PBAF

Partnership for Biodiversity Accounting Financials

PBAF Q&A

Introduction to biodiversity impact assessment

For those financial institutions that are relatively new to the topic of biodiversity impact assessment and would like to gain a better understanding of what it means and how it can be used, this Q&A offers a short introduction.

1. 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 below 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 more than the variety of species and also includes the variety within species (genetic diversity) and of ecosystems (like forests and lakes). The definition also refers to the 'abundance' of species, the number of individuals of a specific species in an area. Two areas can have the same number of species, while the relative abundance of these species differs.

2. Why is biodiversity an important topic to an investor?

Biodiversity underpins the services that nature provides, like carbon sequestration, water purification, pollination and the provision of food and fibres (see figure 1). All economic activities depend on the provision of ecosystem services and biodiversity plays a key role in climate change mitigation and adaptation. The provision of these services has always been taken for granted but is increasingly at risk due to the loss of biodiversity.

The ability of an ecosystem to deliver the services we depend on reduces when the system is less biodiverse. This is affecting companies and can lead to (1) physical risks, (2) transitional risks and (3) systemic risks for investors. An example of a physical risk is the reduction of crop yield due to a reduction of pollinators affecting crop pollination. Transitional risk can arise when consumer preferences change and legislation is put in place to halt the loss of biodiversity, like an increase in protected areas, affecting economic activities. Systemic risks may occur when different physical risks and transitional risks reinforce each other or when financial institutions affected by the loss of biodiversity harm the stability of the financial system. By addressing the loss of biodiversity now, risks can be managed and investment opportunities can be identified.

For more information on the rationale to focus on biodiversity in the financial sector, see question 16 ('What if I want to know more about Finance and Biodiversity?').

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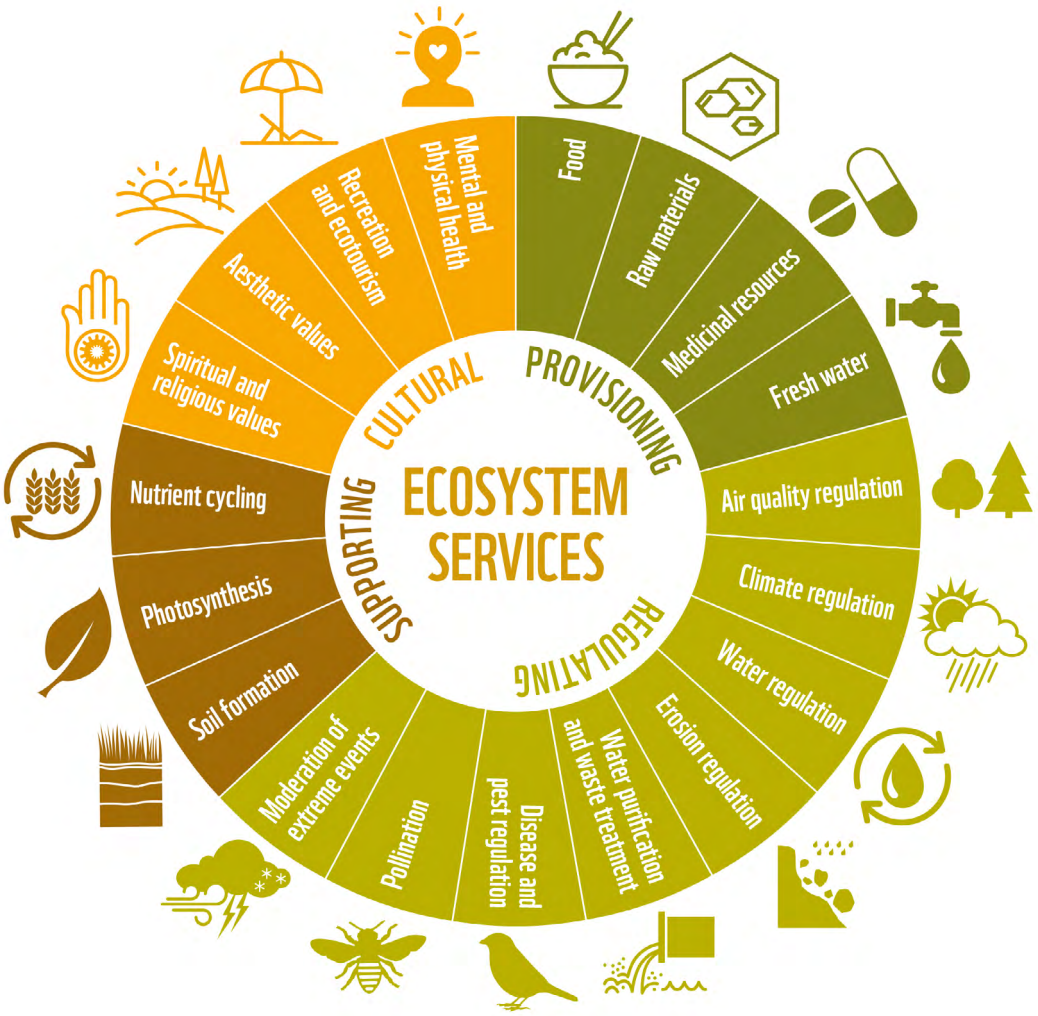


Figure 1: Ecosystem services (from: WWF, Living Planet Report 2016[1])

3. What are the most important drivers of biodiversity loss?

The five main pressures on biodiversity are the following (IPBES, 2020):

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

A single economic activity can trigger a number of these drivers. Deforestation, for example, both impacts the local ecosystem directly through habitat loss, but also contributes to climate change as the stock of greenhouse gasses that was stored in this forest is released.

4. What is a biodiversity impact assessment and a biodiversity footprint?

Most human activities impact biodiversity, either positively (e.g. reforestation activities) or negatively (most economic activities, like agricultural and mining). A biodiversity impact assessment provides insight into the likelihood that a loan or investment, through the economic activities invested in, will have a negative or positive impact on biodiversity and the reasons why.

1 WWF, Living Planet Report 2016; Risk and resilience in a new era, 2016

A biodiversity impact assessment can take different forms, serve different objectives and can be used at different stages in an investment process. Examples range from a deforestation risk screening of loans and investments, an analysis of impact risks based on the IFC Performance Standard 6[2], to a detailed and quantified biodiversity footprint of an entire investment portfolio. See the PBAF publication on impact assessment approaches for more information.

In a '*biodiversity footprint*', the impact on biodiversity is measured and expressed in a metric, like the loss of species or changes in the 'mean species abundance'. This footprint can be based on measuring/monitoring actual changes in biodiversity through time (assessment of *actual impact*), or can be based on an assessment of the expected or '*potential impact*'. This potential impact is often based on the contribution of an economic activity to drivers of biodiversity loss, like land use, pollution and climate change. See the PBAF publication on footprinting for more information.

Different types of impact assessment require different tools, different data and different investments in time and know-how. Financial institutions new to the topic of biodiversity can start with first steps, like a portfolio screening using overviews of 'high impact risk sectors'. An example is included in figure 2[3]. Figure 2 provides an overview of sectors with a high potential impact on biodiversity and high potential dependency on ecosystem services. The overview was based on (among others) data from the ENCORE tool ('Exploring Natural Capital Opportunities, Risks and Exposure').

Rank	Priority from dependencies perspective	Priority from impacts perspective
1	Agricultural Products	Marine Ports & Services
2	Apparel, Accessories & Luxury Goods	Agricultural Products
3	Brewers	Airport Services
4	Distillers & Vintners	Oil & Gas Exploration & Production
5	Electric Utilities	Mining
6	Forest Products	Oil & Gas Storage & Transportation
7	Independent Power Producers & Energy Traders	Oil & Gas Drilling
8	Renewable Electricity	Distribution
9	Textiles	
10	Water Utilities	

Figure 2: High priority sub-industries based on their potential dependencies and impacts on biodiversity (from: UNEP-FI and Global Canopy, Beyond 'Business as Usual: Biodiversity Targets and Finance, 2020).

2 IFC's Environmental and Social Performance Standards define IFC clients' responsibilities for managing their environmental and social risks. IFC Performance Standard 6 focuses on 'Biodiversity Conservation and Sustainable Management of Living Natural Resources'.

3 UN Environment Programme, UNEP Finance Initiative and Global Canopy 2020. Beyond 'Business as Usual': Biodiversity targets and finance. Managing biodiversity risks across business sectors.

5. How does an impact assessment fit with a biodiversity policy and engagement?

It is important to realise that a biodiversity impact assessment is only one step in managing the topic of biodiversity as a financial institution. Other important steps include the development of a biodiversity policy (either or not including sector policies), the use of biodiversity related investment/loan criteria, engagement with investees and setting targets and the development of a long term biodiversity goal (like reaching a 'no net loss' or 'net gain' on a portfolio level). *The results of an impact assessment can be used to inform these other steps.* For example, insight in the drivers of biodiversity loss in different sectors can be used to develop or refine a sector specific biodiversity policy and can be used to ask the right questions in company engagement.

6. Is a biodiversity footprint different from a carbon footprint?

Many impact drivers underly an impact on biodiversity, including the five main drivers mentioned before. Climate change is one of these main drivers. Contrary to the issue of climate change, impacts on biodiversity are localised impacts: the impact on biodiversity not only depends on the impact driver, but also on the location where the impact driver manifests itself. For example, water use in a water scarce area may result in an impact on biodiversity, while the same amount of water use in a water rich location does not result in any impact.

Similar approach

Despite these key differences, conducting a biodiversity footprint is in many ways similar to a carbon footprint. Both footprints use life cycle assessment (LCA) based footprint methodologies. While a carbon footprint is focusing on the emissions of greenhouse gasses, a biodiversity footprint is based on the impact of a number of impact drivers, including climate change, but also drivers like land use, water use and pollution. Financial institutions that have already conducted a carbon footprint *can use this data in the assessment of the impact on biodiversity*. Of course, data on the other pressures will need to be added.

Potential synergies

Climate change and biodiversity *are closely interrelated*. Climate change has an impact on biodiversity loss since rising temperatures can disrupt ecosystems. At the same time, degrading ecosystems release greenhouse gas emissions affecting climate change. Biodiversity can also be a key asset for climate change mitigation and climate change adaptation. Carbon sequestration in carbon-rich ecosystems, like forests, grasslands, drylands, coastal and/or marine ecosystems (e.g. mangroves) and other wetlands (e.g. peatlands) contributes to climate mitigation. Nature-based solutions like agroforestry and restoration of coastal ecosystems (like mangroves) contribute to climate adaptation.

A biodiversity footprint will show to what extent changes induced by a climate policy affect biodiversity (e.g. the first generation of biofuels resulted in increased land use, affecting biodiversity) and the other way around (e.g. reforestation will lead to carbon sequestration, benefiting the carbon footprint). The synergies of addressing climate and biodiversity simultaneously results in opportunities for the financial sector, both from an investment opportunity perspective, like investments in nature based solutions, and from a risk mitigation perspective: addressing two key risks to the sector in a synergetic way.

7. What kind of methodologies are used to assess impacts on biodiversity?

There is a wide variety of impact assessment approaches, with varying related costs, available to assess the biodiversity impact (risk) of loans and investments and a growing number of data providers and consultancies offer services in this field. So many, that it may be hard to see the

trees through the forest. Some of the tools offer data on the biodiversity characteristics of areas ('geospatial data'), others offer an LCA-based approach to calculate a quantified biodiversity footprint. Some tools combine a carbon footprint and a biodiversity footprint, enabling insight in the interconnections between the two topics. The different approaches can be used at different stages in the loan and investment process and serve different objectives. It is therefore important to have a clear idea of what question you want to answer.

Do you want to know:
- If a new client is located in an area of high biodiversity value?
- If a possible investment is linked to deforestation risks?
- What the biodiversity footprint is of a project to identify areas of improvement?
- What the footprint is of your portfolio to see identify impact-hotspots?
- Etc.

These questions can be answered with different assessment approaches, some more complex, time consuming and costly than others. Further guidance can be found in the PBAF publication on impact assessment approaches and the publications mentioned at question 16 ('What if I want to know more about Finance and Biodiversity?').

8. What kind of data is needed for a biodiversity impact assessment?

The need for data/information in an impact assessment depends on the question that needs to be answered ("What is the deforestation risk of this loan?" versus "What is the quantified footprint of my portfolio?") and the way the question is answered (monitoring of actual impact or a calculation of potential impact?).

In general, the steps between a loan or investment and biodiversity are the following:
Step 1: Investment --> Economic activities
Step 2: Economic activities--> Environmental inputs and outputs
Step 3: Environmental inputs and outputs --> Drivers of biodiversity loss
Step 4: Characteristics impact location
Step 5: Drivers of biodiversity loss + Location characteristics --> Impact on biodiversity

The need for data often focuses on the steps 1, 2 and 4. Step 3 and 5 are mostly modelled:
1. To translate loans/investments into economic activities, data on the economic activities of the companies financed is needed. Data providers can provide this data, like data on the sectors and countries where a specific company generates its revenue or where actual production is taking place.
2. To translate economic activities into environmental inputs (resource use) and outputs (emissions), the data from step 1 is combined with environmental data from the company financed (primary data) or from databases (secondary data; often country specific, sector average data). Information about the certifications a company has in place (like FSC) can be used to adjust secondary data.
3. To translate these environmental inputs and outputs into drivers of biodiversity loss (climate change, pollution, etc.) a 'pressure-impact model' can be used. For example, this pressure-impact model translates different greenhouse gas emissions into a contribution to climate change.
4. To gather data on the location where the impact takes place (like data on water scarcity), data from the company, local organisations and/or databases (like water scarcity maps) can be used. Of course, to do this, the asset location must be known, which is not always the case.
5. To combine the drivers (result step 3) and location characteristics (result step 4) into an impact on biodiversity, a pressure-impact model can again be used. For example, the pressure -impact model translates climate change into an impact on biodiversity.

Depending on the impact assessment, one or more of these steps may be irrelevant and the need for data will be reduced. For example, answering the question if an investee is located in or close to a protected area only requires data on step 4, location.

Please note that an impact assessment should also include the value chain (upstream and downstream). For many companies, the biggest part of the impact takes place upstream in the supply chain. When data on the supply chain is missing (which is often the case), value chains can be modelled using databases (reducing the accuracy of the result, but at least providing some insight in potential impacts in the value chain).

9. What scopes are usually included in a biodiversity footprint?

An important question when calculating the biodiversity footprint of a loan or investment is to what extent the financial institution takes responsibility for the impacts in the investees' value chain(s). Financial institutions may decide differently on this point, so transparency is key.
In biodiversity footprinting, scope 1 (impact of the company itself), scope 2 (impact of the energy companies the company sources its energy from) and scope 3 (upstream, towards suppliers and sub-suppliers, and downstream, towards the use and end-of-life phase) need to be included. Inclusion of scope 3 upstream is key since the impact on biodiversity is typically highest in the supply chain: raw material production and processing, like agriculture and mining, mainly due to land use intensity and land use changes. Including scope 3 upstream will provide important insights in how the impact on biodiversity might be influenced through investment criteria and engagement.

Scope 3 downstream is ideally also included since biodiversity impacts can also play an important role in the use and end-of-life phase of products and services. However, inclusion of downstream impacts may pose a challenge due to the fact that it is often not fully clear what downstream looks like. Raw materials can be used in many different products, products can be used in many different ways and products can be disposed of in different ways (re-use, recycling, incineration, landfill). For this reason, current footprinting methodologies tend to include scope 1, scope 2 and scope 3 upstream and in some cases part of scope 3 downstream.

10. Do I focus on my whole portfolio or can I focus on parts of it?

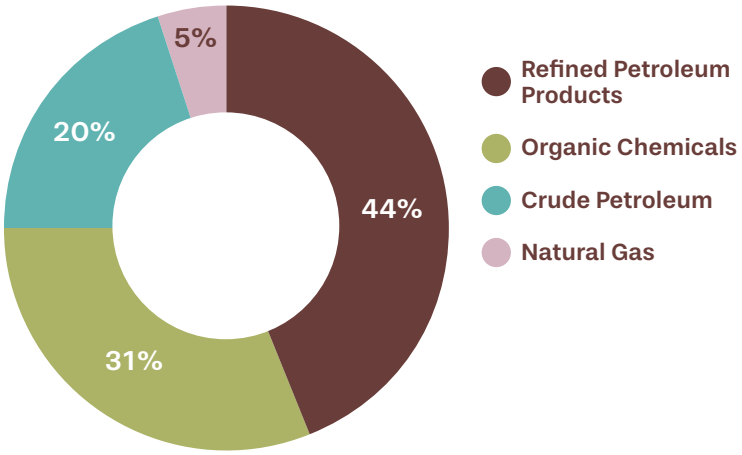
To have a complete picture of your impact on biodiversity, an impact assessment ideally includes all loans and investments in a portfolio. However, in practice a step by step approach may be more realistic. For example, by starting-off with the most important asset classes in a portfolio, with sectors which are known for their high impact on biodiversity or with investees located in or close to areas of high biodiversity value (see also the PBAF publication on impact assessment approaches). Moreover, you may decide to start with one or more pilot projects (one or more loans/investments or projects) to get familiar with impact assessment and explore what approaches are best tailored to your needs.

11. What do the results of a biodiversity impact assessment look like?

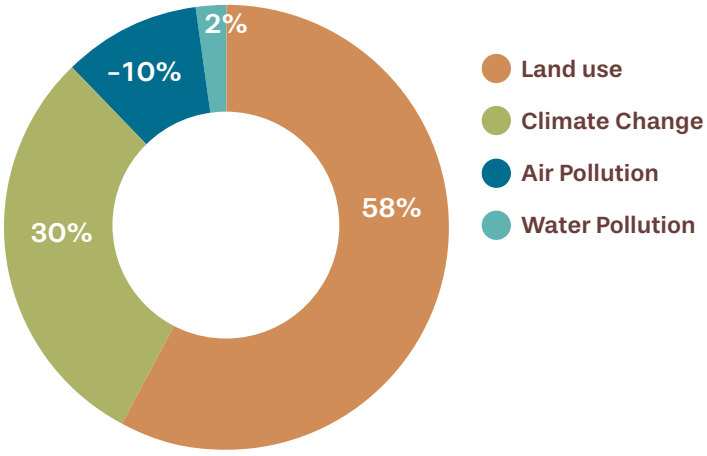
The results of an impact assessment will depend on the assessment conducted. An assessment of deforestation risks can result in an overview of risk scores for different loans or investments, while a biodiversity footprint for a company can result in a graph which shows what part of the potential impact is caused by what driver of biodiversity loss (see the graphics below). The footprint of an investment portfolio can be shown as a total impact score for a portfolio, but also as an impact score per company or sector or per euro invested. The latter can be used to show the 'impact intensity' of a sector.

The graphics below illustrate the footprinting result for a listed oil & gas company, using the Corporate Biodiversity Footprint (CBF).

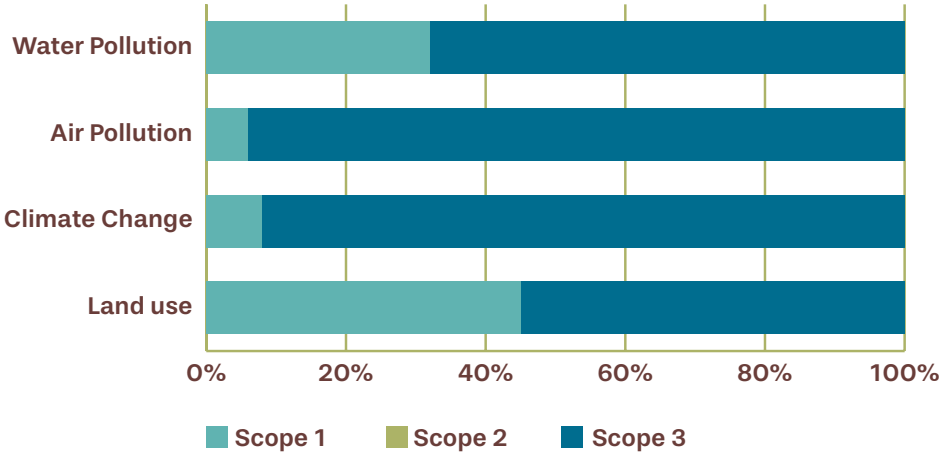
The first graphic shows the absolute contribution of the different products to the total impact calculated. Refined petroleum products are the biggest contributor.



The second graphic shows the main impact drivers. Land use is the most important driver, followed by cimate change.



The third graphic shows the footprint by scope. The impact is highest in the value chain (scope 3 upstream and downstream).



Depending on the way the result is presented, it will allow a financial institution to compare sectors, companies and investments. Note that the real value of an impact assessment is often *in the information behind the score*: what drivers of biodiversity loss or gain are responsible for the score and what does this mean for a sector's or company's action perspective?

12. How can I use the results of a biodiversity impact assessment as an investor?

A biodiversity impact assessment which shows what (potential) impact a sector, company or project has on biodiversity (positive or negative) and why, can be used to:

- inform loan or investment decisions (together with other information);
- decide on the conditions for a loan or investment (e.g. included in a loan agreement);
- engage with the investee to address potential impacts (negative, positive and avoided);
- develop or refine a sector specific biodiversity policy;
- develop a biodiversity goal on a portfolio or asset class level and monitor progress.

By doing so, you can:

- manage biodiversity related risks (physical risks, transitional risks, systemic risks);
- create long-term value and fulfil a fiduciary duty;
- avoid single-issue conclusions driven by a carbon-only approach;
- benefit from improved insight in climate-biodiversity trade-offs or synergies;
- contribute to the conservation and sustainable use of biodiversity.

NB: USE THE RESULT WITH CARE!

Note that in most cases an impact assessment results in a *potential impact*, not an actual impact. Moreover, part of the impact assessment approaches used still rely on *secondary data* (from databases) and do not, only to a very limited extent, take into account the *ecosystem characteristics* of the impact location.

This means that *the result should always be used with care*. For example, use an overview of potential impact (for a portfolio, asset class, company or project) to decide on priorities for further steps, like gathering more accurate, location specific data or engagement with investees.

13. Can I conduct a biodiversity impact assessment myself?

This depends on the impact assessment. A simple risk screening, like an assessment of the biodiversity characteristics of the area where investees are located, can relatively easy be conducted by E&S officers using databases like IBAT[4]. Moreover, some do-it-yourself approaches are available for asset managers to assess a potential impact on biodiversity. More complex footprint calculations will often be conducted by data providers and consultants because of the number of data needed and the software to conduct calculations. In the latter case it is key to understand how such footprints are calculated and what the value and limitations are.

14. What time is needed to conduct a biodiversity impact assessment?

There is no simple answer to this question. This will (again) depend on the question that needs to be answered and on the availability of data needed for the assessment. Conducting a first screening for a project investment looking at local biodiversity characteristics from databases

4 IBAT = Integrated Biodiversity Assessment Tool, offering geographic information on the presence of Protected Areas, Key Biodiversity Areas and Endangered species.

can be done in minutes, while data gathering for a quantified portfolio footprint or project footprint may take a few days, depending on the availability of data.

The trend in the market is that a growing number of databases and dashboards is being developed (either or not behind a paywall) with readily available data on location specific biodiversity characteristics and sector or company specific impact data. This will rapidly reduce the time input required for conducting an impact assessment. Again, it will be key to understand the assumptions behind the calculations and related limitations to the data provided.

15. How can I start?

An easy start to biodiversity impact assessment is to map the exposure of your investment portfolio to high risk sectors, both from an impact and a dependency point of view. See question 4. This will provide first insight in biodiversity related risks.

A second step could be to join one or more of the initiatives on biodiversity in the financial sector, like PBAF or the Finance for Biodiversity Pledge. This will allow you to discuss the topic, different approaches and case studies with colleagues from other financial institutions.

A third step could be to conduct one or two pilot studies, testing one or more impact assessment approaches to gain a better understanding of the methodologies used, the data need, the results and the way these results can be used. Focus could be loans or investments in one or more high priority sectors.

And last but not least (maybe even first): Internalise skills and grow competences with regard to the topic of biodiversity and define your environmental strategy, including at least Biodiversity and Climate, as environmental issues are intertwined ('nature' is systemic 'by nature').

16. What if I want to know more about Finance and Biodiversity?

The following selection of publications provide practical information for financial institutions that want to learn more about the topic (each publication is freely available online):

Introduction/Rationale

- Forum pour l'Investissement Responsible (FIR), Iceberg Data Lab, Finance & Biodiversity; Understanding and Acting, October 2021.
- Banque de France, A "Silent Spring" for the Financial System? Exploring Biodiversity-Related Financial Risks in France, August 2021.
- De Nederlandsche Bank, PBL Netherlands Environmental Assessment Agency, Indebted to nature; Exploring biodiversity risks for the Dutch financial sector, June 2020.
- Principles for Responsible investment (PRI), Investor action on biodiversity: Discussion paper, 2020.

Tools

- PBAF, PBAF Standard vs 2022: Biodiversity impact assessment – Overview of approaches, 2022.
- Finance for Biodiversity Pledge, EU Business @ Biodiversity Platform, Guide on Biodiversity Measurement Approaches, July 2021.
- Sustainable Finance Platform, A Guideline on the use of Deforestation Risk Mitigation Solutions for Financial Institutions, 2020.
- EU Business @ Biodiversity Platform, Assessment of biodiversity measurement approaches for business and financial institutions, Update report 3, March 2021.
- Hilton, S. and Lee, JM J. Assessing Portfolio Impacts – Tools to Measure Biodiversity and SDG Footprints of Financial Portfolios. Gland, Switzerland: WWF, 2021.

Target setting

- UNEP FI and UNEP–WCMC, Biodiversity Target Setting: Guidance for banks (Version 1: June 2021), Principles for Responsible Banking. UNEP Finance Initiative: Geneva, 2021.
- UN Environment Programme, UNEP Finance Initiative and Global Canopy, Beyond 'Business as Usual': Biodiversity targets and finance. Managing biodiversity risks across business sectors. UNEP–WCMC, Cambridge, UK, 2020
- Science Based Targets Network (SBTN), Science Based Targets for Nature, Initial guidance for Business, September 2020.

Disclosure

- TNFD, The TNFD Nature–related Risk & Opportunity Management and Disclosure Framework, Beta v0.1 Release, A Prototype for Consultation with Market Participants, March 2022.