Taking biodiversity into account

PBAF Standard v 2022
Biodiversity impact
assessment -
Overview of approaches

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Through the PBAF Standard v2022, we share the results of discussions between PBAF Partners (financial institutions) on biodiversity impact assessment with other interested parties.
We encourage financial institutions to adopt biodiversity impact assessment as a positive step towards a biodiversity inclusive way of operating. We encourage methodology developers and data providers to align approaches, meeting the PBAF requirements and recommendations presented.

The PBAF Standard v2022 consists of three separate publications:
- PBAF Q&A – Introduction to biodiversity impact assessment
- PBAF Standard v2022 Biodiversity impact assessment – Overview of approaches
- PBAF Standard v2022 Biodiversity impact assessment – Footprinting

An overview of PBAF Partners and Supporters can be found on the PBAF website (**www.pbafglobal.com**)

PBAF is an independent foundation based in the Netherlands and is co–funded by the PBAF Partners and the IKEA Foundation.

We welcome financial institutions to join the PBAF initiative. For more information, visit the PBAF website (**www.pbafglobal.com**) or contact Roel Nozeman, Senior Advisor Biodiversity ASN Bank and PBAF Program Director (**roel.nozeman@asnbank.nl**)

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Foreword Martin Lok

In 2015, when I was leading the Green Growth project at the Netherlands' Ministry of Economic Affairs, I invited Piet Sprengers, today's Chairman of the Board of the PBAF Foundation, to speak at an informal round table discussion in the Ministry. It was a couple of weeks before the Climate Summit in Paris and the topic was innovation. To inspire policy makers, I wanted Piet to share his bank's carbon strategy.

"We have chosen an ambitious carbon target", he told the audience, "not because it is achievable, but because it's necessary." This boldness amazed the audience. Their eyes even widened further when he continued and said that the metrics to track progress where not yet available. "But we have developed a first attempt to calculate our carbon footprint and we are initiating a collaborative platform with like-minded financials to improve it" were his closing remarks.
The audience was flabbergasted, but many of them were also inspired. Doing what must be done and using collaboration to learn how to do it simply was a too compelling narrative not to be loved.

Since 2015, carbon accounting by financials accelerated enormously, and 269 financial institutions globally have now committed to measure and disclose the greenhouse gas emissions associated with their portfolio of loans and investments, using a methodology that was developed collectively. History is now repeating itself. We are witnessing the start of a similar acceleration for biodiversity and the Partnership Biodiversity Accounting Financials (PBAF) is acting to catalyze this. Again, the ingredients of success are the courage to do what must be done, flavored with a hefty pinch of collaboration to create standardized metrics for assessing the biodiversity footprint of a financial portfolio. Metrics that may not yet be perfect but are good enough to apply to direct action to deliver benefits for nature and investment.

To ensure that the PBAF collaboration is carefully crafted, fair, and fit for purpose, a legal entity has been established, the Partnership Biodiversity Accounting Financials Foundation, with a clear governance structure to clarify the responsibilities of all partners. And to provide the fuel that is necessary for a good collaborative process, financial support has been secured and kindly provided by the IKEA Foundation. A support for which the Board and the Partnership are grateful.

In the last year the PBAF community has gone from strength to strength, collaborating to identify, share and address challenges, building capacity to understand and apply biodiversity measurement and working to address gaps and improve the biodiversity measurement for the finance sector. This has in turn has contributed to the outcome that is now available: The PBAF Standard v2022. Compared to 2015 we are ahead of the game. The first standard for biodiversity measurement by financials is now out, while the Nature Summit in Kunming (China) has yet to take place. Kunming will bring a new global biodiversity policy framework and increasing expectations of the finance sector to channel financial flows to deliver positive outcomes for nature. The standard — shaped with and by the industry and its stakeholders — gives a starting point for how finance institutions can understand the implications of the loss of nature for their investments and act to address it. The signal is clear: the finance community is ready for the great acceleration.

Martin Lok

Board Member of the PBAF Foundation

Foreword
Elizabeth Maruma Mrema

It is often said that you need measurement to manage effectively, and this is particularly true in the financial sector with its laser focus on risk and returns. It is therefore great to see the efforts of the Partnership for Biodiversity Accounting Financials, which is a major contribution from the financial sector to halting and reversing loss of biodiversity.

The PBAF Standard v2022 builds on the awareness in the financial sector that the loss of biodiversity constitutes a material risk, and the growing experience with risk and impact assessment among front runners. Many PBAF members have been using the framework in the agricultural lending, to move from assessing risks to generating positive impacts. The PBAF Standard vs2022 structures existing efforts and brings new thinking to the topic and provides valuable building blocks for further work in this field. It covers even further beyond the risk management angle to the opportunities for positive impact. It is particularly exciting to see that the standard is industry led, building on the practical experiences of 30 financial institutions in 7 countries. It feeds in concrete experiences to the development of the Taskforce on Nature-related Financial Disclosures (TNFD).

As co-chair of the TNFD, I am very pleased to see the close alignment between PBAF v2022 and the evolving TNFD framework, and I support further harmonization in this field of biodiversity impact assessment. This will prove to be an important prerequisite for the much-needed standardization, regulation and implementation of biodiversity accounting in the financial and business sector. Financial institutions should find the PBAF v2022 a very practical resource as they pilot test the TNFD beta framework in the year ahead.

This year is a particularly important year for biodiversity with the second part of the Conference of the Parties, or 'COP 15.2', due to take place. The Global Biodiversity Framework will emerge from this event to set out an ambitious plan to implement broad-based action to bring about a transformation in society's relationship with biodiversity. Through this, all parts of society need to work together in an integrated manner to ensure that by 2050 the shared vision of 'living in harmony with nature' is fulfilled. With transformative change needed on every single level of our economies, I appreciate the contributions of PBAF to this vision.

I hope and expect this publication will receive wide support and application and will trigger financial institutions to increase their efforts in assessing their impacts on biodiversity, and to join the TNFD Forum to contribute to industry-wide efforts for shifting finance away from nature-negative and towards nature-positive.

Sincerely,

Elizabeth Maruma Mrema

Co-Chair, Taskforce on Nature-Related Financial Disclosure (TNFD),
UN Assistant Secretary General & Executive Secretary, Secretariat of the
Convention on Biological Diversity

Contents

About this document

Through their loans and investments, financial institutions can play a key role in the conservation and sustainable use of biodiversity, contributing not only to the goals and targets of the 'Post-2020 Global Biodiversity Framework' of the Convention on Biological Diversity (CBD), but also to a reduction of invest-ment risks. To take up this role, science-based, reliable information on how finance impacts ánd depends on biodiversity is an important precondition.

It is against this background that the Partnership for Biodiversity Accounting Financials (PBAF), a partnership of financial institutions initiated in 2019, is developing the 'PBAF Standard'. The PBAF Standard aims to provide guidance to financial institutions on biodiversity impact and dependency assessment and to define what is needed for these assessments to deliver the right information to financial institutions. In the development of its Standard, PBAF aligns and cooperates with other key initiatives. This includes (but is not limited to) the Taskforce on Nature Related Financial Disclosures (TNFD), the European Align initiative and the Finance for Biodiver-sity Pledge.

The focus of the 'PBAF Standard v2022' is on impact assessment (with dependencies included in future revisions) and offers three separate publications: (1) a Q&A on impact assessment, (2) an Overview of impact assessment approaches and assessment of positive impact and (3) guidance, requirements, and recommendations on biodiversity Footprinting.
The Overview of approaches is the focus of this publication.

A variety of impact assessment approaches can be used to assess the (potential or actual) impacts of loans and investments on biodiversity. On the level of a portfolio, an asset class, a company, or a project. Biodiversity impact assessment approaches can be based on the identifi-cation of impact drivers, on the ecological characteristics of the impact location, or on a combi-nation of both. The PBAF Standard v2022 distinguishes five types of impact assessment:

- *Screening of a potential impact* on biodiversity, based on (a) Qualitative information on impact drivers, (b) Asset location and geospatial biodiversity data, (c) Information on impact drivers & geospatial biodiversity data and/or (d) A quantified biodiversity footprint.
- *Measuring actual impact* on biodiversity, based on monitoring of actual changes in biodiver-sity and an attribution of these changes to interventions/actions financed.

These impact assessment approaches can be used for different purposes, at different stages of the loan and investment process. In practice, they can complement each other and are often combined. For example: identification of high-risk sectors on a portfolio level (using sector specific information on impact drivers), followed by a screening of location-related impact risks for individual loans and investments (using geospatial biodiversity data). In this document, guidance is provided on each of these approaches, highlighting some of the tools available and how they can be used.

In addition, this document provides guidance on the assessment of positive impact, starting with project finance. When can a loan or investment be counted as having positive impact on biodiversity? How can it be assessed and reported on? The field of work around 'positive impact on biodiversity' and concepts like 'nature-positive' are developing fast. PBAF does not claim to have the final definitions or wording on this topic. Instead, questions and challenges surroun-ding positive impact are discussed, and requirements and recommendations when claiming positive impact are proposed.

Over the next year, PBAF will take the conversations on this topic forward both within the PBAF Working Groups and in cooperation and alignment with related initiatives.

The document concludes with 'next steps'. Impact assessment is not a goal in itself, but serves a purpose, like the development of a biodiversity policy or engagement with investees. Impact assessment can help financial institutions take biodiversity into account.

1 Introduction
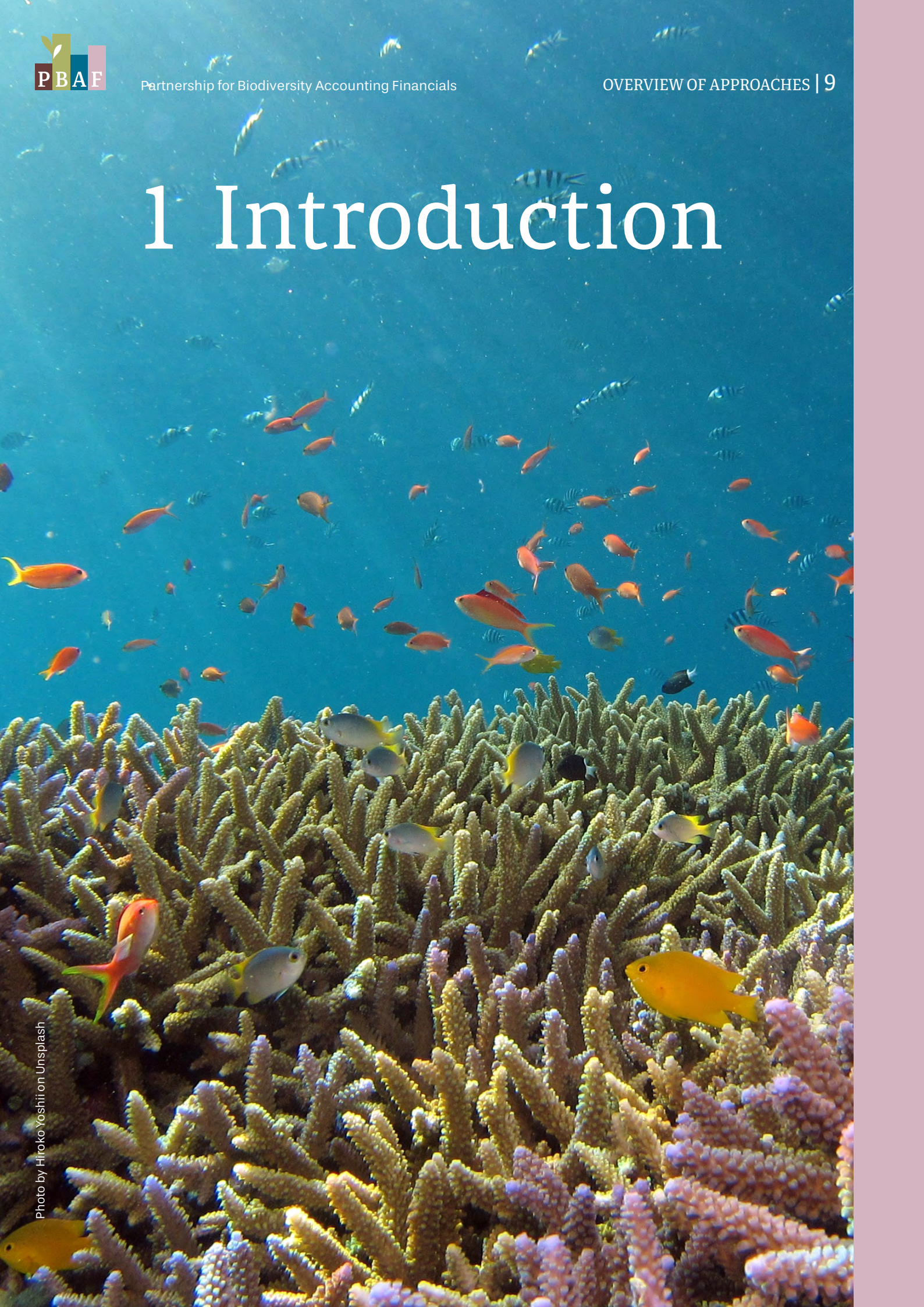
1.1   The Partnership for Biodiversity Accounting Financials

Background

There is growing awareness among financial institutions that impacts and dependencies on biodiversity are highly relevant, both from a risk and an opportunity perspective. Almost all economic activities have an impact on biodiversity and many depend on the ecosystem services that nature provides. These services are increasingly at risk as a result of biodiversity loss. This loss presents financial institutions with increased risk, but also opportunities.

Through their investments, financial institutions can play an important role in reversing the loss of biodiversity and restoring ecosystems, contributing to the 2030 targets of the Convention on Biological Diversity (CBD)[1] (as laid down in the draft Global Biodiversity Framework[2])), thereby also contributing to a reduction of the growing financial risk following from the physical, transition and systemic risks that biodiversity loss presents.

The key role of the financial sector is not only acknowledged by the sector itself, but emphasized by nature organisations and governments. Interaction with and between these actors is key to ensure that biodiversity related government policies, advocacy, field research and investment policies and procedures reinforce each other, creating synergies.

For financial institutions to take up their role, the availability of science–based, reliable data on the impacts on biodiversity is an important precondition.

It is against this background that the Partnership for Biodiversity Accounting Financials (PBAF) was initiated in 2019 by founding partners ASN Bank (part of de Volksbank), ACTIAM, FMO, Robeco, Triodos Bank and Triple Jump. Discussions by this group, building on previous work, including work by the Partnership for Carbon Accounting Financials (PCAF), resulted in the 2020 publication 'Paving the way towards a harmonised biodiversity accounting approach for the financial sec–tor'.[3] This publication was the first step towards a *'PBAF Standard'.*

The PBAF Standard aims to provide *guidance* to financial institutions on biodiversity impact and dependency assessment and to *define what is needed* for these assessments, either or not conducted by data providers, to deliver the right information to financial institutions; information that financial institutions can use to effectively manage and report on biodiversity related risks and opportunities, and contri–bute to the conservation and sustainable use of biodiversity.
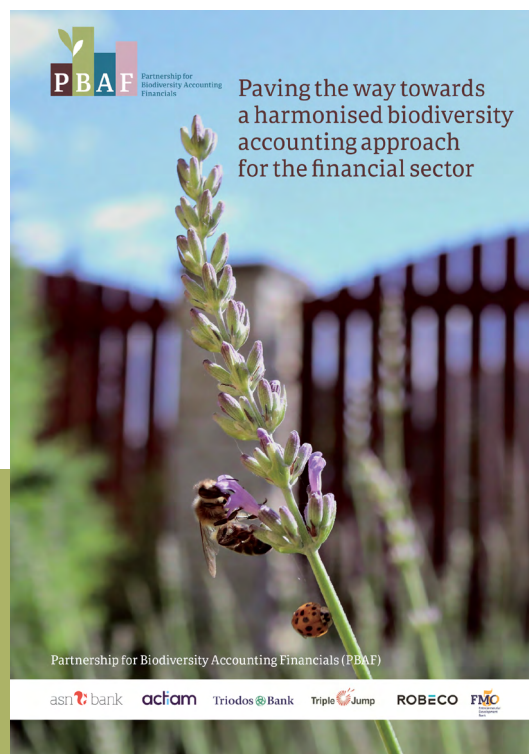
1   **Convention on Biological Diversity**, on the conservation of biodiversity, sustainable use of its components, and equitable sharing of benefits from the use of genetic resources. Signed by 150 government leaders at the 1992 Ro Earth Summit. The 15th Conference of Parties scheduled for Q4, 2022 in Kunming, China, is set to launch a 2030 Global Framework.
2   CBD, Open Working Group on the Post–2020 Global Biodiversity Framework, 'First draft of the post–2020 Global Biodiversity Framework', 5 July 2021.
3   PBAF, 'Paving the way towards a harmonised biodiversity accounting approach for the financial sector', 2020.

Scope of PBAF

PBAF focuses on all types of financial institutions, both private and public. The word 'Accounting' in PBAF refers to the fact that financial institutions should take into account (understand, manage, be accountable) both their impact and dependencies on biodiversity and ecosystem services. PBAF aims to support financial institutions in the assessment of their impacts and dependencies, with this year's report focusing on impact assessment first.

PBAF partners and supporters

PBAF, which in 2021 turned from a project into an independent foundation, has as of May 2022 34 partners and supporters from eight countries. PBAF partners share and discuss practical experiences, challenges and solutions in PBAF Working groups, jointly deciding on topics that should be addressed in the PBAF Standard and co-developing the Standard's contents.

PBAF Sounding Board

A PBAF Sounding Board with experts in the field of biodiversity impact and dependency assessment has been established to provide feedback on the draft guidance, requirements and recommendations included in the draft PBAF Standard. This feedback is taken into account to the extent possible in the PBAF Standard published. Feedback which cannot yet be taken into account feeds into the discussions in the PBAF Working groups. Outcomes of these working groups are taken up in future revisions of the PBAF Standard.

NB: All feedback by PBAF Sounding Board members is carefully considered, but not all feedback is integrated in the PBAF Standard. This also means that the PBAF Standard not necessarily reflects the opinion of the Sounding Board members.

1.2   Alignment and cooperation

The Partnership aligns and cooperates as much as possible with related initiatives in the financial sector, like the European 'Aligning accounting approaches for nature' ('Align') project, the Taskforce on Nature related Financial Disclosures (TNFD), the Finance for Biodiversity Pledge and the Science Based Targets Network (SBTN). The aim of PBAF is not to reinvent the wheel, but to build on the valuable work of these other initiatives and translate this into impact and dependency related guidance, requirements, and recommendations for the financial sector.

Since Align has a similar focus as PBAF and the TNFD provides a broader framework for nature related financial disclosures, the relation with these initiatives is elaborated in more detail below.

PBAF and TNFD

The TNFD "is a global, market-led initiative with the mission to develop and deliver a risk management and disclosure framework for organisations to report and act on evolving nature related risks, with the ultimate aim to support a shift in global financial flows away from nature negative outcomes and toward nature-positive outcomes. The TNFD framework is intended for use globally by corporates and financial institutions of all sizes."[4]

In the TNFD Nature-related Risk & Opportunity Management and Disclosure Framework, Beta v0.1, a Nature-related risk and opportunity assessment approach is introduced: LEAP (Locate, Evaluate, Assess, Prepare). This approach includes 4 phases broken down into 17 analytical components, see figure 1.

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4   TNFD, 'The TNFD Nature-related Risk & Opportunity Management and Disclosure Framework, Beta v0.1 Release', March 2022

In addition to the 17 steps for corporates, the LEAP approach for financial institutions includes a preceding set of 4 guiding questions that consider the type of financial institution, type of product / asset class, level of aggregation and sector in which the institution allocates capital:
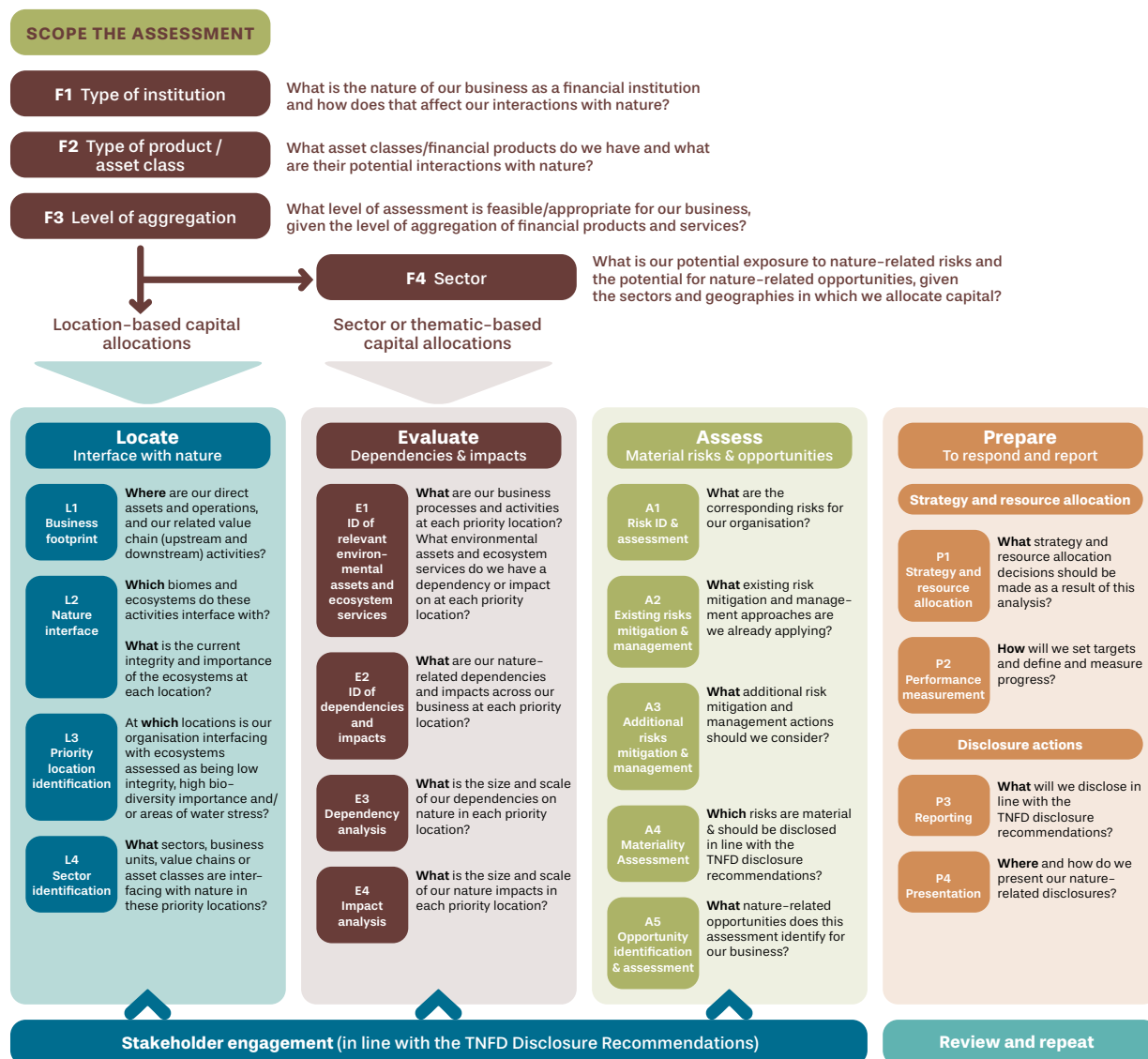

SCOPE THE ASSESSMENT

F1 Type of institution — What is the nature of our business as a financial institution and how does that affect our interactions with nature?

F2 Type of product / asset class — What asset classes/financial products do we have and what are their potential interactions with nature?

F3 Level of aggregation — What level of assessment is feasible/appropriate for our business, given the level of aggregation of financial products and services?

F4 Sector — What is our potential exposure to nature-related risks and the potential for nature-related opportunities, given the sectors and geographies in which we allocate capital?

Location-based capital allocations

Sector or thematic-based capital allocations

Locate
Interface with nature

L1 Business footprint — **Where** are our direct assets and operations, and our related value chain (upstream and downstream) activities?

L2 Nature interface — **Which** biomes and ecosystems do these activities interface with? **What** is the current integrity and importance of the ecosystems at each location?

L3 Priority location identification — At **which** locations is our organisation interfacing with ecosystems assessed as being low integrity, high biodiversity importance and/or areas of water stress?

L4 Sector identification — **What** sectors, business units, value chains or asset classes are interfacing with nature in these priority locations?

Evaluate
Dependencies & impacts

E1 ID of relevant environmental assets and ecosystem services — **What** are our business processes and activities at each priority location? What environmental assets and ecosystem services do we have a dependency or impact on at each priority location?

E2 ID of dependencies and impacts — **What** are our nature-related dependencies and impacts across our business at each priority location?

E3 Dependency analysis — **What** is the size and scale of our dependencies on nature in each priority location?

E4 Impact analysis — **What** is the size and scale of our nature impacts in each priority location?

Assess
Material risks & opportunities

A1 Risk ID & assessment — **What** are the corresponding risks for our organisation?

A2 Existing risks mitigation & management — **What** existing risk mitigation and management approaches are we already applying?

A3 Additional risks mitigation & management — **What** additional risk mitigation and management actions should we consider?

A4 Materiality Assessment — **Which** risks are material & should be disclosed in line with the TNFD disclosure recommendations?

A5 Opportunity identification & assessment — **What** nature-related opportunities does this assessment identify for our business?

Prepare
To respond and report

Strategy and resource allocation

P1 Strategy and resource allocation — **What** strategy and resource allocation decisions should be made as a result of this analysis?

P2 Performance measurement — **How** will we set targets and define and measure progress?

Disclosure actions

P3 Reporting — **What** will we disclose in line with the TNFD disclosure recommendations?

P4 Presentation — **Where** and how do we present our nature-related disclosures?

Stakeholder engagement (in line with the TNFD Disclosure Recommendations)

Review and repeat

Figure 1: TNFD's LEAP approach: Locate, Evaluate, Assess, Prepare (TNFD, March 2022).

The work of PBAF is most closely linked to the 'Evaluate' phase. PBAF provides guidance specifically to the financial sector (TNFD is aimed at all corporates) and defines requirements and recommendations on biodiversity impact and dependency assessments.

In the financial sector, both initiatives will reinforce each other:
- The TNFD Framework shows where biodiversity impact and dependency assessment sits within the bigger picture of nature related risk management and disclosure, underlining the need for financial institutions to assess biodiversity impacts and dependencies.

While:
- PBAF provides guidance to financial institutions that want to analyse their biodiversity impacts and dependencies, generating the information and data needed to take the next steps in the TNFD framework.

PBAF and Align

The Align project will assist the European Commission's efforts to support businesses and other stakeholders in developing standardised natural capital accounting practices, including a standardised approach to biodiversity measurement. This will include[5]:

- Establishing and operating a dedicated natural capital management accounting platform for facilitating best practice exchange among business practitioners and relevant stakeholders.
- Establishing and operating a business driven discussion and alignment process that can streamline and strengthen existing methods and metrics for measuring the impacts and dependencies on biodiversity, including modules for inclusion in ongoing efforts to standar-dise natural capital management accounting practice.
- Defining needs and opportunities relating to education, training, and research, that are necessary for mainstreaming natural capital management accounting within the business community.

PBAF will translate the Align recommendations to the financial sector and adjust where necessary, in close cooperation with the PBAF Partners. PBAF and Align will cooperate in the development of sector-specific guidance.

Align is planning a public consultation of their first draft recommendations mid-2022. PBAF will ensure the 2023 revision of the PBAF Standard takes the Align recommendations into account.

1.3   The PBAF Standard v2022

Three publications

The PBAF Standard v2022 covers three separate publications:

1. PBAF Q&A on biodiversity impact assessment

Offering an introduction to biodiversity impact assessment for financial institutions in sixteen questions and answers.

Target group: Financial institutions & impact investors that are just starting to orientate them-selves on biodiversity impact assessment.

2. PBAF Standard v2022 – Biodiversity impact assessment – Overview of approaches

Provides an overview of different biodiversity impact assessment approaches that can be used by financial institutions and includes a chapter on 'Positive impact'.

Target group: Financial institutions & impact investors that have limited knowledge and experience, to more experienced financial institutions & impact investors.

3. PBAF Standard v2022 – Biodiversity impact assessment – Footprinting

Presents PBAF's view on biodiversity footprinting: what does a biodiversity footprint need to comply with to provide the right information to financial institutions? Includes requirements and recommendations.

Target group: Financial institutions & impact investors with some experience on impact assess-ment, data providers and tool developers.

Building on the first publication but expanding the scope

The PBAF Standard v2022 builds on PBAF's first publication in 2020, which focused on the way a quantified biodiversity impact assessment or 'biodiversity footprint' should be conducted. However, discussions in the PBAF Working groups and feedback received at international meetings showed that the PBAF Standard should not be limited to biodiversity footprints. Rather, it should shed light on other types of impact assessment across the lending and investment

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5   Align, 'Aligning biodiversity metrics for business and support for developing generally accepted accounting principles for natural capital', 2021.

process. Different impact assessment approaches answer different questions. These assessments are not necessarily quantified and include, among others, portfolio screening of impact and dependency risks using geospatial data (e.g., is an asset located in or close to a protected area?), satellite imaging (e.g. is deforestation taking place in the supply chain of a company invested in?) and new technologies such as eDNA and bioacoustics (what species are present in the area affected by the investment?).

By looking at different assessment approaches, the PBAF Standard v2022 aims for a broader picture of how financial institutions can assess impact on biodiversity, realising that:
- due to the increasing number of tools and initiatives and fast technological developments in this field, this picture is rapidly changing and evolving;
- the gap between current practice and the ideal situation is still large. For example, a biodiversity footprint at portfolio level may provide some direction on where in the portfolio impacts are likely to take place (and why), but is unable to take into account the complexities of biodiversity impact on the ground (and asset locations are often unknown).

This is also why this is the 'PBAF Standard v2022', with updates and revisions expected to follow in the years ahead.

Positive impact on biodiversity
A focus on biodiversity is not just about limiting or avoiding negative impacts, but also about investing in positive impact. A shift from 'doing less bad' to 'doing good'. The interest in biodiversity- or nature-positive investments is growing. This is also visible in the work on the EU Taxonomy, defining activities that are considered to have a neutral ('do no significant harm') or positive impact ('substantial contribution') to biodiversity and ecosystems, and the initiation of the Natural Capital Investment Alliance (NCIA). This raises the question what 'biodiversity positive investments' are. When is it possible to talk about a positive impact on biodiversity, what data is needed to understand if a loan or investment has a positive impact and how to disclose a positive impact when reporting on an impact assessment? In 2021/2022 the PBAF Working group on Positive Impact focused on these questions, resulting in a separate chapter in this document (chapter 4). Not claiming to have all the answers but taking a first step in unravelling the topic, indicating challenges and opportunities and potential requirements when assessing and claiming positive impact.

Dependencies on ecosystem services
In the years to come, PBAF will also focus on the assessment of dependencies on biodiversity and ecosystem services. Although first discussions took place in the PBAF Working groups, the focus of this 2022 document is still on impacts. The focus of the next version of the PBAF Standard (v2023) will be expanded to include an assessment of dependencies (building on, amongst others, the work of Align and the TNFD). Until then, it is recommended to always verify whether information on ecosystem services and beneficiaries is available and to take this information into account in investment decisions. An example of an initiative already providing information on dependencies is the ENCORE knowledge base[6].

Balancing effectiveness, practicality and the end goal of biodiversity conservation
Many assessment approaches currently used do not yet result in an accurate picture of impacts and dependencies on biodiversity. The localised nature of biodiversity, and incomplete data on impact drivers and supply chains, constitute important challenges. Limited data and good but imperfect tools help prioritize, but with levels of uncertainty that need to be acknowledged.

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6   ENCORE = Exploring Natural Capital Opportunities, Risks and Exposure, **https://encore.naturalcapital.finance/en**.

PBAF aims to balance the need for practical approaches that can be applied right now, with the need for results that help FIs move in the right direction: towards conservation and sustainable use of biodiversity. What is, at this point in time, best available practice, knowing that the topic is (even) more challenging than carbon? What guidance is needed for financial institutions to understand the value and limitations of impact assessment methodologies and data currently available? The PBAF Standard v2022 aims to provide answers to these questions.

A living document
Note that the PBAF Standard is a *living document*. The PBAF Standard v2022 will be subject to change, building on the output of PBAF Working groups, on publications of closely related initiatives, on changes in regulation and on the latest developments in the field of biodiversity impact assessment.

PBAF would like to thank all initiatives and experts in the finance and biodiversity and impact assessment space for the constructive cooperation leading up to the PBAF Standard v2022.

2 What is biodiversity and why is it important to the financial sector?

Photo by Hans Veth on Unsplash

2.1 Biodiversity and drivers of biodiversity loss

What is biodiversity?
Biodiversity is short for 'biological diversity', referring to the variety of all life on earth. For the full meaning, PBAF refers to the definition from the reputable Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services, **IPBES**:

> **"Biodiversity is the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part.**
>
> **This includes variation in genetic, phenotypic, phylogenetic, and functional attributes, as well as changes in abundance and distribution over time and space within and among species, biological communities and ecosystems."**

The definition shows that biodiversity is not just about species, but also about genetic diversity (diversity within species) and diversity of ecosystems.

Drivers of biodiversity loss
Biodiversity is declining fast, with current species extinction rate at least tens to hundreds of times higher than it has averaged over the past 10 million years.[7] This decline is undermining nature's productivity, resilience, and adaptability, fuelling risk and uncertainty for our economies and well–being[8]. Figure 2 provides an overview of the drivers of biodiversity loss, including indirect drivers and direct drivers of biodiversity loss. Direct drivers[9] of biodiversity loss include:

- **Land and sea use change:** deforestation, but also degradation of grasslands, peatlands, soils and other wetlands, land use change resulting from infrastructure, etc.
- **Direct exploitation**, e.g., overfishing, unsustainable logging, trade in wild species
- **Climate change**, to which many species cannot adapt fast enough (with degradation of ecosystems make them even less resilient)
- **Pollution**, of soils, water, air, and oceans (both on chemical and microscopic levels, and highly visible such as the Great Pacific Garbage Patch)
- **Invasive alien species**, with humans introducing species to parts of the world where they did not evolve and where some become invasive.

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7   S. Díaz et al, IPBES, 'Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services', 2019.
8   Dasgupta, P., 'The Economics of Biodiversity: The Dasgupta Review; Headline messages', 2021.
9   These '*direct drivers*' are sometimes called '*pressures*', for example by the Science Based Targets Network, SBTN.
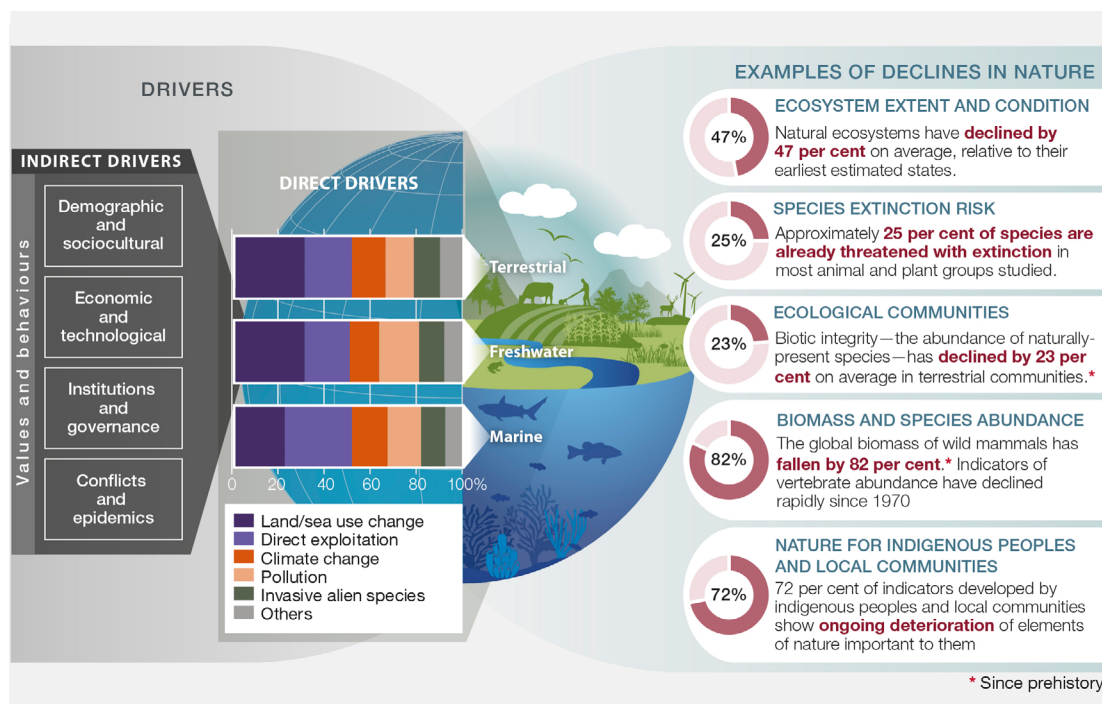
WHAT IS BIODIVERSITY AND WHY IS IT IMPORTANT TO THE FINANCIAL SECTOR?

Figure 2: Indirect drivers and direct drivers of changes in biodiversity (IPBES, 2019)[10]

2.2   Why is biodiversity loss important to financial institutions?

The value of biodiversity

A lot has been written in recent years about the value of biodiversity, including in publications by the Intergovernmental science–policy Panel on Biodiversity and Ecosystem Services (IPBES, 2019) and the Dasgupta Review (2021). At the heart of the value of biodiversity, and the risks of its loss to the financial sector, is the relation between 'biodiversity', 'natural capital' and 'eco–system services'.

Biodiversity, natural capital and ecosystem services
The value of biodiversity is often explained through the services biodiversity underpins (see figure 3). Or, as described in the Natural Capital Protocol:[11] "Biodiversity is critical to the health and stability of natural capital as it provides resilience to shocks like floods and droughts, and it supports fundamental processes such as the carbon and water cycles as well as soil formation. Therefore, biodiversity is both a part of natural capital and also underpins ecosystem services."

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10 IPBES, S. Díaz et al, 'Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services', 2019.
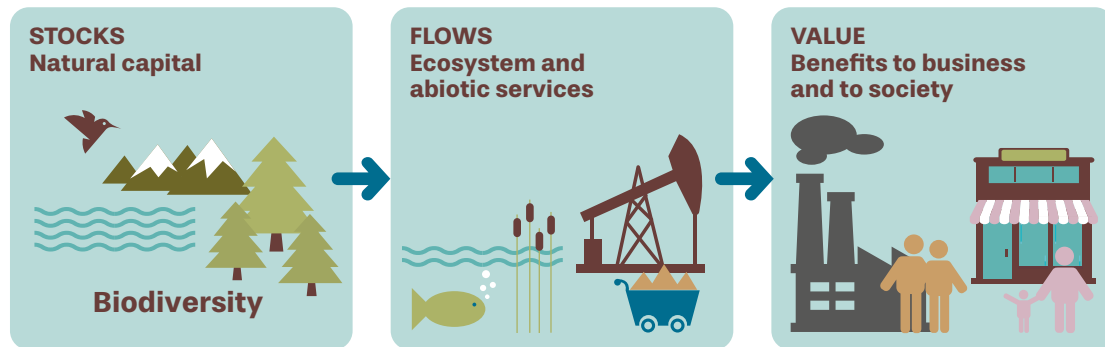11 Natural Capital Coalition, 'Natural Capital Protocol', 2016.

Figure 3: Natural capital stocks, flows, and values (Adapted from Natural Capital Protocol, 2016)

Figure 3 shows how biodiversity, natural capital, ecosystem services and benefits to business and society relate to each other. A loss of biodiversity may result in the loss of ecosystem services and benefits to business, including the financial sector.

The risks of biodiversity loss

The study 'Indebted to Nature' by the Dutch Central Bank[12] states that the loss of biodiversity threatens the health of ecosystems that provide services to the economy, such as animal pollination of food crops, natural water treatment and fertile soil. Moreover, the study indicates that the transition to a sustainable economy carries 'transition risks' for economic activities that have a negative impact on biodiversity. This is also recognized by the Banque de France in its Working paper 'A "Silent Spring" for the Financial System? Exploring Biodiversity-Related Financial Risks in France' (August 2021)[13].

Both studies show that a large part of the financial system depends on ecosystem services: The French study finds that 42% of the value of securities held by French financial institutions comes from issuers that are highly or very highly dependent on one or more ecosystem services. The Dutch study shows that Dutch financial institutions have provided worldwide EUR 510 billion in finance to companies highly or very highly dependent on one or more ecosystem services (representing 36% of the portfolio of more than EUR 1,400 billion examined).

This dependence on ecosystem services is one of the risks induced by the loss of biodiversity. In the 'The TNFD Nature-related Risk & Opportunity Management and Disclosure Framework; Beta v0.1 Release', nature-related risks are divided into physical, transition and systemic risks (see figure 4, below).

12 DNB, PBL, 'Indebted to nature; Exploring biodiversity risks for the Dutch financial sector', June 2020.
13 Banque de France, 'Working paper 'A "Silent Spring" for the Financial System? Exploring Biodiversity-Related Financial Risks in France', August 2021.
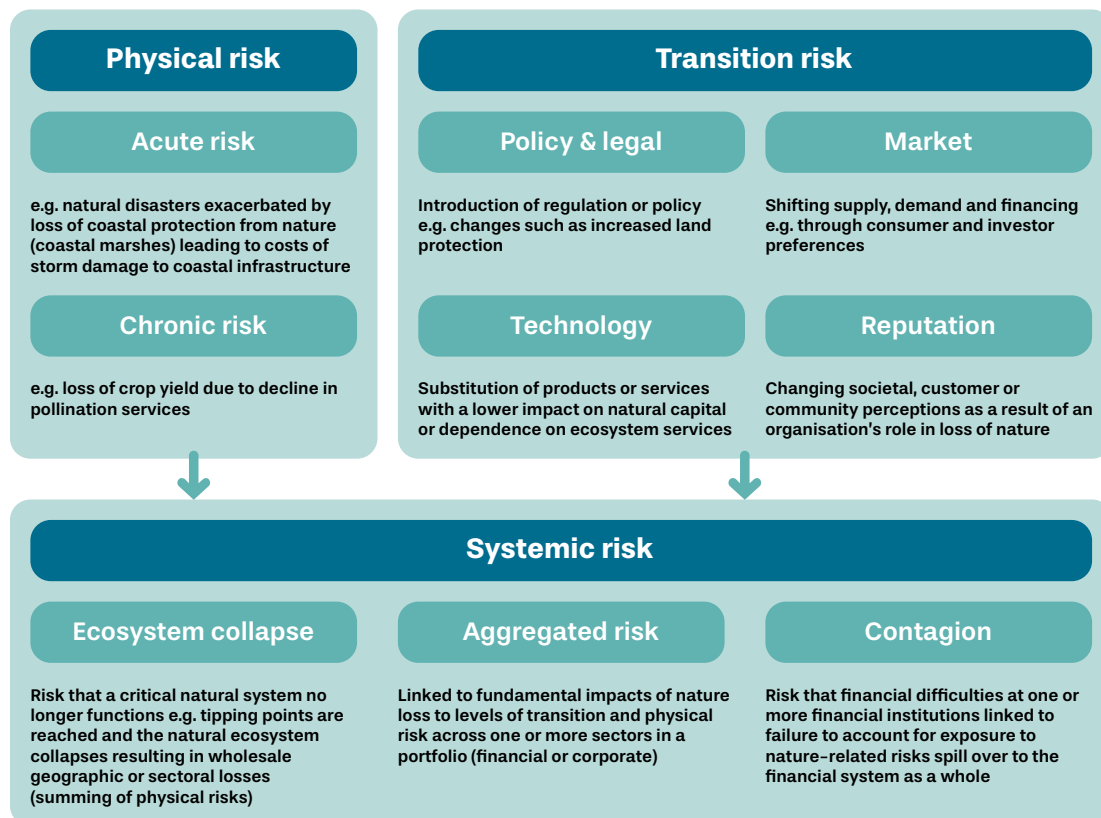
WHAT IS BIODIVERSITY AND WHY IS IT IMPORTANT TO THE FINANCIAL SECTOR?

Physical risk		Transition risk		
Acute risk		**Policy & legal**	**Market**	
e.g. natural disasters exacerbated by loss of coastal protection from nature (coastal marshes) leading to costs of storm damage to coastal infrastructure		Introduction of regulation or policy e.g. changes such as increased land protection	Shifting supply, demand and financing e.g. through consumer and investor preferences	
Chronic risk		**Technology**	**Reputation**	
e.g. loss of crop yield due to decline in pollination services		Substitution of products or services with a lower impact on natural capital or dependence on ecosystem services	Changing societal, customer or community perceptions as a result of an organisation's role in loss of nature	

Systemic risk

Ecosystem collapse	Aggregated risk	Contagion
Risk that a critical natural system no longer functions e.g. tipping points are reached and the natural ecosystem collapses resulting in wholesale geographic or sectoral losses (summing of physical risks)	Linked to fundamental impacts of nature loss to levels of transition and physical risk across one or more sectors in a portfolio (financial or corporate)	Risk that financial difficulties at one or more financial institutions linked to failure to account for exposure to nature-related risks spill over to the financial system as a whole

Figure 4: TNFD's definitions of nature-related risks[14]

The TNFD recognises that without information on (asset) location, an assessment of financial risks due to physical, systemic and transition risks will be difficult. This is illustrated by the LEAP (Locate, Evaluate, Assess, Prepare) process for nature-related risk and opportunity management introduced in the TNFD Framework in which *location* plays a key role[15]. The Beta v0.1 publication of the Framework does recognise the challenge that 'location' may pose to financial institutions and mentions, for example, that "Listed and unlisted equity and debt are more likely to follow a sector or thematic-based capital allocation and would find it more appropriate to start with the 'Evaluate' phase of LEAP".

Recognition of the financial risks by Central Banks
The fact that the loss of biodiversity poses a risk to the financial sector is also recognized by the Network for Greening the Financial System (NGFS), a group of central banks and financial super-visors, sharing best practices and contributing to the development of environment and climate risk management in the financial sector. The NGFS brings together 108 central banks and finan-cial supervisors and 17 observers.

The NGFS is of the view that nature-related risks, including those associated with biodiversity loss, could have significant macroeconomic implications, and that failure to account for, miti-gate, and adapt to these implications is a source of risks for individual financial institutions[16]. Moreover, the NGFS concludes that biodiversity loss is a source of financial risk that can be a

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14 TNFD, 'The TNFD Nature-related Risk & Opportunity Management and Disclosure Framework; Beta v0.1 Release', March 2022.
15 LEAP (Locate, Evaluate, Assess, Prepare) is an integrated assessment process for nature-related risk and opportunity management introduced in the beta version of the TNFD Framework (2022).
16 NGFS, 'NGFS Occasional Paper, Central banking and supervision in the biosphere: An agenda for action on biodiversity loss, finan-cial risk and system stability', Final Report of the NGFS-INSPIRE Study Group on Biodiversity and Financial Stability, March 2022.

threat to financial stability and thus falls within the mandates of central banks and financial supervisors. Central banks and supervisors are expected to increase incentives and mandatory requirements to financial institutions, in order to reduce biodiversity–related financial risks and help guide the allocation of financial resources to support nature–positive activities.

Opportunities

Broad recognition that biodiversity loss needs to be reversed also brings opportunities to invest in biodiversity gain and to 'align financial flows with nature'. The post–2020 Global Biodiversity Framework will need to show what 'aligning financial flows with nature' means. What goals and targets can serve as guidance for financial institutions? The position paper 'Aligning financial flows with biodiversity goals and targets' of the Finance for Biodiversity Foundation (February 2022) identifies actions needed to align financial flows, including[17]:

- Identifying, measuring and managing the risks, dependencies and impacts of their investments and financial activities on biodiversity by integrating these nature–related risks in their financial decisions (greening finance), with the goal of reducing negative impacts and increasing positive impacts.
- Mobilizing funding for a pro–nature/nature positive economy, (conservation projects, mainstreaming biodiversity in economic sectors for sustainable use, financing transitions, nature–based solutions…) and developing adequate financial mechanisms such as blended finance (financing green).

The first action will allow financial institutions to mitigate biodiversity related risks. The second will also bring new opportunities. Both actions will contribute to aligning financial flows with nature.

To capitalize on these opportunities, financial institutions will need the right information. As the TNFD puts it: *"Better information will allow financial institutions and companies to incorporate nature–related risks and opportunities into their strategic planning, risk management and asset allocation decisions."*

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17 Finance for Biodiversity Pledge, 'Position paper Aligning financial flows with biodiversity goals and targets', 16 February 2022.

3 Biodiversity impact assessment in the financial sector

3.1 Introduction

In the last few years, many financial institutions have integrated climate change in their lending and investment decisions. They have started carbon accounting, using methodologies such as PCAF, developed by the Partnership for Carbon Accounting Financials. At the same time, bio-diversity has become a fast-rising topic in the financial sector, both from an impact and a dependency perspective, resulting in multiple initiatives, tools and databases. Examples of such tools and databases include ENCORE (Exploring Natural Capital Opportunities, Risks and Expo-sure), the Integral Biodiversity Assessment Tool (IBAT), the Corporate Biodiversity Footprint (CBF), the Global Biodiversity Score–Financial Institutions (GBS–FI), the Biodiversity Impact Analytics–Global Biodiversity Score (BIA–GBS), the Biodiversity Footprint Financial Institutions (BFFI) and the Species Threat Abatement and Recovery Metric (STAR).

This chapter provides an overview of different *impact assessment approaches* that can be used to assess the (potential or actual) impacts on biodiversity of loans and investments. On a port-folio level, and on the level of an asset class, company or project. The chapter has the following structure:

- Basic concepts of biodiversity impact and biodiversity impact assessment (3.2)
- Different types of impact assessment approaches and their use (3.3)
- Explanation of the different impact assessment approaches (3.4)
- Follow-up to a biodiversity impact assessment approach (3.5)

Please note:
1. For a *quantified biodiversity footprint*, PBAF has developed a separate document ('PBAF Standard v2022 – Biodiversity footprint'). This document provides requirements and recom-mendations that such a footprint, according to PBAF, should comply with in order to deliver the right information for financial institutions to act on.
2. Apart from the guidance on impact assessment presented in this document, a short *Q&A on biodiversity impact assessment* has been developed. This Q&A can be used as a first introduction to biodiversity impact assessment, looking at frequently asked questions and answers to these questions. The Q&A is available through the website of PBAF.

3.2 Basic concepts biodiversity impact assessment

Below, some of the basic concepts in biodiversity impact assessment are defined and explained, including:
- Impact and impact drivers
- Negative impact, avoided impact, positive impact, net impact, cumulative impact
- Direct operations and value chain
- Reference situation
- Recent biodiversity loss and permanence of biodiversity gain
- Data use

3.2.1 Impact and impact drivers

Impact on biodiversity
An impact on biodiversity is defined as a change in biodiversity resulting from impact drivers. This change can be either positive or negative (note that in a biodiversity footprint, avoided (negative) impact is seen as a third category; see the PBAF publication on footprinting).

Impact on biodiversity – actual impact versus potential impact
An *actual* impact on biodiversity is an observed change in biodiversity resulting from impact

drivers. The assessment of actual impacts on biodiversity will require measurement/monitoring of changes in biodiversity over a longer period of time. A challenge in assessing actual impact is that observed changes in biodiversity will need to be attributed to the impact drivers.

A *potential* impact on biodiversity is the impact on biodiversity that *might* take place as a result of changes in the drivers of biodiversity loss and gain. Whether this potential impact will result in an actual impact also depends on the characteristics of the impact location. For example, water use is an important driver of biodiversity loss. Therefore, the use of water has a potential impact on biodiversity. The actual impact of water use will depend on site specific characteristics of the ecosystems, like the level of water scarcity in the impact area.

In case of a biodiversity footprint of a loan and investment portfolio (see paragraph 3.6 and the separate PBAF publication on footprinting), the assessment of actual impact will often not (yet) be feasible. Supply chains are long and complex, making data collection challenging. Furthermore, many impacts (such a climate change impacts) will take years to materialise. Therefore, the potential impact is calculated. This potential impact provides insight in the relations between investments and drivers of biodiversity loss and gain. This insight can be used to address these drivers, for example through engagement.

Impact on biodiversity – direct and indirect impacts
In practice, the terms direct and indirect impacts are used in different ways. In the past, direct impact used to refer to the direct operations of a company and indirect impact to impacts in the value chain (see definitions for direct operations and value chain below). However, a direct impact can also refer to impact drivers that have a direct causal link with the loss of biodiversity (like land-use change) and an indirect impact to impact drivers with an indirect causal link (like greenhouse gas emissions). In the PBAF Standard, the use of the terms direct and indirect impact is prevented; reference is made to impacts in the value chain or to causal linkages where necessary.

Impact drivers
At this point in time, different definitions are being used by different initiatives to define 'drivers' and 'pressures'. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) distinguishes five 'direct drivers' of biodiversity loss (IPBES, 2019)[18], see also chapter 2:

- Land- and sea-use change
- Direct exploitation (also referred to as 'Resource extraction')
- Pollution
- Invasive alien species
- Climate change

Indirect drivers of biodiversity loss, as defined by IPBES, include underlying indirect drivers like demographic and technological changes.

Definitions by SBTN and TNFD
Note that the Science Based Targets Network (SBTN) defines 'drivers' as the changes in values and behaviours ('indirect drivers' in IPBES) and 'pressures' as land- and sea-use change, climate change etc. ('direct drivers' in IPBES).

18 Brondízio, E. S., Settele, J., Díaz, S., Ngo, H. T. (eds), IPBES, 'Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services', IPBES secretariat, Bonn, Germany, 2019.

In 'The TNFD Nature-related Risk & Opportunity Management and Disclosure Framework; Beta v0.1 Release', 'impact drivers' are defined the same way as they are defined in the Natural Capital Protocol[19]: "A measurable quantity of a natural resource that is used as a natural input to production (e.g. the volume of sand and gravel used in construction) or a measurable non-product output of a business activity (e.g. a kilogram of NOx emissions released into the atmosphere by a manufacturing facility)." In the TNFD publication, the five direct drivers included in the IPBES report are referred to as the "five main drives of nature change".

Definition PBAF
In the PBAF Standard, the five direct drivers of biodiversity loss mentioned by IPBES will be referred to as 'impact drivers' or 'drivers of biodiversity loss'. These are the result of 'environmental inputs (resource use) and outputs (emissions, pollution)'.

Note that these environmental inputs and outputs are what the TNFD and the Natural Capital Protocol refer to as 'inputs to production' and 'non-product outputs of a business activity'.

The reason why PBAF uses this terminology is the fact that it clearly separates the steps from (1) environmental inputs and outputs to (2) impact drivers to (3) impact. These steps are also separated in LCA based footprinting approaches (see paragraph 3.6).

Negative impact
A negative impact means a (potential) loss of biodiversity compared to a reference situation (see paragraph 3.2.3). A negative impact may be the result of a negative impact of the activity itself and/or a negative impact in value chains (either upstream in supply chains or downstream in the use and disposal of a product or service).

Avoidance of negative impact (avoided impact)
The avoidance of negative impact on biodiversity refers to the prevention of negative impacts resulting from an intervention/economic activity by means of, for example, better management practices. The reference situation in case of an avoided impact is an alternative scenario, often the situation without the intervention ('business as usual'). The avoided negative impact can refer to future, expected impacts. An example of such a future avoided impact is the gathering/production of non-timber forest products (the intervention) which may prevent deforestation (future impact) by adding value to a forest.

The fact that an avoided impact is linked to an alternative scenario sets it aside from a reduced negative impact, which is linked to a comparison of impact in time.

Positive impact
In the 2020 PBAF publication, a positive impact is defined as follows: "A positive impact means a (potential) gain in biodiversity resulting from interventions/economic activities compared to a reference situation". Building on this definition and the discussions in the PBAF Working group on Positive impact in 2021, the 2022 definition is the following: A positive impact on biodiversity means more animals, plants and/or microbes, improving the health of a natural ecosystem, in a specific location and timeframe, as a result of a human intervention. This impact can be an actual impact or a potential, expected impact. Examples of such interventions are reforestation (if executed properly) or nature restoration, but also the installation of a water treatment facility. See chapter 4 for a more detailed discussion on positive impact.

Note that the concept of 'positive impact' (and 'nature-positive, 'net-gain') is still being discussed internationally, which means that definitions may change.

19 Natural Capital Coalition, 'Natural Capital Protocol', 2016.

Cumulative impact

A cumulative impact is the combination of the impact of a company's direct operations, the impacts of other stakeholders (like other companies in the same area) and other (background) pressures.

Net impact: tread with caution

The concept of a 'net impact' is closely linked to the mitigation hierarchy (see figure 5), in which a 'no-net-loss' can be reached by compensating for impacts that remain (residual impacts) after steps have been taken to avoid, mitigate and restore negative impacts.
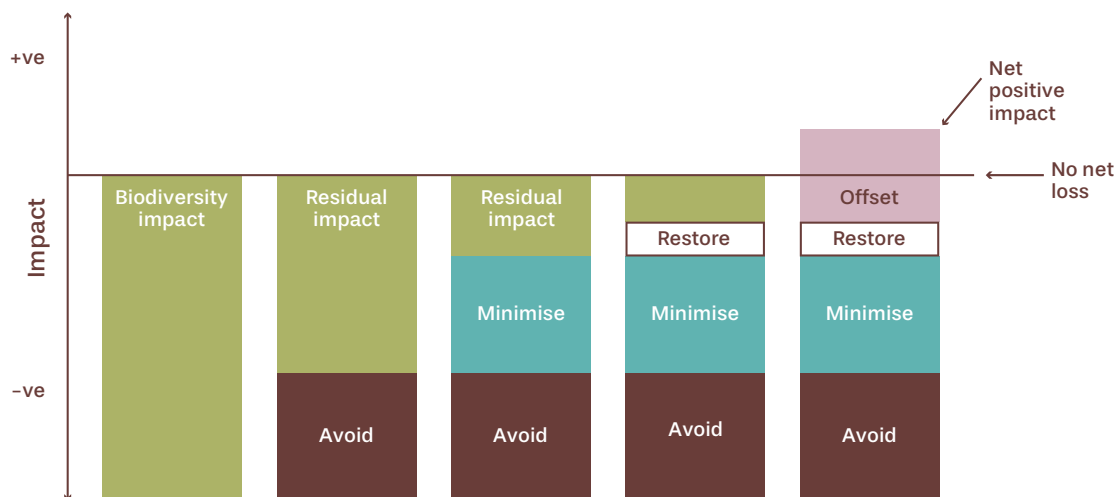

Figure 5: The mitigation hierarchy

Summing positive, avoided and negative impacts to calculate a net impact is highly debatable, since impacts often take place at different locations and even in different regions and may involve different ecosystems, species and genes (no 'ecological equivalence'). For example, a wind park may have a negative impact on biodiversity through the use of raw materials (like metals which need to be mined) and an avoided negative impact by preventing fossil based greenhouse gas emissions (use of wind as an energy source instead of fossil fuels). A large part of the indirect negative impacts resulting from the use of raw materials will probably take place in other countries (e.g. mining in India), while the avoided greenhouse gas emissions avoid adding global warming potential (affecting global biodiversity). Calculating a net impact implies that a negative impact in location A can be compensated with (in this case) an avoided impact on global biodiversity, which is not possible. The consequences of biodiversity loss to stakeholders in location A cannot be compensated with the benefits of biodiversity gain to stakeholders in location B. Moreover, netting impacts requires ecological equivalence of the biodiversity impacted (also called 'like-for-like', referring to areas with highly comparable biodiversity components).

Although negative, avoided and positive impacts cannot just be added up to calculate a net impact, in practice the calculation of a net impact is sometimes used as a way to compare investments in different companies, projects and asset classes. PBAF advises to carefully consider the risk of unintended consequences in doing so, with as the biggest concern that the ultimate goal of reversing biodiversity loss and restoring nature may not be met.

Note that the discussion around 'net impact' is still evolving, which means that the way to deal with the concept of net impact is likely to change in the (near) future.

3.2.2 Direct operations and value chain

An impact assessment may focus on the direct operations of a company or the site of a project, but will often also involve other parts of the value chain. PBAF uses the definitions for direct operations and the value chain provided by the Science Based Targets Network (these definitions were adapted from the GHG Protocol Scope 3 Standard and Natural Capital Protocol):

Direct operations

This category covers all activities and sites (e.g., buildings, farms, mines, retail stores) over which the enterprise has operational or financial control. This includes majority-owned subsidiaries. We refer to this as the sphere of control (with control being one end of an influence spectrum).

Value chain

The value chain is a series of activities, sites, and entities, starting with the raw materials and extending through end-of-life management, that (a) supply or add value to raw materials and intermediate products to produce final products for the marketplace and (b) are involved in the use and end-of-life management of these products. The value chain can be divided into upstream and downstream sites/activities.

Upstream

This covers all activities associated with suppliers (e.g., production or cultivation, sourcing of commodities of goods), as well as transportation of commodities to manufacturing facilities.

Downstream

This covers all activities that are linked to the sale of products and services produced by the company setting targets. This includes the use and reuse of the product and its end of life to include recovery, recycling, and final disposal.

3.2.3 Reference situation

To assess the impact on biodiversity of an investment in an economic activity or 'intervention' (an action that is expected to lead to an impact on biodiversity), a 'reference' or 'baseline' needs to be defined: a negative or positive impact compared to what? The choice of this reference will directly influence the assessment of the impact and is different for negative impacts and avoided negative or positive impacts:

Reference situation negative impacts

The negative impact on biodiversity of an economic activity is the result of the impact drivers linked to this activity in a specific impact area. These impact drivers are caused by inputs (like water use, use of raw materials and land use) and outputs (emissions to air, water and soil). To assess impact, the reference is the situation in which the activity does not take place (no land use, no water use, no emissions, etc.). An investor that invests in this economic activity is considered (partly) responsible for this negative impact (see also the attribution of impact in the PBAF publication on footprinting).

This approach is comparable to the calculation of impact in a carbon footprint, where the baseline is zero greenhouse gas emissions.

Reference situation avoided impact or positive impact

In case of an avoided negative impact, resulting from actions like better management practices or the use of green energy, the baseline is the situation in which these actions do not take place; the 'business as usual' situation. The impact calculated is a 'relative' impact. An investor that invests in such actions is considered (partly) responsible for this avoided negative impact. The same is true for actions with positive impacts on biodiversity, like nature restoration. The reference is the situation in which the action does not take place, the 'business as usual' situation.

This approach is similar to the calculation of the footprint of green energy, which is calculated using energy from an energy mix as the reference, resulting in avoided impact.

BOTH REFERENCE SITUATIONS ARE OFTEN USED IN A FOOTPRINT CALCULATION

Both reference situations may play a role in impact assessment. For example, to calculate the impact on biodiversity for a recycling company, the avoided negative impact on biodiversity resulting from recycling is calculated using the 'business as usual' situation as a reference: the use of virgin materials. To calculate the negative impact of the actions needed to enable recycling, like land use for the recycling plant and transport of waste, the situation without these activities is used as a reference.

3.2.4 Recent biodiversity loss and permanence of biodiversity gain

In case of investments with the aim to avoid negative impacts or create positive impacts, it is important to take into account the risk of biodiversity loss preceding the investment and the permanence of biodiversity gain.

Recent biodiversity loss

When investments aim for conservation and sustainable use of biodiversity, they should take note of potential recent biodiversity losses linked to the economic activity invested in. Like clearing primary forest that can be causally linked or attributed to establishing a plantation.

Permanence of biodiversity gain

The sustainability of the impact shall be considered when investments aim for avoided negative impact or positive impact. What happens to the level of biodiversity after the project/investment has ended? For example, part of the long-term viability of the biodiversity invested in will depend on the connectivity to other landscape elements and the regional context ('Resource Paper – No Net Loss and Loss-Gain Calculations in Biodiversity Offsets', BBOP, 2012). This should be addressed in projects aiming for a biodiversity gain.

The World Bank Group publication 'Biodiversity offsets: A User Guide' (October 2016) discusses the following features of successful long-term conservation:
- Formal legal protection
- On the ground protection and management
- Financial sustainability

Although it may be possible to address the permanence of biodiversity gain in the loan and investment process and conditions, it is accepted that permanence cannot always be guaranteed. How to deal with the permanence of biodiversity in a biodiversity impact assessment may be part of future versions of the PBAF Standard, for example by looking at the possibility of qualitative assurance and looking at the way permanence is dealt with in other areas, like carbon credits.

3.2.5 Data use

Different types of data can be used to assess the impact on biodiversity of an economic activity. A distinction can be made between primary data and secondary data and between ex-ante data (before the impact takes place) and ex-post data (after the impact has taken place).

Primary data versus secondary data

Primary and secondary data can be defined as follows (SBTN, 2020)[20]:
- Primary data:
  Data collected specifically for the assessment being undertaken. For example, collected from

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20 Science Based Targets Network, 'Science-Based Targets for Nature, Initial Guidance for Business', September 2020.

site-level assessments on a specific impact driver through the use of direct measurement (e.g., volume of freshwater used to irrigate a wheat field each month).

- Secondary data:
Data that were originally collected and published for another purpose or a different assessment. Derived from modelled or proxy-level data. This could include data averaged from commodity sourcing (e.g., kg of pollutants emitted for a given volume of leather purchased, hectares of land use per tons of timber purchased) at the national or regional level, or the use of input-output data models to provide estimates of impact-drivers. Uncertainties in the quality of data used will need to be considered and disclosed.

Gathering primary data may be time consuming and costly (e.g., in the case of a biodiversity footprint at the level of an investment portfolio) or detailed primary data may not be available. In that case, an assessment of biodiversity impact may rely on secondary environmental data from databases like EXIOBASE (see the PBAF document on footprinting) and ecoinvent. Other sources of secondary data include data from literature on (for example) different types of land use and related impacts on biodiversity.

Ex-ante versus ex-post data

Ex-ante data
Ex-ante impact data, i.e. the estimated future impact of an investment, is collected or calculated before an activity or intervention takes place, e.g. to support funding decisions in case of project finance. Such data may include both primary data and secondary data.

Ex-post data
Ex-post measurement involves actual impact data collected following an activity/intervention. In general, an ex-post measurement of actual changes in biodiversity can be more accurate than the ex-ante calculation of potential impacts, provided a monitoring system is in place and the data is collected by trained staff.

N.B.: Note that the use of ex-post biodiversity data in an impact assessment will require an *attribution of the changes observed to the intervention* for which the loan or investment was provided. Such an attribution can be quite complex when the changes in biodiversity are potentially the result of multiple impacts (e.g., other companies operating in the same impact area; see 'cumulative impact').

ESTIMATIONS, MEASUREMENTS & CALIBRATIONS

In the three visuals below from left to right:
- Cryosat-2, an ESA satellite, has gathered data on polar ice since 2010 (>720km above Earth, 750kg satellite, orbits both poles every 99 mins). A radar signal to and from the satellite indicates the height of the ice above sea level ('freeboard'). Thickness is measured by combining freeboard with density data.
- An electromagnetic 'EM bird' hangs under a helicopter of the Norwegian Polar Institute and measures ice thickness in the Arctic. An electromagnetic pulse is sent from the EM bird, hanging 10 meters above the ice. Once the pulse hits sea water, it is sent back to the helicopter.
- Glaciologist dr Wolfgang Rack makes a direct measurement of ice thickness and density in Antarctica.
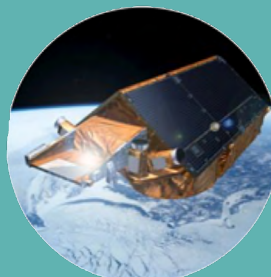
Data from different sources can strengthen one another. Primary field data —a person digging a hole in the ice and measuring the thickness - can be used to calibrate electronic measuring devices installed in satellites in orbit around the planet. Similarly, field data on forest composition can be combined with satellite images for improved interpretation, and zoologists following groups of elephants or whales can improve our understanding of how migratory species depend on connectivity of healthy land- and seascapes. Similarly, baseline and ex-post field measurements can (on a sample basis) be used to verify and improve ex-ante modeled estimates.

3.3 Biodiversity impact assessment approaches

3.3.1 Introduction

The impact on biodiversity is generally determined by the impact drivers in a specific location and the characteristics of the ecosystem and biodiversity in this location. In simplified terms: Impact = Impact drivers + Location. Biodiversity impact assessment approaches can be based on impact drivers, on the biodiversity characteristics of an impact location or on a combination of both. An impact assessment can be qualitative, e.g. a description of sector specific impact risks, or quantitative, like the calculation of an impact score.

Based on this, different impact assessment approaches can be distinguished, which can be applied for different purposes and at different stages in the loan and investment process (see table 1 and figure 6):

Screening potential biodiversity impact:
- based on qualitative information on impact drivers
- based on asset location and geospatial biodiversity data
- on impact drivers & geospatial biodiversity data
- using a quantified biodiversity footprint

or

Measuring actual biodiversity impact

The difference between *screening potential impacts* and *measuring actual impacts* is in line with the draft recommendations of the Align initiative.

Combination of approaches
These impact assessment approaches often complement each other and can be *combined* in 'hybrid' approaches. An example of such a hybrid approach is a screening of loans and investments for impact risk using qualitative information on impact drivers, followed by an analysis of impact risk based on geospatial biodiversity data. Another example is a quantified biodiversity footprint, combined with a qualitative analysis of sector specific impact drivers which could not be included in the quantified footprint.

Tiered approach
Moreover, the different approaches can also be used in a tiered approach, for example:
1. Starting with impact screening on a portfolio level to identify high-risk sectors/companies (scoping step), using qualitative information.
2. Screening loans and investments identified in step 1 for location-related impact risks, using geospatial biodiversity data (are assets located in or near areas with high biodiversity value?)
3. Screening loans and investments resulting from step 1 and 2 for potential impact using a quantified footprint, gaining more detailed insight in the most important impact drivers.
4. Monitoring actual impacts for the loans and investments with the highest potential impact according to step 3.

Costs

Note that different impact assessment approaches, the use of different types of data and a focus on different scopes may incur different costs. For example, costs of screening potential impacts will normally be lower than of measuring actual impact. Costs of gathering primary data are generally higher than using secondary data from databases and including scope 3 in an assess‑ ment may also result in higher costs, especially when looking for primary data in supply chains. What costs are acceptable for what analysis will need to be decided by financial institutions themselves. This will also depend on what decisions the analysis needs to support, and the level of accuracy needed for this decision.

Accuracy

It is important to realise that screening of potential impact will often be less accurate than measuring actual impact. However, screening of impact can be a good first step to limit the amount of work needed when zooming in on potential impact hot spots. Especially when an impact assessment does not take into account location specific characteristics of the ecosy‑ stem (e.g. because the asset location is not known) the result must be treated with care.

> In practice this means that a financial institution should be very careful to base loan and investment decisions on an assessment of potential impact, especially when the impact location is not known. Instead, an assessment of potential impact can be used to *inform* loan and investment decisions, like the need to gather extra (primary) data, the need to engage with investees and the need to draft biodiversity related conditions for a loan or invest‑ ment agreement.

More guidance on where and when the different impact assessment approaches fit best will be developed in future revisions of the PBAF Standard.

3.3.2   Overview of biodiversity impact assessment approaches

Table 1 provides an overview of different types of impact assessment approaches, including a brief explanation, what it can be used for, the effort to conduct an assessment and the main limitations of each approach. Each approach is further discussed in paragraphs 3.4–3.8.

Table 1 Overview of biodiversity impact assessment approaches

	BIODIVERSITY IMPACT ASSESSMENT APPROACH	EXPLANATION	USED TO (EXAMPLES)	EFFORT NEEDED TO CONDUCT THE ASSESSMENT AND MAIN LIMITATIONS
1	Screening potential bio‑ diversity impact based on qualitative information on impact drivers	Based on publications and online databases offering sector specific information on the materiality of impact drivers and potential impact on biodiversity	• Screen an investment universe, portfolio or individual loans and investments for impact risk by establishing the overlap with high impact risk sectors. • List or rank priority sectors, loans and investments (scoping) to focus next steps on biodiversity. • Develop a sector specific biodiversity policy and biodiversity related loan and invest‑	Limited effort Limitations • Information may not be available for all sectors • It only provides an indication of sector specific impact drivers and potential impact (impact risk), not an actual impact.

			ment conditions (identifying mitigation measures). • Inform biodiversity related engagement • Describe potential impact to complement a quantified footprint in which not all impact drivers could be covered.	
2	Screening of potential bio–diversity impact based on asset location and geo–spatial biodiversity data	Use of geospatial data on the presence of protected areas, key biodiversity areas and endangered species. To do this, the asset/ project location must be known.	• Screen an investment universe, portfolio or individual loans and investments for impact risk by establishing the overlap with sensitive locations/ regions. • List or rank priority loans and investments (scoping) to focus next steps on biodiversity. • Develop a location specific biodiversity policy and biodiversity related loan and invest–ment conditions. • Engage with investees to identify and under–stand potential risk exposure	Limited – Medium effort *Limitations* • Only possible when location data of assets financed is available • Results in a potential impact (impact risk), not an actual impact
3	Screening of potential biodiver–sity impact based on impact drivers and geospatial biodiversity data	Combination of approaches 1 and 2. To do this, the asset location must be known.	• Identify impact risks and opportunities for specific loans and investments. For example, to identify opportunities to contri–bute to a reduction of species (abundance and) extinction risks.	Medium – High effort *Limitations* Only possible when location data of assets is available Results in a potential impact (impact risk or opportunity), not an actual impact
4	Screening of potential bio–diversity impact using a quantified biodiversity foot–print	A footprint calculation of a portfolio, asset class, company or project, based on environmental input/ output data and pressure–impact modeling	• Quantify potential impacts on the level of a portfolio, an asset class or individual loans and investments • Used as a scoping step: identifying priority loans and investments for next steps • Develop biodiversity related loan and investment conditions • Identify impact drivers for engagement purposes • Monitor progress to a no–net–loss or net–gain objective	High effort (mostly dealt with by data providers) *Limitations* • Results in a potential impact on biodiver–sity, not an actual impact • Still limited possibi–lities to take local ecosystem characte–ristics into account. • Not all drivers of biodiversity loss are covered by the current methodo–logies. • Potential high dependence on

			assumptions and secondary data, limiting accuracy and responsiveness to company action (mitigation measures).
5	Measuring actual biodiversity impact	On site monitoring of changes in biodiversity. Note that, to assess the impact of economic activities, changes need to be attributed to these activities. This can be a challenge, especially when more activities take place in the same area.	• Quantify actual impact on the level of an individual loan or investment. • Adjust estimated/potential impact used in a footprint calcula-tion. • 'Calibrate' modelled impact. • Verify compliance to loan and investment conditions, like no deforestation. • Identify impact drivers for engagement purposes.	High effort

Impact assessment approaches in the loan and investment process

The impact assessment approaches can be used at different phases of the investment process. Table 2 provides an overview of different phases in the loan and investment process, actions to manage biodiversity impact risks & opportunities in each phase and impact assessment approaches frequently used.

This overview is of course a simplification of reality, but is does provide insight in where the different impact assessment approaches tend to 'sit' in a loan and investment process and what actions they tend to support.

Table 2: Actions to manage impacts on biodiversity in different stages of the loan and investment process and recommended impact assessment approaches.

	PORTFOLIO & SECTOR LEVEL	INDIVIDUAL LOANS & INVESTMENTS/PROJECTS IN A SPECIFIC SECTOR				PORTFOLIO & INDIVIDUAL LOANS AND INVESTMENT
Stages in the Loan & Invest-ment process	**1. Scoping & Identification**	**2. Due diligence**	**3. Defining conditions loan/ investment agreement**	**4. Active ownership**	**5. Exit (end of loan, sale of a stock)**	**6. Reporting**
Actions to manage biodiversity impact risks & opportunities	Screen potential impact of new loans & investments --> due diligence Screen potential impact in existing portfolio --> active ownership	Zoom in on biodiversity impact risks & opportunities new loan/ investment	Translate poten-tial impact risks & opportunities in conditions loan/investment agreement	Monitor actions by investees as agreed Engage with new investees on action plan/ actions agreed Engage with existing high risk/ opportunity investees on new action plan	Measure actual impact investee to verify agreed impact result Identify and share lessons learned and feed into portfolio/ sector strategy	Report on potential and actual impacts on portfolio and/or loan/ investment level, and progress against targets
Impact assessment approaches recommended at the different stages	Assessment of *potential* impact using: • Qualitative info impact drivers • Quantitative footprinting	Assessment of *potential* impact using: • Qualitative info impact drivers • Asset location and geospatial data • Impact drivers, asset location and geospatial data • Quantitative footprinting	Using results due diligence stage (*potential* impact)	Using results due diligence stage (*potential* impact) New assess-ments of *poten-tial* impact for existing loans and investments not yet screened. Same approa-ches apply as in the due diligence stage. Measuring of *actual* impact	Measuring of *actual* impact	Using results previous stages (*potential* and/or *actual* impact)

3.4   Screening of potential impact – qualitative information impact drivers

A first step financial institutions can take to gain insight in biodiversity impact is to gather information from sector–specific publications and online databases/tools. For many sectors, publications by sector associations and nature conservation organisations are available on the (potential) impact of economic sectors on biodiversity. Examples include the ICMM publication 'Good Practice Guidance for Mining and Biodiversity' (ICMM, 2006) and the publication 'Biodiversity Risks and Opportunities in the Apparel sector' (IUCN, 2016). Information on the biodiversity impact of sectors can also be found via online tools. A very early example of online information on biodiversity and the private sector is IFC's 'A Guide to Biodiversity for the Private Sector', which includes an overview of the major biodiversity issues related to a selection of key industry sectors in which IFC operates. More recent examples include IFC's 'Global Map of Environmental & Social Risks in Agro–Commodity Production' (GMAP, **http://gmaptool.org/**) and FMO's ESG Toolkit (**https://www.fmo.nl/esg–toolkit**).

In this way, information on impact drivers and sector specific biodiversity best practices can be identified. This can be used to inform sector specific biodiversity policies (e.g. a palm oil policy), engagement with investees (on impact drivers and best practices identified) or to complement a quantitative footprint (see paragraph 3.7).

Another source of information are overviews of *high impact risk sectors*. These overviews are based on the *drivers of biodiversity loss* linked to the economic activities and production processes in a sector and the significance/materiality of these drivers. An example is the impact module in the ENCORE knowledge base, which enables users to identify sector specific impact drivers and the materiality of these impact drivers. Another example is the sector-level materiality screening tool of the Science Based Targets Network (SBTN).

NB: Impacts on biodiversity are often located upstream in the value chain, in, for example, raw materials from mining or agriculture. Sectors with a relatively low impact at site level can still have a high impact when impacts upstream and downstream are considered. It is therefore important to know how a list of high impact risk sectors was compiled.

GUIDANCE ON HIGH IMPACT RISK

An example of an overview of high impact risk sectors can be found in the publication 'Beyond 'Business as Usual': Biodiversity Targets and Finance' (UN Environment Programme, UNEP Finance Initiative and Global Canopy, 2020). In this case, sectors were selected using data on potential impact and data on the financial flows the sectors receive in the MSCI All Country World Index.

Key sectors from an impact perspective:
- **Agricultural Products**
- **Distribution**
- **Mining**
- **Oil & Gas Exploration & Production**
- **Oil & Gas Storage & Transportation**

The result can be used as a *scoping step*, to select loans and investments in 'high impact risk' sectors. Of course, this information is still high-level and such a screening should be followed up by more in-depth analysis, for example by:
- Zooming in on the materiality of different impact drivers and where these impact drivers occur (on site, upstream or downstream), using information from databases/publication like ENCORE and SBTN.
- Zooming on the location of the loans/investments to assess the overlap with areas of high biodiversity value (see paragraph 3.5)
- Conducting a biodiversity footprint analysis for the loans/investments selected (see paragraph 3.7, using primary data where available, to gain more insight in the potential impact of the loans and investments (what are the hotspots within the selection?) and to gain more insight in the contribution of different impact drivers.

BIODIVERSITY IMPACT ASSESSMENT IN THE FINANCIAL SECTOR

SUMMARISING

In general, a qualitative analysis of potential impact can be a good way of identifying impact risks in different sectors, the impact drivers responsible and best practices. This information can be used as an input to sector specific biodiversity policies and engagement activities. Many studies are available on sector specific biodiversity impacts and ways of avoiding and mitigating these impacts.

Overviews of high-risk impact sectors can help to identify biodiversity impact (risk) hot spots in a portfolio and to decide on priorities for next steps (zooming in). Moreover, such a screening, combined with information from follow-up steps, can also inform the transition to a more sustainable portfolio: what new loans and investments to seek out, which (sub)sectors to include only under strict conditions.

This is a relatively easy first step financial institutions can take to assess risks on a universe and portfolio level. It also shows that a lack of quantitative data should never prevent financial institutions from acting. There is more than enough qualitative information available to identify sector specific impact risks and to take action.

PORTFOLIO SCANS USING ENCORE AND SBTN

ENCORE was developed specifically for financial institutions. This web-based tool is free to use and has several features. The tool provides ratings for both (potential) impacts (how does an economic activity impact nature) ánd (potential) dependencies (how is an economic activity dependent on nature). By entering a specific sector, sub-industry and production process, the user is presented with impacts and dependencies considered 'material'. The level of materiality is presented as Very High, High, Medium, Low or Very Low. More details on database and methodology here.

ENCORE has been applied by multiple financial institutions to assess dependencies, including Banque de France and DNB, the Dutch Central Bank. A growing number of financial institutions uses ENCORE to assess both impacts and dependencies. Note that materiality ratings are provided for Direct Operations. Upstream and Downstream can be assessed separately. For instance, 'production of paper products' does not include growing and harvesting of wood products; that is covered under 'forestry related processes'. Another aspect to consider is the sector and sub-industry categorization. ENCORE uses GICS, while many financial institutions use NACE or NAICS. This requires some conversion efforts.

NATURE-RELATED ISSUE AREA	PRESSURE CATEGORY
Land/Water/Sea Use Change	Terrestrial ecosystem use
	Freshwater ecisystem use
	Marine ecosystem use
Resource explotation	Water use
	Other resources use
Climate Change	GHG emissions
Pollution	Non-GHG air pollutants
	Water pollutants
	Soil pollutants
	Solid Waste
Invasives and Other	Disturbances
	Biological alterations/ interferences

SBTN: assessing impacts from direct operations and downstream

The Science Based Targets Network (SBTN) produced a guidance document for businesses in September 2020. Since then, the network has provided regular updates and tools (for all corporates, not only financials). Some tools are public, some only available to SBTN partners. One of these is the SBTN Sectoral Materiality Tool[21], an Excel file with the same impact materiality ratings as ENCORE for Direct Operations (both work with UNEP-WCMC). The impact or 'pressure' categories (SBTN pressures in image) are largely the same. The tool currently has materiality ratings for impact, not dependencies.

21 It should be noted that, although the SBTN tool was not developed specifically for financial institutions (rather for companies and cities), the tool can be used as described, and the SBTN team is further exploring how the financial sector can best use this tool.

This new SBTN Sectoral Materiality Tool (further improvements in process), has two aspects that differ from ENCORE. The first is a sector categorization more granular (ISIC) than used by ENCORE (GICS). The second is that SBTN explicitly looks not just at Direct Operations, but also Upstream and Downstream. For these reasons, Rabobank with knowledge partner WWF NL chose to analyse potential impacts of its loan portfolio using this tool (while analysing dependencies with ENCORE).

Points noted by users, with some addressed in the next version: 1) granularity of sub-sectors does not always translate to granularity in materiality ratings (e.g. potential impacts for different crops estimated as the same), 2) no data yet for downstream (e.g. plastic waste), 3) as with ENCORE, sector category conversions can be challenging and 4) methodologies behind Direct Operations and Upstream are currently slightly different.

Finally: both the ENCORE and SBTN tools provide broad estimates of potential materiality. Materiality for individual cases will be higher or lower depending on location and mitigation efforts. Certainly useful at the portfolio-level, the results should not be seen as end-result. Rather, in line with both SBTN and TNFD guidance, they help prioritize high-risk sectors and further (location-specific) assessments of risks and opportunities.

3.5   Screening of potential impact – asset location and geospatial biodiversity data

In the recent launch of the TNFD Beta Framework, it was again underlined: for a solid biodiversity impact assessment, location-specific information is crucial. Though starting with a portfolio-wide sector analysis is logical, further analysis – especially of high-risk sectors – requires such information. This starts with the country, for instance where agricultural commodities (a known high-risk sector) originate. Even only the country name provides a better-informed risk analysis, for instance when using the ESG Toolkit developed by FMO and Steward Redqueen (which requires NACE sector information plus a country name and refers to IFC Performance Standards, including PS6 on Biodiversity), or IFC GMAP (developed by IFC World Bank, only focusing on agricultural commodities yet with country risk comparisons and more detailed information on key protected and/or high biodiversity areas, as well as certifications).

The next step is more detailed information on the location (ideally the GPS data of the project area or a map). Data providers and analysts call this 'geospatial biodiversity data' or 'geodata'[22]: information on the biodiversity characteristics of an area, like the presence of protected areas, key biodiversity areas and/or endangered species. A well-known example is the IBAT database. This geospatial data, overlaid with company operations, can be used to assess the risk that an impact by a company or project might be significant due to the biodiversity characteristics of the area.

This approach can be illustrated by the concept of 'critical habitats' in Performance Standard 6 of the International Finance Corporation (IFC)[23]. Critical habitats are defined by IFC as areas of high biodiversity value, based on five criteria. No project activities can be implemented unless strict conditions are met, including the condition that "the project does not lead to measurable adverse impacts on those biodiversity values for which the critical habitat was designated, and on the ecological processes supporting those biodiversity values".

22 Geospatial data is data about objects, events, or phenomena that have a location on the surface of the earth.
23 International Finance Corporation, 'Performance Standard 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources', January 2012.

More guidance on screening of site-based impacts can be found in the publication 'Biodiversity Indicators for Site based Impacts, by UNEP-WCMC, Conservational International and Fauna & Flora International.[24]

USE OF IBAT BY FMO

FMO has embedded ESG risk management as an integral part of its organizational structure and investment process. Project approvals and contracts include both financial and ESG considerations. It has built up a large and experienced team of ESG specialists who are trained to identify, manage and monitor ESG related risks and impacts of FMO investments. Amongst the many ESG tools used by these specialists is also IBAT, the Integrated Biodiversity Assessment Tool involving BirdLife International, Conservation International, IUCN and UNEP-WCMC. FMO is an IBAT partner since 2018.

IBAT is applied at an early stage of FMO's investment process, *during its first selection of clients.* The tool provides the development bank guidance to inform its decisions and is *used as a basic risk screening on biodiversity* to provide a first overview on IUCN Red List of Threatened Species, Protected Areas, and Key Biodiversity Areas.

Amongst the many applications, FMO's ESG specialists generate Proximity Reports and Visual Data Maps presenting the location of high biodiversity areas in relation to the area of FMO's potential investment to gain a basic understanding on the relationship between the client or project and its impact on biodiversity. When it is found, for instance, that a project site encroaches an area that is home to a diverse and unique range of species and ecosystems, that it could be considered a High Conservation Value area, or when project activities are predicted to severely impact biodiversity features and ecosystem services valuable for the livelihood of local population, FMO may decide not to proceed with the evaluation of the opportunity, in line with FMO's exclusion list and applicable ESG requirements outlined in its public Sustainability policy.

However, if risks and impacts can be managed in line with FMO's ESG risk appetite, IBAT results are taken along during the next stage of the investment process. This may include further assessment by independent biodiversity experts during due diligence stage, or contractual requirements for clients to mitigate its biodiversity risks and impacts. FMO's ESG specialists would then continue to use IBAT as a monitoring tool throughout the lifetime of the investment to ensure that biodiversity risks are continuously and correctly categorized, assessed, and mitigated.

Of course, such a screening is only possible *if the asset location is known*, which may not always be the case, especially for asset managers. Moreover, the value chain challenge also applies here. The locations of suppliers to investees may not be known, therefore preventing a screening with geospatial data further upstream. Also, the location of the use and end-of-life of the products is usually not known, preventing a screening with geospatial data further downstream.

SUMMARISING

Screening loans and investments for overlap with areas of high biodiversity value will show what loans and investments require priority attention from a location perspective. An important precondition is of course that asset location is known, which can be a challenge for asset managers.

When asset locations are known, this is a relatively easy step financial institutions can take.

See the section below for more detailed information on the availability and use of geospatial biodiversity data.

24 UNEP-WCMC, Conservational International and Fauna & Flora International, 'Biodiversity Indicators for Site based Impacts', Cambridge, UK, 2020.

Use of geospatial data on biodiversity and ecosystem characteristics
In addition to local biodiversity data provided by investees and available from local experts and partners, data can be retrieved from databases containing geospatial data on biodiversity and ecosystem characteristics.

Data already used in impact assessment in the financial sector includes data on (see Annex 5 for an explanation):
- Threatened species – IUCN Red List
- Protected Areas[25]
- Key Biodiversity Areas[26]
- Satellite data on deforestation
- Species information databases
- Spatial data on ecosystem characteristics, like water quantity/quality
- Monetary values of ecosystem services from, for example, the Ecosystem Services Valuation Database (ESVD)

Geospatial data on biodiversity and ecosystem characteristics, either from companies/projects or databases can be used in an impact assessment in different ways:

1. **In portfolio screening to identify priorities for a more detailed biodiversity impact assessment**
   A portfolio screening based on spatial biodiversity data can be used to decide on priorities regarding a more detailed biodiversity impact assessment. For example, by giving priority to investments in companies located in or close to Protected Areas and Key Biodiversity Areas or with supply chains in or close to Protected Areas and Key Biodiversity Areas.

2. *In an investment analysis to inform a risks and environmental and social impacts identification process*
   Spatial biodiversity data from databases like IBAT can be used to conduct an initial screening ('heat mapping') of an investment portfolio, focusing on the presence of endangered species, protected areas, or Key Biodiversity Areas in and around production/project locations. The result can be used in a risk and environmental/social impact identification process of (potential) loans and investments and can be taken into account in loan/investment conditions. Moreover, the decision not to invest in economic activities located in or close to a protected area or key biodiversity area (or only in activities that promote restoration or conservation of biodiversity) may already be included in a financial institution's biodiversity policy. Note that data on the location of investees/projects is needed to match the biodiversity data with loans and investments.

3. *To establish a baseline in a biodiversity impact assessment*
   Geospatial biodiversity data can be used to establish the baseline or reference situation in a biodiversity impact assessment: the situation before an intervention (e.g., an investment in reforestation). Moreover, geospatial data can be used to identify the land-use type before a land-use change takes place. For the land-use type identified (e.g., forest or pasture), an assumption can be made of the corresponding level of biodiversity or biodiversity intactness, using metrics like PDF or MSA (see the textbox below). This information can be used to assess the impact on biodiversity when the land is transformed in another land-use type (e.g., from pasture to agriculture).

25 A protected area is "a clearly defined geographical space that is recognised as and dedicated to achieving the long-term conservation of nature — with its associated ecosystem services and cultural values — and is managed, through legal or other effective means, to do so" (IBAT, 2022).
26 Key Biodiversity Areas (KBA) are "sites contributing significantly to the global persistence of biodiversity", in terrestrial, freshwater and marine ecosystems" (IBAT, 2022).

LAND-USE TYPES AND THE LEVEL OF BIODIVERSITY

Depending on the impact assessment methodology used, 'land-use types' can be used to assess the level of biodiversity in an area. Examples of land-use types are 'pasture and meadow', 'permanent crops' and 'mosaic agriculture'. Each of these land-use types has been attributed a specific level of biodiversity (expressed in PDF or MSA), based on scientific studies. In this way, the impact on biodiversity of investments resulting in a change in land-use type can be estimated without gathering local biodiversity data. A limitation of this approach is that an area may not fully match with one of the land-use types available.

4. *To translate drivers of biodiversity loss into impact in a footprint*
   Spatial data on ecosystem characteristics, like water scarcity, can be combined with impact drivers, like water use, to calculate a potential impact on biodiversity. The opportunities to do this will vary with the footprinting methodology used (see the PBAF publication on Footprinting). Most footprinting tools will not differentiate between areas of different biodiversity value; the result will be the same for a high conservation value area (HCVA) and an area of limited biodiversity value. When investments in economic activities in HCVAs are excluded through a financial institution's biodiversity policy, this limitation is taken out of the footprint equation.

   NB: To take the local characteristics of an ecosystem into account in the calculation of a footprint, it must be clear where the impact area is located. In case of modelled supply chains, for example, this is not the case.

5. *To combine with the results of a quantitative biodiversity footprint*
   When the result of a quantitative footprint includes an overview of where the potential impacts on biodiversity are likely to be located (e.g., on a world map), spatial biodiversity data can be used as an extra layer to show if impact locations overlap with locations of high biodiversity value (and/or ecosystem services value). Based on the result, the impacts and areas could be earmarked as high priority for follow-up steps. Whether this is a realistic option will depend on the accuracy and granularity of the impact map generated by the footprint. For example, if a footprinting methodology uses modelling of supply chains because better data are not available, and only shows in what countries impacts are likely to take place, the options to combine this information with geospatial biodiversity data will be limited.

6. *To use in predictive spatial modelling*
   Geospatial data can also be used in predictive spatial modelling to assess future changes in biodiversity (and for example ecosystem services) resulting from projects/interventions planned. An example is the 'Adaptation, Biodiversity and Carbon Mapping Tool' (**ABC-Map**), developed by FAO, AFD and the Bundesministerium für Ernährung und Landwirtschaft. This tool allows the user to select an area where an intended land use (change) is planned and to identify the related changes in biodiversity (expressed in MSA) and the value of the ecosystem services provided.

7. *To verify compliance with investment criteria and progress agreed on with investees*
   Satellite data can be used for real time tracking of deforestation or forest degradation. This data can be used to verify compliance with investment criteria on deforestation and to track progress on changes in biodiversity agreed with investees. The result can be used in engagement with companies.

8. *In engagement*
    Spatial data on biodiversity and ecosystem characteristics can be used to:
    - decide on priorities regarding engagement, for example by giving priority to companies located in or close to Key Biodiversity Areas or in areas with a high ecosystem services value; or to focus on companies for which the impact drivers identified (e.g., by means of a biodiversity footprint) overlap with unfavourable ecosystem characteristics, like companies with a potential impact on biodiversity caused by water use, located in water scarce areas;
    - inform the engagement; companies may be asked how potential impacts on nearby areas of high conservation value are being managed.

    A precondition is of course that the location of the companies invested in (and ideally of the suppliers to these companies) is known. This can also be part of the engagement: motivate companies to trace and provide supply chain data. Real time data from satellite imaging can be used to track risks (like deforestation) and verify improvements.

9. *In reporting*
    Location-related information, especially if combined with attractive maps, photos, and other visuals, can be both informative and educational. It makes the projects 'come alive', which helps FIs explain biodiversity related impacts and opportunities to their stakeholders, whether their own investors, clients, partners, management, or employees. When sharing an individual story, FIs are advised to place them in the context of the portfolio as a whole and relate them to targets set and policies agreed upon.

ACTIAM ENGAGEMENT PROGRAM ON DEFORESTATION IN PALM OIL AND SOY

As part of its sustainable investment strategy, ACTIAM has set the goal to reach zero deforestation by 2030. One of the challenges towards reaching that goal is the complexity of consistently measuring deforestation taking place in the supply chains of investee companies. To help with this, in 2019 ACTIAM partnered with Satelligence, a geodata-analytics company, to measure and reduce company-specific deforestation.

In 2020, ACTIAM teamed up with other investors, representing €1.8 trillion in assets, to launch the investor initiative 'Satellite-based engagement towards zero deforestation'. This group of investors enters into dialogue with companies to address deforestation cases found by satellite detection and to call for preventative measures for deforestation. The goal is to speed up the transition to deforestation free supply chains.

('Zero deforestation engagement, Phase 2 update', ACTIAM, December 2021)

ADDRESSING DEFORESTATION RISKS USING TRASE FINANCE

Financial institutions are exposed to deforestation via their loans and investments in companies that produce, trade or use commodities linked to the majority of deforestation worldwide - including soy, beef, palm oil, pulp, coffee and cocoa. Yet it can be difficult for investors to understand their exposure to these risks, due both to the complexity and opacity of global supply chains and the complex corporate structures of companies that trade in forest risk commodities.

Trase's supply chain mapping systematically links individual supply chain actors to specific, subnational production regions, and the sustainability risks and investment opportunities associated with those regions. It identifies the individual companies that export, ship and import a given traded commodity; and It covers all of the exports of a given commodity from a given country of production. Trase Finance maps both the direct and indirect financing of trading companies. This creates a network of the different pathways through which financial institutions and funds are exposed to deforestation risk associated with the trade of forest-risk agricultural commodities. Trase currently covers 13 commodities and 9 sourcing countries.

(Website Trase, March 2022)

More information about the use of geospatial data can be found in the following two publications:
- About the use of geospatial data: 'Geospatial ESG; the emerging application of geospatial data for gaining environmental insights on the asset, corporate and sovereign level', WWF, World Bank Group, Global Canopy, January 2022.
- About screening of sites against biodiversity features: 'Biodiversity Indicators for Site based Impacts' by UNEP–WCMC, Conservational International and Fauna & Flora International (2020).

3.6 Screening of potential impact – impact drivers & geospatial biodiversity data

Impact risks can also be assessed by combining information on specific impact drivers and geospatial biodiversity data. Either by combining the two steps described in the previous two paragraphs (selecting loans and investments based on a screening of high impact risk looking at impact drivers, followed by a screening based on geospatial biodiversity data), or by using tools that combine information on impact drivers and biodiversity characteristics of the impact location. Two examples of such tools are the Biodiversity Impact Metric (BIM) and STAR:

Biodiversity Impact Metric
The Biodiversity Impact Metric (BIM) was developed by the University of Cambridge Institute for Sustainability Leadership (CISL) and can be used to assess and track how a business's sourcing affects nature, through the biodiversity lost because of land and habitat transformation for agricultural production and the intensity of land use. [27] The BIM is based on the following data:

- the land area needed for production of the commodity;
- the proportion of biodiversity lost when the land is transformed to produce the commodity, related to the type of land use and its intensity; and
- the relative global importance of that biodiversity.

The BIM combines data on the impact driver 'land transformation' and geospatial biodiversity data, looking at 'range rarity'. This is a combination of species richness (the number of different species) and uniqueness (the rarity of these species), where rarity is assessed by the size of a species 'range', i.e. the area in which a species is found during its lifetime. To use the BIM, the location of production must be known on at least country level. The accuracy of the metric improves when more granular data is available. The methodology is summarised in figure 6.

Figure 6: Framework for the Biodiversity Impact Metric (From: University of Cambridge Institute for Sustainability Leadership, 'Measuring business impacts on nature: A framework to support better steward-ship of biodiversity in global supply chains', Cambridge, UK, April 2020)

27 University of Cambridge Institute for Sustainability Leadership, 'Measuring business impacts on nature: A framework to support better stewardship of biodiversity in global supply chains', Cambridge, UK, April 2020.

Species Threat Abatement and Recovery Metric

A specific example of an assessment methodology combining information on impact location and impact drivers in this location is the 'Species Threat Abatement and Recovery Metric' (STAR) metric, developed by IUCN in 2021. STAR measures the contribution that investments can make to reducing species extinction risk. STAR apportions the relative contribution of threats (pressures) to each threatened species' extinction risk. For a particular site, land management unit, or administrative region (country or province), STAR shows the potential for reducing extinction risk before investment activities start (ex-ante measure), or can measure the achieved impact of conservation interventions on extinction risk over time (ex-post measure).[28]

Like BIM, STAR looks at the role of impact drivers (the 'threats' or 'pressures') in a specific location with specific biodiversity characteristics. This also means that, to use STAR, location data is key. In 2021, STAR was integrated in the Integral Biodiversity Assessment Tool (IBAT).

SUMMARISING

By screening loans and investments with a combination of data on impact drivers and location characteristics (geospatial biodiversity data), the identification of priority loans and investments can be further refined.

Depending on the tool used, the potential impact on biodiversity can be assessed and expressed in a metric.

3.7   Screening of potential impact – Quantified footprint

A quantitative impact assessment approach can both be used on a portfolio level and at the level of asset classes, single loans and investments. Quantitative impact calculations often include the following four steps:
1. Identification of the economic activities invested in
2. Identification of the environmental inputs and outputs linked to these activities
3. Modeling of the potential impact on biodiversity resulting from these environmental inputs and outputs
4. Complementary qualitative analysis and interpretation of the results

Note that a quantified footprint calculation results in an estimated or *potential* impact. The impact is after all not measured in the field. The impact is modelled using meta-analysis of scientific literature on impacts measured in the field. A quantified biodiversity footprint is based on a combination of primary data (data reported by companies invested in) and secondary data, from databases with (country specific) sector averages. Sometimes, only revenue data per sector and country or region are used as primary data. In this case, a big part of the footprint is based on secondary data. If more primary data is available, for instance on the inputs (purchased goods from other sectors), resource use (direct land and water use) or emissions (direct GHG or other emissions), the footprint will be more accurate.

The potential impact is calculated looking at the impact drivers directly (at the level of the investee) or indirectly (in the value chain) linked to the economic activities invested in. When more primary data is used the footprint will be more responsive to company action (for example, reduced water consumption by the investee will show up in the footprint result). When more secondary data is used (like the average water-use in the sector), the footprint will be less responsive to company action.

28 Species Threat Abatement and Recovery (STAR) Metric: https://www.iucn.org/regions/washington-dc-office/our-work/species-threat-abatement-and-recovery-star-metric

Most footprinting tools calculate an *absolute* impact, like a change in the 'mean species abundance' or the 'potentially disappeared fraction of species'. This is true for the Corporate Biodiversity Footprint (CBF), the Global Biodiversity Score–Financial Institutions (GBS–FI), the Biodiversity Impact Analytics–Global Biodiversity Score (BIA–GBS) and the Biodiversity Footprint Financial Institutions (BFFI). However, there are also tools that calculate a *relative* impact, like the **Net Environmental Contribution Initiative** (NEC, developed by I Care & Consult, Quantis and Sycomore in 2015). This tool, with a focus wider than biodiversity, calculates an impact score between –100% and +100% by looking at 'existing measured average impact of an economic activity'. In this way, a positive NEC indicator means an activity's overall impact is better than the existing measured average. Sector specific certification standards, aiming for a better than average impact, play an important role in the NEC.

A quantitative impact assessment can be used on a portfolio level to identify biodiversity impact hotspots in the portfolio and the reasons behind this impact, the drivers of biodiversity loss. Moreover, the calculations can show where the impact is likely to be in the value chain; at the level of the investee/asset, upstream or downstream. For a more detailed overview of the different steps and data use in each step, see the publication 'PBAF Standard v2022 Biodiversity impact assessment — Footprinting'.

Since the accuracy of the results of a quantified footprint on portfolio level is limited, zooming in on impact hotspots is advised as a next step, looking at a single company or project. Limiting this work to impact hotspots will allow financial institutions to look for more, and better primary data from a company or project, and to look at the biodiversity characteristics of the impact area.

SUMMARISING

Quantification of potential impacts on biodiversity using secondary data and primary data can be used to identify impact hotspots in a loan and investment portfolio and to zoom in and calculate the potential impact of asset classes, single loans and investments.

The calculations will indicate what drivers of biodiversity loss are responsible for the potential impact. In case of existing loans and investments, this information can be used to engage with investees to mitigate the impacts identified. In case of new loans and investments, this information can be used to ask the right questions before a loan or investment decision is made and to decide on the requirements in the loan or investment agreement.

3.8 Measuring actual biodiversity impact

Monitoring of the actual impact on biodiversity of a company or project invested in will require the collection of field data and an attribution of the changes in biodiversity observed to the activities of the company or project. The latter will not always be easy, especially when more economic activities take place in the same area. Moreover, monitoring of actual impact can be costly and time consuming and will require the input of ecological knowledge. However, monitoring of actual impact by investees will be key to change the current reliance on estimates and proxies to a growing availability actual impact data. For this reason, financial institutions should always encourage investees to gather actual impact data, especially for high (impact) risk sectors.

Guidance on the way to collect baseline biodiversity data has, amongst others, been developed by the Cross–Sector Biodiversity Initiative (CSBI), a partnership between IPIECA, the International Council on Mining and Metals (ICMM) and the Equator Principles Association[29]. For some com-

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29 Gullison, R.E., J. Hardner, S. Anstee, M. Meyer, 'Good Practices for the Collection of Biodiversity Baseline Data', Prepared for the Multilateral Financing Institutions Biodiversity Working Group & Cross–Sector Biodiversity Initiative, 2015.

panies this monitoring of actual impact is already common practice (e.g. companies in the mining sector), for most companies this may be a challenge. However, there is a growing number of innovative techniques available that can facilitate the assessment and monitoring of changes in biodiversity, like the use of eDNA (determining the presence of species based on DNA fragments in water or air), bio–acoustics (determining the presence of species based on sound analysis) and the use of satellite imaging.

Monitoring can also focus on interventions planned with the intention to positively affect bio–diversity, like monitoring of the number of hectares reforested, compared to the hectares of reforestation planned. Although this is not monitoring of actual impact on biodiversity, the results can be used to adjust the calculations of potential impact (e.g. using a biodiversity foot–printing approach), resulting in a more accurate calculation.

Financial institutions and their clients and investees are advised to cooperate with others in the landscape on data gathering and analysis. Central or local governments may already track certain species; a local university may be a good parter, or an NGO with relevant experience and expertise.

SUMMARISING

Monitoring of actual changes in biodiversity is key to reduce the current reliance on impact estimations and proxies. For this reason, financial institutions should always encourage investees to collect impact data.

Monitoring of the interventions that intended to lead to a positive impact on biodiversity (like reforestation activities or a reduction of water use) can be used to adjust calculations of potential impact based on expectati-ons (approaches 4 and 5), and for reporting and future planning purposes.

4 Positive impact on biodiversity

Photo by Boris Smokrovic on Unsplash

4.1   Introduction

Doing good

There is increasing interest – in all aspects of society, including in the financial sector – to not just do less harm but also do good. Not just avoid and reduce negative impact but restore and regenerate nature (see image).

But when can a loan or investment be counted as having a positive impact on biodiversity? How can it be assessed and reported on? How can positive impact rightly be claimed, without the risk of inad-vertently unjust claims?
This is what this chapter explores for *project finance*.

This image is called AR³T and summarizes the SBTN Action Framework. It builds both on the mitigation hierarchy in IFC's Performance Standard 6, and on the Conservation Hierarchy

TRANSFORM

RESTORE & REGENERATE

REDUCE

AVOID

Positive impact in the year 2022

The annual Global Risks Report[30] of the World Eco-nomic Forum paints a stark picture of all environ-mental, societal, economic, geopolitical, and techno-logical challenges. Many of these are interrelated, and many (e.g., climate change, food security and pandemics) are linked to biodiversity loss.

Many financial institutions now have policies in place that reduce greenhouse gas emissions, deforestation, pollution, water use, etc. Still, truly positive impacts on biodiversity remain exception rather than rule. At a global level there is still more deforestation, land degradation, over-exploitation, polluted soils, and plastic in oceans. Increasingly, it is recognized that the focus should shift from only avoiding and reducing harm, to restoration and regeneration. Once restored, healthy ecosystems can capture carbon, help adapt to climate change and provide natural capital to sustain a growing population.

An increasing number of financial institutions is now actively exploring what projects to fund, or funds to develop, that can help restore and regenerate biodiversity. This chapter supports these efforts with proposed requirements, recommendations, and guidance.

Evolving field of work

It is important to note the following:

● The field of work around 'positive impact on biodiversity', 'nature-positive' and concepts like 'net-gain' is developing fast[31]. Discussions focus on how these concepts should be defined, how they relate to the global biodiversity goals, what they mean on the level of a corporation, a company, a product, or a project and how they can be measured.
PBAF does not claim to have the final definitions or wording on positive impact. However, this chapter addresses questions and challenges surrounding positive impact assessment and has translated these into proposed Requirements and Recommendations when claiming positive impact in *project finance*. With that, PBAF aims to play an active role in the discus-sion. Financial Institutions are advised to strive to meet these requirements and consider the applicability of each recommendation. The PBAF Working Groups will continue to cooperate and align with other initiatives in this field, including Align, the Finance for Biodiversity
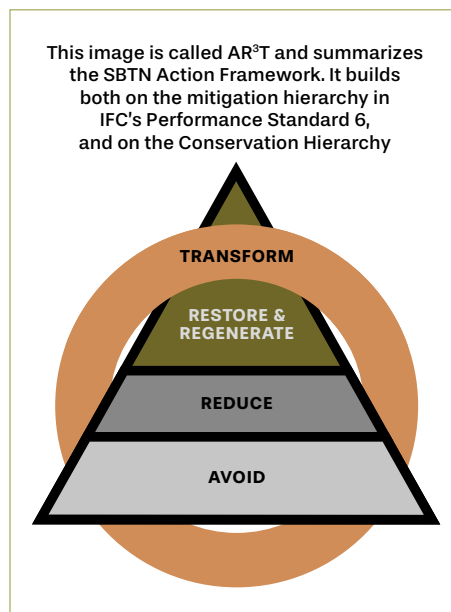
30 World Economic Forum, **'The Global Risks Report 2022'**, 17th Edition, 2022.
31 One example of related work is **this publication** by the WBCSD of December 2021: *What does nature-positive mean for business?*

Pledge, the EU Business & Biodiversity Platform and WBCSD. Requirements and Recommendations will be adjusted where relevant and integrated in the PBAF Standard v2023.

- The proposed Requirements and Recommendations in this chapter are aimed at individual, field-based projects receiving loans or investment. For asset managers, especially those that do not know the field locations of assets under management, the Requirements and Recommendations may be less feasible (though part of the solution may lie in gathering more location-specific information). Over the next year PBAF will continue the development of guidance for direct financiers, investors and asset managers.

Cautious and encouraging

This chapter aims to find a balance between on the one hand cautious definitions, aiming at maintaining integrity when communicating about positive impact. There should be no room for greenwashing, which (in addition to carrying great reputational and liability risks) can unintentionally lead to further biodiversity loss. On the other hand, there should be both encouragement and support to financial institutions that sincerely want to take steps towards more positive impact on biodiversity.

This chapter presents both proposed Requirements (worded as Requirements, '**R**'), and guidance on what FIs are encouraged to do (Recommendations or Advice, '**A**'). Note that the numbering of these requirements and recommendations is specific to this chapter and therefore starts with again with '1'.

4.2   Positive impact means more biodiversity

4.2.1   Bottom line: positive impact means more biodiversity

The bottom line is straightforward. If a financial institution says one of their investments has had or will have a positive impact on biodiversity, they must provide evidence that their investment either has had, or present convincing arguments why it will result in more (wild) animals, plants or microbes in a given area. This means financial institutions need to be clear about:

- **Where** (in what landscape, waterbody, or seascape)
- **When** (have numbers of species increased, or when are they expected to, and how sustainable is that progress / is it expected to be)
- **What** (which species have benefited or are expected to benefit from the investment; is there an increase in numbers of already existing species in that area, and/or has the diversity itself increased; how does the increase contribute to a healthier ecosystem)
- **Why** (why did species numbers and/or diversity increase, or why are these expected to increase)

> **POSITIVE IMPACT ON BIODIVERSITY**
>
> **More animals, plants and/or microbes, improving the health of a natural ecosystem, in a specific location and timeframe, as a result of a human intervention**

In reality, defining positive impact is not that simple. PBAF will work with other initiatives towards improved understanding and wording, including with initiatives mentioned in the previous paragraph, and regulatory processes such as the EU Taxonomy and EU Directives under development. As there are few definitions on positive impact, PBAF proposes the definition as in the box above.

Though the wording may be further optimized, PBAF considers it crucial that if the global trend of biodiversity loss is to be reversed, we do need to aim for 'more biodiversity' and not just 'reduced pressures'.

Below a description of a theoretical case study, after which we explore each of the four questions above (Where, When, What & Why), followed by paragraphs on Data and Reporting.

POSITIVE IMPACT ON BIODIVERSITY

BOX 1: FARM SWITCHES TO ORGANIC AND INVESTS IN RESTORATION

A farm that produces multiple fruits and vegetables switches to organic, excluding the use of pesticides on the farm, working with natural predators of pests (such as lady-bugs), with improved water efficiency leading to less water use.

The size of the land they farm stays the same. They have owned and farmed on this land for more than two decades, and the land was already used for agriculture by the previous owners. Their new production method reduces negative pressures on soil and waterways. The aim is that the soil biodiversity (worms, micro-organisms) will improve, compared to the years farming more conventionally.

The size, location and boundaries of the farm were already known to the investor (this is an ongoing invest-ment, with engagement of the

financial institution). What is new to the investor, is more information on the surrounding landscape. The owner of this farm purchases a piece of land of a neighbouring farm that has also been used to farm on for decades. They have carefully chosen this piece of land, looking at the surrounding landscape, because if restored it can function as a wild-life corridor between two pieces of forest. They decide to actively refo-rest this land. They choose native species, and among the native species they look for those best adapted to the warmer and more extreme weather that is predicted for their region. The aim is for more biodiversity compared to the years the land was used as farmland, directly on the reforested piece of land, but also in the surrounding landscape because of the wildlife corridor. The hope is to restore the biodiversity to levels similar to those

before the land started to be used as farmland.

The entire project (both the transi-tion to organic and the restoration) is financed through a combination of a multi-year loan by a financial insti-tution and a subsidy by an EU pro-gram.

Possible variations to this example:
- Farmland is certified sustainable but not organic
- Farmland is expanded or decre-ased
- New piece of land becomes a combination of fruit trees and restoration
- New piece of land is not refo-rested but left to rewild on its own
- The project is co-financed by at least two different financial institutions.

"The farm case study above is one simplified example used to illustrate the proposed Requirements and Recom-mendations on the following pages. In Annex 1, another case study is presented of a hotel chain near mangroves and coral reefs. It combines smaller and larger interventions, considers upstream and downstream impacts and can be used to explore the proposed Requirements and Recommendations in this chapter from another perspective."

4.2.2   WHERE: the location

Biodiversity is not just a number of species, or the number of animals or plants (or micro-orga-nisms) of a certain species. Biodiversity is called 'the web of life' because of the invisible thread of interactions and interdependence of species within a certain landscape, seascape, or waterway.

Whether species can flourish or not depends on the health of the ecosystem within which they live. That ecosystem health in turn depends on several factors including the type of ecosystem (savannah, tropical rainforest, peatland, mangrove, coral reef), the size of the landscape, how fragmented, connected and/or intact natural areas are, whether air, the quality of soil and/or water, what future impact climate change is likely to have, etc. This is all location dependent.

Financial institutions are frequently (though not always) far removed from the location where their investments impact biodiversity. Though financial institutions also fund projects close to home, many invest in or provide loans to projects on the other side of the planet. The challenge is more than just geographical distance, but also a lack of information. Frequently, financial institu-tions are not aware of the locations of projects they invest in (especially if they invest through one or more intermediaries).

Assessing positive impact on biodiversity requires knowledge of the project area. PBAF conclu-des that to reasonably claim an investment is foreseen to have, or has had, positive impact on biodiversity, the location must be known.

R1: *when a financial institution claims an investment is foreseen to have, or has had, positive impact on biodiversity, they must know the geographic location.*
- *This means knowing the geographic location including GPS and project boundaries (the legal and geographic boundaries of the project; whether farm, concession or other).*
- *If a fund groups multiple project landscapes, the financial institution must be able to request the GPS from the intermediary partner or auditor (this can be confirmed on a sample basis).*

A1: *when an investment in an intervention (e.g. a project) is foreseen to have, or has had, positive impact on biodiversity, a financial institution should work with the investee to better understand the broader landscape[32], waterway, or seascape:*
- *Ecologically: air and water flows, soil connectivity and erosion, wildlife corridors, neighbou-ring protected areas – anything that can be affected by the intervention, or that can affect the intervention.*
- *Socio-economically: understanding demographics, culture, economic activities, social impacts, dependencies and/or other stakeholder relations to the intervention area.*
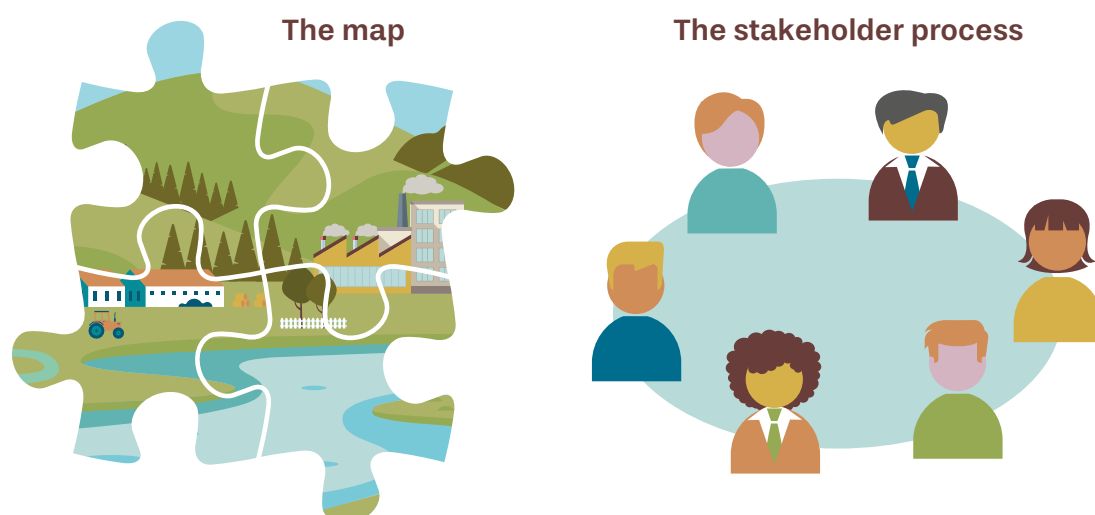

The map   **The stakeholder process**

Figure 7: Applying the landscape approach means looking beyond the direct project area. It combines looking both at the Map and the People: at a geospatial analysis (puzzle to the left) and stakeholder analysis & engage-ment (round table on the right). Image adapted from Wageningen Center for Development Innovation.

R2: *when a financial institution claims an investment is foreseen to have, or has had, positive impact on biodiversity, they must be clear that the claim only refers to that specific geographic location, and they must recognize that there are also positive and/or negative impacts upstream or downstream (see chapter 3 for definitions). This requires both internal awareness and thoughtful external communication.*

A2: *when financial institutions claim an investment is foreseen to have, or has had, positive impact on biodiversity in a specific geographical location, they should make an effort to also assess and improve any impacts upstream and downstream.*

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32 Sources to consult on the wider landscape include IFC Performance Standard 6, and more specifically the **Guidance Notes to IFC Performance Standard 6.** The IFC Performance Standards are applied by many banks that have adopted the Equator Principles. Other guidance on landscape thinking include the **Little Sustainable Landscapes Book**, the three **Landscape Zones** as described by Commonland and the **Global Landscape Forum**.

POSITIVE IMPACT IN BIODIVERSITY FOOTPRINTING

Note that when a biodiversity footprint is calculated for a specific project, upstream and downstream (potential) impacts on biodiversity tend to be included in the result. This will show to what extent a positive impact on site level is likely to go hand in hand with negative, avoided or positive impacts in the value chain. In the disclosure of the footprinting results, the negative, avoided and positive impacts need to be reported separately (see the footprinting document of the PBAF Standard v2022).

What the impacts on site level (direct operations) and in the value chain mean for the ambition of companies and financial sintitutions to reach a 'no net loss' or 'net gain' will depend on the definition of these ambitions. This is part of the current discussions around positive impact and 'nature-positive', as mentioned in paragraph 4.1.

The **blue text** in the Farm case (box on the right) shows that the location and size of the farm are known. What is implicit, but not explicit is whether the investee has provided GPS details and a geographic map of the farm and the newly acquired land to be restored, including legal boundaries. If these are available, that would mean this PBAF Requirement is met.

Regarding the wider landscape, the text **in green** indicates the investee has indeed looked at the surrounding landscape from the ecological perspective. What is not mentioned is what other (socio-economic) activity borders the farm. Has the farm considered ecological impact from ánd on its neighbours, for instance through soil, water and/or air?

What is also not known is whether the investee has recent and/or historic satellite images of the landscape. Finally, the text does not provide information on the social context. Is the farm close to indigenous peoples, to a town or city? Which people have a stake in the farm's activities (impacts or dependencies) or in the wider landscape?

This farm case is not explicit about any impacts upstream or downstream. If indeed pesticides are measurable reduced or phased out altogether, this may lead to avoided negative impact upstream (less GHG emissions and other pressures related to transport and production).

If the farm does work with natural pest predators such as ladybugs, and buys seedlings for tree planting, they may work with their supply chain to assess any positive or negative impacts of how

The Farm, with info on the project location (**Requirements***) and wider landscape (* **Recommendations***) highlighted*

A farm that produces multiple fruits and vegetables switches to organic, **excluding the use of pesticides on the farm,** working with **natural predators of pests** (such as ladybugs), with improved water efficiency leading to less water use.

The size of the land they farm stays the same. They have owned and farmed on this land for more than two decades, and the land was already used for agriculture by the previous owners. Their new production method reduces negative pressures on soil and waterways. The aim is that the soil biodiversity (worms, microorganisms) will improve, compared to the years they have been farming more conventionally.

The size, location and boundaries of the farm were already known to the investor (this is an ongoing investment, with engagement of the financial institution). What is new to the investor, is more information on the surrounding landscape. The owner of this farm purchases a piece of land of a neighbouring farm that has also been used to farm on for decades. They have carefully chosen this piece of land, **looking at the surrounding landscape, because if restored it can function as a wildlife corridor between two pieces of forest. They decide to actively reforest this land. They choose native species, and among the native species they look for those best adapted to the warmer and more extreme weather that is predicted for their region.** The aim is for more biodiversity compared to the years the land was used as farmland, directly on the reforested piece of land, but also in the surrounding landscape because of the wildlife corridor.
The hope is to restore the biodiversity to levels similar to those before the land started to be used as farmland.

The entire project (both the transition to organic and the restoration) is financed through a combination of a multi-year loan by a financial institution and a subsidy by an EU program.

these are produced. Downstream questions include those related to waste management and the packaging and transport used in bringing their produce from field to fork.

4.2.3   WHEN: the reference situation: time linked to state in project location

Perhaps the most crucial question related to measuring positive impact on biodiversity is: compared to what situation? If you say there is a positive impact, this should mean more biodiversity, as stated in paragraph 4.2.1. But more biodiversity compared to what later or earlier time, compared to what state of biodiversity, in what specific location? Over the last decade, this question has been discussed and analyzed from different perspectives.

One perspective is to take as the reference a point in time before there was any anthropogenic disturbance of the ecosystem in the project area. With the rationale: prevent incentives that would degrade a natural area, only to claim positive impacts when restoring it later. Many of those reading will be aware on discussions around cut–off dates related to deforestation. The reason: prevention of greenwashing and unintentionally incentivizing or rewarding those that contributed to deforestation.

However, you also do not want to prevent those that want to restore areas that have been degraded for longer and/or have had an economic land use such as agriculture or mining. And you want to support those that truly want to switch to more sustainable land use than in previous years. In other words: you want to disincentivize greenwashing while encouraging truly sustainable efforts.

PBAF has considered this question with two straightforward criteria in mind:
- The Requirement on Reference has to effectively support efforts that truly lead to increases in biodiversity. Not only is there great reputational risk in anything resembling greenwashing, the more important point is that if positive impact is claimed where there is none (or even a loss), this worsens a global situation of historic biodiversity loss. There is a dire need of projects that really do deliver biodiversity increases. The definition of a PBAF Requirement can affect not just one but many projects. It has to be worded to be part of the solution, not the problem.
- The Requirement on Reference has to be practical in order to encourage financial institutions and their investees to work towards making biodiversity increases a reality. This remains secondary to the first – any project financed should give maximum efforts to realize actual biodiversity increases – but if it is not practical or feasible, it will not happen – however much we want it to.

PBAF concludes the most important aspect of this is transparency and a commitment to understanding land use trends. This includes looking back at land use prior to that by the current owner or concession holders, including using satellite imagery. If all financial institutions do this, and investees become used to the question, a broader understanding of better land use emerges.

PBAF does not prescribe cut off dates but does expect all financial institutions to research and report land use history, with the above perspectives in mind. PBAF expects financial institutions to be maximally transparent about their findings on land use history, and pro–actively share key information (see below). A financial institution that claims an investment will result in a positive biodiversity impact between 2022 and 2030, while they know (or could easily have known) that the project area was only recently deforested or degraded, may risk opening themselves up to reputational risk, or potentially liability risk. A financial institution that works conscientiously with its clients on more sustainable production and/or on restoration that leads to a truly positive impact on biodiversity, should feel encouraged to do so.

With this in mind, the following requirements and recommendations are included.

R3: *when claiming positive impact on biodiversity in an intervention (co-)financed, financial institutions must be explicit about the reference situation. This means being explicit (meaning pro-actively including in external communications and not 'summary-deleting' key information) about:*
- *the project area boundaries (or waterbody or seascape)*
- *between what moments in time: when was the referenced situation?*
- *state of the project area (ideally of the wider landscape) before the intervention (e.g. land use type: natural state such as primary forest; degraded but natural; used for farming, mining, other)*

R4: *Financial institutions must research and report questions on the land use history in the project area. This means actively researching[33] when the project area was converted to the current economic use, when the first degradation or conversion started, and disclosing this information when reporting.*

R5: *Financial institutions cannot claim positive biodiversity impact in a landscape if they were directly or indirectly involved (as investor or co-financer) in conversion or degradation of a natural ecosystem in that same landscape.*

R6: *When claiming positive biodiversity impact, financial institutions should work with the investee to consider how the biodiversity increases, once realized, can be improved and/or sustained beyond the project and/or monitoring period agreed.*

A3: *Financial institutions and investees are advised to include baseline measurements[34] in monitoring.*

In the case of an estimated biodiversity increase from the past until now, parties involved some-times struggle with the realization that they do not have a baseline measurement (to measure the increase against). In the case of an estimated biodiversity increase in the future, financial institutions are advised to monitor carefully, including planning and financing smart baseline measurements. Cooperation with others interested in that particular landscape or on data gathering on the topic concerned (the species or type of forest) should be considered for reason of efficiency. See also paragraph 4.3 on Data.

If we look at the hypothetical farm, we see (on the next page) in blue that, in this case, the investee is aiming for a biodiversity increase in two different project areas:
- with the switch from conventional agriculture to organic on the land they farm
- with the restoration of the newly purchased piece of land which was previously used as cropland

In the case of the hypothetical farm, there is an expected biodiversity increase, e.g., in the future, after the transition and restoration, compared to the years the project areas were used as farm-land. What is implicit is what the starting point and end point in time are for each of the project areas. The investee would have to make these dates explicit, which should be feasible for this case, given that the timing of the new production method and/or restoration activities should be known. In a real investment in this farm there should be:
- explicit start and end dates; the 'before' and 'after' of the interventions
- knowledge on the state of biodiversity before intervention = baseline

33 Sources to consult include **'Geospatial ESG'** by WWF, World Bank Group and Global Canopy, January 2022
34 Sources to consult include the **'Good Practices for the Collection of Biodiversity Baseline Data'**, Gullison, R.E., J. Hardner, S. Anstee, M. Meyer, 2015.

In theory, you could also take as the reference 'the future situation without the intervention' (as there could be other trends that influence the state of biodiversity during the intervention period). If you would do so, you would need a benchmark area comparable to the intervention area. Arguably the more practical reference point for the farm below is the situation before the intervention; with local experts consulted on any other factors throughout the project period that could impact biodiversity.

What species increase is estimated and/or measured, and what data are used for estimation and/or measurement at start and end date, will be discussed in paragraph 4.2.4 and paragraph 4.3, respectively.

4.2.4 WHAT: which species have benefited or are expected to benefit

Another key question: WHAT biodiversity has increased or is expected to increase (as a result of an investment, within a certain project area and a certain timeframe)? Which species benefit and how does that contribute to the health of that ecosystem?

"Biodiversity literally means diversity of life (for the definitions according to IPBES and CBD see chapter 3). A narrow interpretation would be to only count an increase of the number of species and not increased number of individuals of one species. For the purposes of this Standard, PBAF recognizes both more species diversity (more variety) ánd increases in numbers of species as positive impact (paying special attention to threatened and/or vulnerable species, as defined by IUCN's Red List; or as defined by regional or national authorities or experts).

The longer-term health of an ecosystem is not determined by one species only, and an increase in numbers of one species can influence other species. However, some species are 'indicator species' (such as kingfishers, that indicate freshwater is clean enough for them to forage) or 'keystones species' (such as wolves, that help control other species populations and can shape an entire ecosystem). Moreover, PBAF considers the mere fact that financial institutions engage with investees on what species occur in the landscape part of the solution. Jointly understanding what biodiversity is, learning how different species interact in an ecosystem. PBAF considers being explicit about species part of what 'biodiversity accounting' should look like.

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*The farm case study, with info on the reference question (**Requirement**) highlighted*

A farm that produces multiple fruits and vegetables switches to organic, excluding the use of pesticides on the farm, working with natural predators of pests (such as ladybugs), with improved water efficiency leading to less water use.

The size of the land they farm stays the same. **They have owned and farmed on this land for more than two decades, and the land was also used as cropland by the previous owners.** Their new production method reduces negative pressures on soil and waterways. The aim is that the soil biodiversity (worms, micro-organisms) will improve, **compared to the years they have been farming more conventionally.**

The size, location and boundaries of the farm were already known to the investor (this is an ongoing investment, with engagement of the financial institution). What is new to the investor, is more information on the surrounding landscape. The owner of this farm purchases a piece of land of a neighbouring farm that has also been used to farm on for decades. They have carefully chosen this piece of land, looking at the surrounding landscape, because if restored it can function as a wildlife corridor between two pieces of forest. They decide to actively reforest this land. They choose native species, and among the native species they look for those best adapted to the warmer and more extreme weather that is predicted for their region. The aim is for **more biodiversity compared to the years the land was used as farmland,** directly on the reforested piece of land, but also in the surrounding landscape because of the wildlife corridor. **The hope is to restore the biodiversity to levels similar to those before the land started to be used as farmland.**

The entire project (both the transition to organic and the restoration) is financed through a combination of a multi-year loan by a financial institution and a subsidy by an EU program.

TWO EXAMPLES

Panthera pardus is the official **species** name for leopard. *Panthera tigris* is the **species** name for tiger. Both species share the same **genus** Panthera and are part of the **family** of Felidae (felines, aka cats).

There are 5.000 different species of ladybugs (in UK called ladybirds). These insects are all part of one **family** (Coccinellidae).

In the requirement below, PBAF does not expect financial institutions to know all the species in the project area in names, numbers, history, and trends. PBAF does expect financial institutions to know the species they expect to benefit if they claim positive impact on biodiversity (at least the family of species, see textbox). PBAF is aware of Align's work on measuring biodiversity and will work to incorporate best practices on biodiversity measurements in the PBAF Standard v2023.

R7: when financial institutions claim they have or have had positive impact on biodiversity in an investment, they must be explicit about what type of species and/or diversity increase is measured or estimated[35]:

- *What increase in diversity of species is expected or realized (e.g., native tree species, bird, mammal or bee species, and/or different soil micro-organism species),*
- *What increase in numbers of species are expected or realized in the project area and reference period, with special attention to threatened species and/or indicator or keystone species,*
- *How that (indicator or keystone) species increase contributes to a healthier ecosystem.*

A4: when financial institutions claim they will have or have had positive impact on biodiversity in an investment, they should work with the investee to better understand and learn about the species that live in the project area and/or the wider landscape. Their names, interdependence on and with other species in the ecosystem, historic and expected future trends, etc.

Looking at the hypothetical farm, the sections highlighted in blue below give some indication on the type of biodiversity positively impacted. In this case, the information on species is still very generic (soil biodiversity, native tree species). For an investment claiming positive impact on biodiversity, more species-specific information should be provided. A baseline, plus information about biodiversity on the land prior to human interventions, can help investees and investors better identify the right indicators (which can include specific species and/or reduction of pressures on those species, see also paragraph 4.3 on Data).

The farm case study, with info on the Species question **(Requirement)** *highlighted*

A farm that produces multiple fruits and vegetables switches to organic, excluding the use of pesticides on the farm, working with natural predators of pests (such as ladybugs), with improved water efficiency leading to less water use.

The size of the land they farm stays the same. They have owned and farmed on this land for more than two decades, and the land was also used as cropland by the previous owners. Their new production method reduces negative pressures on soil and waterways. The aim is that the **soil biodiversity (worms, micro-organisms)** will improve, compared to the years they have been farming more conventionally.

The size, location and boundaries of the farm were already known to the investor (this is an ongoing investment, with engagement of the financial institution). What is new to the investor, is more information on the surrounding landscape. The owner of this farm purchases a piece of land of a neighbouring farm that has also been used to farm on for decades. They have carefully chosen this piece of land, looking at the surrounding landscape, because if restored it can function as a **wildlife corridor** between two pieces of forest. They decide to actively reforest this land. They choose **native species,** and among the native species they look for those **best adapted to the warmer and more extreme weather that is predicted for their region.** The aim is for more biodiversity compared to the years the land was used as farmland, directly on the reforested piece of land, but also in the surrounding landscape because of the wildlife corridor.
The hope is to restore the **biodiversity to levels similar to those before** the land started to be used as farmland.

The entire project (both the transition to organic and the restoration) is financed through a combination of a multi-year loan by a financial institution and a subsidy by an EU program.

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35 One of the methodologies that financial instutions can apply is the Species Threat and Abatement and Restoration Metric, acronym **STAR** (see also chapter 3). The benefit of STAR is that it combines impact drivers with specific locations and the species in those locations.

It should be noted that PBAF does not favour one specific metric or methodology, and descriptions can be both qualitative and quantitative. The link with the 'Why' (see paragraph 4.2.5) is key here: the party making the claim of positive impact must explain on what assumptions they base estimated species and/or diversity increases (if not directly measured). This means referencing both the species affected (the What) and the pressures lifted or preconditions improved that result in species increases (the Why).

4.2.5   WHY: strategy, assumptions, and attribution

Fundamental questions relate to why species numbers or diversity increased or are expected to increase, and why this is beneficial to that ecosystem? Why does the financial institution think that positive impact on biodiversity is a result of the intervention financed? What are the strategic assumptions? What impact drivers or pressures did or will the project reduce, and/or what space or conditions were created that a positive impact on biodiversity is estimated and/or was measured?

Verify strategic assumptions

There is always the risk that positive impact will not happen due to flawed assumptions and/or unforeseen events. Or that the positive impact does happen but is the result of another intervention action taken by other stakeholders in the direct project area and/or the wider landscape.

Financial institutions should minimize risks by verifying assumptions, cautious about large assumption jumps between intervention, change in impact driver and actual change in the state of biodiversity. This can be done by engaging reputable experts with knowledge of the specific ecosystem and biodiversity in the project area. Financial institutions should make the strategic assumptions explicit in communications about the project. They are advised to include in this work a solid stakeholder analysis, of stakeholders depending on and impacting the biodiversity in the project area, but also the wider landscape.

Verify attribution

Related is the question of attribution. How directly did the financial institution's investment contribute to the project? In the case of a loan, is the entire loan intended for this intervention, or was the money also used for equipment or activities not related to the strategic plan analysed above? And was the financial institution one of more co–financiers, or the only one?

R8: *FIs must make explicit which strategic assumptions are made that positive impact (estimated or assessed) is / will be the result of the intervention (co–)financed by them*
- *What was the strategy behind the intervention co-financed? What impact driver/ pressure on biodiversity was intended to be reduced / what better conditions created, and what validity is behind these assumptions (e.g., what experts approved of the plan?)*
- *What level of attribution does the financial institution and/or investee claim and why? For instance, did the financial institution fully fund the strategic intervention or a percentage?*

The farm case study, with info on the Strategy question (**Requirement** *and* **Recommendation** *) highlighted*

A farm that produces multiple fruits and vegetables switches to organic, excluding the use of pesticides on the farm, working with natural predators of pests (such as ladybugs), with improved water efficiency leading to less water use.

The size of the land they farm stays the same. They have owned and farmed on this land for more than two decades, and the land was also used as cropland by the **previous owners. Their new production method reduces negative pressures on soil and waterways. The aim is that the soil biodiversity (worms, micro–organisms) will improve,** compared to the years they have been farming more conventionally.

The size, location and boundaries of the farm were already known to the investor (this is an ongoing investment, with engagement of the FI). What is new to the investor is more information on the surrounding landscape. The owner of this farm purchases a piece of land **of a neighbouring farm** that has also been used to farm on for decades. **They have carefully chosen this piece of land, looking at the surrounding landscape, because if restored it can function as a wildlife corridor between two pieces of forest.** They decide to actively reforest this land. **They choose native species, and among the native species they look for those best adapted to the warmer and more extreme weather that is predicted for their region.** The aim is for more biodiversity compared to the years the land was used as farmland, directly on the reforested piece of land, but **also in the surrounding landscape because of the wildlife corridor. The hope is to restore the biodiversity to levels similar to those before the land started to be used as farmland.**

The entire project (both the transition to organic and the restoration) is financed through a combination of a multi–year loan by a financial institution and a subsidy by an EU program.

A5: *FIs should carefully consider who are key stakeholders – either key in realizing the impact and/or directly affected. Potentially material stakeholders include:*
- *The investee (C-suite, senior management, employees, advisors, other)*
- *Local stakeholders (communities, companies, local government, universities, other)*
- *Global stakeholders (public, private, knowledge institutions, NGOs, etc.)*

In the case of the farm, there are explicit and implicit assumptions in blue, and stakeholder relations mentioned are limited to those in green. The claim made by the FI should take into account the contribution of the subsidy and recognize the EU program as a partner in the project.

4.3 Data: ideal and proxy, quantitative and qualitative

To answer the questions asked in paragraph 4.2, financial Institutions and their investees need access to data. As in paragraph 4.2.3 on Reference, the perspectives of effectiveness and practicality need to be balanced.

One point of view: we can make a long list of data that – if time and money would not be a limit – we would really like to have before making an investment in a project aiming for a positive impact on biodiversity. You want to develop the best strategy, finance the best project or fund, estimate in advance, monitor during and measure after as precisely as possible. And of course, report about it in a clear, convincing, and inspirational way both to your leadership team and externally.

From another perspective, you want data gathering to be as efficient as possible in time and money. Because the time, human and financial resources that are spent on data gathering and analysis, monitoring and evaluation, cannot be spent on the investment itself or on other valuable activities.

Again that balance question: data needs to be good enough to be confident of what you can claim (no greenwashing, no high risk of false assumptions), to be certain you are working in the right direction. At the same time, data requirements should not be so comprehensive that it becomes a disincentive for making positive impact investments a reality (either for the financial institution or the investee).

For instance: ideally, we would like to know the exact number of all species in the project area (while we're dreaming: in the wider landscape), both historically, at the start of the project, at the end of the project and ten years after the financial institution has exited the project. However, in addition to considerations around financial costs of assessments in relation to the investment, some species are notoriously difficult to count. Field surveys of elusive top of the food chain wildlife like giant pandas and tigers can take years. That makes it automatically impossible to see annual progress based on such data. Counting the number of earthworms in a square meter of soil, though, can be done in a day.

In Annex 4 we have made a list of 'ideal data' to have as an investee or financial institution aiming for positive impact. Though nothing is black and white, in the columns we have indicated whether such data fall into the category of 'need to have' or rather in the category 'nice to have'. There is also a column for how such data can be gathered (can this be done directly or are proxy data possible and reliable). And whether the data are primarily quantitative, qualitative or a combination.

Given the complexities in data gathering, both **transparency** and **planning** are crucial:
- Transparency relates to what was stated in paragraph 4.2.5 on assumptions: what is the claim

of positive impact based on? Clarity on data used, the limitations and efforts to improve data input, are relevant.

- Planning refers to considering what data gathering is feasible as discussed above, but also what data is needed at what stage of the investment phases. Investment decisions are often based on estimated impacts in the future, comparing different options. Once an investment is made and a project started, baselines are easily overlooked but vital if you want to measure progress later. Monitoring & evaluation are crucial to test the previous assumptions and where needed adjust, and of course to be able to report on progress (whether internally or externally).

R9: *Financial institutions must be transparent about the data used to support assumptions and/ or claims relating to positive impact on biodiversity, distinguishing estimations from measure– ments, direct data from indirect data, field measurements from digital databases, etc.*

R10: *Financial institutions must make an effort to improve and/or calibrate data throughout the investment period to reduce the margin of error. At the start of an investment there can only be best estimates of positive impact during the investment period. To verify how much impact is realized, financial institutions should work with clients on baseline data at the start of the investment period, while monitoring & evaluating during and at the end of the investment period, and (to verify the improvement is sustained) post–investment.*

A6: *Financial institutions are advised to carefully consider and in reporting distinguish different data use throughout an investment process, to acknowledge levels of uncertainty. This means distinguishing estimations from measurements, starting baselines on time, calibrating secon– dary data with primary data, monitoring & evaluation, etc.*

A7: *Financial institutions are encouraged to:*
- *Include qualitative data in internal and external communications (especially at a time where many are not yet familiar with what positive impact on biodiversity means in practice)*
- *Be creative and innovative in data use (example, eDNA) and share experiences with new methodologies so the good can be filtered from the bad in a joint global effort*
- *Share data with other stakeholders wherever possible*

4.4 Reporting and other forms of communication

In the introduction to this chapter, the balance between cautious and encouraging was desci– bed. Or as worded in paragraph 4.2.3 on Reference: between a strong focus on effectiveness (positive impact must truly be positive) and practicality (the perfect should not be the enemy of the good, especially while biodiversity accounting is a new and developing field in the world of finance).

Because biodiversity is so inherently diverse, and because many financial institutions and their stakeholders (boards, clients, partners) are not yet used to taking biodiversity into account, good communications are vital. The following are proposed requirements and recommendations regarding communication about positive impact.

R11: *when reporting externally on positive impact on biodiversity, financial institutions must be able to include in their communications the Where, When, What & Why. That means the loca– tion, reference situation (state of nature before and after intervention), biodiversity increase (which species), attribution and assumptions, and data use on which the positive impact esti– mation or measurement is based.*

In pro-active communications, some aspects can be summarized. Still, the Where (location) & What (species in relation to ecosystem) should be explicitly included, and financial institutions must be able to reactively answer questions on the When & Why. This also means acknowledging there may be other impacts upstream and downstream of the project location.

The main point is to not claim more than justified, while communicating on positive impact. This means understanding the 'Where, When, What & Why' well enough to be able to clearly explain the (expected) positive impact. This requires internal clarity on assumptions and cause-effect relationships. In turn, this may require building up expertise.

R12: *Positive impact on biodiversity in one project cannot be added to or subtracted from negative impact in the same or another project. Direct units of measurement are not comparable in content (when species and the pressures on them differ from location to location), and indirect units of measurement cannot confidently compare positive with negative impact numerically, one on one. Positive and negative impact should therefore be reported side-by-side, with full transparency on the data and methodology used to estimate or measure impact, including the level of (un)certainty in different projects.*

A8: *Financial institutions are encouraged to report not only on quantitative data, but also on qualitative data. Assuming transparency on assumptions and data use, they are encouraged to tell stories to clients, colleagues, competitors, and many others. Such stories can illustrate how investments aim to achieve positive impact, celebrate projects where positive impacts was realized and inspire more to follow.*

The requirement under R11 can be supported by this Recommendation. A map of the location, a picture of one or more indicator species in the landscape. An interview with a farmer who describes how species return, soils regenerate or water is purified. It can make a complex picture come alive.

A9: *FIs are strongly encouraged to show transparency in reporting, in the sense of sharing both successes ánd lessons learned. If a well-intended strategy does not lead to intended results, drawing lessons openly can help others learn, and help garner mutual understanding and respect.*

5 Steps following an impact assessment

Impact assessments serve a purpose. In other words, the work is not finished when the impact or dependency screening results are in, or the data-file with the quantified footprinting results is ready. The work is just starting. For example, an impact screening using geospatial data can be used in an E&S screening of investment opportunities. A quantified biodiversity footprint provides insight into the expected biodiversity impact of investments and can be used in engagement with investees or to monitor progress. Moreover, impact assessments (and dependency assessments) are expected to be used increasingly to inform compliance to regulations and to assess financial risks resulting from physical risks, transition risks and systemic risks, as identified by the TNFD (see chapter 2).

The figure below provides an overview of the next steps a financial institution can take following a biodiversity impact assessment).
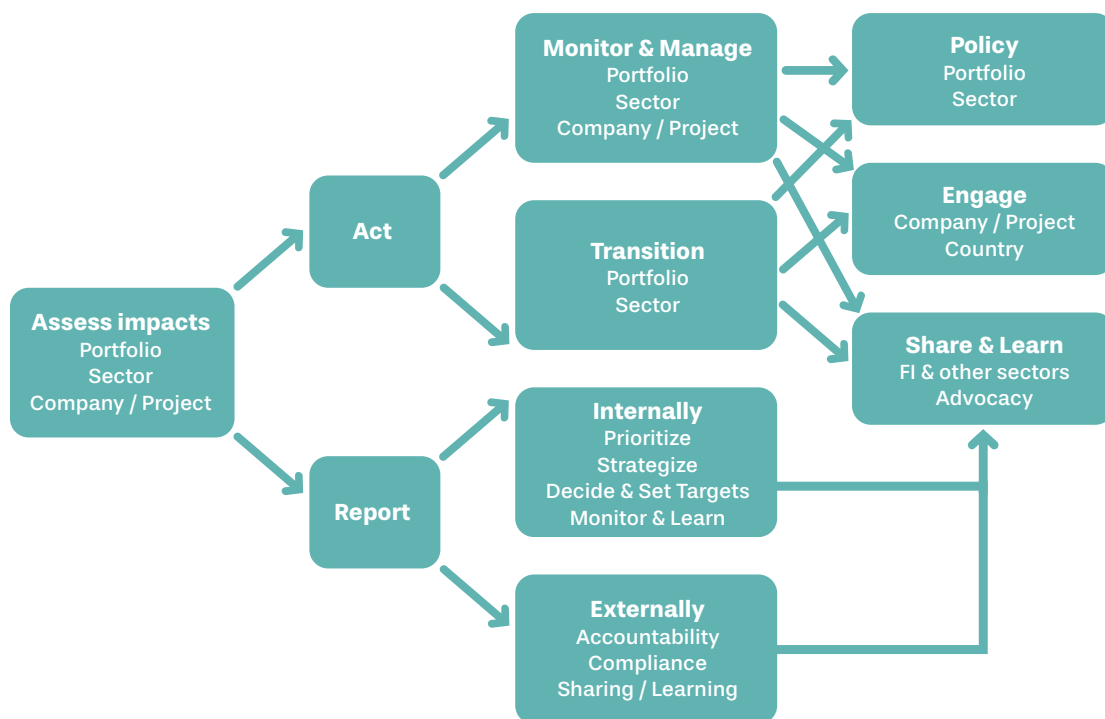

Figure 8: Next steps a financial institution can take following a biodiversity impact assessment

Although PBAF focuses on how an impact assessment should be conducted to provide the right information to act on, the intended use will determine what the 'right information' is. The more experience financial institutions have with using these types of assessments in their loans and investments, the clearer it will become what data is needed (what scope, accuracy, granularity, benchmarks, etc.) and what this means for the PBAF guidance, requirements and recommendations.

Future revisions of the PBAF Standard will begin with the end in mind. Aiming for guidance, requirements and recommendations that serve the purpose of the steps that follow. So that ultimately, impact assessments can help lead to reverse biodiversity loss and restore ecosystems.

References

ACTIAM, 'Zero deforestation engagement, Phase 2 update', December 2021.

Align, 'Aligning biodiversity metrics for business and support for developing generally accepted accounting principles for natural capital', 2021.

Banque de France, 'Working paper 'A "Silent Spring" for the Financial System? Exploring Biodiversity-Related Financial Risks in France', August 2021.

Birdlife International, Conservation International, IUCN, UNEP-WCMC, Integrated Biodiversity Assessment Tool (IBAT), 2022, **https://www.ibat-alliance.org/**.

Brondízio, E. S., Settele, J., Díaz, S., Ngo, H. T. (eds), IPBES, 'Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services', IPBES secretariat, Bonn, Germany, 2019.

CBD, Open Working Group on the Post-2020 Global Biodiversity Framework, 'First draft of the post-2020 Global Biodiversity Framework', 5 July 2021.

Dasgupta, P., 'The Economics of Biodiversity: The Dasgupta Review; Headline messages', 2021.

DNB, PBL, 'Indebted to nature; Exploring biodiversity risks for the Dutch financial sector', June 2020.

ENCORE = Exploring Natural Capital Opportunities, Risks and Exposure,
https://encore.naturalcapital.finance/en

EU Business & Biodiversity Platform, 'Biodiversity measurement approaches for business and financial institutions; Thematic report Biodiversity Data', 18 March 2022.

FAO, AFD, Bundesministerium für Ernährung und Landwirtschaft, 'Adaptation, Biodiversity and Carbon Mapping Tool' (**ABC-Map**), 2021.

Finance for Biodiversity Pledge, 'Position paper Aligning financial flows with biodiversity goals and targets', 16 February 2022.

FMO, ESG Toolkit, 2021, **https://www.fmo.nl/esg-toolkit**.

Foundation for Sustainable Development, Ecosystem Services Valuation database (ESVD), 2021,
https://www.esvd.net/.

Gullison, R.E., J. Hardner, S. Anstee, M. Meyer, 'Good Practices for the Collection of Biodiversity Baseline Data', Prepared for the Multilateral Financing Institutions Biodiversity Working Group & Cross-Sector Biodiversity Initiative, 2015.

ICMM, 'Good Practice Guidance for Mining and Biodiversity', 2006.

IFC, WWF, ITC, 'Global Map of Environmental & Social Risk in Agro-commodity Production' (GMAP), 2022.

IFC, 'Performance Standard 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources', January 2012.

IFC, 'International Finance Corporation's Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources', June 2019.

IFC, 'A Guide to Biodiversity for the Private Sector', no date,
https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/
sustainability–at–ifc/publications/biodiversityguide

IPBES, S. Díaz et al, 'Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services', 2019.

IUCN, 'Biodiversity Risks and Opportunities in the Apparel sector', 2016.
Finance for Biodiversity Pledge, 'Position paper Aligning financial flows with biodiversity goals and targets', 16 February 2022.

IUCN, Species Threat Abatement and Recovery (STAR) Metric, https://www.iucn.org/regions/
washington–dc–office/our–work/species–threat–abatement–and–recovery–star–metric.

Natural Capital Coalition, 'Natural Capital Protocol', 2016.

Net Environmental Contribution Initiative (NEC), https://nec–initiative.org/.

NGFS, 'NGFS Occasional Paper, Central banking and supervision in the biosphere: An agenda for action on biodiversity loss, financial risk and system stability', Final Report of the NGFS–INSPIRE Study Group on Biodiversity and Financial Stability, March 2022.

PBAF, 'Paving the way towards a harmonised biodiversity accounting approach for the financial sector', 2020.

Science Based Targets Network, 'Science–Based Targets for Nature, Initial Guidance for Business', September 2020.

TNFD, 'The TNFD Nature–related Risk & Opportunity Management and Disclosure Framework, Beta v0.1 Release', March 2022.

TNFD, 'Discussion paper; A Landscape Assessment of Nature–related Data and Analytics Availability', March 2022.

Trase Finance, 2022, https://trase.finance/.

UN Environment Programme, UNEP Finance Initiative and Global Canopy, 'Beyond 'Business as Usual': Biodiversity Targets and Finance', 2020.

UNEP–WCMC, Conservational International and Fauna & Flora International, 'Biodiversity Indicators for Site based Impacts', Cambridge, UK, 2020.

University of Cambridge Institute for Sustainability Leadership, 'Measuring business impacts on nature: A framework to support better stewardship of biodiversity in global supply chains', Cambridge, UK, April 2020.

World Business Council for Sustainable Development (WBCSD), 'What does nature–positive mean for business?', December 2021.

World Economic Forum, 'The Global Risks Report 2022', 17th Edition, 2022.

WWF, World Bank Group, Global Canopy, 'Geospatial ESG; the emerging application of geospatial data for gaining environmental insights on the asset, corporate and sovereign level', January 2022.

Annexes

Annex 1: Alternative case study to the chapter on positive impact

The farm case study in chapter 4 is one simplified example used to illustrate the proposed Requirements and Recommendations. The below theoretical case study is included:

- to underline there are many different biomes, not just terrestrial ecosystems;
- to provide food for thought on how financial institutions and their investees can consider both smaller and larger interventions to create positive change;
- to underline that restoration is an important strategy when aiming for more biodiversity, creating space for species to thrive (in addition to reducing pressures);
- to stimulate the readers' thinking on applying the proposed Requirements and Recommen– dations, and on how positive impact could be measured (hectares of restored mangroves, indicator species such as kingfishers that may benefit, etc.) and what other aspects there are to consider (such as the upstream impact of building materials).

HOTEL CHAIN COMMITS TO SUSTAINABLE RENOVATION AND RESTORATION

A hotel chain has a CEO and a Management Team that come out of their annual strategy session on a mission. They want to be the first hotel chain that can show positive biodiversity impact. They are acti– vely exploring multiple options for more sustainable operations, inclu– ding adjusting their procurement strategy (for everything from buil– ding materials to transport to the soaps provided to guests), verifying all their buildings' outputs to air, soil and water (aiming for zero pollution in the landscapes surrounding), adjusting their marketing to aim for more regional visitors that arrive by train or electric cars, etc.

On one of their existing locations, a renovation is scheduled of a hotel complex right on a beach, which in turn borders an extensive coral reef. Historically, the surrounding land– scape has had a lot of mangroves, but many of these coastal forests have been removed to make space for piers and landing stages for boats, and for beach houses whose doors open right onto the beach. In recent years, some of these beach houses have had water damage in the winter season during storms. There have been complaints about diving boats (that the hotel partners with) leaving anchors on the coral reefs, and dive instructors letting the tourists get too close to the coral (touching => damage) and marine wildlife. There have also been com– plaints about tourists strolling from the hotel beach onto a beach where turtles hatch two kilometres outside the company's concession.

The company sets up a competition, inviting architects to work with designers, regional planners, biolo– gists, social experts, and local government to come up with a comprehensive renovation pro– posal, explicitly taking into account the local landscape, including attention to the landscape outside the hotel's concession.
The winning design includes the purchase of a small piece of indu– strial land of a neighbour so the complex can expand without requi– ring natural land to be converted. All building materials have conditions (they include certified timber, bam– boo, and rattan); energy and waste have strict annual improvement targets.

It lifts all tourism houses more than three meters of the beach (most more than five), with great views overlooking the ocean (circular steps down and one wheelchair road for the elderly and less fit). Underneath these dwellings and (working with partners in the region) beyond their own concession, mangroves will be restored. Buoys are placed at strategic locations near the coral reef, where boats can dock without damaging the coral. The hotel shop offers suntan lotions, but only those that do not carry coral

reef damaging chemicals. The company sets up a training plan with a diverse team of local and global experts, for which they part–ner with a university. The aim is for future excursions to not disturb or degrade any of the natural areas, but rather photograph and monitor them. The hotel trains all staff and all partners that the hotel works with (including diving and boat operators and guides). It includes optional photography training and contests which tourists can participate in. The training includes information on all local biodiversity (existing and historic), including strategies behind conservation plans (of the turtles, but also much smaller and less iconic species). With local partners and the expert team, the hotel designs a citizen & tourist science monitoring program.

Annex 2: Overview proposed requirements and recommendations positive impact

In this Annex, an overview is provided of the proposed PBAF requirements (R) and recommendations (A) formulated for the assessment and disclosure of positive impact in project finance.

WHERE: the location

R1: *when a financial institution claims an investment is foreseen to have, or has had, positive impact on biodiversity, they must know the geographic location.*
- *This means knowing the geographic location including GPS and project boundaries (the legal and geographic boundaries of the project; whether farm, concession or other).*
- *If a fund groups multiple project landscapes, the financial institution must be able to request the GPS from the intermediary partner or auditor (this can be confirmed on a sample basis).*

A1: *when an investment in an intervention (e.g. a project) is foreseen to have, or has had, positive impact on biodiversity, a financial institution should work with the investee to better understand the broader landscape[1], waterway, or seascape:*
- *Ecologically: air and water flows, soil connectivity and erosion, wildlife corridors, neighbouring protected areas – anything that can be affected by the intervention, or that can affect the intervention.*
- *Socio-economically: understanding demographics, culture, economic activities, social impacts, dependencies and/or other stakeholder relations to the intervention area.*

R2: *when a financial institution claims an investment is foreseen to have, or has had, positive impact on biodiversity, they must be clear that the claim only refers to that specific geographic location, and they must recognize that there are also positive and/or negative impacts upstream or downstream (see chapter 3 for definitions). This requires both internal awareness and thoughtful external communication.*

A2: *when financial institutions claim an investment is foreseen to have, or has had, positive impact on biodiversity in a specific geographical location, they should make an effort to also assess and improve any impacts upstream and downstream.*

WHEN: the reference situation: time linked to state in project location

R3: *when claiming positive impact on biodiversity in an intervention (co-)financed, financial institutions must be explicit about the reference situation. This means being explicit (meaning pro-actively including in external communications and not 'summary-deleting' key information) about:*
- *the **project area boundaries** (or waterbody or seascape)*
- ***between what moments in time**: when was the referenced situation?*

1   Sources to consult on the wider landscape include IFC Performance Standard 6, and more specifically the **Guidance Notes to IFC Performance Standard 6**. The IFC Performance Standards are applied by many banks that have adopted the Equator Principles. Other guidance on landscape thinking include the **Little Sustainable Landscapes Book**, the three **Landscape Zones** as described by Commonland and the **Global Landscape Forum**.

- **state of the project area** (ideally of the wider landscape) before the intervention (e.g. land use type: natural state such as primary forest; degraded but natural; used for farming, mining, other)

R4: Financial institutions must research and report questions on the land use history in the project area. This means actively researching[2] when the project area was converted to the current economic use, when the first degradation or conversion started, and disclosing this information when reporting.

R5: Financial institutions cannot claim positive biodiversity impact in a landscape if they were directly or indirectly involved (as investor or co-financer) in conversion or degradation of a natural ecosystem in that same landscape.

R6: When claiming positive biodiversity impact, financial institutions should work with the investee to consider how the biodiversity increases, once realized, can be improved and/or sustained beyond the project and/or monitoring period agreed.

A3: Financial institutions and investees are advised to include baseline measurements[3] in monitoring.

WHAT: which species have benefited or are expected to benefit

R7: when financial institutions claim they have or have had positive impact on biodiversity in an investment, they must be explicit about what type of species and/or diversity increase is measured or estimated[4]:
- What increase in **diversity** of species is expected or realized (e.g., native tree species, bird, mammal or bee species, and/or different soil micro-organism species),
- What increase in **numbers** of species are expected or realized in the project area and reference period, with special attention to threatened species and/or indicator or keystone species,
- How that (indicator or keystone) species increase contributes to a healthier ecosystem.

A4: when financial institutions claim they will have or have had positive impact on biodiversity in an investment, they should work with the investee to better understand and learn about the species that live in the project area and/or the wider landscape. Their names, interdependence on and with other species in the ecosystem, historic and expected future trends, etc.

WHY: strategy, assumptions, and attribution

R8: FIs must make explicit which strategic assumptions are made that positive impact (estimated or assessed) is / will be the result of the intervention (co-)financed by them
- What was the strategy behind the intervention co-financed? What impact driver/ pressure on biodiversity was intended to be reduced / what better conditions created, and what validity is behind these assumptions (e.g., what experts approved of the plan?)
- What level of attribution does the financial institution and/or investee claim and why? For instance, did the financial institution fully fund the strategic intervention or a percentage?

A5: FIs should carefully consider who are key stakeholders – either key in realizing the impact and/or directly affected. Potentially material stakeholders include:
- The investee (C-suite, senior management, employees, advisors, other)

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2   Sources to consult include **'Geospatial ESG'** by WWF, World Bank Group and Global Canopy, January 2022
3   Sources to consult include the **'Good Practices for the Collection of Biodiversity Baseline Data'**, Gullison, R.E., J. Hardner, S. Anstee, M. Meyer, 2015.
4   One of the methodologies that financial institutions can apply is the Species Threat and Abatement and Restoration Metric, acronym **STAR** (see also chapter 3).

- *Local stakeholders (communities, companies, local government, universities, other)*
- *Global stakeholders (public, private, knowledge institutions, NGOs, etc.)*

Data: ideal and proxy, quantitative and qualitative

R9: *Financial institutions must be transparent about the data used to support assumptions and/or claims relating to positive impact on biodiversity, distinguishing estimations from measurements, direct data from indirect data, field measurements from digital databases, etc.*

R10: *Financial institutions must make an effort to improve and/or calibrate data throughout the investment period to reduce the margin of error. At the start of an investment there can only be best estimates of positive impact during the investment period. To verify how much impact is realized, financial institutions should work with clients on baseline data at the start of the invest–ment period, while monitoring & evaluating during and at the end of the investment period, and (to verify the improvement is sustained) post–investment.*

A6: *Financial institutions are advised to carefully consider and in reporting distinguish different data use throughout an investment process, to acknowledge levels of uncertainty. This means distinguishing estimations from measurements, starting baselines on time, calibrating secondary data with primary data, monitoring & evaluation, etc.*

A7: *Financial institutions are encouraged to:*
- *Include qualitative data in internal and external communications (especially at a time where many are not yet familiar with what positive impact on biodiversity means in practice)*
- *Be creative and innovative in data use (example, eDNA) and share experiences with new methodologies so the good can be filtered from the bad in a joint global effort*
- *Share data with other stakeholders wherever possible*

Reporting and other forms of communication

R11: *when reporting externally on positive impact on biodiversity, financial institutions must be able to include in their communications the Where, When, What & Why. That means the location, reference situation (state of nature before and after intervention), biodiversity increase (which species), attribution and assumptions, and data use on which the positive impact estimation or measurement is based.*

R12: *Positive impact on biodiversity in one project cannot be added to or subtracted from negative impact in the same or another project. Direct units of measurement are not comparable in content (when species and the pressures on them differ from location to location), and indirect units of measurement cannot confidently compare positive with negative impact numerically, one on one. Positive and negative impact should therefore be reported side–by–side, with full transparency on the data and methodology used to estimate or measure impact, including the level of (un)certainty in different projects.*

A8: *Financial institutions are encouraged to report not only on quantitative data, but also on quali–tative data. Assuming transparency on assumptions and data use, they are encouraged to tell stories to clients, colleagues, competitors, and many others. Such stories can illustrate how investments aim to achieve positive impact, celebrate projects where positive impacts was reali–zed and inspire more to follow.*

A9: *FIs are strongly encouraged to show transparency in reporting, in the sense of sharing both successes ánd lessons learned. If a well–intended strategy does not lead to intended results, drawing lessons openly can help others learn, and help garner mutual understanding and respect.*

Annex 3: Data positive impact

This annex explores types of data relevant when claiming and reporting on positive impact (chapter 4). The key question is what data use can really help achieve positive impact on biodiversity. Managing what you measure should contribute to that goal; not lead to unintended bureaucracy. The intention is to combine reliability with practicality. Still, investments (time, money, human resources) to build up capacity, within financial institutions and in partnership with others, need to be made. It is the only way to gather data and learn, interpret, and optimize data use – especially at a time when many financial institutions are first starting to take biodiversity into account.

Note 1: There will be substantial overlap between data types below and what is already gathered in ESG analyses before investments are made. This is especially the case for financial institutions that apply the IFC Performance Standards. However, many financial institutions do not use these consistently (yet) and the data types below align with and sometimes go beyond what is currently used.

Note 2: Thoughts behind this data as discussed in the PBAF Working Group Positive Impact:
- Ideal data does not mean all data you can think of; it should all be relevant data
- Relevant data are sometimes sector-based
- Feasibility of data gathering (time/frequency, money, side effects) should be considered
- Proxy data should be relevant, trustworthy, (preferably) third party verifiable, feasible, efficient (time/money) but also creative/innovative (eDNA, citizen science etc.)
- Proxy data should be calibrated/optimized by real data whenever possible
- Role of questionnaires to be completed by clients and suppliers can be burdensome & bureaucratic, which is especially a concern for microfinance. Still, they can be effective if done well (developed jointly between those asking and those completing).

Note 3: At least three biodiversity data related publications were released in Q1 of 2022. The table below will be further aligned with and adjusted in PBAF v2023 based on these reports:
- WWF, World Bank Group, Global Canopy, 'Geospatial ESG; the emerging application of geospatial data for gaining environmental insights on the asset, corporate and sovereign level', January 2022.
- TNFD, 'Discussion paper; A Landscape Assessment of Nature-related Data and Analytics Availability', March 2022.
- EU Business & Biodiversity Platform, 'Biodiversity measurement approaches for business and financial institutions; Thematic report Biodiversity Data', March 2022.

Note 4: Those interested can find a wide range of tools (>160, with several dozen prioritized for first steps) in the SBTN Tool Database (available to SBTN partners).

The Requirement (R#) and Recommendation or Advice (A#) numbers in the table below correspond to the letter & number combinations in chapter 4. Across all data use are Requirements 9–12 and Recommendations & Advice 6–9:

R9:   Transparency on data use
R10:   Make an effort to improve and calibrate data
R11:   When reporting externally, include the Where, When, What & Why
R12:   Report positive and negative impact side by side

A6:   Carefully plan (and report on) different types of data used
A7:   Include qualitative data, innovative data, share data
A8:   Include storytelling to celebrate, education and inspire
A9:   Transparency about successes and failures

	DATA NEED Contributing to a Recommendation (A) Requirement (R) or	IDEAL DATA Wish list for research & analysis if time, energy and money were not a limiting factor	DATA TYPE AND SOURCES Measurements or estimates; recent or not; verifiable or not; field, maps, labs, archives, databases, satellite imagery.
STATE OF NATURE			
1	R1: Geographic location A1: Understand broader landscape	Type of ecosystem: land, wetland, ocean; within those more detail: tropical rainforest, savannah, coral reef etc.	Basic information known to client, can be upgraded with the use of experts familiar with that land- or seascape
2	R1: Geographic location R3: Clear on reference	GPS location data (of all boundary points project)	Data from client, or GPS experts if client provides access to map and/ or site
3	R1: Geographic location R3: Clear on reference	Size of area in hectares	If GPS location data are complete following those. Otherwise estimate from map, satellite, field measure-ments.
4	R3: Clear on reference R4: Research land use history R6: Sustained positive impact A3: Baseline measurements A1: Understand broader landscape	Annual satellite images of project area and/or surrounding landscape	Satellite images, analysed and placed in context by experts (satellite experts with local experts)
5	R1: Geographic location R3: Clear on reference R6: Sustained positive impact A3: Baseline measurements	Level of protection status of core and adjacent area(s) (IUCN categories as in link and/or national status)	IBAT, IUCN GreenList, (national and local) government, thematic and/or local experts
6	R3: Clear on reference R6: Sustained positive impact R7: What species positively impacted A1: Understand broader landscape A3: Baseline measurements A4: Learn more about species	Biodiversity richness of the area (how many species; including on land, in water, soil)	IBAT, IUCN RedList, thematic and/or local experts. New tech: eDNA (from water, soil or air), Bioacoustics
7	R3: Clear on reference R6: Sustained positive impact R7: What species positively impacted A1: Understand broader landscape A3: Baseline measurements A4: Learn more about species	Number of endangered/red listed species, including trends over time (including migratory species that breed but not around year-round)	Answer related to previous question, but more in-depth per species. IUCN RedList, IBAT
8	R3: Clear on reference R6: Sustained positive impact R7: What species positively impacted A1: Understand broader landscape A3: Baseline measurements A4: Learn more about species	Density per species (numbers of animals/plants) over time	IUCN RedList, WWF Living Planet Index
9	R3: Clear on reference R4: Research land use history R6: Sustained positive impact R7: What species positively impacted A1: Understand broader landscape A3: Baseline measurements A4: Learn more about species	High Conservation Value (HCV)/ High Carbon Stock (HCS) value	Expert analysis (see links to HCV and HCS to the left)
10	R2: Acknowledge value chain R6: Sustained positive impact landscape R7: What species positively impacted A1: Understand broader	In addition to project area over which the investee has direct control, information on broader landscape ('value chain adjacent areas', SBTN) Here, the connectivity question is vital:	Combination of data sources above, but for broader landscape

	A2: Estimate/assess value chain impacts A4: Learn more about species A5: stakeholder analysis	how does the project area fit into the broader landscape; is either of the areas part of a migratory route and/or wildlife corridor and if so for what species, how does project area impact and depend on broader landscape through air, water, soil, etc.	
DIRECT AND INDIRECT DRIVERS / PRESSURES, DEPENDENCIES			
1	R2: Acknowledge value chain R3: Clear on reference R4: Research land use history R6: Sustained positive impact R7: What species positively impacted R8: Explicit assumptions and attribution A1: Understand broader landscape A2: Estimate/Assess value chain impacts A3: Baseline measurements A4: Learn more about species A5: Stakeholder analysis	Direct drivers and dependencies over time (including land and sea use change, current and expected impacts from climate change, invasive species, exploitation, pollution)	Encore and SBTN can be used for very first scan subsector; client, thematic and local experts for project area and broader landscape specific analysis
2	R4: Research land use history R6: Sustained positive impact R8: Explicit assumptions and atttribution A1: Understand broader landscape A4: Learn more about species A5: Stakeholder analysis	Geopolitical reality: neighbouring countries, harbours, trade policies etc. This from perspective of impact and dependency on project area and surrounding landscape.	Client, investment team, sector specialists, policy & trade experts, lawyers
3	R4: Research land use history R6: Sustained positive impact R8: Explicit assumptions and attribution A1: Understand broader landscape A3: Baseline measurements A4: Learn more about species A5: Stakeholder analysis	Socio-political context: communities, composition, diversity (over time), how they and their livelihoods relate to the area (both mutual impact and dependencies)	Client, investment team, thematic (social) and local experts
4	R4: Research land use history R6: Sustained positive impact R8: Explicit assumptions and attribution A1: Understand broader landscape A3: Baseline measurements A4: Learn more about species A5: Stakeholder analysis	Economic activities in the broader landscape relevant to biodiversity e.g., water use; discharge of pollutants (to water, air or soil that can reach the project area and/or affect project area biodiversity through wildlife corridors affected, etc).	Client, investment team, thematic (economic, ESG) and local experts
INVESTMENT SPECIFIC			
1	R8: Explicit assumptions and attribution	Direct investment in land- or seascape-based activity or indirect investment in intermediary	Investment officer/team
2	R8: Explicit assumptions and attribution	Type of investment: loan, equity, insurance, subsidy, other	Investment officer/team
3	R8: Explicit assumptions and attribution	Volume in euro or dollars	Investment officer/team
4	R2: Acknowledge value chain A2: Estimate and assess value chain impacts R8: Explicit strategic assumptions	Sector-specific data	Investment officer/team, client
5	R3: Clear on reference R6: Sustained positive impact	Time period of investment in years incl. exit strategy	Investment officer/team
6	R5: no claim on positive impact if involved earlier in degradation or conversion	Previous investments of a similar nature and experiences / lessons from those investments	Investment officer/team, ESG specialists, sector specialists, colleague FIs, partners

7	R6: Sustained positive impact R8: Explicit assumptions and attribution A3: Baseline measurements A5: Stakeholder analysis	Local livelihood consequences of project, incl. green jobs, loss of access to project area	Investment team, social specialist, local experts
8	R8: Explicit strategic assumptions A3: Baseline measurements	Any active conservation, restoration, afforestation and/or reforestation activities part of the project	Investment officer/team and ESG specialists
9	R2: Acknowledge value chain R8: Explicit assumptions and attribution A2: Estimate and assess value chain impacts A3: Baseline measurements	Production method details (such as certified according to reputable (ISEAL) standards like organic, FSC, Rainforest Alliance; intercropping, etc)	Client, investment officer/team, ESG specialists
10	R6: Sustained positive impact R8: Explicit assumptions and attribution A3: Baseline measurements A5: Stakeholder analysis	Existing relations with stakeholders in the broader landscape (both of investor and investee)	Client, investment team, partners

Annex 4: Geospatial data in impact assessment in the financial sector

The following geospatial data is already used in impact assessment in the financial sector (selection):

- **Threatened species – IUCN Red List**
  The IUCN Red List of Threatened Species (also known as the IUCN Red List) is a compendium of information on threats, ecological requirements, and habitats of over 105,000 species; and on conservation actions that can be taken to reduce or prevent extinctions. It assesses the risk of extinction of a species based on past, present, and projected threats. Species assessments are conducted following a standardized process using IUCN Red List Categories and Criteria, ensuring high standards of scientific documentation, information management, expert review, and justification. IUCN aims to re-evaluate the IUCN Red List category every five to ten years to monitor change. Data on threatened species is included in the 'Integrated Biodiversity Assessment Tool' (IBAT).

- **Protected Areas**
  The 'World Database on Protected Areas' (WDPA) is a joint project between UN Environment and the International Union for Conservation of Nature (IUCN), managed by UN Environment World Conservation Monitoring Centre. A protected area is "a clearly defined geographical space that is recognised as and dedicated to achieving the long-term conservation of nature — with its associated ecosystem services and cultural values — and is managed, through legal or other effective means, to do so". Data for the WDPA is collected from international convention secretariats, governments, and collaborating NGOs. The IBAT database shows what protected areas are located within a specified area (e.g., within 20 km of a specified production location).

- **Key Biodiversity Areas**
  Key Biodiversity Areas (KBA) are "sites contributing significantly to the global persistence of biodiversity", in terrestrial, freshwater and marine ecosystems. Sites qualify as global KBAs if they meet one or more of 11 criteria, clustered into five categories: threatened biodiversity; geographically restricted biodiversity; ecological integrity; biological processes; and, irreplaceability. The 'World Database of Key Biodiversity Areas' is managed by BirdLife International on behalf of the KBA Partnership. The IBAT database shows what KBAs are located within a specified area (e.g., within 20 km of a specified production location).

- **Satellite data on deforestation**
  Satellite monitoring generates a wealth of information on biodiversity that can be used to assess (changes in) biodiversity in high spatial and temporal resolution. Satellites can track near-real time loss of biodiversity caused by, for example, deforestation, city expansion or fragmentation of natural areas. A growing number of data providers is offering such data to financial institutions. Note that is important to not only gain access to data, but also effectively analyze them.

- **Species information databases**
  Numerous databases exist with detailed information on the location of species. One of the largest is the 'Global Biodiversity Information Facility' (GBIF). GBIF is an international network

and data infrastructure funded by the world's governments and aimed at providing anyone, anywhere, open access to data about all types of life on Earth. Options to monitor biodiversity increase rapidly. One of the new promising methodologies is the use of eDNA to monitor species diversity by analysing the DNA in water (and recently even in air) sources.

- **Spatial data on ecosystem characteristics, like water quantity/quality**
  For some ecosystem characteristics, detailed maps are available, like the 'Aqueduct Water Risk Atlas' (WRI), the Global Water Tool (WBCSD) and the Water Risk Filter (WWF) for water quantity and quality.

- **The Ecosystem Services Valuation Database (ESVD)**
  The ESVD, developed by the Foundation for Sustainable Development (FSD), contains currently over 6,700 monetary values of ecosystem services from over 900 studies on eco-systems and its ecosystem services from all around the world. The rationale for developing this database was to provide information on the economic benefits of biodiversity conser-vation, the costs of loss of biodiversity and the costs of in-action to halt biodiversity loss. The ESVD is different than the databases listed above, as it does not provide information on what biodiversity can be found where. However, if you know where the biodiversity impact will take place, it will become possible to also determine the potential impact on ecosystem services and the monetary value of the changes in these ecosystem services.