

PwC Sustainable Finance

Managing biodiversity risks and opportunities

An introduction for financial institutions



Table of contents

Table of figures.....	3
A Problem statement.....	5
B Guidance for implementation.....	6
1 Scoping	7
a Analysis of minimum requirements.....	7
b Setting level of ambition.....	11
2 Evaluation (risks, opportunities, dependencies and impacts).....	12
a Relevance analysis.....	12
b Location and materiality analysis.....	14
c Analysis of company resilience under different scenarios	18
d Gap analysis.....	19
3 Target setting and action plans.....	20
a Goals and policies.....	20
b Action plans and regular monitoring.....	23
4 Data architecture and reporting.....	24
a Identification of data needed for reporting	24
b Identification of data sources.....	26
c Setting up processes and clarifying responsibilities	28
C Annex.....	29
1 Case study – NGS Bank (fictitious)	29
2 Case Study – Global Protegere Insurance (fictitious)	36
3 Information on regulatory requirements	44
Contacts.....	45

Table of figures

Fig. 1	Overview of the four key steps for action on biodiversity in the financial sector.....	6
Fig. 2	Examples of how biodiversity risks can pose financial risks.....	8
Fig. 3	Responsibilities regarding biodiversity in different departments of financial institutions.....	9
Fig. 4	Timeline of biodiversity-related regulations.....	10
Fig. 5	Three different levels of ambition.....	11
Fig. 6	Analysis with the ENCORE tool	12
Fig. 7	Heat map based on the WWF Biodiversity Risk Filter.....	13
Fig. 8	CSRD materiality analysis.....	16
Fig. 9	Different nature scenarios.....	18
Fig. 10	Implications of the GBF for the financial sector and investors.....	21
Fig. 11	Building an ESG data architecture.....	25
Fig. 12	Three different types of ESG data sources under selected regulations.....	27
Fig. 13	Case study: NGS Bank	30
Fig. 14	Example heat map based on ENCORE	32
Fig. 15	Use case Global Protegere Inc.	37
Fig. 16	Example of a biodiversity heat map	40
Fig. 17	Examples of biodiversity dependencies.....	41
Fig. 18	Examples of biodiversity impacts.....	42



A Problem statement

The issue of addressing biodiversity risks is gaining importance in the financial sector. There are several reasons why financial institutions need to address biodiversity sooner rather than later. The EU has proposed several regulatory measures that require institutions to report on biodiversity-related factors, and the European Central Bank (ECB), in its supervisory role in the European financial system, has announced that it expects institutions to address all environmental risks beyond climate risk. All sectors are dependent on biodiversity to a certain degree, but more than half are moderately or highly dependent. Furthermore, there are important synergies between climate protection and biodiversity protection. However, financial institutions are struggling to get started on integrating biodiversity aspects into their strategy, governance, risk management and reporting.

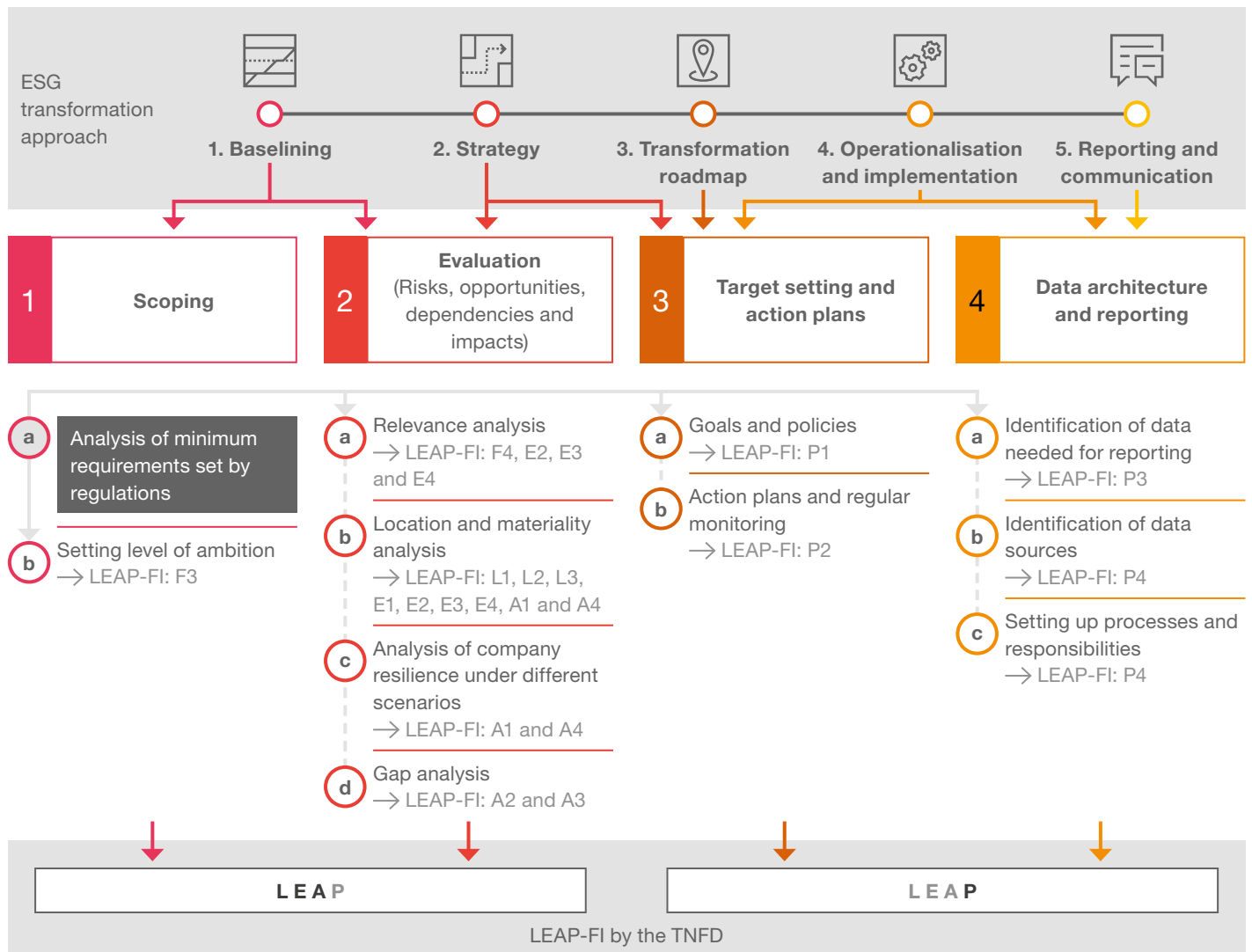
More background information, context and an overview of the status quo in the German financial sector can be found in the joint [PwC Germany and WWF Germany study](#) *“From net zero to nature positive – Why the German financial sector should now address biodiversity”*.

B Guidance for implementation

To help you get started with the topic, this PwC point of view provides initial concrete recommendations for action.

Our recommendations for action on biodiversity for the financial sector consist of four steps: scoping, evaluation, target setting and action plans, and data architecture and reporting. The following figure provides an overview of the process.

Fig. 1 Overview of the four key steps for action on biodiversity in the financial sector



The individual steps are explained in detail below.

Please note: the individual steps are not independent of each other and need to be pursued simultaneously under certain circumstances. Findings from one step can influence other steps that may have already been completed. The whole process is therefore iterative. The steps are based on the LEAP-FI process by the TNFD (beta v0.3 version).

1 Scoping

The first step is to educate yourself on the role of financial institutions in protecting and restoring biodiversity and ecosystems, as well as current and future minimum requirements under applicable regulations, in order to set your level of ambition.

a Analysis of minimum requirements

- Understand the relevance of biodiversity for the economy and the financial sector
- Understand the regulations: Corporate Sustainability Reporting Directive (CSRD), EU taxonomy, Sustainable Finance Disclosure Regulation (SFDR), EU Nature Restoration Law, risk management



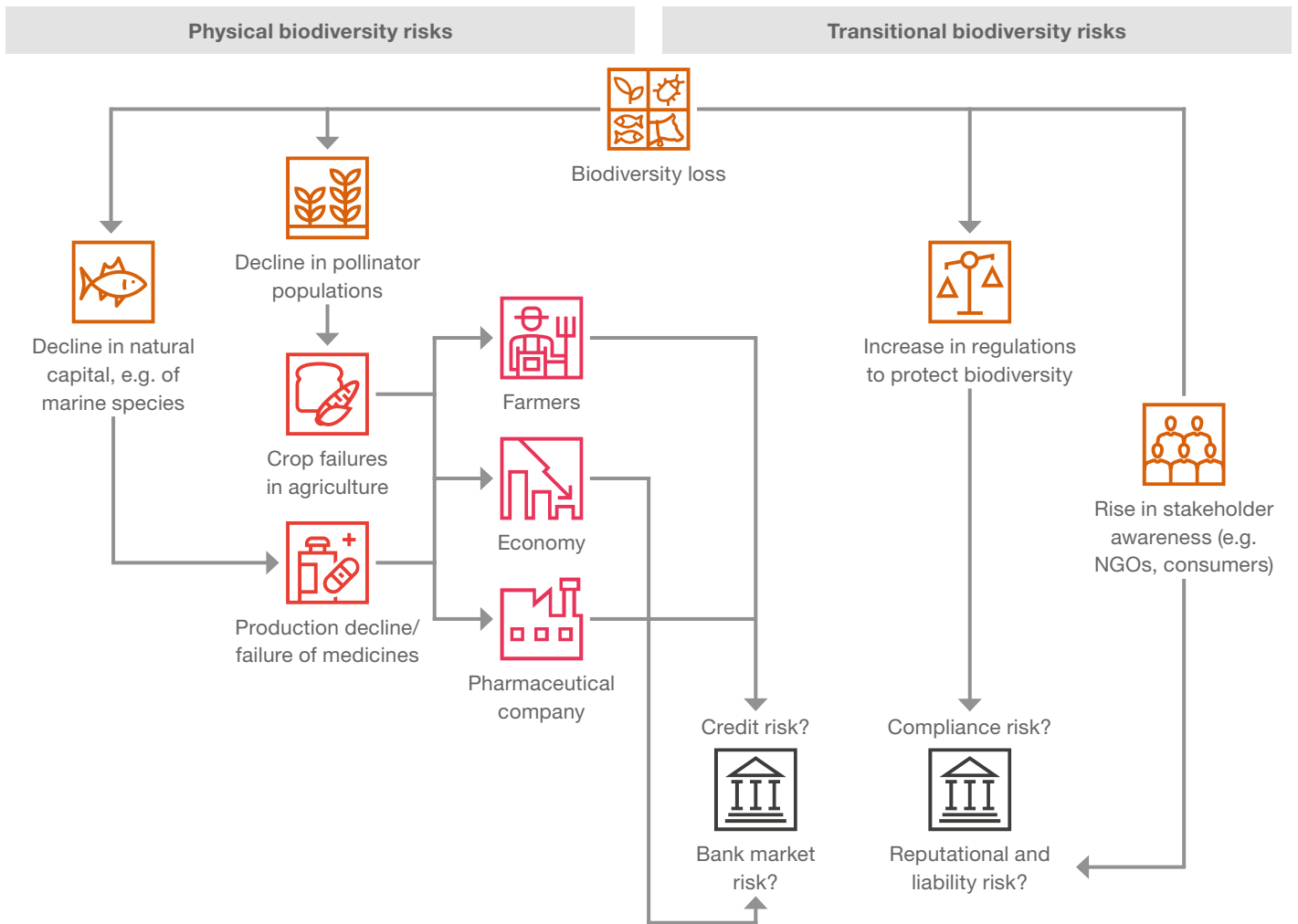
What are the regulations relating to biodiversity and when will they take effect?

Not part of LEAP-FI

To build up the relevant expertise on the topic of biodiversity risks and opportunities, you should first familiarise yourself with the definitions of terms such as nature, natural capital, ecosystem services and biodiversity by consulting [the Taskforce on Nature-Related Financial Disclosures \(TNFD\) website](#). It is important to understand biodiversity as a multi-dimensional phenomenon. In contrast to climate change, it cannot be measured using one metric (for climate change, the main metric used is CO₂ emissions); instead, it requires several dimensions to be taken into account, such as abundance of species, soil quality and pesticide use. Furthermore, biodiversity data is always location-specific – i.e. land use has different impacts in biodiversity-sensitive areas.

How is the financial sector affected by biodiversity risks? The economy is highly dependent on biodiversity and healthy ecosystems, especially in areas such as the agricultural and food industries. A good overview of the dependence of various sectors on natural resources is provided by a [study on nature risks by the World Economic Forum from 2020](#) (p. 14). As a financial institution, you could take a sector-based risk analysis approach for your existing portfolio and clients. The following figure is intended to give you some examples of how biodiversity loss can pose a risk to financial institutions.

Fig. 2 Examples of how biodiversity risks can pose financial risks



The topic of biodiversity loss and the associated risks is also of great importance for insurance companies, as the climate crisis is increasing the frequency and extent of damage caused by natural disasters. Loss of biodiversity can further increase the extent of damage – for example, through the loss of mangrove forests, which serve as natural protection against flooding in coastal areas. Due to the synergies and interdependence between climate risk and biodiversity risk, the two issues should be considered together.









If half of global GDP depends on nature and its services, then value creation by the companies in our portfolio is also dependent on healthy ecosystems and the biodiversity that underpins them.

Snorre Gjerde, NBIM

Within a financial institution, almost all departments are affected by the topic of biodiversity.

Fig. 3 Responsibilities regarding biodiversity in different departments of financial institutions

Department		Responsibility with regard to biodiversity
Strategy and governance	 CEO	Set biodiversity objectives and KPIs
Products and distribution	 CSO	Consider development of biodiversity-related products, e.g. biodiversity funds
Risk management	 CRO	Analysis of traditional and physical biodiversity risks and opportunities
Control and reporting	 CFO	Disclosure of significant impacts and dependencies on biodiversity
Processes, inventories, data, systems and organisation	 COO  CIO	Collection and processing of biodiversity data, e.g. location of assets

The EU is working on a set of regulations that include biodiversity-related disclosures. The first step is to know the minimum requirements that the regulations impose on your company with regard to biodiversity. In addition to reporting requirements, the ECB and national supervisory bodies are increasingly focusing on environmental risks, including biodiversity. The following figure provides an overview of the regulatory environment with regard to biodiversity.

Fig. 4 Timeline of biodiversity-related regulations

	2022	2023	2024	2025	2026	2027
SFDR		Q2: First publication date PAI statement (Annex I SFDR) for FY22				
Taxonomy	Q1: Platform on Sustainable Finance Report on technical screening criteria (TSCs) for four remaining environmental goals	Q2: Draft Delegated Act on TSCs for environmental goals 3–6 (environmental goal 6 = biodiversity)	Q1: Entry into force of the reporting obligation for financial companies on taxonomy compliance for FY23 for climate goals	Q1: Entry into force of the reporting obligation for financial companies on taxonomy compliance for FY24 for all 6 environmental goals		
CSRD				Q1: Application date for companies subject to NFRD for FY24	Q1: Application date for other large companies for FY25	Q1: Application date for capital market-oriented SMEs for FY26
Risk management	Q1: Second ECB Thematic Review for SIs and BaFin Thematic Review for selected LSIs: emphasis on the relevance of biodiversity risks	Q2: 7th MaRisk amendment (implementation BaFin guidance on sustainability risks)	Until year-end: ECB expects full compliance with its expectations on climate and environmental risks			
Nature Restoration Law	Q4: Publication of legislative proposal					
TNFD	Q1: Beta release Q2: Beta release Q4: Beta release	Q1: Beta release Q3: Final guide				

■ Actions required/recommended

Current and upcoming regulations determine the minimum requirements for dealing with biodiversity risks and opportunities. More information on these requirements can be found in the annex.

Challenges in this step (1a) may include the following:

- Upskilling relevant employees, up to management level, on biodiversity-related challenges and opportunities and potential biodiversity-related measures in the company
- Maintaining an overview of the dynamic developments in regulations

b Setting level of ambition

- Set your company’s strategic ambition level with regard to biodiversity



What level of ambition does my company have with regard to protecting and restoring biodiversity?

LEAP-FI: F3 – Type of analysis

After you have gained the necessary knowledge on biodiversity and on the minimum requirements imposed by the regulations, you can set your level of ambition for the next steps. Broadly speaking, there are three different levels of ambition:

Fig. 5 Three different levels of ambition

Level of ambition	Description
Low to medium Compliance with regulations	You comply with regulations (PAI statement under the SFDR, EU taxonomy, CSDR if applicable), including expectations held by supervisory bodies. Beyond this, however, you have not made any voluntary commitments and you do not analyse or exploit potential opportunities.
Medium to high Compliance with regulations and voluntary commitments	You comply with regulations (PAI statement under the SFDR, EU taxonomy, CSDR where applicable), including expectations held by regulators. You also make voluntary commitments, e.g. by joining initiatives such as the TNFD or SBTN.
High (first mover) Beyond compliance, ambitious company targets and pioneer on the market	You comply with regulations, even if they do not (yet) apply to you, and join initiatives and enter into voluntary ambitious commitments. You integrate biodiversity aspects into the entire organisation and actively utilise opportunities that arise from this.

Challenges in this step (1b) may include the following:

- Finding the right balance between available financial and human resources and the long-term interests of the company

2 Evaluation (risks, opportunities, dependencies and impacts)

This step is about evaluating biodiversity-related risks and opportunities and impacts for your company.

a Relevance analysis

- Analyse your dependencies and impacts on biodiversity
- Draw a heat map to identify the most relevant sectors with regard to biodiversity



Do I have companies from sectors which are materially dependent on biodiversity and/or have material impacts on biodiversity in my portfolio; and if so, how many?



Which sectors should I focus on?

LEAP-FI: L3 – Priority location identification; L4 – Sector identification

Fig. 6 Analysis with the ENCORE tool



In this step, you will need to perform an analysis of your portfolio of assets and loans to establish your dependence on biodiversity and your impact on natural capital and biodiversity.

There are many tools which you can use for this exercise. A list of these tools can be found in the PwC Germany and WWF Germany study. In this paper, we will present two tools – the ENCORE tool and the WWF Biodiversity Risk Filter – as examples. In the ENCORE framework, the first step is to classify the affected investments and financing activities in your portfolio by sector and, if possible, by sub-industry and production process.

Having done this, the next step is to determine the level of dependence on individual ecosystem services and what your company's impact on them is. The scale ranges from very low materiality to high materiality.

The WWF Biodiversity Risk Filter offers similar functions. It can be used to analyse physical and reputational biodiversity risks (transition risks will also be integrated in the future). Three modules have been made available so far. The first module, *Inform*, provides a good overview of dependencies and impacts of 25 different industries based on 33 different biodiversity factors (based on data from ENCORE). The other two modules are useful for *step 2b* and will be explained there.

You can use the information obtained on biodiversity dependencies and impacts of different sectors in your portfolio to draw heat maps. Heat maps help you to identify the riskiest assets, which will then be the focus of the next steps. The following graphic is an example heat map based on an analysis carried out with the WWF Biodiversity Risk Filter.

Fig. 7 Heat map based on the WWF Biodiversity Risk Filter

WWF sector	Dependence on nature	Impact on nature	Overall
Agriculture (animal products)	Medium	High	High
Agriculture (plant products)	High	High	High
Appliances and general manufacturing	Medium	Low	Low
Automotive, electrical equipment and machinery production	Medium	Low	Low
Electronics and semiconductor manufacturing	Medium	Low	Low
Fishing and aquaculture	High	Medium	Medium
Healthcare, pharmaceuticals and biotech	Medium	Low	Low
Hospitality services	Medium	Low	Low
Oil, gas and consumable fuels	Medium	High	High
Paper and forest products	High	High	High
Transportation services	Medium	Medium	Medium
Water utilities/water service providers	High	Low	Low

■ High materiality rating ■ Medium materiality rating ■ Low materiality rating

Challenges in this step (2a) may include the following:

- Selection of a suitable tool for your company
- Classification of portfolios according to the sector logic of the tool used
- Identification of relevant sectors for the next steps according to your level of ambition

b Location and materiality analysis

- Determine the locations of investments and financing activities in the relevant sectors
- Identify biodiversity-sensitive areas
- Financial materiality
- Non-financial materiality

? Where are the most relevant assets and financing activities with regard to biodiversity located in my portfolios?

? Which locations are biodiversity-sensitive locations?

? Are there material biodiversity risks for my business?

? What opportunities are there for my company with regard to biodiversity?

? What impact does my company have on biodiversity?

LEAP-FI: L1 – Business footprint; L2 – Nature interface; E1 – ID of relevant environmental assets and ecosystem services; E2 – ID of dependence and impacts; E3 – Dependency analysis; E4 – Impact analysis; A1 – Risk and opportunity ID; A4 – Risk and opportunity materiality assessment

The next step is to determine the location of the investments and financing activities that you identified as relevant in [step 2a](#). Location data can be obtained directly from the relevant company – for example, through location-specific questions as part of the due diligence process (primary data). Alternatively, you could use publicly available data or commercial data from external data providers, such as geodata (e.g. geographical coordinates of facilities). External data is often collected at a national level. It is important to keep in mind that you will need to disclose the data sources and methodology used in your reporting. If the solution is not perfect from the start – for example, due to data quality and availability issues – you should also set out the steps that you have planned to improve data quality in the future.

In addition, you need to identify [global biodiversity hotspots](#), of which there are currently 36. Sources such as the Integrated Biodiversity Assessment Tool (IBAT) database can be useful for obtaining data on biodiversity-sensitive areas worldwide. In the future, companies will have to report on location-specific data under the CSRD.

Excerpt from EU Sustainability Reporting Standard (ESRS) E4: Biodiversity and ecosystems



- “22. The undertaking shall specifically disclose: [...]
- (c) whether or not it has sites located in or near biodiversity-sensitive areas and whether activities related to these sites negatively affect these areas: [...]
 - (d) a list of material sites based on the results of paragraph 22 (c). The undertaking shall disclose these locations by:
 - i. specifying the activities negatively affecting these areas;
 - ii. providing a breakdown of sites according to the impacts and dependencies identified, and to the ecological status of the areas (with reference to the specific ecosystem baseline level) where they are located; and
 - iii. specifying the biodiversity-sensitive areas impacted, as defined in paragraph 22 c ii for users to be able to determine the location and the responsible competent authority with regards to the activities specified in paragraph 22(d) i.”



There’s a lot of talk about data availability. However, there are some impressive datasets out there, such as data on species richness, protected sites, water stressed areas, etc. [...] We are also seeing new technological tools develop, such as geospatial analytics, and leading companies are sharpening their disclosures, for example by publishing coordinates of palm oil suppliers or proximity of mining sites to protected areas. We are positive that these developments will help us enhance our understanding of the impact and dependencies of our portfolio in the future.

Snorre Gjerde, NBIM

After your location analysis, you will be able to conduct a materiality analysis. The CSRD, which is set to start entering into force in 2025, will require companies to consider not only financial materiality (outside-in perspective – the impact of ESG risks on your company’s financial performance), but also impact materiality (inside-out perspective – the impact of your companies’ business model on the environment and society). You will need to analyse biodiversity-related risks and opportunities, as well as your impact on biodiversity and ecosystems. So far, supervisory bodies such as the ECB have focused on financial materiality. Gathering data on impact materiality will require the involvement of other functions in your company, such as the sustainability team.

Fig. 8 CSRD materiality analysis

Characteristics of materiality analysis	
1	Materiality: financial (outside-in) and/or non financial (inside-out) materiality
2	Scope: consideration of the entire value chain; short, medium and long term
3	Identification of stakeholders and users of the sustainability information
4	Implications for processes: new processes and control mechanisms will be necessary
5	Documentation and testing obligations: preparation of a process document, external testing

<p>Non-financial materiality</p> <ul style="list-style-type: none"> • Actual or potential significant effects on humans or the environment • Short, medium or long term • Direct or indirect impacts or contribution to them 	<p>Financial materiality</p> <ul style="list-style-type: none"> • Influence on future cash flows and enterprise value • Short, medium or long term • Not covered by financial statements at reporting date
--	--

Financial materiality/outside-in perspective

In order to identify material risks and opportunities, the results of the analysis with ENCORE or the WWF Risk Filter (step 2a) will then have to be combined with the location data of the investments and financing activities that were identified as relevant. An example of a material financial risk would be that of one of your investments or financing activities is located in a water-scarce region and involves a sector, sub-industry or production process that is highly dependent on groundwater or good water quality. This is because this situation would entail financial risks for the company in which you have invested or to which you have granted a loan. Therefore, this constitutes a market risk in your asset portfolio, as share prices may drop as a consequence, or a credit risk in your loan portfolio may arise.

The reputational risk associated with such a situation should not be neglected either. Stakeholders are increasingly aware of biodiversity-related issues, and negative biodiversity impacts by companies can create significant reputational risks with financial repercussions, such as a loss of clients, drops in share prices or negative consequences for recruiting and retainment.

An example of a biodiversity-related opportunity would be investing specifically in nature-based solutions that address the issue of protecting water supplies. The global market for investments in nature tech startups was \$2 billion in 2022, with an average growth rate of 52% per year since 2018.

Non-financial materiality/inside-out perspective

In order to determine material negative impacts on biodiversity, it is also necessary to combine the location data with the results of the analysis using ENCORE or the WWF Risk Filter (step 2a). An example of a negative material impact could be created by an investment which causes high levels of water pollution being located in a biodiversity hotspot with a wide variety of plants and animals that are dependent on freshwater.

Another useful methodology for analysing your company's impact on biodiversity is to calculate your biodiversity footprint. For example, it can measure the biodiversity loss within one year, expressed by area, that your company's business model causes. The important aspect with regard to the biodiversity footprint is not so much the absolute value, as there are different approaches to calculating this, but relative changes over time. This also provides information on the largest contributors to biodiversity loss, and thus on the most important starting points for reducing your company's negative impact on biodiversity.

The PBAF standards can help with analysis of non-financial materiality. There are three different publications that focus on measuring impacts on biodiversity:

- A. Q&A: provides an introduction to biodiversity impact assessment for financial institutions in 16 questions and answers. Suitable for financial institutions just starting to engage in biodiversity impact assessment.
- B. Overview of biodiversity impact assessments: provides an overview of different biodiversity impact assessment approaches that can be used by financial institutions and includes a chapter on positive impacts. Suitable for financial institutions at all levels of knowledge and experience.
- C. Biodiversity impact assessments – footprinting: suitable for financial institutions with in-depth knowledge and experience of biodiversity.

The WWF Risk Filter offers two modules that can be useful for determining both financial and non-financial materiality. With Explore, you can enter site data and obtain related biodiversity risks. Assess allows you to analyse the biodiversity risks of entire portfolios. To do this, you enter the following information about the companies in your portfolio in the Portfolio Manager: company, industry, location. relevance of the location for the overall performance of the company.



Challenges in this step (2b) may include the following:

- Accurate location of assets and financing activities
- Determining materiality according to your level of ambition
- Resources for analysing both financial and non-financial materiality

c Analysis of company resilience under different scenarios

- Analyse biodiversity risks and opportunities under different nature scenarios – e.g. based on nature scenarios by the Network for the Greening of the Financial System (NGFS)

? What impact would different nature scenarios have on my company?

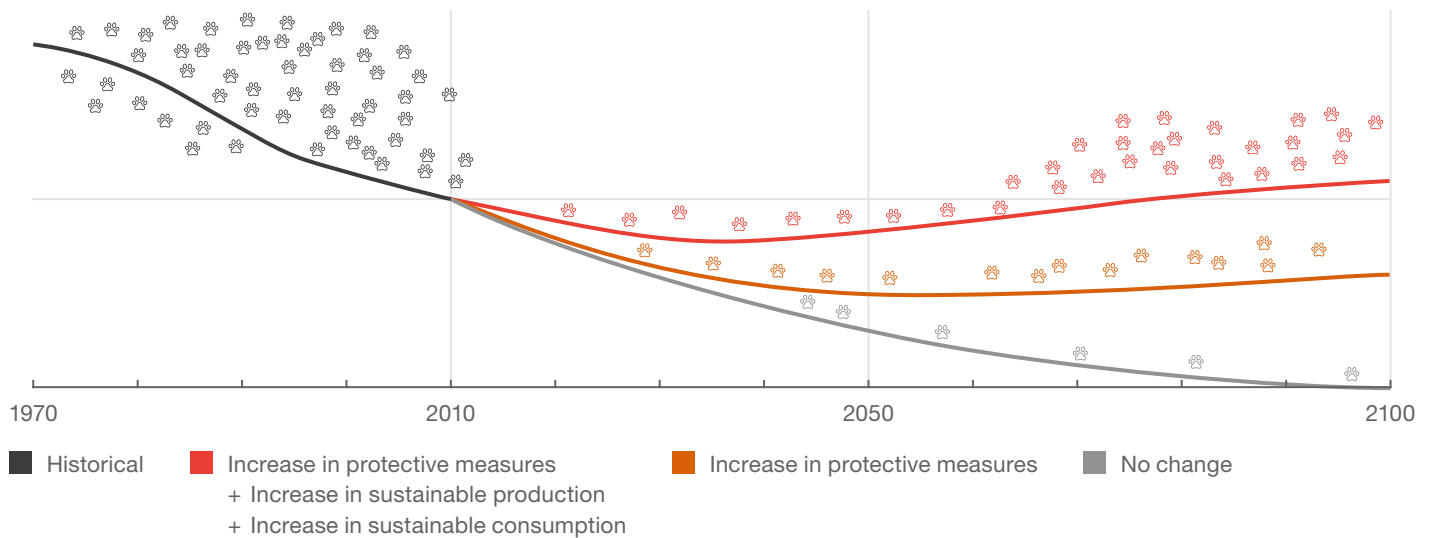
LEAP-FI: A1 – Risk and opportunity ID; A4 – Risk and opportunity materiality assessment

This step involves analysing the resilience of your company under different scenarios. Much like climate change predictions, there are different scenarios for how nature and biodiversity will develop. Each scenario entails different biodiversity risks for your business.

The NGFS and the TNFD are both currently working on nature scenarios to be published in 2023.

The following figure provides an abstract overview of possible different scenarios:

Fig. 9 Different nature scenarios



In addition, the Principles for Responsible Investment (PRI) initiative published a combined climate and nature scenario in January 2023 – “IPR Forecast Policy Scenario + Nature” – to help investors manage biodiversity risk. It is a beta scenario that shows what could happen if nature-related policies are integrated into a climate-related scenario.

Challenges in this step (2c) may include the following:

- Selecting drivers
- Selection and number of scenarios
- Interpreting results and identifying suitable measures

d Gap analysis

- Examine whether material risks are sufficiently managed and mitigated
- Determine need for action
- Take advantage of opportunities

- ? **What approaches to risk mitigation and management are already in place in my company?**
- ? **Do these cover the biodiversity-related risks that we have identified?**
- ? **What additional risk mitigation and risk management measures should be considered?**
- ? **How can my company take advantage of biodiversity-related opportunities?**

LEAP-FI: A2 – Existing risk mitigation and risk and opportunity management; A3 – Additional risk mitigation and risk and opportunity management

Steps 2b and 2c produce a list of material biodiversity risks for your company. You will then need to ask a number of questions to determine whether these risks are sufficiently mitigated by your current risk management systems. Have biodiversity-related risks been identified? Have biodiversity-related risks been incorporated into the overall risk assessment? If this is not the case, you should determine what needs to be done for the next steps. The material risks also need more in-depth analysis. What are the key risk drivers and how can the risks be mitigated? You should also take an in-depth look at the opportunities that may arise and think about how you could take advantage of them.

Challenges in this step (2d) may include the following:

- Integration of biodiversity-related risks into existing risk management process



3 Target setting and action plans

Based on the results of step 2, the third step is to formulate company-specific biodiversity objectives with corresponding KPIs. In addition, action plans should be drawn up to implement these objectives.

a Goals and policies

- Use internationally agreed biodiversity objectives as guidance
- Formulate objectives – e.g. by using guidance from the Science-Based Targets Network (SBTN)
- Formulate policies

The first part of step 3 is to formulate objectives and to make them mandatory through policies. The following key questions need to be addressed:

- ? Which biodiversity-related objectives should my company aim for based on the level of ambition we have identified, and in which business units?**
- ? Which KPIs can be used to measure progress?**
- ? How can biodiversity be integrated into the company's current ESG framework – e.g. climate strategy, risk management and ESG due diligence?**

LEAP-FI: P1: Strategy and resource allocation

When formulating internal biodiversity objectives, internationally agreed biodiversity objectives are useful guides. The objectives should follow a strategy for how to increase biodiversity-related maturity over time.

In December 2022, the 15th Conference of the Parties to the UN Convention on Biological Diversity took place in Montreal. The Kunming-Montreal Global Biodiversity Framework (GBF) was adopted at the conference. It contains four overarching long-term objectives and 23 sub-objectives to be achieved by 2030. Some targets are of particular relevance for the financial sector. The following figure provides an overview.

Fig. 10 Implications of the GBF for the financial sector and investors

Objective	GBF target(s)	Impact on private financial institutions and investors
Land and water use: 30 % land and marine conservation by 2030, halting degradation and supporting restoration of 30 % of degraded areas and increasing the area and quality of green and blue spaces in urban areas	1, 2, 3, 12	High
Species extinction: halting species extinction (plus species recovery), sustainable wild species management, sustainable and legal wild species trade and eliminating/minimising impact of alien species by at least 50 % by 2030	4, 5, 6, 9	High
Pollutants and nutrients: reducing pollutant output and nutrients and pesticides by at least half, working towards eliminating plastic pollution	7	High (specific industries)
Climate change impact reduction: on biodiversity and increasing resilience through use of nature-based solutions	8	Medium
Sustainable farming practices: in aquaculture, agriculture, fisheries and forestry, including reduction in harmful subsidies by at least \$500 billion per year by 2030	10, 18	High (specific industries)
Integrating nature into planning, policy and development: in addition, securing ecosystem services benefits to local communities and indigenous people (including genetic and digital sequencing information (DSI), use of biotechnology)	11, 13, 14, 17	Medium
Transparency and monitoring disclosures: legal, administrative and policy measures taken to encourage and enable financial institutions and businesses to monitor and disclose biodiversity risks, dependencies and impacts, as well as improving consumer information to enable people to make better choices, aiming to reduce overconsumption and halving food waste by 2030	15, 16	High
Mobilising finance and capacity: totalling \$200 billion per year including from developing countries (\$25 billion by 2025, \$30 billion+ in 2040), domestic financing, blended finance, green bonds and biodiversity offsets and credits. Innovation and capacity, data availability – including rights of indigenous people and gender equality in decision-making and access. Calls to make equal use of synergies between climate action and nature action	19, 20, 21, 22, 23	High

Source: Environmental Finance, Biodiversity Insight, 2023, p. 2.

Guidance for setting biodiversity objectives is provided by organisations such as the SBTN. The SBTN's science-based targets (SBTs) for nature will be compatible with the GBF objectives. A final version of the guide for setting nature-based targets is due to be published in 2023.

The SBTN is working on developing SBTs:

- Initial guidance published in September 2020
- SBTs to be designed to support the UN Sustainable Development Goals (SDGs)

Mission: the SBTN aims to transform economic systems and protect the global commons: air, water, land, biodiversity and ocean.

SBTs give companies and cities a clear pathway to competitiveness and resilience by using science to define their role in restoring nature. We define SBTs as measurable, actionable and time-bound objectives – based on the best available science – that allow actors to align with Earth's limits and societal sustainability goals.





Similar to SBTi for climate

Five steps for setting nature SBTs:

1. **Assess:** what and where are your company's biggest impacts and dependencies on nature and the environment?
2. **Prioritise:** where do you need to focus and take more action, both in areas where you have direct control and more broadly across your whole "sphere of influence"?
3. **Measure:** collect baseline data for your priority targets and locations and, where possible, set targets.
4. **Act:** use our Action Framework and act to avoid future impacts, reduce current impacts, regenerate and restore ecosystems, and transform systems.
5. **Track:** finally, monitor progress towards targets and report publicly on this progress.

When setting objectives, it is advisable to distinguish between new business and existing business. Meeting objectives for new business is usually relatively quick and easy (low to medium level of ambition), while meeting them for existing business tends to be difficult and takes a long time (high level of ambition).

Your objectives and KPIs should then be translated into binding policies. You can either formulate a multidimensional policy that covers several ESG and biodiversity topics or integrate biodiversity into an existing policy, or you can formulate policies for specific biodiversity-related topics – e.g. palm oil. Your level of ambition will determine how strict the requirements are. However, it is important that the goals are measurable and that progress is monitored.

In the target-setting phase, it is also advisable to engage with stakeholders; for example, by conducting a stakeholder workshop. This provides you with an opportunity to present key findings of the evaluation phase and discuss stakeholders' views on potential measures.

Challenges in this step (3a) may include the following:

- Selecting realistic goals – they should be ambitious but not overwhelming
- Ensuring measurability of objectives
- Managing risk in your existing asset and loan portfolio

b Action plans and regular monitoring

- Set KPIs and measure progress

After you have developed your objectives and formulated relevant policies, you need to take action to achieve the goals and monitor your progress. This step answers the following questions:

 **How do I ensure progress towards my company's biodiversity goals?**

 **How can I reduce my overall impact and dependence on biodiversity?**

LEAP-FI: P2 – Performance measurement

The TNFD offers guidance on metrics (beta v0.3, p. 52). It distinguishes between exposure metrics for nature-related dependencies and impacts and magnitude metrics referring to financial implications to the organisation. For example, when assessing the degradation of a freshwater habitat due to pollutants, one exposure metric could be the change in mean species abundance in freshwater ecosystems and one magnitude metric could be the value of assets as a function of area.



As part of risk management, mitigating actions should be taken, i.e. decreasing activities that are harmful to biodiversity. You need to set out an approach for how to deal with high-risk companies in your asset or loan portfolio; for example, by setting minimum biodiversity-related criteria in your due diligence process for project finance, or by excluding companies with a negative impact on biodiversity from your asset portfolio. You could also pursue an engagement strategy with high-risk companies which involves planning and implementing risk mitigation measures together with the company in question.

Actions should be set out for each target and KPI. The KPIs should then be measured at regular intervals. This allows countermeasures to be taken early enough if the KPIs do not move towards the target.

Challenges in this step (3b) may include the following:

- Setting the right KPIs and tracking progress



4 Data architecture and reporting

In the fourth and final step, the results of the analysis of biodiversity risks and opportunities, dependence and impacts need to be converted to relevant reporting formats. As biodiversity data is required under multiple regulations and should also be used for guidance purposes (e.g. fulfilling your company's biodiversity strategy), it is important to establish an effective internal ESG data architecture which includes biodiversity KPIs.

a Identification of data needed for reporting

- Identify biodiversity-related KPIs that you need to report on (regulatory requirements and voluntary commitments)

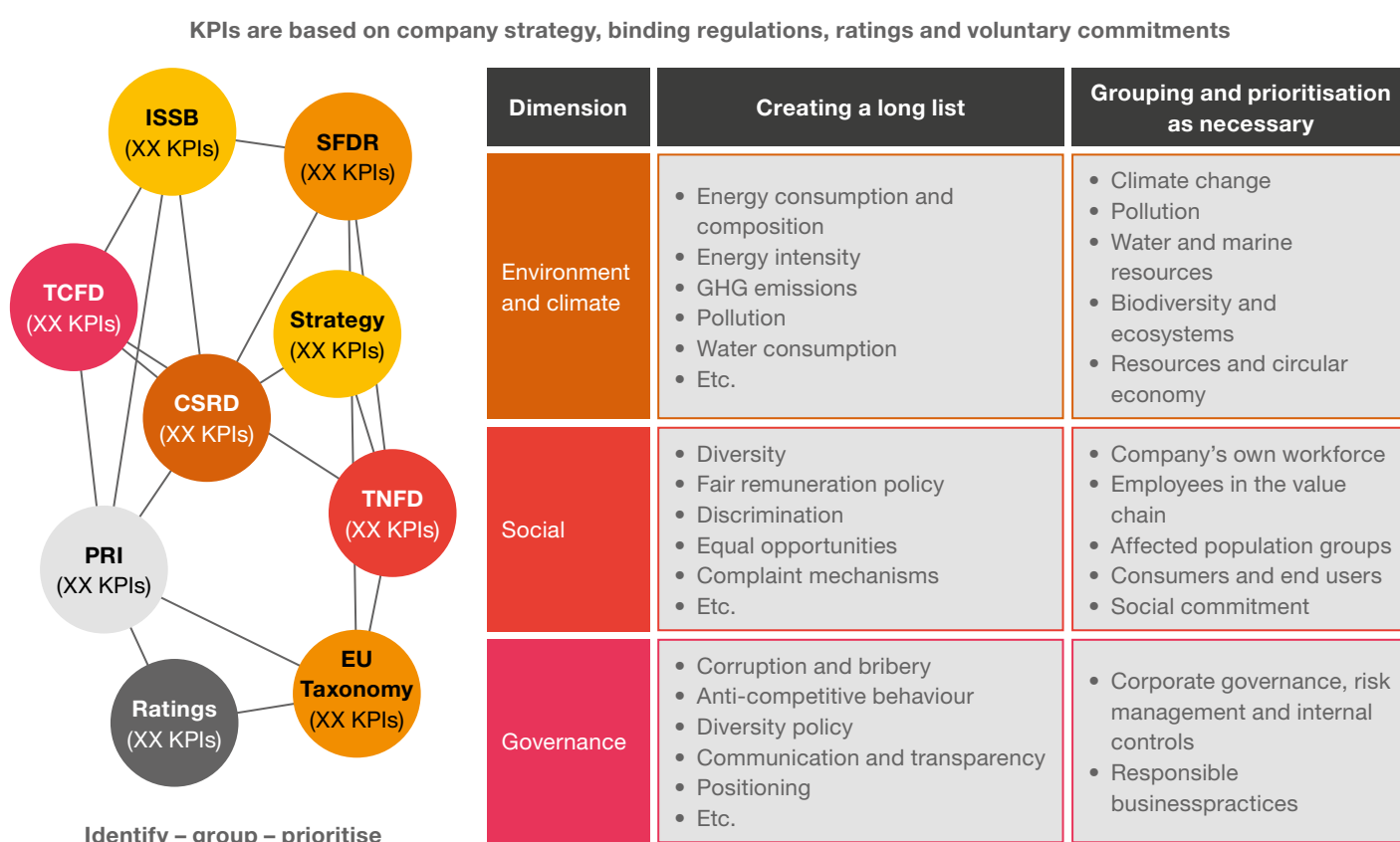


What kind of biodiversity data do I need to report, which format do I need to report it in and which channels do I need to use?

LEAP-FI: P3 – Reporting

First, you should identify which biodiversity-related KPIs (in addition to ESG KPIs as a whole) you need to report on. You should also integrate KPIs for voluntary commitments – e.g. if you have joined the TNFD. Under the CSRD, for example, there are six different disclosure requirements for biodiversity alone, and the ESRSs include a total of 82 disclosure requirements. For each disclosure requirement, you need suitable KPIs. For example, metrics related to material impacts resulting in biodiversity and ecosystem change must be disclosed (ESRS Disclosure Requirement E4-5). You should compile all KPIs across all reporting requirements in a long list and assign them to the three areas of ESG: environment (e.g. biodiversity, climate), social and governance. The KPIs can then be grouped and prioritised. The following figure provides an example summary of the procedure.

Fig. 11 Building an ESG data architecture



Challenges in this step (4a) may include the following:

- Grouping KPIs
- Prioritising KPIs

b Identification of data sources

This step is about determining where you can get the relevant data from.

- Identify possible data sources based on your level of ambition and regulatory requirements
- Work towards using internal/primary data in the long term
- Check data quality and granularity
- Use data for internal management as well

? Is the needed data available within your company? If so, which department is it in?

? Which department should be responsible for collecting this data?

? Does the data need to be purchased externally?

LEAP-FI: P4 – Presentation

Many of the biodiversity-related data points that need to be disclosed should exist in your organisation or will have been identified by going through steps 1 to 3 described in this document. Your level of ambition will determine how granular you want the data to be – e.g. for conducting a sector analysis for existing business and an individual company analysis for new business.

ESG data can generally be divided into three categories:

1. Primary/internal data – e.g. your company’s own data, data collected from clients through questionnaires
2. External data – e.g. data purchased from an external data provider, such as ESG ratings
3. Approximations – e.g. assumptions about a specific company based on sector-specific or country-level data

As already outlined, biodiversity data is complex, as the issue is multi-dimensional and location-specific. However, data availability will improve as the CSRD comes into force from 2025 onwards.

In terms of disclosure, it is important to note that approximations are not allowed under all regulations. The following figure provides an overview of which type of data is allowed under various regulations.

Fig. 12 Three different types of ESG data sources under selected regulations

ESG data categories			
	Internal data	External data	Approximation
Example	ESG customer data	ESG ratings	Estimated/derived data
EU taxonomy	✓	✓	✗
Risk management	✓	✓	✓
SFDR	✓	✓	✗
CSRD	✓	✓	✓
Voluntary reporting	✓	✓	✓
	Lack of data – set to improve from 2025 with the CSRD	Lack of transparency and auditability, central review required	Not permissible under some regulations

✓ Use permitted ✗ Use not permitted

The long-term goal should always be to use internal or primary data, as this is the most cost-effective way, and you will need to gather the data regularly. In each case, it is important to check whether the required data is available at the necessary levels of quality and granularity. If not, other sources will have to be considered.

There are different types of external data. In addition to ESG ratings, these include data from sources such as third-party expert opinions or certificates as required by the EU taxonomy regulation. It is always important to understand exactly what kind of data is being purchased, what quality it is and what it will be used for. When purchasing taxonomy ratios, for example, some data providers deliver taxonomy ratios as disclosed by the companies, whereas others include their own calculations or approximations in the analysis. The EU taxonomy does not allow the use of approximations. Approximations may only be used for voluntary taxonomy disclosures, which must be clearly distinguishable from mandatory reporting.

It is important to note here that an important goal of the CSRD is to improve the availability of ESG data. From 2025 onwards, corporate disclosures under the CSRD will significantly improve the availability of primary data for financial companies. All data reported under the CSRD will be made centrally accessible through the European Single Access Point (ESAP). This platform is expected to be up and running with basic functions by the end of 2025.

There is still much to do in the area of data, but there are also many initiatives already underway in this area. For example, PwC is working with the TNFD on a data catalyst initiative that aims to set out guidance in the TNFD’s final recommendations in September 2023 for data usage in populating metrics for the TNFD framework. Other initiatives and tools focusing on biodiversity data availability include IBAT or the PRI initiative. The TNFD offers an overview of existing tools on its website, along with [additional guidance for disclosures by financial institutions](#).



It is important to note that the collected data should not only be used for reporting purposes, but should also be integrated into your internal strategic decision-making processes. For example, the decision on whether to divest from a particular industry due to high biodiversity risks also needs to consider the financial consequences for your company. These must be weighed up against potential reputational risks, credit risks and market risks associated with continuing with the investment.

Challenges in this step (4b) may include the following:

- Availability of sufficient-quality biodiversity-related data
- Understanding the methodology behind third-party data
- Assessing the quality of third-party data

c Setting up processes and clarifying responsibilities

- Set up standard processes to ensure data availability
- Establish data owners
- Consider the relevant IT architecture from the start

? Which standard processes should I establish so that the required data is always available?

? Who are the data owners?

? How can I ensure data quality for external assurance?

LEAP-FI: P4 – Presentation

Standard processes should be set up to ensure the availability of the required data. For example, geodata/location data should always be collected in the business initiation process (see also [step 2b](#)). For existing business, the required data must be collected step by step. In addition, responsibility for individual datasets must be specified (data governance) – i.e. the data owners, who ensure the data meets the required standards of quality for new and existing business.

In addition to functional implementation, technical implementation is also needed. This requires the appropriate IT resources, so the project should be started well in advance and IT implementation should be considered from the very beginning.

Challenges in this step (4c) may include the following:

- Determining the data owners
- Starting IT implementation early enough

C Annex

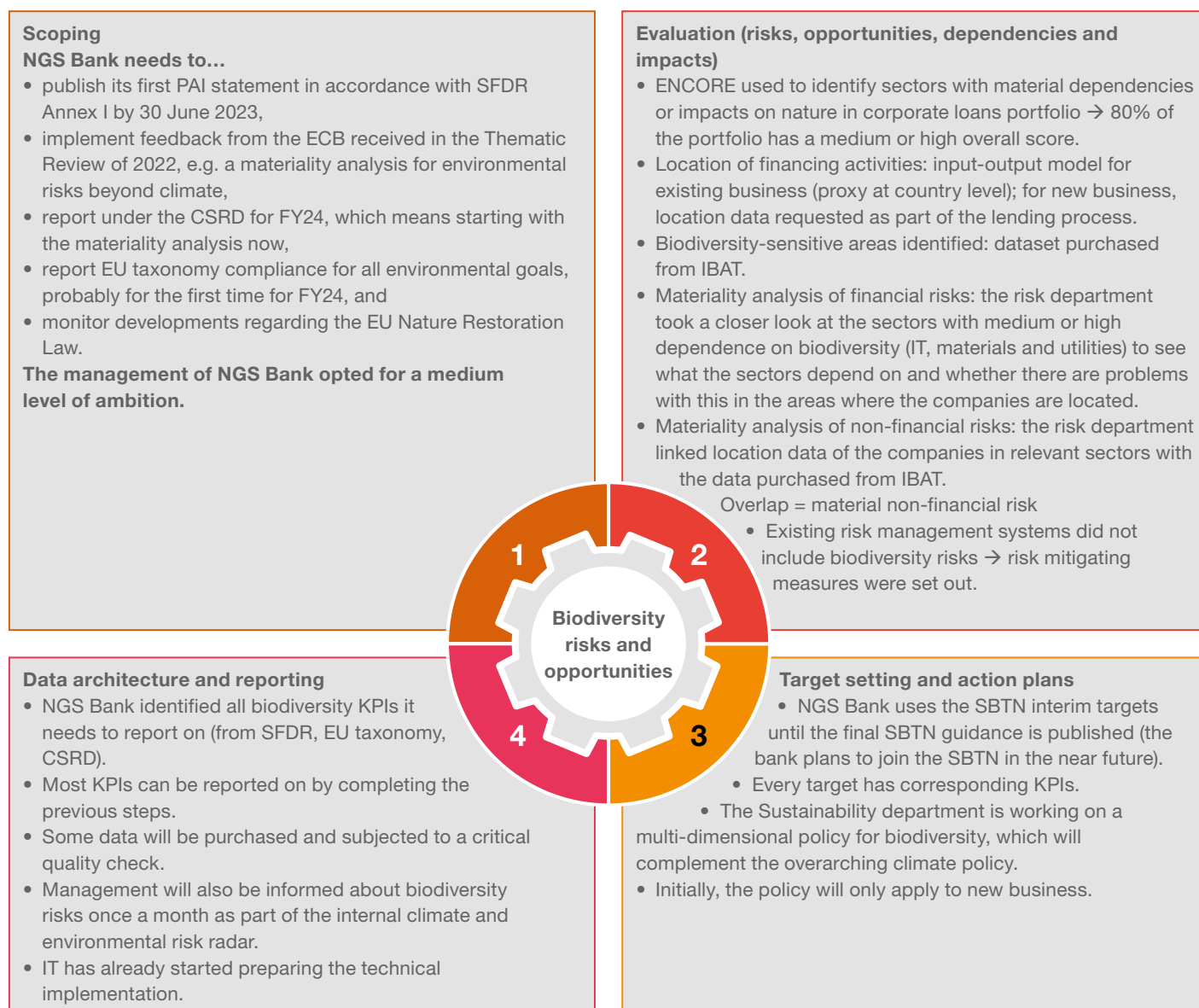
1 Case study – NGS Bank (fictitious)

Example company: NGS Bank (fictitious)

NGS Bank is a public limited company with 30,000 employees based in Frankfurt am Main, Germany. It has a total balance sheet of €250 billion and is supervised by the ECB as a significant institution (SI). Its key business model and strategy is defined by its core business of granting corporate loans in a variety of sectors. However, the bank's private customer/retail business is fairly small. Its level of ESG ambition is medium, and it aims to achieve net zero financed emissions by 2050. Furthermore, it sees itself as partner in financing the green transition of the economy. NGS Bank wants to be compliant with regulations and take stakeholder interests into consideration to preserve its good reputation.

In the following, NGS Bank will go through all the steps described in chapter B to provide illustrative examples. The following graphic gives an overview of the steps, which are described in detail below.



Fig. 13 Case study: NGS Bank


Step 1a: The Sustainability department of NGS Bank has agreed to use the TNFD definitions internally.

The most important terms were explained in the bank's monthly internal sustainability newsletter, which is sent to all employees. In addition, a short article emphasised the relevance of the issue of biodiversity loss for the bank and gave examples of how the bank could be affected (physical risks and transitory risks). It was announced that there would be a kick-off meeting in the near future for all departments affected by the topic: Strategy, Product Development, Risk Management, Reporting and IT.

In addition, it was decided together with management that NGS Bank will join the TNFD forum, which provides useful information but does not impose any obligations.

NGS Bank must publish its first principal adverse impact (PAI) statement in accordance with the SFDR Annex I by 30 June 2023. This also includes information on investments in companies that have a negative impact on biodiversity-sensitive areas.

In 2021 and 2022, NGS Bank had to participate in the ECB's Thematic Review on Climate and Environmental Risks. At the end of 2022, NGS Bank received its feedback letter from the ECB, which criticised, among other things, the fact that NGS Bank had so far dealt only with climate risks. The ECB expects a materiality analysis for both climate and environmental risks, including biodiversity risks, by the end of March 2023.

From 2025, NGS Bank will be required to report under the CSRD, i.e. starting with the financial year 2024. Therefore, the Sustainability department has already started its materiality analysis to find out whether it has to report in accordance with ESRS E4, which is the reporting standard for biodiversity.

In addition, the technical screening criteria (TSCs) for environmental objectives 3–6 of the EU taxonomy will probably have to be applied from 2025 onwards, i.e. starting with the financial year 2024. NGS Bank will start reporting on taxonomy compliance for the financial year 2023, but only for climate objectives 1 and 2. There are already plans to review the TSCs for biodiversity this year on the basis of the recommendations in the report by the Platform on Sustainable Finance.

The EU Nature Restoration Law currently has no direct impact on NGS Bank, but the Compliance department will keep an eye on developments. In the future, the bank may consider asking companies during the business initiation process how they are affected by this law and what measures they plan to take.

Step 1b: The management of NGS Bank has opted for a medium level of ambition. The current human resources do not allow a high level of ambition and this would also not match the positioning of NGS Bank in the market. However, management considers a low level of ambition to be too short-sighted due to the high level of dependence on biodiversity in the global economy. NGS Bank will therefore primarily focus on complying with regulations and supervisory requirements, but will consider some additional measures. In addition, a decision on joining the TNFD or another initiative will be made in about six months, after initial steps have been taken.

Step 2a: NGS Bank has structured its corporate loans portfolio according to the ENCORE sector logic. A breakdown according to NACE codes has already been carried out within the framework of the ECB climate stress test. Unfortunately, the NACE codes are not identical to ENCORE's sectors, but it proved possible to use an Excel table to create transparency on NGS Bank's allocation of sectors. Each sector was then analysed in ENCORE in terms of its impacts and dependence on natural capital. The results were documented in Excel.

To create a heat map, the results from the analysis with ENCORE were aggregated. For this purpose, the mean value over the different impacts and the mean value over the different dependencies was calculated for each sector. The results were then presented in the form of a heat map. NGS Bank decided to include all sectors with a "medium" or "high" overall score in the next sub-steps.

Fig. 14 Example heat map based on ENCORE

Sectors	IT	Healthcare	Financial	Industrial	Energy	Materials	Utilities	Real estate
Direct physical input	3.00	3.22	N/A	2.89	2.90	2.93	4.00	3.50
Enables production process	N/A	2.50	N/A	1.96	2.39	2.77	2.83	N/A
Mitigates direct impacts	1.67	1.00	N/A	1.94	2.04	1.55	1.61	1.67
Protection from disruption	3.17	3.00	2.00	2.63	2.35	3.26	2.58	1.50
Total dependence on nature	2.61	2.43	2.00	2.36	2.42	2.63	2.76	2.22

ENCORE sector	Dependence on nature	Impact on nature	Overall
IT	Medium	High	Medium
Healthcare	Low	High	Medium
Financial	Low	Medium	Medium
Industrial	Low	High	Medium
Energy	Low	High	Medium
Materials	Medium	High	Medium
Utilities	Medium	High	Medium
Real estate	Low	High	Medium

Continue with these sectors (approx. 80% of corporate loan portfolio)

■ High materiality rating
 ■ Medium materiality rating
 ■ Low materiality rating



Step 2b: From now on, NGS Bank will request location data from companies as part of the lending process in the sectors defined as relevant for new business.

For **existing business**, NGS Bank will initially use EXIOBASE's input-output models, which provide information on which sectors operate in which countries. However, these are only a proxy; over time, NGS Bank wants to send out questionnaires to its existing customers asking for location data. In the future, NGS Bank hopes that the CSRD will make the data more accessible. To identify biodiversity-sensitive areas, NGS Bank has purchased a dataset from IBAT. For the materiality analysis of **financial risks**, the Risk Management department took a closer look at the dependence on biodiversity and location data of the relevant sectors. "Medium" dependence was only found in the IT, materials and utilities sectors. In each case, a detailed look was taken at what the sectors depend on – e.g. groundwater or soil quality – and then research was conducted to see whether the areas where the companies are located face challenges in this regard. This was the case for all three sectors.

To take advantage of **opportunities**, NGS Bank would like to take a closer look at the market for nature-based solutions and probably provide financing in this area. For the materiality analysis of **non-financial risks**, the Risk Management department linked the location data of the companies in the corporate loan portfolio from the relevant sectors with the data purchased from IBAT. When location data and biodiversity-sensitive areas overlap, there is a material non-financial risk. This was the case for all relevant sectors.

The results will be used by NGS Bank for its CSRD materiality analysis.

Step 2c: For the scenario analysis, NGS Bank has decided to wait for the NGFS scenarios. It would then like to proceed in the same way as for scenario analysis of climate risks. The scenarios will also take transitional risks into account, which NGS Bank has not focused on yet.

Step 2d: As NGS Bank had not previously analysed biodiversity risks, these risks were not sufficiently mitigated. In particular, the inside-out perspective has not yet been incorporated into risk management. Regarding financial risks and non-financial risks, NGS Bank would like to ask the companies in its portfolio with material financial and/or material non-financial risks about the extent to which they are aware of this and have mitigation plans in place (engagement strategy). If no plans are in place, NGS Bank will require that they develop transition plans. Otherwise, credit conditions may be made less favourable in the future, or the issuing loans to these companies may be stopped altogether. As already mentioned, NGS Bank would like to take a closer look at the market for nature-based solutions and probably provide financing in this area.

Step 3a: NGS Bank's Sustainability department has already taken a closer look at the GBF and familiarised itself with the implications for financial companies. In particular, goals 14 (directing financial flows towards GBF goals), 15 (reporting) and 19 (increasing financial resources) are considered to be relevant for NGS Bank.

As the final SBTN guidance has not yet been published, NGS Bank is using the SBTN interim targets for the time being. In the near future, it will probably join the SBTN. Every target has corresponding KPIs in order to measure progress towards achieving the goal.



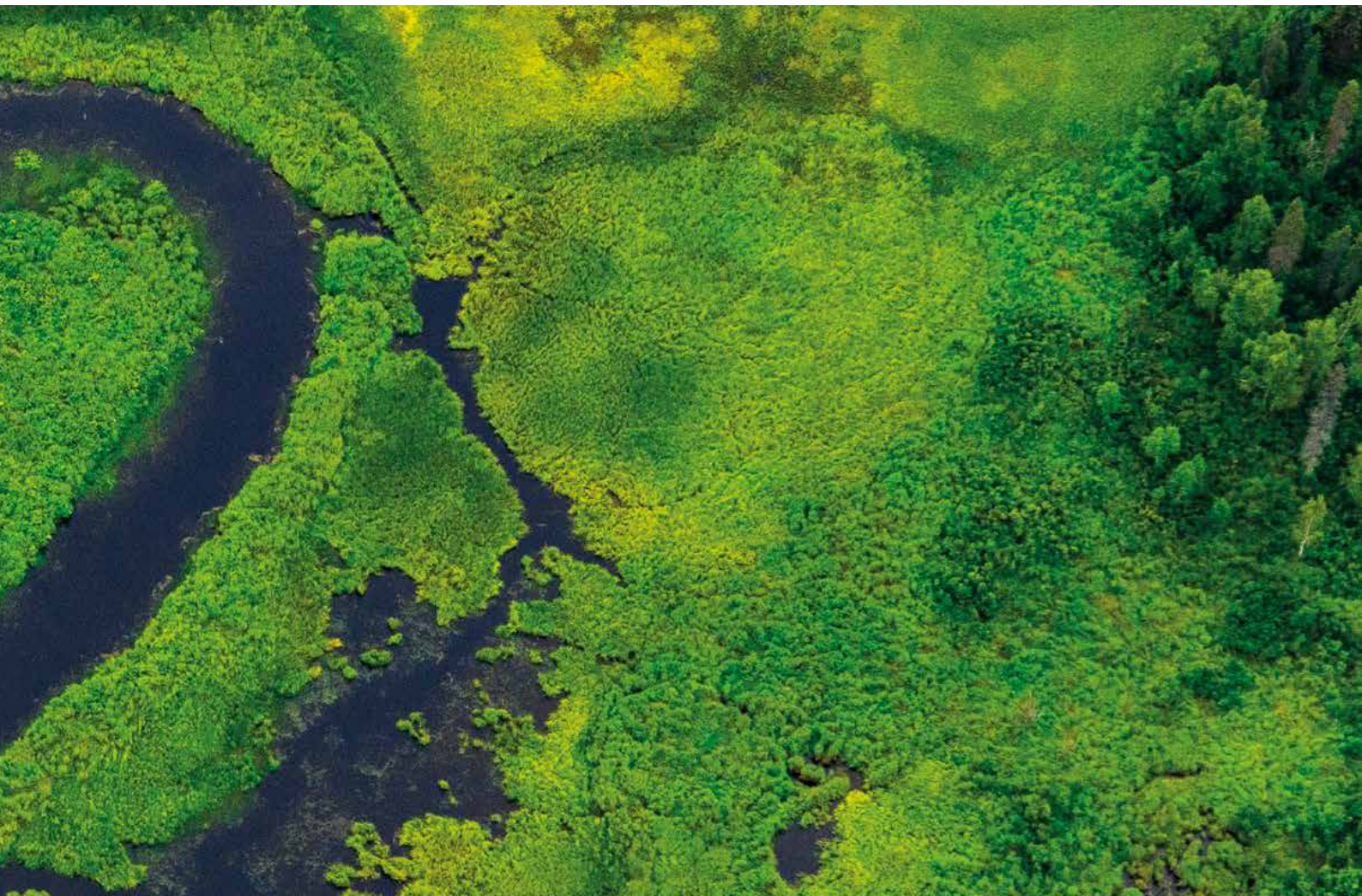
As biodiversity is a multi-dimensional construct, NGS Bank decided to formulate a multi-dimensional policy for biodiversity. NGS Bank already has an overarching climate policy, which will be complemented. The Sustainability department is currently working on the policy. It will cover different aspects, such as land use, water use, use of pesticides and deforestation.

Step 3b: The comprehensive biodiversity policy will initially only apply to new business. NGS Bank will then apply it to existing business step by step, by engaging with the relevant companies in its portfolios.

Step 4a: NGS Bank identified all biodiversity KPIs it needs to report on (from the SFDR, EU taxonomy and CSRD) and grouped them. Having carried out the previous steps, the bank is already able to report on most KPIs and groups of KPIs.

Step 4b: Some data will be purchased and then subjected to a critical quality check. Management will also be informed about biodiversity risks once a month as part of the internal climate and environmental risk radar.

Step 4c: As already mentioned, NGS Bank will collect geodata as a standard part of the business initiation process from now on. For existing business, it will collect the required data through questionnaires. This will happen step by step, starting with the most relevant sectors. The different KPI groups have been assigned to different departments, which are responsible for ensuring that the data is available and of sufficient quality. The IT department has already started preparing for the technical implementation process.



2 Case Study – Global Protegere Insurance (fictitious)

The Global Protegere Inc. is a German-based leading international (re-)insurance company that falls under the regulation of the German supervisory authority (BaFin) and the European Insurance and Occupational Pensions Authority (EIOPA). Global Protegre Inc. provides a range of (re-)insurance products and services to businesses and individuals worldwide. The company has a diversified portfolio of (re-)insurance products, including property and casualty insurance, life insurance, and health insurance.

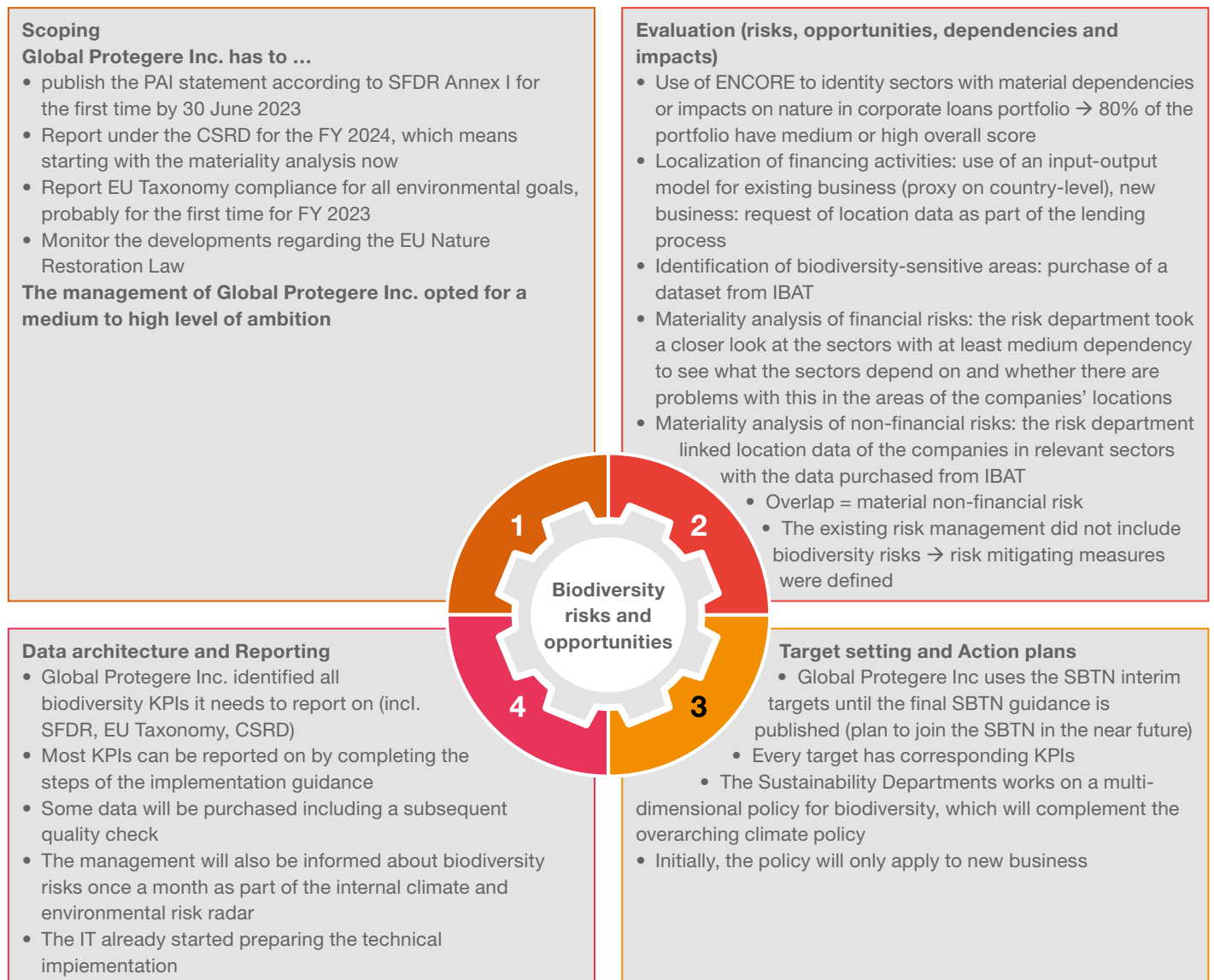
In terms of gross premium written, the company's revenue in 2022 was \$50 billion. This includes both insurance and reinsurance products. In addition, Global Protegere Inc. has a diversified investment portfolio of \$200 billion as of December 2022.

The company has a strong track record of profitability and financial stability, with a robust risk management framework that enables it to manage a range of risks, including those related to climate change. Global Protegere Inc. plans to extend its risk management framework towards biodiversity thereby acting upon regulatory changes and stakeholder interests. In addition, the company has a strong commitment to sustainability and has developed a range of initiatives to reduce its environmental impact and support the transition to a low-carbon economy. The ambition level can be described as medium to high.

In the following, Global Protegere Inc. will apply all steps described in chapter B to provide illustrative examples. The following graphic gives an overview of the steps which are then described in detail below.



Fig. 15 Use case Global Protegere Inc.





Step 1a: In an internal meeting, the Sustainability Department of Global Protegere Inc. has agreed to use the framework of the TNFD as part of the company's ambitions to address biodiversity risks .

Following the meeting, the Sustainability Department recognised that many colleagues were not aware of the relevance of biodiversity loss for the insurance sector. EIOPA published a Staff paper on naturerelated risks and impacts for insurance in March 2023 that declared biodiversity risks as a bigger threat to the stability of the financial sector than climate related risks.¹ Aiming to address this knowledge gap, the Sustainability Department published a series of articles focusing on the most important concepts as well as a webinar for Global Protegere Inc.'s employees in which they further investigated the nexus between physical and transitional biodiversity risks and the insurance sector. At the end of the webinar, it was announced that there would be a kick-off meeting in the near future for all departments affected by the topic: Strategy & Governance, Products (incl. underwriting, claims and pricing) & Distribution, Risk Management, Steering & Reporting and IT.

Emphasising the importance of this new topic, Global Protegere Inc.'s management also decided to join the TNFD forum, a global multi-disciplinary consultative group of institutions which provides useful information and exchange on the TNFD framework but does not involve any obligations.

After gaining a better understanding of its role as an insurance company in the protection and restoration of biodiversity and ecosystems, Global Protegere Inc. makes an assessment of the regulatory landscape and identifies the following requirements related to biodiversity:

According to the SFDR, Global Protegere Inc.'s must publish a Principal Adverse Impact (PAI) statement for its life insurance activities by 30 June 2023 to disclose any negative impacts on sustainability factors including biodiversity. Given that Global Protegere Inc. has identified biodiversity as a relevant sustainability factor, it would need to disclose any negative impacts on biodiversity caused or contributed to by its investments in its PAI statement. The company would also need to explain what actions it is taking or plans to take to mitigate those negative impacts. Global Protegere Inc.'s reinsurance activities and its non-life business are not in scope of the SFDR.

In 2025, Global Protegere Inc.'s will also be required to report under the CSRD for the financial year 2024. Therefore, the Sustainability Department has already started with the materiality analysis to find out whether it has to report according to the ESRS E4, the reporting standard for biodiversity. In case biodiversity is identified as a material topic, the CSRD requires Global Protegere Inc. to disclose information on the "impact of the company's activities, products and services on biodiversity and related risks". This could include information on the company's use of natural resources, its impact on ecosystems, and its efforts to mitigate negative impacts and promote biodiversity.

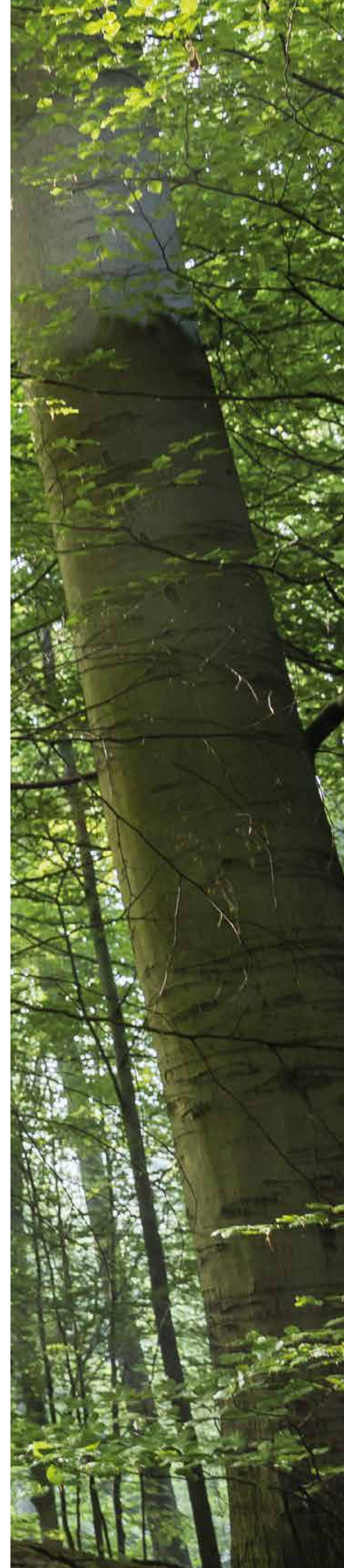
¹ EIOPA (2023): EIOPA Staff paper on naturerelated risks and impacts for insurance. Available at: <https://www.eiopa.europa.eu/system/files/2023-03/EIOPA%20Staff%20paper%20-%20Nature-related%20risks%20and%20impacts%20for%20insurance.pdf> (Accessed: 20 April 2023)

In addition, Global Protegere Inc. falls in the scope of the **EU Taxonomy Regulation** and the company already reported on the environmental objectives 1–2 with regards to its non-life business and investments. After the Environmental Delegated Act has been published for consultation by the European Commission in April 2023, it can be assumed that the Technical Screening Criteria (TSC) for the environmental objectives 3–6 of the EU Taxonomy will have to be applied from 2024 onwards, for the financial year 2023. In order to prepare the reporting, Global Protegere Inc. is already reviewing the TSC for biodiversity on the basis of Annex IV of the Environmental Delegated Act.

The **EU Nature Restoration Law** is a new initiative aimed at protecting and restoring biodiversity in the European Union as part of the Commission's wider Biodiversity Strategy for 2030. Currently there is no direct impact on Global Protegere Inc., but the Compliance Department will keep an eye on developments. In the future, it may be considered to ask the companies in the business initiation process how they are affected by this law and what measures they plan to take.

Step 1b: Based on the regulatory requirements and its own sustainability commitment, the management of Global Protegere Inc. has opted for a medium to high **level of ambition** in line with its positioning in the market. The company can build on existing disclosure when applying new regulatory requirements and reporting on biodiversity which could accelerate the identification of key risks and opportunities such as investments in nature-based solutions. In general, opting for a medium to high ambition level can help Global Protegere Inc. to move beyond basic reporting and start to integrate environmental considerations more fully into their decision-making processes. Joining the TFND or similar initiatives also counts as a voluntary commitment. Unfortunately, Global Protegere Inc. resources currently do not allow for a high level of ambition as this requires a significant investment of time and expertise to fully streamline biodiversity risks and opportunities into a company's strategy and operations. In turn, a low level of ambition is ruled out by the management for being too short-sighted due to the high dependence of the global economy on biodiversity and rising pressure from stakeholders.

Step 2a: In order to identify and evaluate biodiversity-related risks, opportunities, dependencies and impacts, Global Protegere Inc. uses the ENCORE tool to structure its (re-)insurance activities and investment portfolio according to the ENCORE sector logic. As part of the Taxonomy reporting, Global Protegere Inc. has already worked on a breakdown of economic activities according to the NACE classification system. Based on this mapping, each sector is now analysed with the help of the ENCORE tool and its focus on double materiality. Hence, Global Protegere Inc. explores how its economic activities impact and rely on ecosystem services and natural capital. The results are documented in an Excel sheet and provide the basis for the creation of heat maps.



The creation of a heat map requires to aggregate the results from the analysis with ENCORE. For this purpose, the mean value over the different impacts and the mean value over the different dependencies was calculated for each sector. The results are then presented in the form of a heat map. Global Protegere Inc. decides to include all sectors with a “medium” or “high” overall score in the next sub-steps.

Fig. 16 Example of a biodiversity heat map

Sectors	IT	Healthcare	Financial	Industrial	Energy	Materials	Utilities	Real estate
Direct physical input	3.00	3.22	N/A	2.89	2.90	2.93	4.00	3.50
Enables production process	N/A	2.50	N/A	1.96	2.39	2.77	2.83	N/A
Mitigates direct impacts	1.67	1.00	N/A	1.94	2.04	1.55	1.61	1.67
Protection from disruption	3.17	3.00	2.00	2.63	2.35	3.26	2.58	1.50
Total dependence on nature	2.61	2.43	2.00	2.36	2.42	2.63	2.76	2.22

ENCORE sector	Dependence on nature	Impact on nature	Overall
IT	Medium	High	Medium
Healthcare	Low	High	Medium
Financial	Low	Medium	Medium
Industrial	Low	High	Medium
Energy	Low	High	Medium
Materials	Medium	High	Medium
Utilities	Medium	High	Medium
Real estate	Low	High	Medium

Continue with these sectors (approx. 80% of corporate loan portfolio)

■ High materiality rating ■ Medium materiality rating ■ Low materiality rating

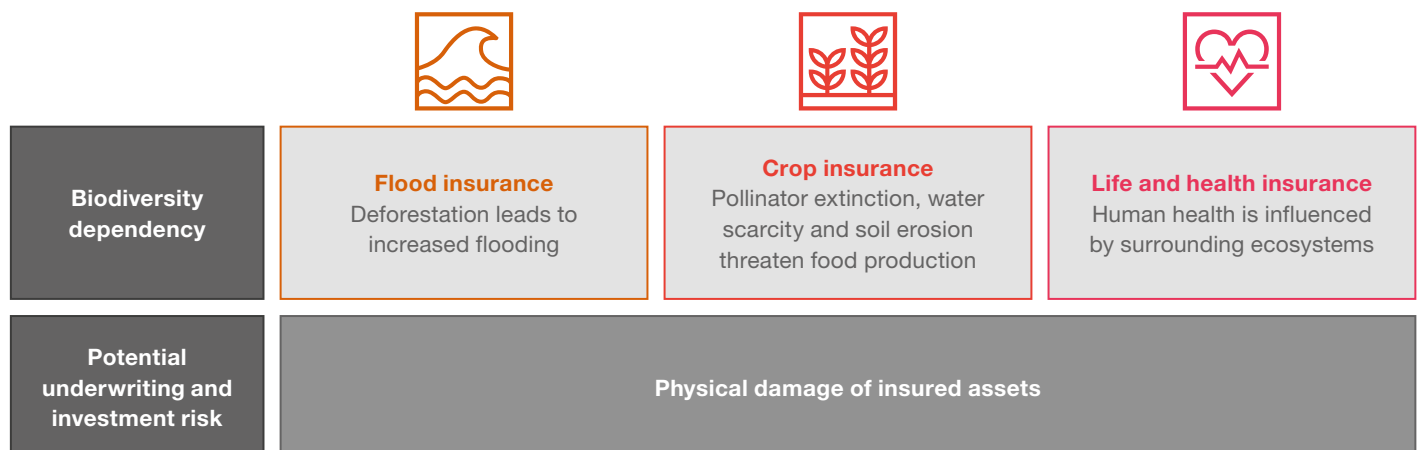
Step 2b: Global Protegere Inc.’s needs to gain a better understanding of where most relevant economic activities are located. Luckily, **location data** is already available for (re-)insurance activities as this information is key for the pricing process of premiums. Regarding investments activities, Global Protegere Inc. will request location data from **new investee companies** that operate in relevant sectors. For **existing business**, Global Protegere Inc. will initially use Exiobase’s input-output models, which provide information on which sectors operate in which countries. However, these are only a proxy and Global Protegere Inc. already plans to send out questionnaires to its existing investees asking for location data. In the future, Global Protegere Inc. hopes that the CSRD will make the data more accessible as companies will have to report on location-specific data.

Additionally, Global Protegere Inc. needs to identify whether some of its economic activities are located in biodiversity-sensitive areas. Therefore, the company purchases a dataset from IBAT.

For the **materiality analysis of financial risks**, the risk department took a closer look at the dependencies, impacts and location data of relevant sectors using the ENCORE tool:

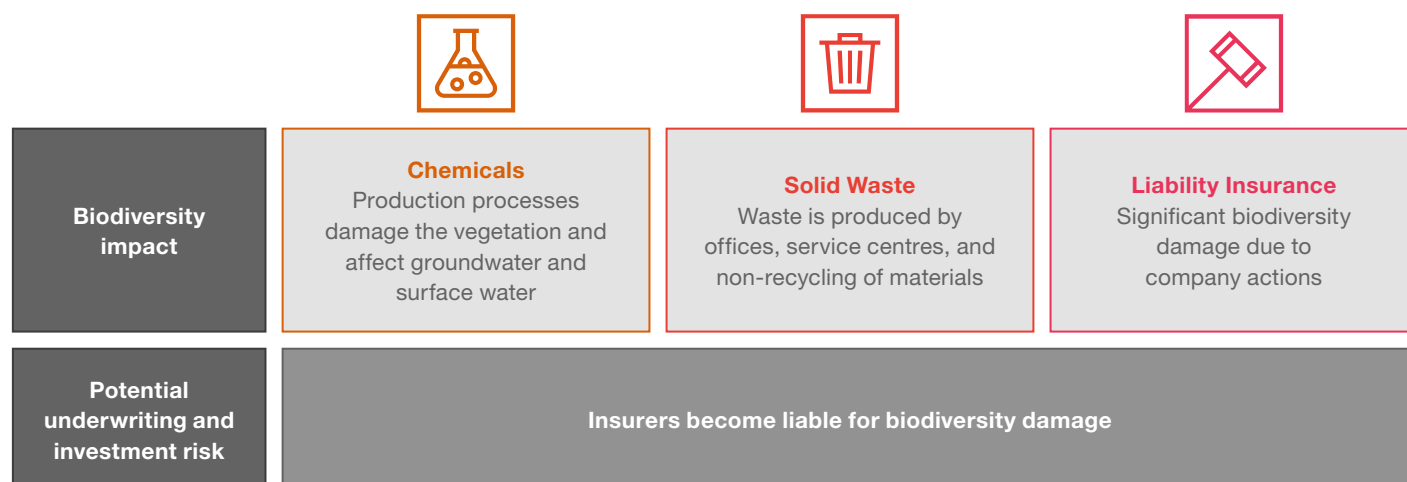
Regarding its dependencies, Global Protegere Inc. explores ways in which its economic activities rely on ecosystem services and natural capital. For (re-)insurance activities, a **dependency** that could be identified was mass stabilisation and erosion control provided by vegetation that covers and stabilises terrestrial, coastal and marine ecosystems, coastal wetlands and dunes. Moreover, vegetation on slopes also prevents avalanches and landslides, and mangroves, sea grass and macroalgae provide erosion and flood protection of coasts and sediments thereby lowering the risk exposure of Global Protegere Inc.'s policyholders. In addition, Global Protegere Inc. provides underwriting services to a major food corporation and is also invested in multinational agribusinesses. For those underwriting and investment activities, "high" dependencies were found, among others, in the agricultural sector where ecosystem services such as ground and surface water provide direct physical inputs while soil quality and pollination are enablers of agricultural production. In each case, a detailed look is taken e.g. to investigate at whether the sectors depend on groundwater or soil quality, and then research is conducted to see whether the areas of the company locations face challenges in this regard.

Fig. 17 Examples of biodiversity dependencies



Additionally, Global Protegere Inc. repeats the same process to investigate the impacts of its own operations and economic activities on ecosystem services and natural capital such as water footprints and environmental pollution. Based on the analysis with the ENCORE tool, waste produced by offices and service centres, and the non-recycling of materials has been assigned a medium materiality. In addition, Global Protegere Inc.'s underwriting activities also cover chemical companies. The underlying production processes of synthetic fertilisers heavily impact the soil quality as well as groundwater and surface water sources. Consequently, the materiality is classified as high.

Fig. 18 Examples of biodiversity impacts



To take advantage of **opportunities**, Global Protegere Inc. would like to do a market screening for nature-based solutions and probably provide financial support for reforestation projects, wetland restoration, or habitat conservation. In addition, it plans to incorporate natural capital considerations into underwriting by offering lower premiums to clients that adopt sustainable land use practices. For the materiality analysis of **non-financial risks**, the risk department of Global Protegere Inc. links the location data of policyholders and investee companies from the relevant sectors with the data purchased from IBAT. When location data and biodiversity-sensitive areas overlap, there is a material non-financial risk. This was the case for all relevant sectors.

The results will be used by the Global Protegere Inc. for the CSRD materiality analysis.

Step 2c: For the **scenario analysis**, the Global Protegere Inc. decides to wait for the scenarios of the NGFS which are expected to be published this year. Then it would like to proceed in the same way as for the scenario analysis of climate risks. The scenarios will also take transitional risks into account, which Global Protegere Inc. has not focused on yet.

Step 2d: As Global Protegere Inc. is currently in the process of analysing biodiversity risks, these risks are not yet sufficiently mitigated. In particular, the inside-out perspective is not yet part of the **risk management**. Regarding financial risks and non-financial risks, Global Protegere Inc. would like to ask the policyholders and investee companies with material (non-)financial risks if they are aware of their risk exposure and to what extent they have mitigation plans in place (engagement strategy). If no plans are in place, Global Protegere Inc. requires the development of transition plans. Otherwise, conditions for insurance coverage could deteriorate in the future or Global Protegere Inc. decides to divest from certain companies.

Step 3a: Global Protegere Inc.'s Sustainability Department has already taken a closer look at the Kunming-Montreal Global Biodiversity Framework (GBF) and familiarised itself with the implications for financial companies. In particular, goals 14 (directing financial flows towards GBF goals), 15 (reporting) and 19 (increasing financial resources) are considered as relevant.



As the final SBTN guidance is not yet published, Global Protegere Inc. uses the SBTN interim targets for now. In the near future, it will probably join the SBTN. Every target has corresponding KPIs in order to measure progress towards achieving the goal.

As biodiversity is a multi-dimensional construct, Global Protegere Inc. decides to formulate a multi-dimensional policy for biodiversity. Global Protegere Inc. already has an overarching climate policy, which will be complemented with a biodiversity policy by the Sustainability Department. It will cover different aspects as for example land use, water use, use of pesticides, and deforestation.

Step 3b: The comprehensive biodiversity policy will initially only apply to new business. Global Protegere Inc. will then step by step apply it to existing business by engaging with the respective policyholders and investee companies in its portfolios.

Step 4a: Global Protegere Inc. identified all biodiversity KPIs it needs to report on (from SFDR, EU Taxonomy, and CSRD) and grouped them. It can already report on most KPIs (groups) after having carried out the previous steps.

Step 4b: Some data will be purchased and will then be subjected to a critical quality check. The management will also be informed about biodiversity risks once a month as part of the internal climate and environmental risk radar.

Step 4c: As already mentioned, Global Protegere Inc. will collect geodata as part of the business initiation process as a standard process from now on. For existing business, it will collect the required data through questionnaires. This will happen step-by-step, starting with the most relevant sectors. The different KPI groups have been assigned to different departments, which are responsible for the availability and quality of the data. The IT department has already started preparing the technical implementation.

3 Information on regulatory requirements

CSRD

Under the CSRD, which aims to put sustainability reporting on a par with financial reporting, the European Financial Reporting Advisory Group (EFRAG) has developed European reporting standards (the ESRSs). The first draft of these standards was submitted to the EU at the end of 2022. One ESRS deals with biodiversity and ecosystems (ESRS E4) and applies the principle of double materiality. Thus, companies will be required to report on the risks, opportunities and impact of the company in relation to biodiversity and ecosystems (financial materiality/outside-in perspective), as well as on the impact of the company on biodiversity and ecosystems (non-financial materiality/inside-out perspective). If the materiality analysis prescribed by the CSRD reveals biodiversity risks that are considered material for the company's business model, ESRS E4 must be applied from 2025 for the financial year 2024 by the first group of companies (see step 2b).

EU taxonomy

The protection and restoration of biodiversity and ecosystems is environmental objective 6 of the EU taxonomy. A public consultation on the Delegated Act for the four EU environmental objectives other than the two climate objectives has been published by the EU, a final version of the Delegated Act is expected in June 2023. For taxonomy compliance, an economic activity must make a significant contribution to one of the environmental objectives and should not cause significant harm to the other five environmental objectives ("do no significant harm"). In relation to biodiversity, this means that a taxonomy-compliant economic activity should not cause harm to the good status and resilience of ecosystems or the conservation status of habitats and species. For the two climate objectives industrial companies must report on taxonomy compliance for the first time in 2023 for the financial year 2022; the financial industry is due to start one year later. For the four other environmental objectives reporting on taxonomy compliance is due to start one year later respectively. In the meantime, since 2022, financial and industrial companies are already obliged to report a limited amount of quantitative and qualitative information with regard to the climate and environmental objectives, the so called taxonomy eligibility.

SFDR

Under the SFDR, PAI statements must be published for the financial year 2022 onwards. The template also includes information on biodiversity, as the share of investments in companies whose sites are located in or near biodiversity-sensitive areas must be disclosed if the activities of these companies have a negative impact on these areas (SFDR Annex I).

EU Nature Restoration Law (proposal)

In June 2022, the EU Commission published a legislative proposal for nature restoration. This law is intended to make the EU Biodiversity Strategy and the Global Biodiversity Framework adopted at COP15 legally binding, and contains binding targets for the protection of biodiversity – for example, that at least 20% of land and marine areas should be placed under protection by 2030 and the use of pesticides should be halved.

Risk management

The ECB published a guide on climate and environmental risks in 2020. The guide clearly aims to integrate climate and environmental risks, including biodiversity risks, into strategy, risk management and reporting of the institutions it supervises. The ECB expects SIs to fully comply with all recommendations by the end of 2024. The German financial supervisor BaFin also published a guide on sustainability risks in 2020, which includes biodiversity risks. The contents of the guide were included in the consultation version of the 7th MaRisk amendment.

Contacts



Ullrich Hartmann
Partner, Leader Sustainable Finance
Germany
Tel: +49 69 9585-2115
ullrich.hartmann@pwc.com



Angela McClellan
Director, Sustainable Finance
Germany
Tel: +49 30 2636-1040
angela.mcclellan@pwc.com

Authors

Angela McClellan
Director, Sustainable Finance
Germany
Tel: +49 30 2636-1040
angela.mcclellan@pwc.com

Carolin Isabel Schwarz
Associate
Germany
Tel: +49 69 9585-3483
carolin.isabel.schwarz@pwc.com

About us

Our clients face diverse challenges, strive to put new ideas into practice and seek expert advice. They turn to us for comprehensive support and practical solutions that deliver maximum value. Whether for a global player, a family business or a public institution, we leverage all of our assets: experience, industry knowledge, high standards of quality, commitment to innovation and the resources of our expert network in 152 countries. Building a trusting and cooperative relationship with our clients is particularly important to us – the better we know and understand our clients' needs, the more effectively we can support them.

PwC Germany. More than 13,000 dedicated people at 21 locations. €2.61 billion in turnover. The leading auditing and consulting firm in Germany.

For more information about the PwC Global Centre for Nature Positive Business please visit:



Thank you for
your valuable input

Ullrich Hartmann
Germany

Christoph Schellhas
Germany

Lena Giehler
Germany

Karoline Hallmeyer
Germany

Zarah Hausen
Germany

Klaus Böcker
Germany

Taylor Carroll
Netherlands

Galia Wells
United Kingdom

Tom Engelhard
United Kingdom

Kathleen Allen
Canada



Managing biodiversity risks and opportunities

Published by PricewaterhouseCoopers GmbH Wirtschaftsprüfungsgesellschaft

By Ullrich Hartmann, Angela McClellan and Carolin Isabel Schwarz

May 2023, 48 Pages, 18 Figures, Soft cover

All rights reserved. This material may not be reproduced in any form, copied onto microfilm or saved and edited in any digital medium without the explicit permission of the editor.

This publication is intended to be a resource for our clients, and the information therein was correct to the best of the authors' knowledge at the time of publication. Before making any decision or taking any action, you should consult the sources or contacts listed here. The opinions reflected are those of the authors. The graphics may contain rounding differences.

