MSA's terrestrial pressures	Not covered directly	Not covered by the biodiversity impact index metric because is not an information applied for all sectors (but assessed as a management	Emissions	Climate change	

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indicator for
LIFE certified
companies)

Natural capital value (e.g. EUR) [Kering's EP&L]	No characterisation factor
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Qualitative/score card [BIE]	No characterisation factor ⁴⁴
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⁴⁴ The level of pressure is nonetheless assessed based on site documentation.

The different metrics and aggregation approaches meet different needs and answer different questions such as:

- MSA and PDF: how best to maintain global functional diversity?
- Risk of extinction unit: what are the conservation actions with the highest potential to prevent species extinction?
- Biodiversity impact index: how to determine the extent of actions which should be implemented in proportion to a company's impact on biodiversity?
- Natural capital monetary or non-monetary value: what are the impacts on other people's dependencies?
- Elementary units specific to taxa or habitats: how to ensure site-level no net loss?

To assess the consequences for decision making, it is useful to consider an example. The examples in Box 1 shows the importance of complementary qualitative analyses and environmental safeguards, including the strict need to implement approaches compatible with the mitigation hierarchy at the site level. The examples also highlight the need to have multiple measures to ensure an appropriate decision is made.

Box 1: The implication of using different measurement approaches for decision making

Example 1: a company considers transforming two patches of natural forest into intensive agriculture.

Two patches of forest are considered for development – forest A and forest B. In the example, both are large patches of contiguous intact forest with healthy ecosystems. Forest A hosts a few hundred species and only one endangered species while Forest B hosts a couple of thousands of species and many endangered species. Intactness metrics like MSA and PDF will consider both forests equivalent because they are both undisturbed. So the company might decide to cut down the Forest B. Species-focused metrics like the risk of extinction will value the Forest B more because of its high number of species and in particular endangered species. Results from ecosystem service metrics like the natural capital value will depend on the potential beneficiaries of the services provided by both forests.

Example 2: another company is considering developing an undisturbed grassland with a few dozen species and no endangered species, far from any human activity.

Intactness metrics will warn against the destruction of this undisturbed area. Species-focused metrics will conversely consider the low number of species means losses are limited. Ecosystem service metrics will similarly consider the lack of beneficiaries mean this ecosystem has a low value. However, the development of such an ecosystem would still lead to the complete loss of ecological functions, and potentially put at risk the survival of species whose habitats would be destroyed.

5.3.3 Long-lasting impacts

Another significant difference between approaches lies in how they deal with long-lasting impacts such as the impact of GHG emissions on climate change. Such gases continue to warm the climate dozens (or even hundreds) of years after their emissions, well beyond the usual timeframe of most assessments. Tools using the PDF unit [BFFI, PBF] deal with this question by integrating impacts over time. Other tools like the GBS do not integrate over time but nonetheless take into account the persistence of impacts through the distinction of a dynamic and a static footprint. These two approaches are illustrated in Figure 6. The majority of other approaches currently do not have a specific approach to account for the persistence of some impacts. The Aligning Biodiversity Measures for Business initiative recognizes the importance of taking into account the persistence of impacts over time and the need for each measurement approach to clarify how it currently deals with this issue.

This issue has consequences in terms of the units used (PDF.m².yr or PDF.m² for instance) and the values reported (much higher if time-integrated assessments are used). It therefore affects the capacity of non-expert stakeholders to understand the results but also how targets should be set (e.g. time-integrated targets need to be set if the methodology integrates results over time).

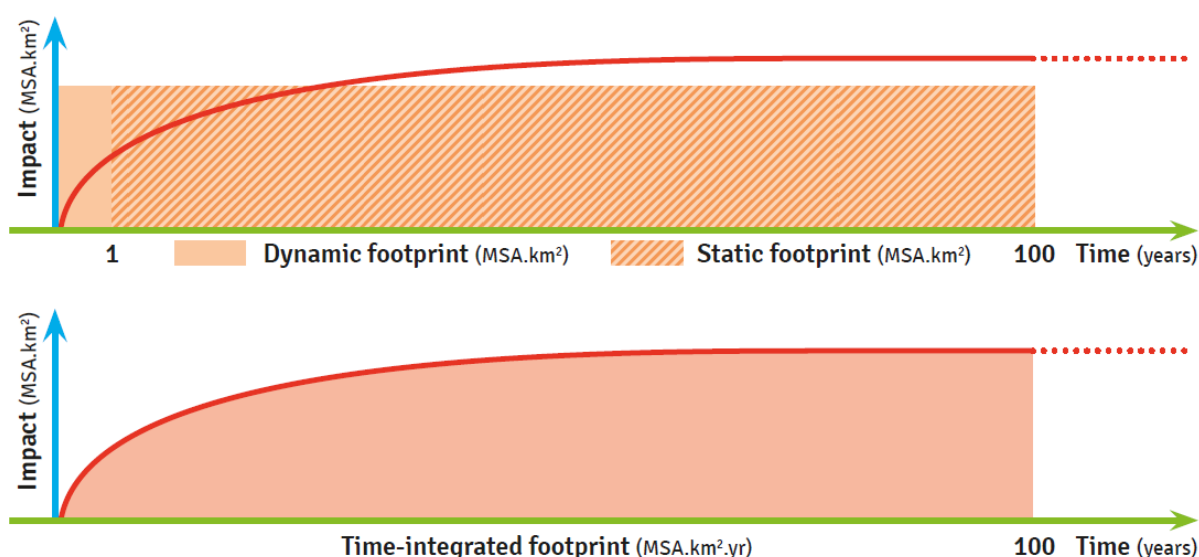


Figure 6: Illustration of two approaches to account for persistent effects over time (CDC Biodiversité, 2019).

5.3.4 Linking metrics focused on elementary components of biodiversity and aggregated metrics

A more useful distinction than linking site level and portfolio approaches might be to explore linking metrics focused on elementary components of biodiversity (taxa and habitats, e.g. the number of individuals of a given species) and aggregated, pressure (or economic activity)-based metrics. There are three ways in which these two approaches are linked (see Figure 7):

- Data on the abundance and richness of species can, if comprehensive enough, be aggregated into metrics such as the MSA;
- Approaches using aggregated metrics could push businesses to collect direct measurements on their sites in order to satisfy screening and “environmental safeguards”;
- Data inputs useful for approaches using pressure and economic activities (e.g. land use in ha, water consumption, etc.) could be collected by approaches focusing on taxa and habitats.

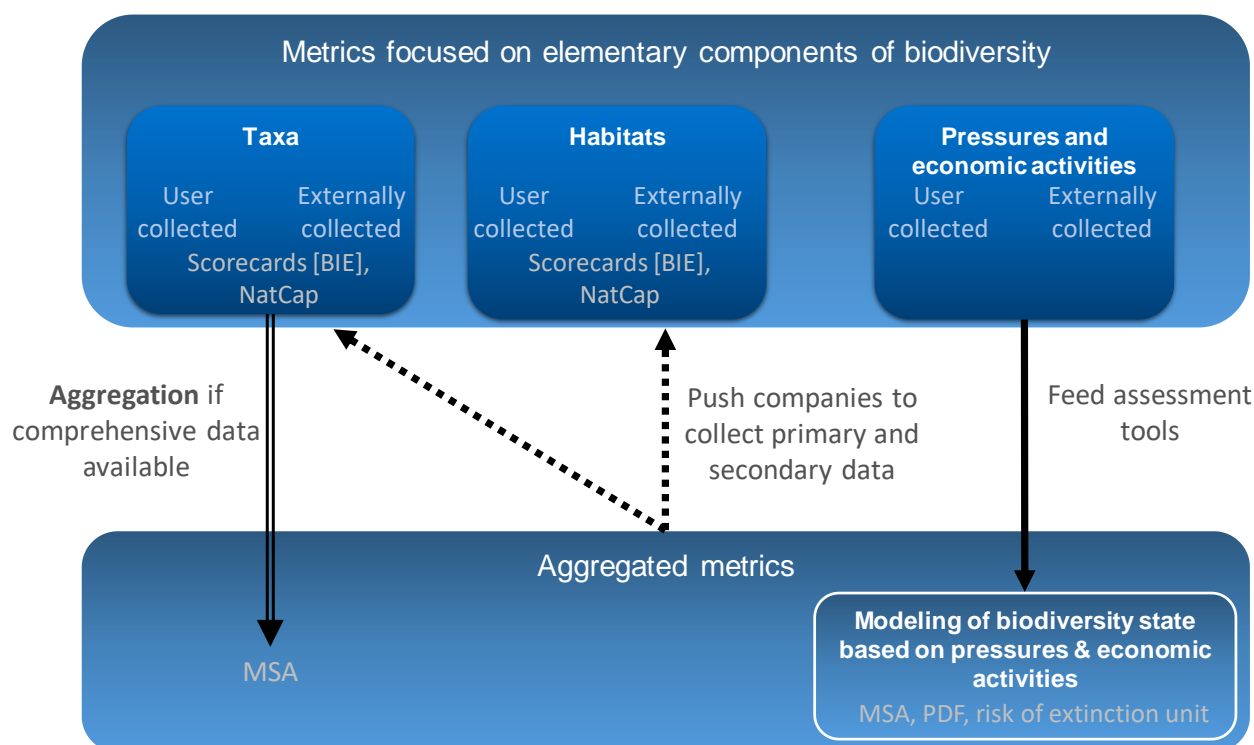


Figure 7: Links between approaches focusing on elementary components of biodiversity and approaches using aggregated metrics.

5.4 Next steps

The findings and proposals related to corporate data inputs, characterisation factors and metrics will be further discussed and refined in updated position papers from the ABMB subgroup. The following topics have been identified as requiring further work:

Corporate data inputs

1. Enhancement of the data mapping spreadsheet to include more data sources, this mapping could also be linked to the data accuracy scale.
2. Further refinement of the common input indicators (core data requirements) is needed to come up with a list of input indicators businesses should all collect.
3. Refinement of the data accuracy scale especially regarding direct measurements of biodiversity state, but also to reflect that there are different levels of quality of directly measured data and to include guidance on how the scale can be applied by developers or users in their application of measurement approaches.

Characterisation factors and metrics

1. It will be important to understand what metrics can be used in which context and for which business application/ decision. The Platform will explore this issue in more detail.
2. Further understanding of how approaches based on measures of biodiversity state and approaches using characterisation factors (i.e. models) linking pressures and economic activities to biodiversity state can link and complement each other, ideally through a joint pilot between 2 or more different measurement approaches.

Recommendations for developers of measurement approaches:

- Contribute to the refinement of the data accuracy scale outlined above.

- Identify and disclose key data inputs into the assessment and ensure that data gaps, uncertainties and limitations are clearly communicated.
- Support the development of common input indicators across measurement approaches by including some input indicators in the list of data requested to companies even if they are not directly useful to your approach.
- Explore how links between different types of data (modelled and measured) can complement each other.
- Be transparent about the strengths and weaknesses of the metric being employed by your approach.

Recommendations for users of measurement approaches:

- Identify your material biodiversity issues (risks and opportunities): for these issues decide on the best way to measure them (you might need different measurement approaches and different metrics according to the type of business application and the organisational focus area)
- Collect the input indicators (data inputs) necessary to produce accurate and relevant assessments.
- Be aware of the pressures and types of biodiversity covered by the characterisation factors (or the use of direct measurements of biodiversity state) available to each measurement approach and the implications for decision making.
- Understand the metrics being employed by different measurement approaches, the questions they are designed to address and how this reflects the objectives of your own assessment.

6 DISCLOSURE

This chapter focuses on how biodiversity measurement approaches can play a role in external disclosure. It is based on the findings and outputs so far of Subgroup 4 of the ABMB initiative⁴⁵.

6.1 Developments in corporate biodiversity disclosure

The quality of biodiversity information disclosed by companies is currently poor, with a focus on management narratives and little quantitative, non-monetary information. To effectively report on biodiversity, changes in its status (extent and condition) due to corporate activities and those of others must be measured and disclosed. Current disclosures do not enable a picture of corporate risk exposure and performance to be formed.

Drivers are increasing for companies to disclose their impacts on biodiversity. Some key developments include:

- A growing momentum behind the concept of a Task Force for Nature Impacts Disclosure proposed by Axa and WWF for the G7 in 2019⁴⁶ and based on the Task Force for Climate Disclosure (TFCD) that would require disclosure of material biodiversity related risks;
- The integration of biodiversity and ecosystem services into the EU Sustainable Finance Action Plan sustainable finance taxonomy and associated requirements for more comprehensive corporate reporting on environmental, social and governance issues;
- A move towards mandatory disclosure of corporate biodiversity footprints in France;
- A proposed review of the Global Reporting Initiative (GRI) indicators on biodiversity; and
- Exploration of the potential for a science based target for biodiversity in the lead up to the revision of the global biodiversity policy framework in 2020.

None of these initiatives as yet propose concrete disclosure requirements or measurement methodologies. Hence there is the potential for the biodiversity measurement approaches described within this document to play a role in enhancing corporate biodiversity disclosure.

6.2 Biodiversity measurement approaches and corporate disclosure

Although many of the measurement approaches were designed primarily to provide management information to inform internal decisions rather than for public disclosure purposes, they can nonetheless play a role in disclosure. and hence may help companies communicate their contributions to the SDGs and the future Post-2020 Global Biodiversity Framework under the CBD.

6.2.1 How measurement approaches are reflecting corporate disclosure needs

A key challenge around effectively reporting on a company's biodiversity impact is that it requires extensive effort to monitor the state and condition of biodiversity at given locations.

The biodiversity measurement approaches analysed in this project provide ways of measuring state and/or condition, which will enable companies to assess the scale of their impacts on biodiversity. This is the critical piece of information missing from current corporate biodiversity disclosures⁴⁷. By assessing the scale of

⁴⁵ See UNEP-WCMC. 2019. Corporate biodiversity measurement approaches within the current and future global policy context (A discussion paper).

⁴⁶

https://d2ouvy59p0dg6k.cloudfront.net/downloads/report_wwf_france__axa_into_the_wild_may_2019__dv_1.pdf

⁴⁷ Addison, P.F.E., Bull, J.W. and Milner-Gulland, E.J. (2018a). 'Using conservation science to advance corporate biodiversity accountability'. Conservation Biology. <https://doi.org/10.1111/cobi.13190>

companies' impacts, reporting organisations will be better positioned to adopt/define biodiversity policies, strategies and science-based targets, as well as to disclose the scale of their risks/exposure and opportunities.

However, biodiversity measurement approaches have some key differences:

- Different output data or key performance indicators; some focus on impacts on ecosystems/habitats/land cover (e.g. BFFI, GBS, PBF), while others focus on species (e.g. STAR) or monetary values (e.g. EP&L).
- Some approaches model or extrapolate biodiversity impacts from indirect environmental pressure (e.g. GHG emissions and water use) or economic data (e.g. spending on specific commodities) (e.g. BFFI, EP&L, GBS, PBF),
- Others use primary and secondary biodiversity data (e.g. inventory of ecosystem extent and condition) to measure actual changes in biodiversity (e.g. BIE).

In the case of approaches based on indirect non-biodiversity pressure and/or economic input data, some experts argue that they cannot be responsive to site-level management intervention, as they are not based on actual biodiversity data and/or legislative requirements (e.g. no-net-loss for a protected species). They are not designed to ascertain the effectiveness of mitigation efforts on the ground for a specific project or site (e.g. ensuring the ecological equivalency principle is respected for no-net-loss or net gain targets as part of permitting requirements). While site level data is required to accurately assess a change in biodiversity state, gathering site level data may be difficult and/or costly for some business applications (e.g. sector wide impact assessment, supply risk analysis, portfolio risk assessment). Hence, for these applications, the use of global data sets and extrapolations may be the only cost-effective means by which measurement of biodiversity impacts can be undertaken. Improving the resolution and coverage of global data would go some way to addressing these challenges. Each measurement approach is therefore likely to have a varying role in disclosure, e.g. the need to disclose identification and management of risk or the need to disclose effectiveness of impact mitigation responses.

Measurement approaches focus on different dimensions of biodiversity (e.g. species versus loss of habitats) and have different underlying methodologies. These variations make it particularly important that approaches are transparent in their scope, limitations and their implications for decision making

To gain greater clarity on how they could each be used for external disclosure purposes, developers of measurement approaches were asked to indicate whether their approach was able to deliver against external disclosure and policy target requirements. The results are depicted in Table 12 below.

Table 12: The utility of biodiversity measurement approaches for external disclosure and reporting against policy targets based on information provided by developers as part of the work under the Natural Capital Accounting workstream of the EU B@B Platform.

Measurement approach			External disclosure	Policy targets
Agrobiodiversity Index			Allows comparison of company performance, but not yet adapted or tested for companies	Can help monitor company's contribution to the global development goals and targets related to agrobiodiversity. In particular Aichi Target 7 related to sustainable agriculture.
Biodiversity Institutions	Footprint	Financial	Not designed to reflect external reporting requirements. This may change if biodiversity reporting requirements for financial institutions are introduced.	Not designed to reflect or link into global targets on biodiversity. However, a financial institution can link the footprint result to references like the Aichi targets and SDGs to decide on the steps they should take based on the footprint results.
Biodiversity Impact Metric			Not designed to reflect reporting requirements, could be used for external reporting. Does not provide insight into overall performance but can	Consistent with monitoring and measuring impacts related to SDG15

	provide indication of where potential issues/risks might lie in the supply chain. Consistent	
Biodiversity Indicators for Extractives	Primarily designed for internal management purposes. The possibility of adapting indicators to meet external reporting needs will be explored once piloting has been completed at the end of 2019.	Can link to corporate contributions to Sustainable Development Goal targets, for example 15.5 or Aichi Targets.
Biodiversity Performance Tool for Food Sector	Not designed for external disclosure at corporate level but to assess farm level performance.	Direct link to SDG 15 “protect, restore and promote biodiversity on land”.
Global Biodiversity Score	Could potentially be used for external disclosure, responsive to French national government move towards requiring corporate biodiversity footprints.	Can help quantitatively track targets, including Aichi Targets 4, 5 and 7, as well as SDGs 12.4, 15.2 and 15.5.
Life Key	Organizations using the Methodology may use detailed reports for their internal management and disclosure, particularly after third party audits. The LIFE certification is designed to allow third party assessment and disclosure of biodiversity performance. Independent certification bodies are required to publish reports of LIFE companies containing their metrics.	Designed for global targets such as: <ul style="list-style-type: none"> • Aichi Targets: see Principle 7 of LIFE Biodiversity Management Standards. • Global targets on biodiversity: Ecoregions classification and fragility; national biodiversity priorities; IUCN protected areas classification. • SDGs.
Product Biodiversity Footprint	Methodology is product level, and not appropriate for corporate disclosure unless the company produces a limited number of products and services and the impact of each is added.	Not suitable for tracking progress to high level societal targets such as Aichi targets.
Species Threat Abatement and Recovery metric	Not designed for corporate reporting, but could be adapted for this.	Exploring means by which approach can be linked into Post-2020 Global Biodiversity Framework targets

There is the need for clear targets to encourage broader uptake of the measurement approaches. However, merely ‘contributing to global targets’ might not change behaviour significantly. Ultimately, there is the need to determine how the transition can be made from aiming to meet policy targets to enacting regulatory requirements to drive broad scale behavioural change.

6.2.2 Using an accounting framework for disclosure

Different measurement approaches have different levels of transparency. Although they aim to measure biodiversity impacts or footprint, they are not placed within the context of an accounting framework. Without such a framework there will be limited ability for such approaches to demonstrate a comprehensive picture of performance at a corporate level that is consistent with financial accounting. Clearly it is not the intention of some measurement approaches to measure corporate performance, however, for those that do, the Biological

Diversity Protocol could provide this consistent, financial accounting based framework (see Box 2). It is therefore used here as a case study example of the principles which must be addressed by such a framework.

Box 2: The Biological Diversity Protocol - a case study

The BD Protocol is an accounting framework compatible with the measurement approaches that use primary and secondary biodiversity data, giving it direct relevance to corporate reporting. It is currently in draft and will be reworked following stakeholder feedback¹. The BD Protocol is compatible with the Natural Capital Protocol and shares a similar intent as the Greenhouse Gas (GHG) Protocol which was developed to drive consistency in the development of GHG inventories and disclosure. Based on the mitigation hierarchy (hence compatible with legislative requirements related to protected species and habitat, and CBD based on COP decision 14/3) and core accounting and reporting principles (e.g. ecological equivalency, accuracy, transparency), it aims to provide biodiversity information users with the reasonable confidence that a company's biodiversity disclosure (e.g., impacts and performance) can be/has been verified on the ground, in line with many other environmental disclosure mechanisms (e.g. GRI and CDP).

The BD Protocol is based on the assumption that, for any impact accounting framework to present a complete and accurate representation of the net consequences of an organisation, it must be able to account for both periodic (e.g. annual) and historical (e.g. since the start of a business) performance. This is the case with financial accounting and reporting, which uses double-entry bookkeeping (DEBK) to produce Statements of Financial Position and Performance (i.e. Balance Sheet and Profit/Loss Statement).

To help provide a comprehensive audit trail of the biodiversity impacts of an organisation, the BD Protocol embraces an accounting framework that is based on a biodiversity impact inventory (similar to a GHG emissions inventory) and enables the measurement of net impacts over time. This involves the development of biodiversity accounts which record and allow the monitoring of both periodic and accumulated changes in biodiversity (for both impacts on ecosystems/habitats/land cover and species). The BD Protocol adapts DEBK to that end. Accounting for biodiversity impacts revolves around the following equations:

- **Statement of Biodiversity Position:** (A) total biodiversity impacts (i.e. biodiversity assets or stocks) = (B) accumulated positive impacts + (C) accumulated negative impacts;
- **Statement of Biodiversity Performance:** (E) net biodiversity impacts over the accounting period = (F) periodic positive impacts or gains - (G) periodic negative impacts or losses.

The BD Protocol can be used by biodiversity measurement approaches to produce Statements of Biodiversity Position and Performance. The draft BD Protocol currently requires adherence to a number of accounting and reporting principles, which include building a biodiversity impact inventory based on primary and secondary, site-based biodiversity data. Some biodiversity measurement approaches (e.g., those relying on biodiversity pressure and economic data to model biodiversity impacts) cannot be applied in the context of the draft BD Protocol (V. 1.0) at this stage.

6.3 Next steps

Future work is required to enhance the quality and uptake of corporate biodiversity disclosure. Understanding how different measurement approaches can use the principles and concepts set out in the BDP or similar tools will be important to ensure their use for credible public disclosure. As they evolve, it will be important to understand how existing biodiversity measurement approaches and frameworks can help to improve corporate disclosure and reporting against national/global policy targets. Clarity on this point will help companies assess how well different approaches meet their disclosure needs.

Recommendations for developers of measurement approaches:

- Consider the role that your approach can play in public disclosures and the information required to ensure that the user of the information derived from the application of the approach has reasonable assurance over its quality and measure

- Draw on the guidance on principles, scope, boundaries etc laid out in the draft Biological Diversity Protocol to enhance the value of the approach for public disclosure
- For measurement approaches for which public disclosure is a target business application, contribute to revisions of appropriate reporting guidance e.g. the Global Reporting Initiative

Recommendations for users of measurement approaches:

- If public disclosure is a key business application, ensure that the measurement approach you select has been designed with this application in mind and in particular that the approach is transparent regarding its limitations etc
- Consider setting out a roadmap for public disclosure that starts with a more restricted level of disclosure and aspiring to complete, rigorous and accurate disclosure

COLOPHON

ASSESSMENT OF BIODIVERSITY MEASUREMENT APPROACHES FOR BUSINESSES AND FINANCIAL INSTITUTIONS

UPDATE 2 REPORT BY EU BUSINESS @ BIODIVERSITY PLATFORM

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DATE

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ABOUT THE EU B@B PLATFORM

The EU B@B Platform is a forum for dialogue and policy interface to discuss the links between business and biodiversity at EU level. It was set up by the European Commission with the aim to work with and help businesses integrate natural capital and biodiversity considerations into business practices. The EU B@B Platform focuses its work on three thematic workstreams: Natural Capital Accounting, Innovation and Finance. ICF is supporting the European Commission in running the EU B@B Platform since 2013. Arcadis is leading the Natural Capital Workstream.

ABOUT ALIGNING BIODIVERSITY MEASURES FOR BUSINESS

The Aligning Biodiversity Measures for Business initiative aims to form a common view amongst key stakeholders on the measurement, monitoring and disclosure of corporate biodiversity impacts and dependencies. It will encourage the development of more credible indicators of corporate contribution to global biodiversity goals into corporate reporting and global policy frameworks. Organisations engaging in the initiative include: IUCN, Cambridge University (Cambridge Institute for Sustainability Leadership), The Nature Conservancy, the European Business @ Biodiversity Platform, CDC Biodiversité, PRé, CREM, Fauna & Flora International, Conservation International, Biodiversity International, The Biodiversity Consultancy, Arcadis, Endangered Wildlife Trust, PBL Netherlands Environment Assessment Agency, the Natural Capital Coalition, Ecoacsa, Global Nature Fund and Arizona State University